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# The design, development and implementation of electronic professional portfolios for educators

by

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## DEO GLORIA

To my parents.

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# Terminology used in this study

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Academic	It has to do with learning and is related to a learning institution.
Analyse	To examine and find the essence, elements or structure of something.
Analysis	A detailed examination of the essence, elements or structure of a concept.
Assessment	Appraisal or valuation.
Assessment criteria	Criteria or standards something is judged by.
Bulletin board	An electronic communication platform where messages are submitted.
CD ROM	Compact disc read only memory
Code of conduct	A standardised norm of behaviour.
Competencies	The ability to perform specific tasks, abilities.
Component	A part of a larger whole.
Design	A preliminary plan or concept for the making or production of a specific product.
Development	To bring into existence or in a visible state.
Education system	The official guidelines that prescribes the principles of the teaching and learning model of a country.
Education	Having to do with teaching and learning.
Educator	Any person who teaches, educates or train people.
Electronic portfolio	A purposeful collection of work that is presented by electronic means and displays an individual's efforts, progress and achievements in one or more areas.
E-mail	An electronic mail service.
Evaluation	Assessment or appraisal of something.
Flexible learning	Learning that is flexible in terms of mode, time and location.
Hardware	Technological peripherals e.g. computers, printers.
Implementation	To put a design or plan into effect.
Internet	An international computer network.
Learner	A pupil or student who is taught or trained by an educator.
List server	An electronic communication platform where messages are submitted and distributed to subscribers of the list server.

Look and feel	The unique appearance of an electronic presentation.
Model	A simplified description of a system and/or a graphic representation of a proposed structure.
Module	One subject of a qualification.
Occupational	Referring to an occupation.
Outcomes	What the learner should be able to do or demonstrate as the result of a learning programme.
Portfolio	A purposeful collection of work and displays an individual's efforts, progress and achievements in one or more areas.
Procedure	The mode of performing a task or a series of actions conducted in a certain order or manner.
Process	A series of stages of performing a task
Professional	Belonging to a profession and having the skill of a professional.
Qualification	All diplomas, certificates and degrees presented by educational institutions.
Skills	Abilities, expertness.
Software	Computer programmes.
Standards	A norm or principle to which others should conform.
Telematic Education	A system of flexible learning including different education modes and can include distance education.

## Acronyms used in this study

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CAE	Computer-assisted Education
DOE	Department of Education
ETQA	Education and Training Qualifications Authority
FET	Further Education and Training
GET	General Education and Training
HET	Higher Education and Training
IS	Information Science
ISP	Internet Service Provider
IT	Information Technology
MA	Master in Arts
MEd	Master in Education
NSB	National Standards Body
NQF	National Qualifications Framework
OBA	Outcomes-based Assessment
OBE	Outcomes-based Education
SACE	South African Council for Educators
SAQA	South African Qualifications Authority
SGB	Standards Generating Body
TLO	Teaching and Learning Outcomes
WWW	World Wide Web

# Opsomming

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## Die ontwerp, ontwikkeling en implementering van elektroniese professionele portefeuljies vir opvoeders

deur

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Die implementering van assessering met behulp van elektroniese portefeuljies moet binne 'n spesifieke raamwerk of model plaasvind. Hierdie navorsing is geïnisieer om so 'n model daar te stel en fokus daarom op:

- Die prosesse en prosedures wat gevolg word tydens die implementering van hierdie assessering;
- Die insette van die opvoeder voor implementering;
- Die opvoeder se rol rakende die voorsiening van toepaslike werktuie om elektroniese portefeuljies saam te stel;
- Die assesseringskriteria en assesseringsinstrument(e).

Die Suid-Afrikaanse onderwysstelsel het sedert 1995 betekenisvolle veranderings ondergaan. Hierdie nuwe onderwysstelsel is hoofsaaklik op uitkomsgebaseerde onderwys (UGO) gebaseer, met die uitgangspunt dat leerders aan die einde van die leerproses in staat moet wees om iets te kan *doen*.

Portefeuljies kan in UGO gebruik word, want dit voorsien die opvoeder van tasbare bewyse van 'n leerder se vermoëns. Elektroniese portefeuljies is 'n betekenisvolle versameling van werk wat op 'n elektroniese wyse aangebied word en 'n leerder se vordering en prestasies insluit. Die gebruik van elektroniese portefeuljies is baie gewild omdat dit 'n "draagbare" en toeganklike werktuig vir lewenslange leer is.

Die South African Council for Educators (SACE) het ontstaan om as beskermer van die professionalisme van opvoeders op te tree en alle opvoeders word verplig om by die SACE te registreer. Daar moet ook elke 3 jaar aansoek gedoen word om herregistrasie en elektroniese portefeuljies kan met sukses aangewend word om bewyse van professionele groei en ontwikkeling aan te bied.



Assessering met behulp van portefeuljes is in een van die modules van die MEd (Rekenaargesteuende Onderwys) van die Universiteit van Pretoria geïmplementeer. Ten einde leerders in staat te stel om elektronies portefeuljes te ontwikkel, is 'n stel portefeulje-template in Microsoft Word 97, met aanlyn-gidse ontwerp en ontwikkel. Vir die leerders wat oor 'n hoër vlak van rekenaarvaardighede beskik, is 'n stel webgebaseerde portefeulje-template ontwikkel.

Assessering van die elektroniese portefeuljes word met behulp van 'n assesseringsinstrument gedoen en alhoewel dit die eerste keer was wat hierdie groep leerders van elektroniese portefeuljes gebruik gemaak het, het hulle aangedui dat hulle dit graag sou wou uitbrei om die ander modules in te sluit.

Die voorgestelde model vir die implementering van assessering met behulp van elektroniese portefeuljes bestaan uit vyf fases:

- Die analisefase – 'n analise van die doel en komponente van die elektroniese portefeulje, die verskillende vaardigheidsvlakke van die leerders en die beskikbare infrastruktuur word gedoen;
- Die ontwerp- en ontwikkelingsfase – meerdere opsies of strategieë word daargestel om 'n diverse groep leerders in staat te stel om elektroniese portefeuljes te ontwikkel en 'n toepaslike assesseringsinstrument word ontwikkel.
- Die sensiteringsfase – die leerders word bewus gemaak van die belangrikheid van elektroniese portefeuljes en word gemotiveer om dit aan te wend as 'n werktuig vir lewenslange leer;
- Die saamstelfase – die leerders stel hulle eie elektroniese portefeuljes saam, volgens die gespesifiseerde prosesse en prosedures;
- Die assesseringsfase - formele opvoederassessering, meer informele portuurgroepassessering en selfassessering vind plaas.

Hierdie navorsingsprojek het hopelik die meriete van die ontwikkeling van elektroniese portefeuljes vir opvoeders daargestel en beklemtoon dat elektroniese, professionele portefeuljes as 'n nuttige werktuig deur opvoeders aangewend kan word!

Sleutel terme: Elektroniese portefeuljes; Assessering; Evaluering; Internet; Uitkomsgebaseerde Onderwys; Vaardighede; Model; Portefeulje-assessering; Onderwysersopleiding; Uitkomsgebaseerde Assessering.

# Abstract

---

## **The design, development and implementation of electronic professional portfolios for educators**

by

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Department: Teaching and Training Studies  
Degree: Philosophiae Doctor in Computer-assisted Education

The implementation of electronic portfolio assessment should be done within a specific framework or model. This research was initiated to provide such a model and it focuses on:

- The processes and procedures followed when implementing electronic portfolio assessment;
- The input of the educator before implementation;
- The educator's role regarding the provision of applicable tools to compile electronic portfolios;
- The assessment criteria and assessment instrument(s).

The South African education system has changed considerably since 1995. This new education system is based mainly on Outcomes-based Education (OBE) whose main principle is that learners should be able *to do* something at the end of any learning process.

Portfolios can be used in OBE because it provides the educator with visible proof of learners' accomplishments. Electronic portfolios are purposeful collections of work, presented by electronic means and displays learners' efforts, progress and achievements. The use of electronic portfolios is gaining popularity because it is a portable and accessible tool for lifelong learning.

The South African Council for Educators (SACE) was established to act as guardian of professionalism of educators and all educators are compelled to register with the SACE. Re-registration takes place every 3 years and electronic portfolios can be used successfully to present the council with evidence regarding the professional growth and development of educators.

Portfolio assessment was incorporated as part of one of the modules of the MEd (Computer-assisted Education) at the University of Pretoria. To enable these MEd learners to compile electronic portfolios, a set of portfolio templates with on-line guides was designed and developed in Microsoft Word 97. For the more computer skilled learners, an additional set of webbased templates was developed.

The electronic portfolios were assessed according to an assessment instrument and although it was the first electronic portfolios compiled by this group of learners, they indicated that they would like to expand their electronic portfolios to include information and assignments regarding other modules too.

The suggested model for the implementation of electronic portfolio assessment comprises of five phases:

- The analysis phase - an analysis of the purpose and components of the electronic portfolio, the different skill levels of the learners and the available infrastructure should be done;
- The design and development phase - multiple pathways or strategies to enable a diverse group of learners to compile electronic portfolios and a suitable assessment instrument should be developed;
- The sensitising phase - the learners should be made aware of the importance of electronic portfolios and should be motivated to utilise it as a tool for lifelong learning;
- The compilation phase – the learners should compile the electronic portfolios according to the specified processes and procedures;
- The assessment phase - formal educator assessment, more informal peer assessment and self-assessment should be done.

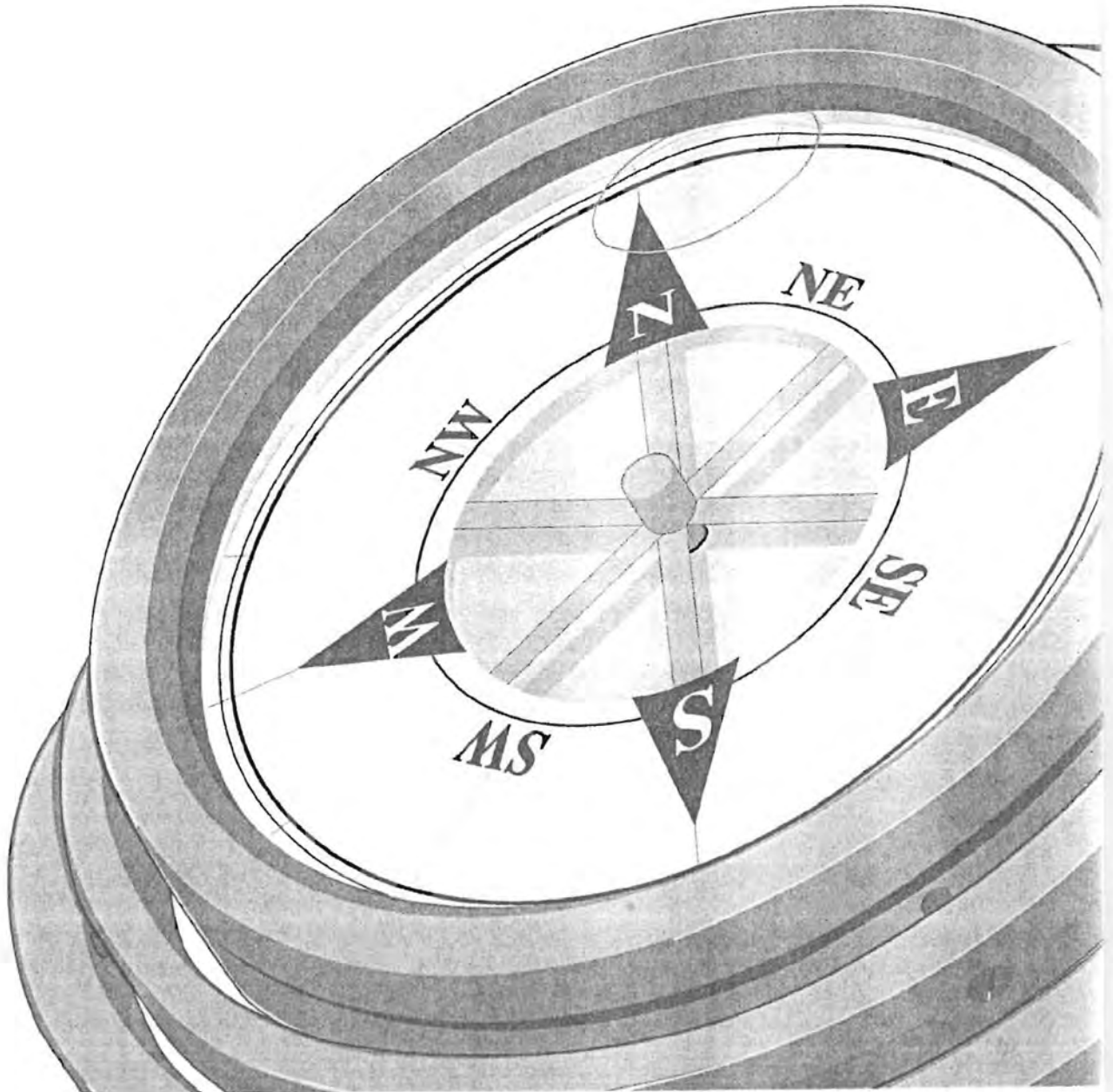
Hopefully, this research project have demonstrated the outstanding merit of the developing and implementing of electronic, professional portfolios for educators. It can be derived from this study that the electronic, professional portfolio is an authentic tool to document teaching excellence!

Key terms: Electronic portfolios; Assessment; Evaluation; Internet; Outcomes-based Education; Competencies; Model; Portfolio assessment; Educator Training; Outcomes-based Assessment.

# 1

## Orientation

---



## 1.1 Introduction

This chapter will provide an orientation to this research and is presented as follows:

- Background;
- Research problem;
- The purpose of the research;
- The research programme;
- Presentation of the research.

## 1.2 Background

*"Academic, occupational and professional requirements will no longer be stated in terms of the input of content or the time taken. Instead, the emphasis will be on the acquisition of applied competencies which will be described using outcomes."* (Department of Education, 1997c:51).

In the past, an educator was regarded as qualified on the basis of a recognised qualification that emphasised the time a learner spent on acquiring the qualification, but in the future, qualifications will be defined in terms of their outcomes and these will be assessed in an integrated manner that emphasise the *competencies* of the educator.

Since 1995, all education in South Africa should be based on an Outcomes-based Education model. According to the Department of Education (1997c:59) an educator qualification that is based on the outcomes-based education model, will consist of three dimensions, namely the professional, occupational and academic dimensions. Knowledge and understanding are seen as part of the academic dimension (*knowing that*) while the occupational dimension is concerned with the skills that should be required (*knowing how to*). The professional dimension concerns the values and attitudes or orientation that are integrated into the other two dimensions.

Emphasis is placed on the integration of the academic, occupational and professional dimensions of an outcome within three kinds of competencies (foundational, practical and reflexive) and with an ethical value orientation that constitutes professionalism and applied competence. In this context one needs to engage in an integrated assessment procedure that can capture the complexity and nuances of a learner's knowledge, skills and values, before one can make valid judgements (Department of Education, 1997c:69).

The South African Council for Educators (SACE) has been established to act as the guardian of the professionalism of educators and in order to practise as an educator in South Africa, registration is compulsory. The SACE has also set standards, criteria and a specific code of conduct that teachers have to adhere to as a pre-requisite for registration and licensing. Educators will have to renew their licenses regularly (possibly every three years). Specific professional requirements will have to be fulfilled in order to qualify for re-licensing e.g. "*successful completion of in-service programmes, performance appraisal for developmental purposes and demonstrated compliance with the Code of Conduct.*" (Department of Education, 1997c:43). However, logistical problems may arise as educators are expected to submit lengthy paper-based evidence that they qualify for re-licensing. It was suggested that the SACE be linked to the South African Qualifications Authority (SAQA) database to enable them to have access to each educator's qualifications. Another means of obtaining this important information, is by using electronic portfolios.

Electronic portfolios can also be used for assessment purposes in the learning environment, especially when an Outcomes-based Education (OBE) model is implemented. Many researchers, including Tillema (1998) indicated that electronic portfolios have many uses, one being that it can function as an alternative assessment tool. It can also be used to inform other people (e.g. the educator or peers) about the learner's skills and competencies and allow the learner to demonstrate these skills and competencies.

The development of technology and the World Wide Web (WWW), created a platform that can be used for many different purposes, including education and training. Computer technology is also relatively accessible to many people and creates a vehicle for learners to market themselves as well as enabling them to compare their competencies nationally and internationally. Although electronic portfolio development requires a very high level of computer skills and include many time consuming activities, there are many advantages to using electronic portfolios.

### **1.3 The research problem**

*Computer-assisted Aids for Education* (RMX 880) is one of the compulsory modules of the MEd (Computer-assisted Education (CAE)), MEd (Information Technology (IT)) and MA (Information Science (IS)) qualifications of the University of Pretoria. Most of the learners that register for these qualifications are educators. They will have to comply with the licensing standards as set by the SACE, and for this reason the presenter of this module for 1999 decided to implement electronic portfolio assessment in this module. In doing so, the

learners will be equipped with a tool for lifelong learning, while presenting their assignments to the module presenter in the form of an electronic portfolio. Based on the assumption that the computer skills of the group of learners who will register for this module will vary, it is also assumed that the presenter of this module will experience problems with the implementation of electronic portfolio assessment in this module. The presenter needed a model for implementing portfolio assessment as a strategy, due to a lack of knowledge and skills regarding:

- The processes and procedures to be followed when implementing electronic portfolio assessment in educator training, while taking into consideration the diverse group of learners registered for this module;
- The input of the presenter before the implementation phase;
- The presenter's role regarding the provision of applicable tools, to enhance electronic portfolio compilation;
- The assessment criteria and assessment instrument(s) an educator will need to develop to assess the electronic portfolios.

This research is an attempt to provide such a model.

## 1.4 The purpose of this research

The purpose of this research is to establish a model for the implementation of electronic portfolio assessment in education.

To be able to establish such a model, an attempt will be made to establish:

- The processes and procedures that need to be followed when implementing electronic portfolio assessment in educator training, taking into consideration the diverse group of learners;
- The input of the presenter before implementing electronic portfolio assessment;
- The presenter's role in providing instruments/tools for the learners, to ensure successful implementation of electronic portfolio assessment;
- The development of assessment criteria and an assessment instrument for electronic portfolio assessment.

## 1.5 The research programme

The research programme consists of the following phases:

- Analysis of the training environment context;
- Construction of tools for compiling electronic portfolios;
- Implementation of strategies pertaining to electronic portfolios assessment;
- Revision of the tools used for compiling electronic portfolios;
- Designing of a model for implementing electronic portfolio assessment.

### 1.5.1 Analysis of the training environment context

The training environment should be analysed regarding the purpose of the module, the skills levels of the learners and the relevant literature.

An analysis of the purpose of the module will be made, taking into consideration:

- The outcomes of the module;
- The content of the module.

The skills levels of the learners will be analysed regarding their level of:

- Computer skills;
- Critical thinking skills;
- Creative ability;
- Communication skills.

A comprehensive literature study will be done. International literature regarding the following topics will be investigated in detail:

- Education in South Africa, with special reference to Outcomes-based Education, the role of the National Qualifications Framework (NQF) and the South African Qualifications Authority (SAQA);
- Teacher education, including teacher qualifications and the role of the South African Council for Educators (SACE);
- Electronic portfolios, the types and uses of electronic portfolios, as well as its components;
- Electronic portfolio assessment and the criteria involved in the construction of an assessment instrument.



## **1.5.2 Construction of tools for compiling electronic portfolios**

The learners will be provided with tools to enable them to construct electronic portfolios. These tools will have to make provision for learners with different levels of computer skills and should be designed and developed accordingly.

The design will be done, based on the results of the analysis and will include setting design specifications for:

- Microsoft Word 97 portfolio templates;
- On-line guides to accompany the templates;
- An assignment to provide the learners with the task to compile an electronic portfolio;
- The presentation of appropriate journal articles.

The development based on the design specifications will be done, and the following will be developed:

- Microsoft Word 97 portfolio templates;
- On-line guides to accompany the templates;
- The formulation of an assignment;
- Presentation of applicable journal articles.

## **1.5.3 The pre-implementation and implementation phases of electronic portfolio assessment**

The implementation of electronic portfolio assessment will be preceded by a pre-implementation phase that includes the following:

- The development of a schedule for the module;
- The establishment of an electronic list server and bulletin board;
- The development of a CD ROM with all the information regarding this module;
- The development of a questionnaire regarding the computer skills of the learners;
- The establishment of preliminary arrangements regarding the processes and procedures the learners need to follow;
- The development of an electronic slideshow to provide learners with the theoretical background regarding electronic portfolios;
- The development of a demonstration of the processes and procedures followed while compiling the electronic portfolios;

- The development of a questionnaire regarding these processes and procedures;
- The development of assessment criteria and an assessment instrument for electronic portfolio assessment.

The implementation phase will consist of the following:

- Presenting an orientation to the learners regarding the module they are registered for;
- Providing an introduction to the educators, and presenting the CD ROM containing the information regarding the module and assignments;
- Administering the questionnaire regarding computer skills;
- Processing the results of the questionnaire regarding computer skills;
- Presenting the electronic slideshow and the demonstration to the learners;
- Administering the questionnaire regarding processes and procedures followed while compiling the electronic portfolios;
- Assessing the electronic portfolios;
- Processing the results of the questionnaire regarding the processes and procedures followed while compiling the electronic portfolios;
- Evaluating the processes and procedures followed by the learners.

#### **1.5.4 Revision of the tools used for compiling electronic portfolios**

The feedback from the learners regarding the provided templates, will determine whether revised templates should be developed. The revision of the templates will be done based on the feedback from the learners, to meet their specified needs.

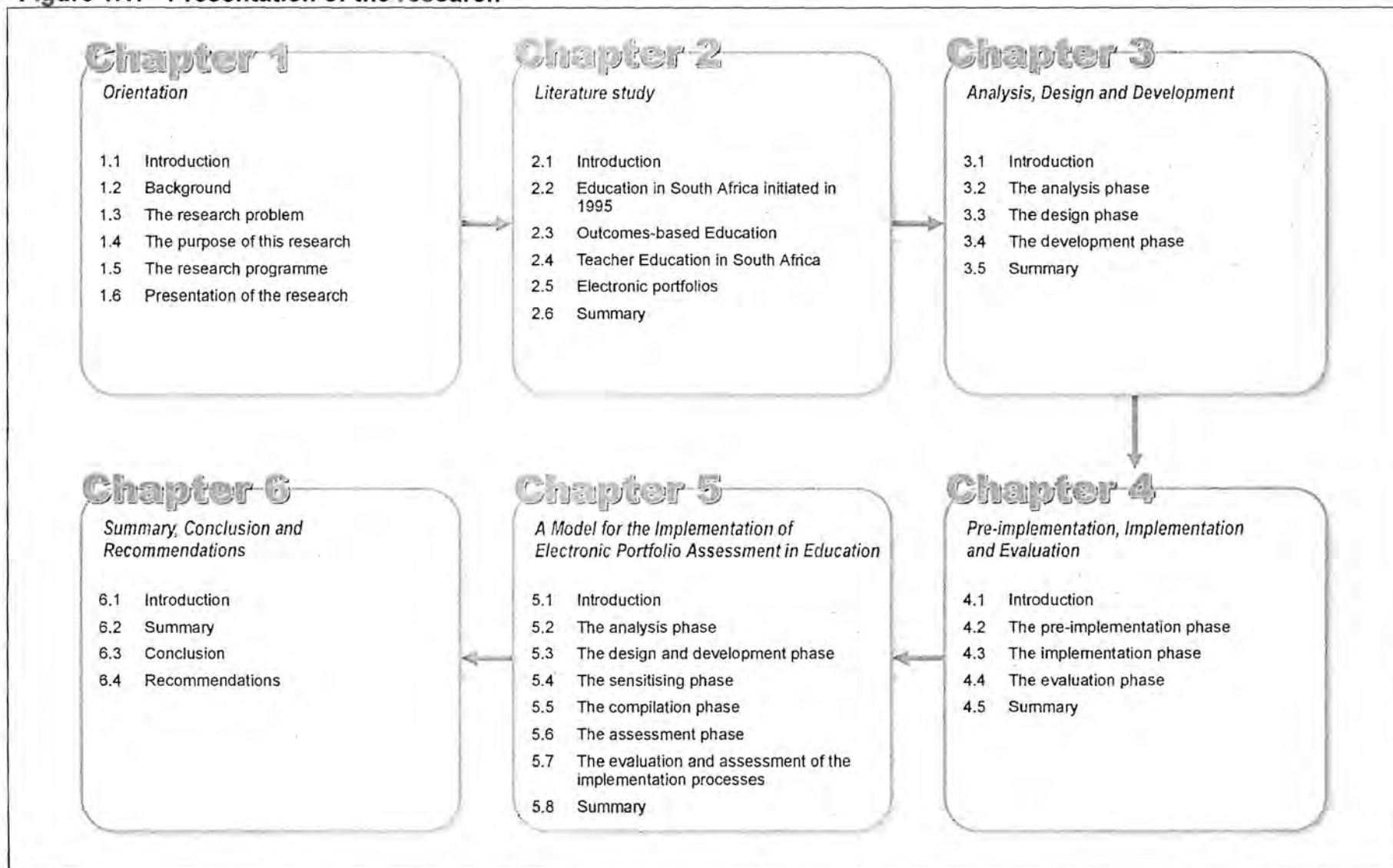
#### **1.5.5 Designing a model for implementing electronic portfolio assessment**

A model for the implementation of electronic portfolio assessment in education will be designed and developed.

### **1.6 Presentation of the research**

The research will be presented in 6 chapters, as presented graphically in Figure 1.1.

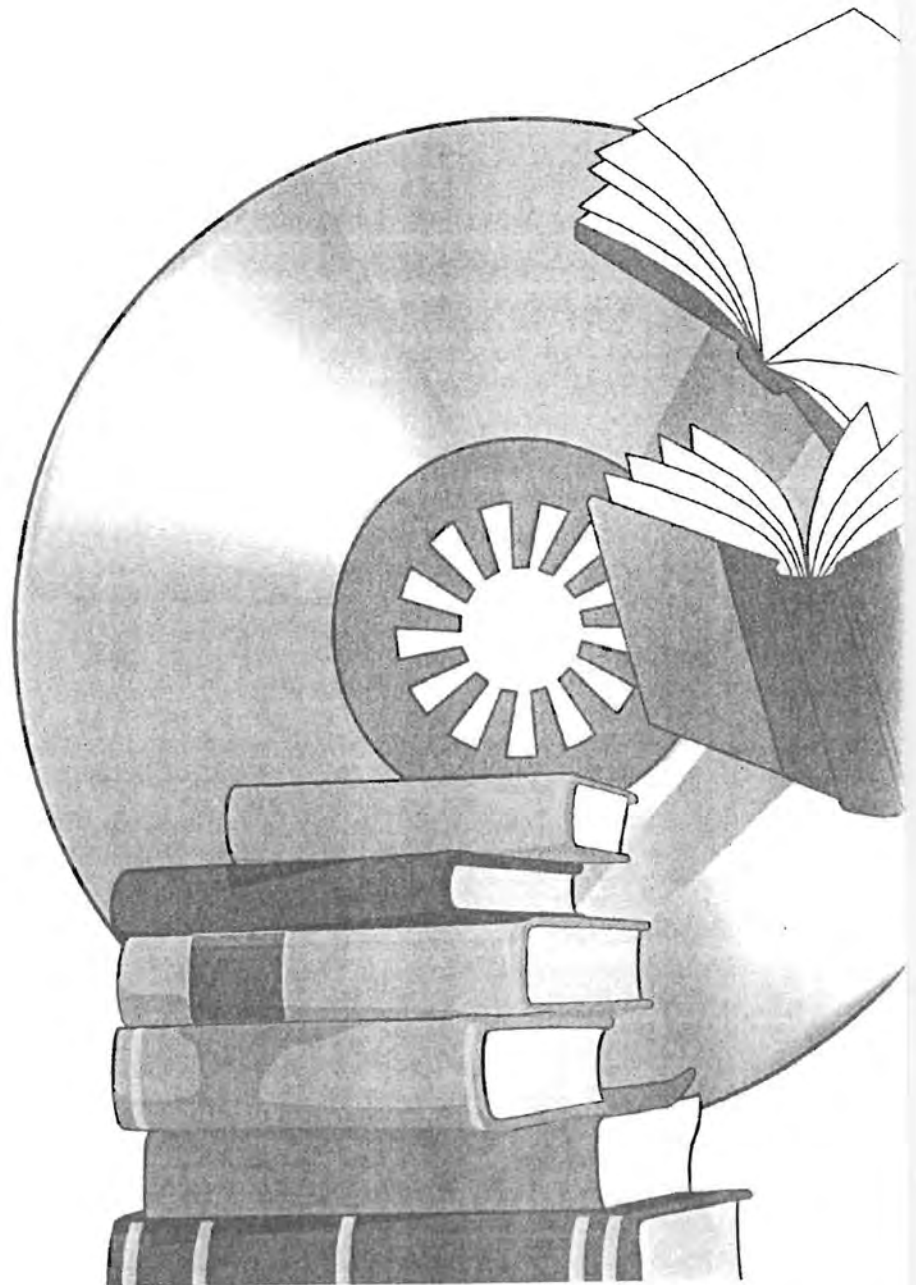
Figure 1.1: Presentation of the research



# Literature Study

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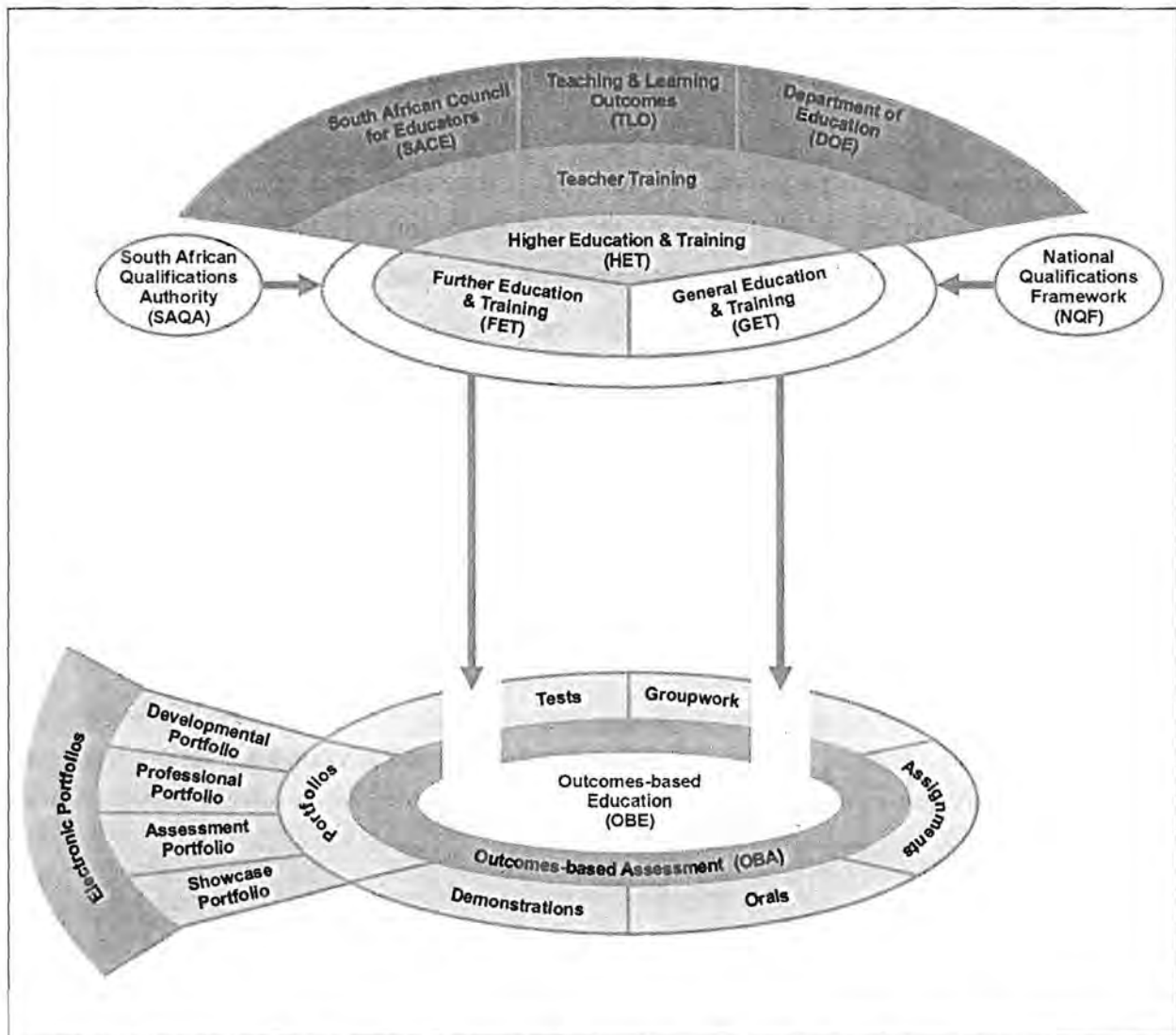
# 2



## 2.1 Introduction

The literature study, as presented in this chapter provides an overview of the new educational system in South Africa, initiated in 1995 (Departement van Onderwys, 1995). The structures, frameworks, acts and policy documents regarding the educational environment, specifically Higher Education and Training (HET), are investigated. The use of electronic portfolios in education is closely related to assessment, and therefore the main focus of this literature study will be on the views and research results of many researchers working in the field of electronic portfolios, portfolio development and assessment. Figure 2.1 is a graphical presentation of the contents of Chapter 2.

**Figure 2.1: The information presented in Chapter 2**



## 2.2 Education in South Africa initiated in 1995

South Africa's education system is in a process of widespread change since 1995 and a complete paradigm shift is being made, suggesting changes to the entire educational process (Department of Education, 1997a). The aim of these changes is to produce more qualified learners, who are equipped to deal with the demands of "... *an increasingly competitive world* " (Department of Education, 1997a:6). Transforming a complete educational system does not happen overnight, and therefore new structures are established to determine and implement this transformation process.

The National Qualifications Framework (NQF) and the South African Qualifications Authority (SAQA) are two of the important driving forces in the transformation process.

### 2.2.1 The National Qualifications Framework

The National Qualifications Framework (NQF) was established with the purpose to provide a framework for urgent reforms necessary in South African education and training (HSRC, 1995:5). The framework can be presented as a matrix that indicates the levels and bands of the new education and training dispensation. Figure 2.2 is a graphical representation of the NQF levels and bands as adapted from the Government Gazette (Department of Education, 1997b:12).

The objectives of the National Qualifications Framework (NQF), according to the Department of Education (1997c:35), are:

- To create an integrated national framework for learning achievements;
- To facilitate access to education and mobility and progressions within education, training and career paths;
- To enhance the quality of education and training;
- To accelerate the redress of past unfair discrimination in education, training and employment opportunities, to contribute to the full personal development of each learner for the social and economic development of the nation at large.

The first and foremost purpose with the NQF is to provide a framework for transformation in education and training in South Africa. Setting national standards for education and training is also one of the reasons for the establishment of the NQF. The national standards "... *were housed within a qualifications framework designed to promote lifelong learning, integrate*

Figure 2.2: The levels, bands and fields of the NQF (Adapted from the Department of Education, 1997b:12)

NQF LEVEL	BAND	DESCRIPTION	TYPE OF QUALIFICATION	
8 7 6 5	Higher Education and Training Band (HET)	<ul style="list-style-type: none"> <li>Consists of 4 levels</li> <li>Divided into 12 fields</li> <li>Field 08: "Education, Training and Development"</li> </ul>	Doctorates ↑ Diplomas	
4 3 2	Further Education and Training (FET)	<ul style="list-style-type: none"> <li>Consists of 3 levels</li> <li>Divided into 12 fields</li> </ul>	Certificates	
1	General Education and Training (GET)	<ul style="list-style-type: none"> <li>Consists of 4 phases</li> <li>ABET levels 1-4</li> <li>Traditional School education</li> <li>Grades 0-9</li> </ul>	Senior Phase ----- Inter- mediate Phase ----- Foun- dation Phase ----- Pre- school	ABET Level 4 ----- ABET Level 3 ----- ABET Level 2 ----- ABET Level 1

education and training, recognise learning gained outside of formal institutions and allow for flexible, portable credits and qualifications ..." (SAQA, 1997:3).

## 2.2.2 The South African Qualifications Authority

The South African Qualifications Authority (SAQA) was established when the SAQA act (4 October 1995:Gazette No 16725) was passed (SAQA, 1997:4). "*The mission of SAQA is to ensure the development and implementation of a National Qualifications Framework.*" (Department of Education, 1997c:35).

"*The functions of SAQA are to:*

- *oversee the development of the National Qualifications Framework (NQF);*
- *formulate and publish policies and criteria for registration of bodies responsible for establishing education and training standards and the accreditation of bodies responsible for monitoring and auditing achievements in terms of standards and qualifications;*
- *oversee the implementation of the NQF;*
- *advise the Minister of Education and Labour on registration of standards and qualifications;*
- *be responsible for the finances of SAQA".* (Department of Education, 1997c:35).

It consists of a chairperson and nominated members from the following sectors: labour, business, universities, technikons, teachers' and technical colleges, adult basic education and training, early childhood development, the teaching profession, and special education needs (SAQA, 1997:4). SAQA has authority over the NQF.

The National Standards Bodies (NSBs) form an integral part of SAQA. Applicable organisations are invited to nominate persons to serve as members of a specific National Standards Body (NSB). Each NSB is composed of a maximum of 6 representatives each from the 6 categories of organisations, namely, government departments, organised business, organised labour, providers of education and training, critical interest groups and community/learner organisations (Suid-Afrikaanse Kwalifikasie-Owerheid, 1998).

The functions of the NSBs will, among others, be to:

- Define the boundaries of their specific domain;
- Define a framework for the establishment of Standard Generating Bodies (SGBs); and
- Ensure that the work of the SGBs meet the requirements of SAQA regarding registration of standards and qualifications (Suid-Afrikaanse Kwalifikasie-Owerheid, 1998:44).



Each NSB may establish SGBs for the specified domain. A Standard Generating Body is composed of not more than twenty five nominated members. The functions of the SGBs will, among other, be to:

- Generate standards and qualifications in specifically identified sub-domains and levels, corresponding with the requirements of SAQA;
- Revise and update standards;
- Recommend standards and qualifications to the NSBs (Suid-Afrikaanse Kwalifikasie-Owerheid, 1998:48).

The establishment of SAQA, the NSBs and SGBs, provides structures to oversee the implementation of the changes in the education system. One of the most drastic changes and the feature that distinguishes the new education system from the old, is the implementation of Outcomes-based Education (OBE).

## 2.3 Outcomes-based Education

OBE is to be implemented in all areas of education, from early childhood development to higher education to adult basic education. According to Bonville (1996) OBE is designed to produce learners who will be able to function well in the changing world that we live in, while Manno (1994) indicates that OBE will bring about social changes in society.

But what exactly is Outcomes-based Education?

### 2.3.1 Definitions of Outcomes-based Education

According to Spady (1994:1) "*Outcome-Based Education means clearly focussing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences.*".

According to Education Week on the Web (1999) Outcomes-based Education is an educational theory "... *that guides curriculum by setting goals for students to accomplish.*" (<http://www.edweek.org/context/glossary/obe.htm>) – the main focus being the goals or outcomes. McNeir (1993) confirms this by describing OBE as a model that "... *defines learning not by what students have been taught, but by what they can demonstrate they have learned.*" (<http://interact.uoregon.edu/osscl/INTROS/INT0493.HTM>).

Brennan (1999) describes outcomes from a parents perspective and indicates that "... *outcomes in education is a bit like milestones that we use to describe the development of a child.*" ([http://www.acsa.edu.au/networks/netpages/obe\\_june.htm](http://www.acsa.edu.au/networks/netpages/obe_june.htm)). Outcomes should become more complex as the child grows older and more matured. The same principle is applicable regarding academic outcomes – the more a learner "matures", the more complex the academic outcomes will become.

According to Boschee & Baron (1993) OBE is learner-centered education, designed to emphasise results and it is based on the belief that all individuals can learn. OBE can only be implemented under the following conditions:

- What the learner must learn (the outcome(s)) is clearly described and set out;
- The progress of each learner is assessed according to his/her demonstrated skills or competencies;
- Individualisation in terms of learner's needs and/or potential is accommodated.

## 2.3.2 What are outcomes?

According to Spady (1994:2) outcomes are "... *clear learning results that we want students to demonstrate at the end of significant learning experiences.*". The emphasis in OBE is on what learners can *do* and not only what they *know*. The Department of Education (1997a:24) describes an outcome as follows: "*The 'outcome' is the result of the learning programme; what the learner knows, can do, values and wishes to be like.*".

It is obvious that the knowledge and skills obtained during the learning process will determine how and what the learner will be able to demonstrate at the end of the learning cycle. This does not emphasise the importance of knowledge only but the way the knowledge is applied as it is the most important aspect that will be assessed during the learning process.

When educators set outcomes for their learners, it is important that adequate and clear descriptions of the outcomes will be presented. It is no longer acceptable to indicate outcomes as "being able to understand or know something", but words like *describe*, *explain*, *design* or *produce* should rather be used (Spady, 1994:2). According to Brennan (1999) clear and visible outcomes will remove many misunderstandings and put learners and educators in a partnership to achieve better results regarding learning outcomes.

According to the Department of Education (1997c:75) the outcomes for educator training should consist of three dimensions, namely the occupational, academic and professional

dimensions, integrating knowledge, skills and values. Educator training is part of the Higher Education and Training Band (HET) and this implies that all HET qualifications will need to adhere to these set dimensions.

Kirstein ([s.a]:<http://www.angelfire.com/me/louiskirstein/obe.html>) defines outcomes according to Boschee & Baron (1993) as "... *future oriented, publicly defined, learner-centered, focussed on life skills and context, characterised by high expectations of and for all learners and sources from which all other educational decisions flow.*".

### **2.3.3 Assessment in Outcomes-based Education**

OBE implies that the learners are responsible for their own learning and progress (Department of Education, 1997a:6). Assessment is a continuous process and learners are allowed to learn at their own pace. A learner should demonstrate his/her progress through integrated tasks and the application of skills to real world problems.

According to the Gauteng Department of Education (1999:5) assessment in OBE can be described as "... *a process of gathering valid and reliable information about the performance of the learner, on an on-going basis, against clearly defined criteria, using a variety of methods, tools, techniques and contexts, recording the findings, reflecting and reporting by giving positive, supportive and motivational feedback to learners, other educators and parents.*".

The Gauteng Department of Education (1999) indicates the characteristics of assessment in OBE with emphasis on the learner, reaching his/her full potential. They refer to Outcomes-based Assessment (OBA) and indicate that more emphasis is placed on the ability of the learner to apply relevant knowledge in real-life situations. OBA should also be participative, democratic, transparent, criterion-referenced and is a definite shift away from memorisation as learning. OBA should be integrated throughout the teaching and learning process in an "... *assessment cycle ...*" (Gauteng Department of Education, 1999:7).

### **2.3.4 The purpose of Outcomes-based Assessment**

The purpose of Outcomes-based Assessment should be to improve the performance of the learner towards the achievement of the specified outcomes. Four main functions of Outcomes-based Assessment can be identified and is presented in Table 2.1.

**Table 2.1: The functions of Outcomes-based Assessment (Gauteng Department of Education, 1999:7-9)**

Purpose	Description
<b>Formative function</b>	<ul style="list-style-type: none"> <li>▪ It monitors and supports the learning process.</li> <li>▪ It is continuously built into learning activities.</li> <li>▪ It provides constructive feedback.</li> <li>▪ It guides the educator to select appropriate follow-up activities.</li> </ul>
<b>Base-line function</b>	<ul style="list-style-type: none"> <li>▪ It takes place at the beginning of a new set of activities.</li> <li>▪ The purpose is to determine what the learner knows and can demonstrate.</li> </ul>
<b>Diagnostic function</b>	<ul style="list-style-type: none"> <li>▪ It is used to establish the nature and cause of learning difficulties.</li> <li>▪ Based on the nature and cause of the problem it is used to select appropriate remedial actions.</li> </ul>
<b>Summative function</b>	<ul style="list-style-type: none"> <li>▪ It should present an overview of the performance of the learner.</li> <li>▪ It takes the form of a series of assessment activities over a period of time.</li> <li>▪ It may include results from written tests and examinations.</li> </ul>

It is important to note that continuous assessment is important in OBE and for that reason the Gauteng Department of Education (1999:9) refers to "*The Cycle of Continuous Assessment*".

Spady (1994:2) indicates that the goal of the learning process is to enable learners to demonstrate that they have mastered the pre-set outcomes, at the end of the learning experience. He also indicates that this does not necessarily mean that the time frame in which to achieve the set outcomes will be the same for all learners in a specific group, but all learners should be motivated to reach the set outcomes.

According to Closson (1993) OBE will change the focus in education from the content to the learner, an important aspect being that all learners can succeed, but not necessarily in the same time frame or in the same way. A learner will have to be able to demonstrate his/her mastering of a specific goal – one way may be by using portfolio assessment (Closson,

1993; Gauteng Department of Education, 1999). Closson (1993) refers to an educational institution in Vermont that uses a combination of traditional tests and portfolio assessment to determine a learner's level of competency.

## 2.3.5 Portfolios in Outcomes-based Assessment

The Gauteng Department of Education (1999) indicates that different types of progress reports and records of learner achievement should be used. Teacher records and learner profiles are two record keeping facilities mentioned and it is suggested that portfolios can be included as part of the learner profile. Portfolios can be used to be "...*visible proof of the development and improvement of learner achievement.*" (Gauteng Department of Education, 1999:24). The portfolio should comprise of samples of work which demonstrate the integration of "... *knowledge, concepts, attitudes, values and skills.*" (Gauteng Department of Education, 1999:24). The educator is responsible for the assessment of the portfolio, but it is important that the learners will compile their portfolios in cooperation with the educator. Comments from other people e.g. peers, parents and other educators may also be included (Gauteng Department of Education, 1999).

### 2.3.5.1 Different types of portfolios

Kizlik & Associates (1997-1999) indicate that the content and structure of a portfolio will be greatly influenced by its purpose. Different types of portfolios can be identified, but in most cases it would not be possible to label a portfolio as *only* being a developmental or showcase portfolio. In most cases it would be a combination of different types of portfolios, depending on the purpose and function of that specific portfolio.

The School Page (1996) indicates that portfolios can among other things be used for the following: "... *supervisor assessment, license assessment, employment interviews, promotion assessment, grant application information and pre-service teacher education programs*".

According to Tillema (1998:263) and Tomkinson (1997) learners can use portfolios mainly for two purposes namely to present their development or for assessment purposes, although other types of portfolios are also available. The different types of portfolios being used in educational institutions world wide, are presented in Table 2.2.

**Table 2.2: The different types of portfolios**

Type	Description	Reference(s)
<b>Developmental portfolio</b>	<p><b>Description</b></p> <p>A developmental portfolio presents the reader with a "history" of how the learner developed and mastered new skills and competencies.</p> <p><b>Components</b></p> <p>A developmental portfolio will contain the following:</p> <ul style="list-style-type: none"> <li>▪ a reflective collection of selected samples of work;</li> <li>▪ work samples in different phases of completion, emphasising the development and improvement of specific skills or competencies;</li> <li>▪ self-reflection and self-evaluation regarding the different stages of completion of the work samples, to present the learner's own development and meta-cognitive processes;</li> <li>▪ comments of the educator or evaluator;</li> <li>▪ records of all accomplishments (academic as well as with regards to sports or hobbies).</li> </ul>	<p>Guhlin [s.a.]; Hurst, Wilson &amp; Cramer (1998); Lankers (1998); Mt Edgecumbe High School (1999a); Kalamazoo College (1997a); Ferrier (1998); Collinson (1995).</p>
<b>Professional portfolio</b>	<p><b>Description</b></p> <p>A professional portfolio will usually be presented to an employer and it demonstrates professional development over a period of time. It can be utilised as a tool for continuing, professional development and evaluation.</p>	<p>Hurst, Wilson &amp; Cramer (1998); Winsor &amp; Ellefson (1995); DeLiberations [s.a]; Baume [s.a.]; Settedacati (1995); Winsor (1998); Van Niekerk (1998).</p>

**Table 2.2: The different types of portfolios (continued)**

Type	Description	Reference(s)
<b>Professional portfolio (continued)</b>	<p><b><u>Components</u></b></p> <p>A professional portfolio will contain the following:</p> <ul style="list-style-type: none"> <li>▪ real life examples of work done demonstrating what one is able to do;</li> <li>▪ a holistic view of the skills and competencies of the presenter e.g. an educator can use it to provide a collection of evidence of teaching skills and competencies</li> </ul>	
<b>Assessment portfolio</b>	<p><b><u>Description</u></b></p> <p>An assessment portfolio is a useful tool for educators to assess according to the principles of OBE. It contains examples to demonstrate the learner's skills and competencies in specific areas.</p> <p><b><u>Components</u></b></p> <p>An assessment portfolio will contain the following:</p> <ul style="list-style-type: none"> <li>▪ work samples demonstrating skills and competencies in specific learning areas;</li> <li>▪ statements regarding self-assessment and self-evaluation by the learner about his/her own skills and competencies;</li> <li>▪ statements regarding informal peer assessment;</li> <li>▪ formal assessment as done by the educator using a pre-set assessment instrument.</li> </ul> <p>Portfolio assessment is presented in more detail in Paragraph 2.5.6.</p>	Kizlik & Associates (1997-1999); Guhlin [s.a.]; Lankers (1998).

**Table 2.2: The different types of portfolios (continued)**

Type	Description	Reference(s)
<b>Showcase portfolio</b>	<p><b><u>Description</u></b>            A showcase portfolio presents a collection of only the best work samples of the learner.</p> <p><b><u>Components</u></b>            A showcase portfolio will contain the following:</p> <ul style="list-style-type: none"> <li>▪ only the best samples and highest achievements of a learner's work;</li> <li>▪ a summary of the skills and competencies of the learner.</li> </ul>	Lankers (1998); Winsor (1998).

### 2.3.5.2 Why use portfolios in education?

There are many advantages to using portfolios in education for both learners and educators namely:

- It promotes collaborative learning and assessment between the educator and the learner;
- It helps the educator as well as the learner to keep track of the progress of the learner;
- It encourages the learner to make experience a part of learning;
- It provides learners with the opportunity to reflect on their own learning;
- It encourages learners to take responsibility for their own learning;
- It can be used as a career tool for lifelong learning.

These advantages are described in Table 2.3.



**Table 2.3: Advantages of using portfolios in education**

Advantage	Description	Reference(s)
<p><b>Collaborative learning and assessment</b></p>	<p><b><u>Principle</u></b></p> <ul style="list-style-type: none"> <li>▪ Learners tend to learn collaboratively with their lecturers and are also active participants in the evaluation process.</li> <li>▪ There is a tendency to utilise personal access to the lecturers more often, than would be the case if portfolio development was not an integral part of the learning process.</li> <li>▪ Collaboration in peer groups is also promoted and learners are more willing to compare their portfolios with those of fellow-learners.</li> </ul> <p><b><u>Advantages</u></b></p> <p>Collaborative learning and assessment provide the learner with the opportunity to:</p> <ul style="list-style-type: none"> <li>▪ share with the educator, their parents and peers a real display of his/her work without concentrating only on test scores;</li> <li>▪ discuss assignments with the educator, with the purpose to improve the assignment, even after grading;</li> <li>▪ be an active participant in the assessment process.</li> </ul>	<p>Dietz (1995); Benoit &amp; Yang (1996); Barton &amp; Collins (1997); Hoepfl (1993); Van Niekerk (1998); Winsor (1998); Mt Edgecumbe High School (1999a); Gillespie <i>et al.</i> (1996); Courts &amp; McInerney (1993); Colorado School of Mines (1999); Robbins <i>et al.</i> (1995); Barrett (1998b); Barrett (1998d).</p>

**Table 2.3: Advantages of using portfolios in education (continued)**

<b>Advantage</b>	<b>Description</b>	<b>Reference(s)</b>
<b>Keep track of progress</b>	<p><b><u>Principle</u></b>            A portfolio, if kept up-to-date, can keep track of a learner's progress over a long period of time.</p> <p><b><u>Advantages</u></b>            Keeping track of progress provides the learner with the opportunity to:</p> <ul style="list-style-type: none"> <li>▪ keep track of his/her personal growth, academically as well as with regard to non-academic activities;</li> <li>▪ present others (educators, peers employers) with a complete record of personal and professional growth over a period of time.</li> </ul>	Van Niekerk (1998); Kalamazoo College (1997a); Collinson (1995); MacIsaac & Jackson (1994); Dietz (1995); Wiedmer (1998); Winsor (1998); Tillema (1998).
<b>Experience as part of learning</b>	<p><b><u>Principle</u></b>            Compiling a portfolio encourages the learner to make experience an integral part of his/her learning.</p> <p><b><u>Advantages</u></b>            Making experience a part of learning provides the learner with the opportunity to:</p> <ul style="list-style-type: none"> <li>▪ reflect on prior learning;</li> <li>▪ identify strengths and weaknesses with regard to specific skills and competencies;</li> <li>▪ include other evidence of learning, which would not otherwise be assessed by the educator.</li> </ul>	Van Niekerk (1998); Dietz (1995); Kalamazoo College (1997a); Kalamazoo College (1997b).

**Table 2.3: Advantages of using portfolios in education (continued)**

Advantage	Description	Reference(s)
<p><b>Self-reflection on learning</b></p>	<p><b><u>Principle</u></b>            Learners are expected to reflect on their own work, skills and competencies with regard to progress, development, strengths and weaknesses.</p> <p><b><u>Advantages</u></b>            Providing learners with the opportunity to reflect on their own learning, they:</p> <ul style="list-style-type: none"> <li>▪ are allowed to view their work from another perspective, which increases the level of self-understanding;</li> <li>▪ value their own learning more;</li> <li>▪ are able to "rate" the development (or lack of development) of their own skills and competencies;</li> <li>▪ are encouraged to see revision as an ongoing process;</li> <li>▪ tend to be much more critical about their own work;</li> <li>▪ are encouraged to "learn about learning";</li> <li>▪ will be able to demonstrate the ability to work meaningfully with the concepts and content of the learning material.</li> </ul>	<p>Johnson (1994); Raines (1996); Seely (1994); Winsor (1998); Kalamazoo College (1997a); Kalamazoo College (1997b); Barnett &amp; Lee (1994); Gillespie <i>et al.</i> (1996); Van Niekerk (1998); Wiedmer (1998); Tillema (1998); Colorado School of Mines (1999).</p>

**Table 2.3: Advantages of using portfolios in education (continued)**

Advantage	Description	Reference(s)
<b>Responsibility for learning</b>	<p><b><u>Principle</u></b>            The process of portfolio development is able to guide the learner towards taking responsibility for his/her own learning – which implicates independent learners.</p> <p><b><u>Advantages</u></b>            Allowing learners to take responsibility for their own learning provides learners with the opportunity to:</p> <ul style="list-style-type: none"> <li>▪ take risks, because there is not only a single measure of achievements;</li> <li>▪ identify their own shortcomings regarding their résumé;</li> <li>▪ perform even better, because the increased responsibility can serve as a motivator;</li> <li>▪ compare their portfolios with that of fellow learners and this serves as a motivator to improve results.</li> </ul>	Guillaume & Yopp (1995); Van Niekerk (1998); Kalamazoo (1997b); Iowa State University [s.a.]; Wiedmer (1998); Tillema (1998).
<b>Career tool for lifelong learning</b>	<p><b><u>Principle</u></b>            One should use the portfolio to keep a record of all learning experiences, through one's whole career.</p>	Mt Edgecumbe High School (1999a); Kalamazoo College (1997a).

**Table 2.3: Advantages of using portfolios in education (continued)**

Advantage	Description	Reference(s)
<b>Career tool for lifelong learning (continued)</b>	<p><b><u>Advantages</u></b></p> <ul style="list-style-type: none"> <li>▪ It is a tool one can use to present information and keep record of all accomplishments – professional as well as non-professional.</li> <li>▪ Any prospective employer is presented with an overview of a "complete" person.</li> </ul>	

### 2.3.5.3 Portfolio Assessment

Van Niekerk (1998) indicates that educators should view portfolio assessment as a tool that allows them not only to assess specific assignments, but to assess a learner's performance in a holistic context. She sets some guidelines for the assessment of portfolios, based on the demonstration of specific abilities by the learner. These guidelines cover a very wide range of applicable competencies, and are presented in Table 2.4.

**Table 2.4: Guidelines for the assessment of portfolios (Adapted from Van Niekerk, 1998:95-99)**

Ability	Description
<b>The ability to communicate content effectively</b>	<ul style="list-style-type: none"> <li>▪ Structure work logically:             <ul style="list-style-type: none"> <li>– select an appropriate framework for the assignment;</li> <li>– a logical flow of ideas;</li> </ul> </li> <li>▪ Use academically acceptable language:             <ul style="list-style-type: none"> <li>– grammar;</li> <li>– avoid slang or informal language;</li> <li>– provide additional supporting details, examples or information if something may be confusing or not clear;</li> <li>– avoid subjective statements.</li> </ul> </li> </ul>

**Table 2.4: Guidelines for the assessment of portfolios (Adapted from Van Niekerk, 1998:95-99) (continued)**

Ability	Description
<b>Mechanical ability</b>	<ul style="list-style-type: none"> <li>▪ Format the content by the correct and consistent use of:               <ul style="list-style-type: none"> <li>– table of contents;</li> <li>– titles/headings;</li> <li>– numbering/bullets;</li> <li>– emphasising text e.g. underlining, italics, bold, colour;</li> <li>– upper and lower case;</li> <li>– navigation.</li> </ul> </li> </ul>
<b>Creative ability</b>	<ul style="list-style-type: none"> <li>▪ Come up with new ideas and insights.</li> </ul>
<b>The ability to make experience an integral part of learning</b>	<ul style="list-style-type: none"> <li>▪ Focus on the process of learning as well as the products of learning by including reflective items which indicate awareness of:               <ul style="list-style-type: none"> <li>– the value of the learning process and knowledge gained.</li> </ul> </li> </ul>
<b>The ability to reflect on prior learning</b>	<ul style="list-style-type: none"> <li>▪ Make the link between prior knowledge and the newly acquired knowledge:               <ul style="list-style-type: none"> <li>– Including items which indicate a building on existing or prior knowledge.</li> </ul> </li> </ul>
<b>The ability to reflect on strengths and weaknesses as a learner</b>	<ul style="list-style-type: none"> <li>▪ Recognise strengths and weaknesses and reflect on these:               <ul style="list-style-type: none"> <li>– Including reflective items to identify strengths and weaknesses regarding learning.</li> </ul> </li> </ul>
<b>The ability to keep track of learning</b>	<ul style="list-style-type: none"> <li>▪ Keep track of learning:               <ul style="list-style-type: none"> <li>– Include items of reflection and revision on a continuous basis.</li> </ul> </li> </ul>
<b>The ability to assume responsibility for learning</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate a willingness to assume responsibility for learning:               <ul style="list-style-type: none"> <li>– include items which indicate a willingness to do more than expected.</li> </ul> </li> </ul>

**Table 2.4: Guidelines for the assessment of portfolios (Adapted from Van Niekerk, 1998:95-99) (continued)**

Ability	Description
<b>The willingness to take risks while developing creative solutions</b>	<ul style="list-style-type: none"> <li>▪ Take risks in the search for solutions:               <ul style="list-style-type: none"> <li>– include items which indicate a boldness to explore, take chances and to come up with unique solutions to problems.</li> </ul> </li> </ul>
<b>The ability to work meaningfully with concepts and content</b>	<ul style="list-style-type: none"> <li>▪ Interpret, analyse apply, compare, distinguish between and critically evaluate concepts and content:               <ul style="list-style-type: none"> <li>– Include items such as summaries and reflection on the meaning of concepts and critical evaluation.</li> </ul> </li> </ul>
<b>The ability to assess and value own learning</b>	<ul style="list-style-type: none"> <li>▪ Assess own learning in terms of quality of learning:               <ul style="list-style-type: none"> <li>– complete and include self assessment activities.</li> </ul> </li> </ul>
<b>The ability to make practical applications of theory</b>	<ul style="list-style-type: none"> <li>▪ Use the theory in practice:               <ul style="list-style-type: none"> <li>– include items which indicate an ability to apply what was learned in own life world.</li> </ul> </li> </ul>

Portfolios can be powerful tools for an educator to use in the classroom, but it can also be a powerful tool for learners as well as educators to use in their own lifelong learning process.

## 2.4 Teacher Education in South Africa

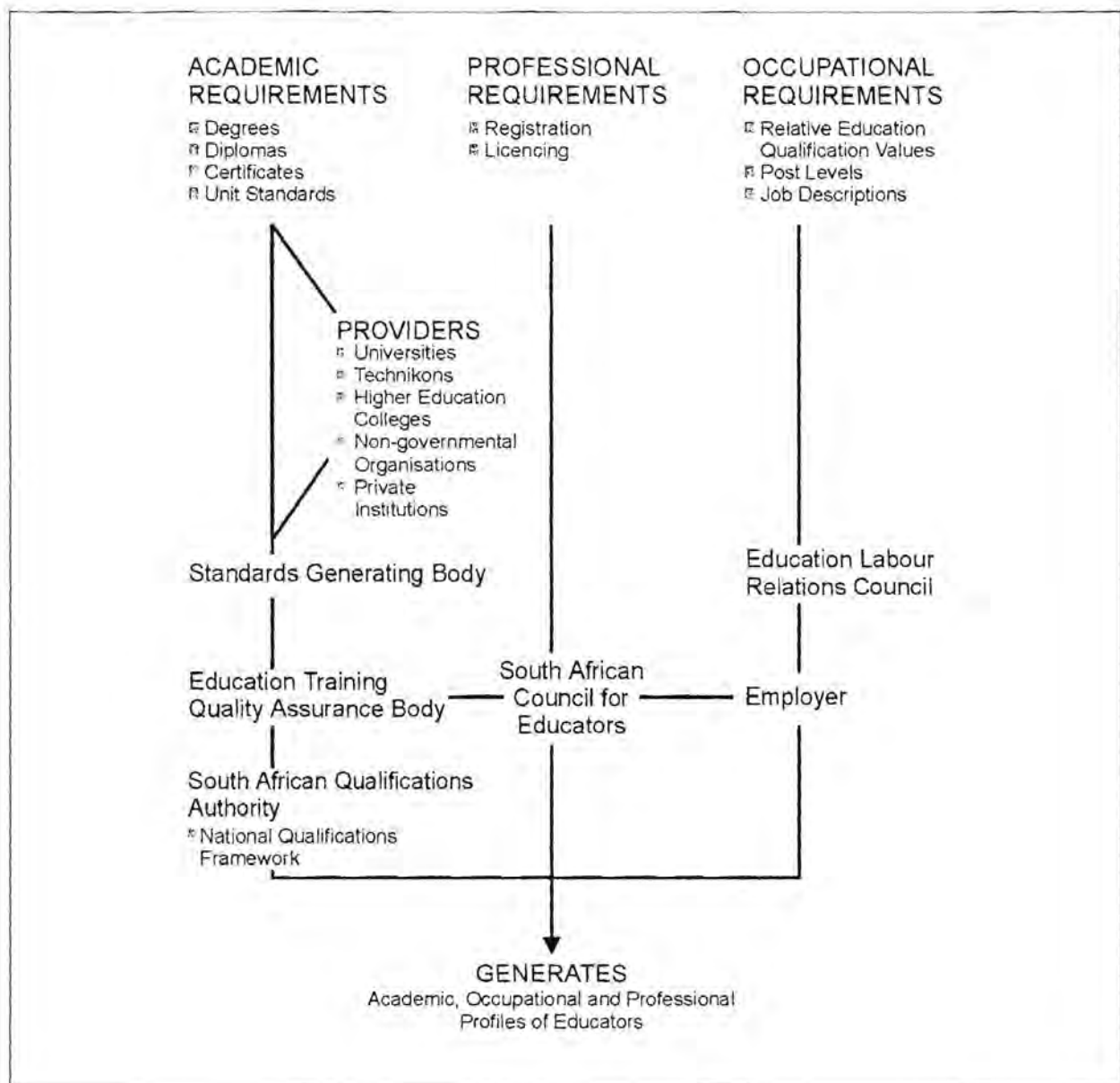
Teacher Education in South Africa is part of the HET band. All education in South Africa is working towards a system that is completely based on Outcomes-based Education (OBE), with emphasis on the application of skills and competencies. The transition from the “old” system to this new paradigm is a time consuming but necessary process. The situation with teacher or educator education is no different, it should be outcomes-based – teachers can no longer be rated only according to the qualifications they obtained and the duration of their studies, but rather on their skills and competencies. They will no longer only be assessed once they graduate, but will be expected to demonstrate their skills and competencies every three years, this will be the case when they apply for registration or re-registration at the South African Council for Educators (SACE) (Department of Education, 1997c).

The Technical Committee on Norms and Standards for Teacher Education proposed that, in order to become a qualified professional educator, a learner in the field of education must fulfil requirements in three categories:

- Academic requirements;
- Professional requirements;
- Occupational requirements (Department of Education, 1997c:27).

Educators should also be lifelong learners and should continuously be improving themselves according to the academic, professional and occupational requirements. Figure 2.3 indicates the three dimensions of an education and training development qualification as presented by the Department of Education (1997c:28).

**Figure 2.3: Three dimensions of an education and training development qualification (Department of Education, 1997c:28)**



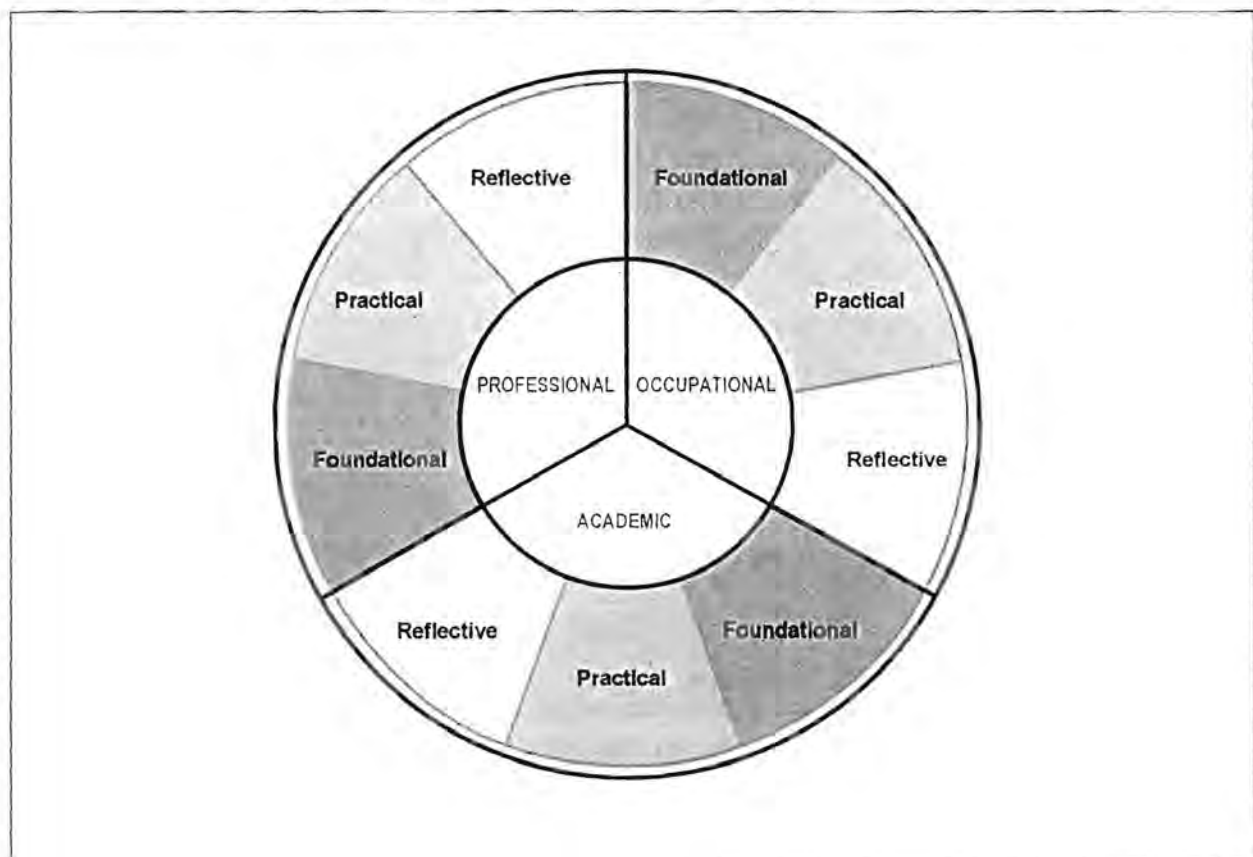


## 2.4.1 Teacher qualifications

According to NQF and SAQA regulations, a qualification is "... a recognition of 'applied competence' in a particular academic and/or occupational field." (Department of Education, 1997c:57). This "applied competence" will be assessed by a variety of assessment techniques – based on Outcomes-based Education. Three types of applied competence are required, namely reflective, practical and foundational competencies. The purpose of the qualification will determine the relationship between the three competencies, but they are all applicable to the three requirements of teacher qualifications namely academic, occupational and professional requirements.

The relationship between teacher competencies and requirements is presented graphically in Figure 2.4 – an adapted presentation of the figure presented by the Department of Education (1997c:60).

**Figure 2.4: The relationship between the academic, occupational and professional requirements and the reflective, practical and foundational competencies in teacher education (Adapted from the Department of Education, 1997c:60)**



The three types of requirements applicable to teacher qualifications are presented in Table 2.5.

**Table 2.5: The requirements for teacher qualifications**

Requirement	Description
<b>Academic requirements</b>	<p><b><u>Organisation</u></b></p> <p>The academic requirements for teacher qualifications are set by the Technical Committee on the Revision of Norms and Standards for Educators.</p> <p><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>▪ The academic education and training are provided by the traditional training institutions namely universities, technikons and colleges as well as untraditional non governmental organisations (NGOs) and private institutions.</li> <li>▪ The qualifications could be degrees, diplomas, certificates or unit standards (Department of Education, 1997c:28).</li> </ul>
<b>Professional requirements</b>	<p><b><u>Organisation</u></b></p> <p>The professional requirements for teachers are set by the South African Council for Educators (SACE) who is responsible for registration and licensing of educators.</p> <p><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>▪ The emphasis is on the professional status of educators and that they should be in a constant process of developing themselves further – to accept the responsibility for lifelong learning.</li> <li>▪ One way to keep track of educators' development is to require them to renew their licenses with the SACE on a regular basis – possibly every three years (Department of Education, 1997c:43).</li> </ul>

**Table 2.5: The requirements for teacher qualifications (continued)**

Requirement	Description
<b>Professional requirements (continued)</b>	<ul style="list-style-type: none"> <li>▪ Professional requirements set to re-licensing of educators could motivate them to acquire other qualifications thus creating a professional educator core.</li> </ul>
<b>Occupational requirements</b>	<p><b><u>Organisation</u></b></p> <p>The occupational requirements for teachers are set by the Department of Education (DOE).</p> <p><b><u>Description</u></b></p> <ul style="list-style-type: none"> <li>▪ The DOE is the main employer of teachers in South Africa and the conditions of employment are regulated by different laws.</li> <li>▪ The DOE is also responsible for the relative education qualification value, description of post levels and job descriptions (Department of Education, 1997c:43).</li> </ul>

Previously the total emphasis on teacher education was on the academic and occupational dimensions of teacher qualifications while at present the professional dimension is also emphasised.

## 2.4.2 The South African Council for Educators

The South African Council for Educators (SACE) is a body that has been established to "... *act as the guardian of the professionalism of teachers.*" (Department of Education, 1997c:42). The SACE was established in 1995 after agreement by the state and the trade unions representing educators, to establish a professional council "... *to register educators and discipline them if they are in breach of a code of conduct.*" (Department of Education, 2000:2). One of the main objectives is to ensure that all educators (teachers, lecturers, trainers etc.) adhere to a specified set of criteria and comply with the code of conduct. Educators complying with this code of conduct will always act in a professional manner.

The SACE code of conduct states the following:

- Definitions of applicable terminology used in the code of conduct (educator, learner and parent);
- A preamble indicating the presumed attitude of an educator who are registered with the SACE;
- Conduct: The educator and the learner;
- Conduct: The educator and the parent;
- Conduct: The educator and the community;
- Conduct: The educator and his/her colleagues;
- Conduct: The educator and the profession;
- Conduct: The educator and his/her employer;
- Conduct: The educator and the council.

For the complete Code of conduct, see Appendix A on the CD ROM.

According to the Draft SACE Bill (Department of Education, 2000:8) the SACE will consist of the following members:

- *"A chairperson;*
- *Eighteen educators nominated by the organised profession;*
- *Five persons nominated by the Department of Education;*
- *Two persons nominated by the national associations of school governing bodies;*
- *Two persons nominated by the council on Higher Education; one person nominated by national bodies representing independent or private institutions; and*
- *The chief executive officer of the council."*

All educators, that is "*...any person who teaches, educates or trains other persons...*" (South African Council for Educators, 1999:1), should register with the SACE. According to the Norms and Standards for Teacher Education (Department of Education, 1997c) educators will have to apply for re-registration at the SACE after a period of three years. Their application for registration will have to be accompanied by proof of qualifications as well as proof of skills and competencies.

When an educator is registered and licensed by the SACE this license is "*... a document entitling its holder to practice a trade or profession, and signifying that the license-holder meets competency and other requirements for practice*" (Department of Education, 1997c:xii). The process of licensing and re-licensing could prove itself to be a heavy administrative burden on the SACE and therefore solutions and ways to ease this burden will

have to be created. One possible solution as indicated by the Department of Education (1997b) is to link the SACE with the computerised SAQA database that will contain all qualifications obtained by all learners. This system will however only indicate the "official" qualifications and not the skills and competencies which are also important.

A possible way in which educators can present the SACE with proof of professional development, skills and competencies, could be to use portfolios – each educator could keep a complete portfolio of all professional and other activities. Referring to the reasons why any lifelong learner should use a portfolio, as discussed in Table 2.3, an added advantage could be to present the portfolio to the SACE when applying for re-licensing, because it will contain all the necessary information regarding proof of skills and competencies. Portfolios can take many different formats, but the use of *electronic* portfolios may prove to contain even more advantages, as will be discussed in Paragraph 2.5.2.

## 2.5 Electronic portfolios

Kalamazoo College started the so-called "K" plan in 1963 (Kalamazoo College, 1997a; Kalamazoo College, 1997-98). This plan aimed at increasing experiential learning by incorporating individualised projects into their curriculum. This led to the incorporation of the Kalamazoo Portfolio as a graduation requirement during the last few years. The Kalamazoo Portfolio was the first of its kind in the United States and rating their successes, many other colleges followed their lead. Originally the concept of an electronic portfolio was born in the Experiential Education Committee, consisting of educators, students and administrators (Kalamazoo College, 1997d). People's perceptions regarding portfolios, and specifically electronic portfolios differ. One tends to associate it with artists, photographers, architects or even fashion and photographic models, who use it to display their accomplishments or favourite works, but one is not so comfortable to associate it with learners, teachers or educators (Van Niekerk, 1998; Kizlik & Associates, 1997-1999; Fisher, 1994; Sweet, 1993a; Winsor & Ellefson, 1995). The use of portfolios has increased during the last few years in many occupations, especially so in the educational environment (Advisory Centre for University Education, 1998; Guillaume & Yopp, 1995; Wolf, Whinery & Hagerty, 1995). Learners as well as educators use electronic portfolios in many different ways for many different purposes.

According to Tillema (1998) portfolios have many uses, one being that it can function as an alternative assessment tool or to inform other people about your skills and competencies,

and also demonstrate these skills and competencies visually. Another advantage is that it "*fosters further learning and growth*" (Tillema, 1998:263).

Wiedmer (1998:586) confirms this perception and indicates that the use of electronic portfolios is gaining popularity in the educational field while it was formerly only accepted as a "*business tool*". It is fast becoming a very popular educational tool because educators are discovering the benefits of utilising electronic portfolios as tool to validate individual performances. By using electronic portfolios learners are able to demonstrate what they *know* and *can do* (skills and competencies) in ways that were not available before.

Barrett (1998c), who did extensive research on educational electronic portfolios, cautions against the use of electronic portfolios, without pre-set standards when she indicates that "... *a portfolio without standards is just a multimedia presentation or a fancy electronic résumé or a digital scrapbook.*" (Barrett, 1998c). The importance of curriculum related content may never be downplayed in favour of the aesthetics and "bells and whistles" included in an electronic portfolio.

## 2.5.1 Definition(s) of electronic portfolios

Many researchers and educators defined portfolios and more specifically electronic portfolios. The definitions may vary according to the circumstances in which the electronic portfolio is being used. A summary of the views of many researchers is presented in Table 2.6.

**Table 2.6: Electronic portfolios defined**

Concept	Description	Reference(s)
<b>A purposeful collection of work</b>	<ul style="list-style-type: none"> <li>▪ The work represented in an electronic portfolio should be included for a specific purpose e.g. to indicate one's professional development or for assessment purposes.</li> </ul>	Wiedmer (1998); Paulson, Paulson & Meyer (1991); Kizlik & Associates (1997-1999); Mt Edgecumbe High School (1999a); The School Page (1996);

**Table 2.6: Electronic portfolios defined (continued)**

<b>Concept</b>	<b>Description</b>	<b>Reference(s)</b>
<b>A purposeful collection of work (continued)</b>	<ul style="list-style-type: none"> <li>▪ An extensive collection of all kinds of evidence to demonstrate growth and competencies acquired over a long period of time can be presented in an electronic portfolio.</li> <li>▪ Samples of applied skills (using multimedia) could easily be included to demonstrate competencies, skills and knowledge.</li> </ul>	Hoepfl (1993); Tillema (1998:263); Horry County Schools (1998); Bergman (1999); Barrett (1998b); Gillespie ( <i>et al.</i> (1996); Sweet (1993a).
<b>Presented by electronic means</b>	<ul style="list-style-type: none"> <li>▪ There is a definite movement away from the traditional portfolio in a paper folder.</li> <li>▪ Portfolios are captured and presented electronically, using different kinds electronic media.</li> <li>▪ A detailed discussion regarding the different electronic formats in which an electronic portfolio can be created, is presented in Paragraph 2.5.3.</li> </ul>	Wiedmer (1998); Barrett (1994); Barrett (1997); Barrett (1998a); Barrett (1999); Bergman (1999); Florida State University (1999); Guhlin [s.a.]; Kalamazoo College (1997a); Milone Jr (1995); Moersch & Fisher III (1995); Mt Edgecumbe High School (1999a); Untch [s.a.].
<b>An individual's efforts, progress, and achievements in one or more areas are presented</b>	<ul style="list-style-type: none"> <li>▪ Individuals who construct electronic portfolios should utilise it to demonstrate their efforts and achievements regarding the learning activities and professional development.</li> </ul>	Wiedmer (1998); Sweet (1993a); Guhlin [s.a.]; Paulson, Paulson & Meyer (1991:60); Kizlik & Associates (1997-1999); Mt Edgecumbe High School (1999a); The School Page (1996);

**Table 2.6: Electronic portfolios defined (continued)**

Concept	Description	Reference(s)
<b>An individual's efforts, progress, and achievements in one or more areas are presented (continued)</b>	<ul style="list-style-type: none"> <li>▪ It should be a collection of selected items and can be used to indicate the standard of work done by the presenter of the portfolio.</li> <li>▪ Different records and examples (using multimedia) of work should be included to indicate personal growth.</li> </ul>	Hoepfl (1993); Tillema (1998:263); Horry County Schools (1998); Bergman (1999); Barrett (1998b); Gillespie <i>et al.</i> (1996).
<b>Self-reflection on any aspect presented in the portfolio is provided</b>	<ul style="list-style-type: none"> <li>▪ Self-reflection on learning is discussed in detail as one of the advantages of using electronic portfolios in Paragraph 2.5.2.</li> <li>▪ It is essential that learners should use the opportunity to reflect on their own work, among others to identify their own strengths and weaknesses.</li> </ul>	Guhlin [s.a.]; Paulson, Paulson & Meyer (1991:60); Tillema (1998:263); Kizlik & Associates (1997-1999); Pawluk (1999).
<b>Physical proof of the learner's abilities, skills and competencies is presented</b>	<ul style="list-style-type: none"> <li>▪ A description of what the presenter of the portfolio is able to do is not sufficient, work samples and documentation or other media should be included to serve as a proof of the abilities of that person.</li> <li>▪ Some researchers indicate this as being the strongest feature of an electronic portfolio – actual work done is presented. It need not all be completed projects, even work-in-progress can be included.</li> </ul>	Guhlin [s.a.]; Wiedmer (1998); Sweet (1993a); Mt Edgecumbe High School (1999a); The School Page (1996); Hoepfl (1993); Tillema (1998); Bergman (1999); Barrett (1998a); Gillespie <i>et al.</i> (1996); Kizlik & Associates (1997-1999); Iowa State University [s.a.]; Stiggins (1994).



**Table 2.6: Electronic portfolios defined (continued)**

Concept	Description	Reference(s)
<b>Physical proof of the learner's abilities, skills and competencies is presented (continued)</b>	<ul style="list-style-type: none"> <li>All items included should display the skills, competencies, knowledge and talents of the learner.</li> </ul>	

Electronic portfolios can take many different formats and the purpose of the portfolio will greatly determine the materials included, but in essence it will provide an overview of the learner's achievements, progress, knowledge, skills and competencies.

## 2.5.2 Why electronic portfolios?

Communication has undergone radical changes during the last few decades, mostly due to development regarding technology. This development influences all areas of life, including education. Education can benefit greatly from these developments, if applied properly and correctly. In our daily lives we are exposed to the electronic presentation of information and this feature of technology was recognised by educators as a useful tool in education.

Many different electronic applications can be found in education, one being the use of electronic portfolios. Moersch & Fisher III (1995) indicate that a combination of innovations regarding pedagogy and technology resulted in the use of electronic portfolios. The main reasons for using portfolios in an electronic format, are presented in Table 2.7.

**Table 2.7: Why electronic portfolios?**

Concept	Description	Reference(s)
<b>Portability</b>	<ul style="list-style-type: none"> <li>A portfolio in an electronic format is more portable than a paper-based portfolio because one does not need to present folders full of documents, as is the case with a paper-based portfolio.</li> </ul>	Wiedmer (1998); Milone (1995) and Sheingold (1992) in Barrett (1998a); Lankers (1998).

**Table 2.7: Why electronic portfolios? (continued)**

<b>Concept</b>	<b>Description</b>	<b>Reference(s)</b>
<b>Portability (continued)</b>	<ul style="list-style-type: none"> <li>▪ This "portability" is possible as a result of the development of CD ROM technology and access to the World Wide Web (WWW).</li> <li>▪ By using a CD ROM or the World Wide Web to present portfolios, it can be widely distributed with ease.</li> </ul>	
<b>Accessibility/Visibility</b>	<ul style="list-style-type: none"> <li>▪ More and more people are using the Internet to retrieve information.</li> <li>▪ Internet/web based portfolios are gaining popularity and more and more learners prefer to develop their portfolios and publish it on the World Wide Web.</li> <li>▪ One of the remarkable advantages of a web based portfolio is that it can be available internationally and the learner gets worldwide exposure, potential employers can view and evaluate work samples of candidates as presented in their electronic portfolios.</li> <li>▪ Portfolios can be published on the World Wide Web, using:               <ul style="list-style-type: none"> <li>– the services of an Internet Service Provider (IPS);</li> <li>– a dedicated server supplied by an educational institution - which will make it accessible to other educators as well as fellow learners.</li> </ul> </li> </ul>	Lankers (1998); Mt Edgecumbe High School (1999a).

**Table 2.7: Why electronic portfolios? (continued)**

Concept	Description	Reference(s)
<b>Accessibility/Visibility (continued)</b>	<ul style="list-style-type: none"> <li>▪ Accessibility can also be achieved when using CD ROM technology to present an electronic portfolio.</li> <li>▪ Such a CD ROM can be distributed to many potential employers, without the possibility of the "original" material being damaged.</li> </ul>	
<b>The inclusion of multimedia components</b>	<ul style="list-style-type: none"> <li>▪ Multimedia provide the opportunity to include <i>real life</i> events as proof of skills – this is not possible in a paper-based portfolio.</li> <li>▪ Multimedia, such as video, audio, graphics, animations as well as text, which were not at all possible in a paper-based portfolio, can be used to provide proof of the learner's skills and competencies.</li> </ul>	Wiedmer (1998); The School Page (1996); Kizlik & Associates (1997-1999); Mt. Edgecumbe High School (1999a); The School Page (1996); Hurst, Wilson & Cramer (1998); Kalamazoo College (1997c); Lankers (1998).
<b>Ease of managing and updating data and safe storage mode</b>	<ul style="list-style-type: none"> <li>▪ Electronic portfolios can be managed and reviewed with relative ease.</li> <li>▪ Different programmes are available which allow the learners to manage their portfolios in the sense that they can decide which work samples and projects to either include or exclude, depending on the purpose of the specific portfolio.</li> </ul>	Barrett (1998b); Barrett (1994); Niguidula (1996).

**Table 2.7: Why electronic portfolios? (continued)**

Concept	Description	Reference(s)
<b>Ease of managing and updating data and safe storage mode (continued)</b>	<ul style="list-style-type: none"> <li>▪ The learner keeps a master copy of the portfolio, and distributes copies thereof. There is no possibility of the original material being damaged.</li> <li>▪ CD ROM technology is very popular for storing electronic portfolios because it is safe, data cannot easily be lost and it can save a large amount of data.</li> </ul>	

The electronic portfolio is the perfect tool to also present a *demonstration* (in contrast to a *description*) of skills, competencies and capabilities. Learners who were forced to present an electronic portfolio as a prerequisite to graduation indicated that they found it extremely useful because they "... *learn how best to present yourself...*" (Kalamazoo College, 1997b).

Wiedmer (1998:587) summarises the power of the electronic portfolio when he indicates that "*The electronic format permits one to summarize primary beliefs and attitudes by condensing lifelong experiences into a compact and portable product.*"

### 2.5.3 Tools used to compile electronic portfolios

Different tools to develop and present portfolios in an electronic format exist, ranging from "off the shelf" software to Internet applications. Wiedmer (1998:586) indicates that electronic portfolio software (off the shelf software) can be used with ease to create a multimedia collection of student work and to connect that work to performance standards. Using this type of software is sometimes easier to use because the learner can concentrate on the development of the contents of the portfolio without having to design a "look and feel" and other technical issues.

Some of the possible tools that can be used to compile electronic portfolios, is presented in Table 2.8.

**Table 2.8: Tools to create electronic portfolios**

<b>Type</b>	<b>Description</b>	<b>Reference(s)</b>
<b>Off-the shelf software</b>	<p><b><u>Description</u></b></p> <p>Off-the-shelf software is single purpose programmes developed with the sole purpose to compile electronic portfolios.</p> <p><b><u>Advantages</u></b></p> <p>The use of such off-the-shelf programmes is gaining popularity because the user can concentrate on the content of the portfolio, and needn't pay much attention to the format.</p> <p><b><u>Examples</u></b></p> <p>Commercial programmes that are available for this purpose include the Grady profile, Learner profile, Chalkboard, Scholastic's portfolio product, KidPix and Digital Portfolio.</p>	Barrett (1994); Niguidula (1996); Wiedmer (1998); Barrett (1998a).
<b>Multimedia Authoring software</b>	<p><b><u>Description</u></b></p> <p>These are programmes that can be used by educators and instructional designers to develop educational software.</p> <p><b><u>Advantages</u></b></p> <p>It can be used to develop electronic portfolios with great success because of its ability to incorporate multimedia components with ease.</p>	Barrett (1994); Barrett (1998a).

Table 2.8: Tools to create electronic portfolios (continued)

Type	Description	Reference(s)
<b>Multimedia Authoring software (continued)</b>	<p><b><u>Examples</u></b></p> <p>Commercial programmes that are available for this purpose, include Quest and Macromedia Authorware.</p>	
<b>Electronic presentation software</b>	<p><b><u>Description</u></b></p> <p>This is software that can be used to develop electronic slide shows or presentations.</p> <p><b><u>Advantages</u></b></p> <p>These programmes are developed to present information, and are usually very user friendly and can include multimedia components with ease.</p> <p><b><u>Examples</u></b></p> <p>Commercial programmes that are available for this purpose include Microsoft Powerpoint and Presentations.</p>	Barrett (1994); Barrett (1998a).
<b>Internet applications</b>	<p><b><u>Description</u></b></p> <p>This is software that is developed to create documents that can be published on the Internet, usually using hypertext markup language (html).</p> <p><b><u>Advantages</u></b></p> <p>One need not have knowledge about html and it can be used to create an electronic portfolio that can be viewed with an Internet browser and published on the World Wide Web.</p>	Barrett (1994); Wiedmer (1998); Lankers (1998); Mt Edgecumbe High School (1999a); Barrett (1998a).

**Table 2.8: Tools to create electronic portfolios (continued)**

Type	Description	Reference(s)
<b>Internet applications (continued)</b>	<u>Examples</u> Html editors that are available for this purpose include Microsoft Front Page and Netscape Composer.	

Very often the learner's level of computer skills will determine which tool will be used to compile an electronic portfolio (Barrett, 1998a).

## 2.5.4 Components of electronic portfolios

According to Kizlik & Associates (1997-1999) portfolios used in the classroom and for assessment purposes will consist of the content of the curriculum followed in a specific course or qualification. This may be true, but there are much more to an electronic portfolio than it being just a collection of assignments for a specific course. Hurst, Wilson & Cramer (1998:579), Winsor (1998) and the University of Oregon (1998) confirms this view and indicates that the purpose of the electronic portfolio will also determine to a large extent the components to be included in that portfolio. Professional developmental electronic portfolios can be used to the benefit of learner educators because it is a means of presenting proof of professional development to examiners and future employers. Therefore the focus of this study will be on this type of electronic portfolio.

It is important to keep in mind that the portfolio should present a reflective collection of skills and competencies, it is not just a "scrap book". It can be enriched with a personal touch, but the presentation needs to remain professional, and the principle of "*less is more*" might be applicable because it should be easy to access and "*should not become to cumbersome for someone to read.*" (Hurst, Wilson & Cramer, 1998:579). It is also important to not only include written components (Collinson, 1995).

An extensive literature study identified different components that should be present in the professional developmental electronic portfolio:

- A user-friendly interface;
- Different multimedia components;
- A table of contents;
- Personal data;

- An academic record;
- A description of skills;
- A description of projects;
- A summary of work experience;
- Letters of reference;
- Goals/career planning;
- Achievements/awards;
- Self-reflection/evaluation;
- Community activities;
- Leisure activities.

These components are discussed in Paragraphs 2.5.4.1– 2.5.4.14.

### **2.5.4.1 Interface**

The saying "first impressions last" is applicable when developing an electronic portfolio. The interface used when developing an electronic portfolio should be so simple that anyone could be able to access it without specific instructions and skills (Mt. Edgecumbe High School, 1999a; Bergman, 1999). A suitable "look and feel" should be selected which will be used throughout the portfolio and it should be aesthetically acceptable (Milone, 1995). Navigation tools should be used consistently and on each page a custom header should be inserted to ensure that readers know at all times what the page they are viewing is all about and information should be presented logically.

As with all electronic applications it is of extreme importance that it runs mechanically and technically error-free and that all links to applicable sources should function properly (Kalamazoo College, 1997a).

### **2.5.4.2 Multimedia components**

One of the main differences between paper-based portfolios and electronic portfolios is that the latter has the ability to include multimedia components. Multimedia refer to all types of media, not only written text, but a combination of text, sound, graphics, animations and even video. Many researchers such as Collinson (1995); Moersch & Fisher III (1995) and Mt Edgecumbe High School (1999a) indicate that the portfolio should be able to include any type of media, not only specific formats. One should also be able to link to other programmes e.g. databases or electronic presentations.

The different media that can be included in an electronic portfolio, are presented in Table 2.9.



**Table 2.9: Different media that can be included in an electronic portfolio**

<b>Medium</b>	<b>Description</b>
<b>Descriptive text</b>	Text should be used to describe the purpose of the portfolio, what the portfolio consists of and some of the skills (e.g. writing skills) and projects will also be presented in text (Wiedmer, 1998; Barrett, 1997; Barrett, 1998a). Other text components should include essays, reports, tests, self-reflective items as well as peer and educator evaluations or comments on projects (Milone, 1995; Seldin, 1997; Mt Edgecumbe High School, 1999a; GIHE, Griffith University, 1996).
<b>Copies of applicable documents</b>	Scanned copies of applicable documents should be included e.g. certificates and/or diplomas obtained including a description of when and where it was obtained (Mt Edgecumbe High School, 1999a; Milone, 1995; The School Page, 1996; Winsor, 1998). According to Hurst, Wilson & Cramer (1998:580) scanned copies of official documents can be used to provide needed certification information about the educator.
<b>Graphics</b>	Graphic images e.g. clipart can be used for esthetical purposes to compliment the "look and feel" of the portfolio. Other applicable graphics or scanned photographs should also be included e.g. a photograph of the person whose portfolio it is, photographs taken in the work place or graduation photographs (Kizlik & Associates, 1997-1999; Mt. Edgecumbe High School, 1999a; Wolf, Whinery & Hagerty, 1995; Milone, 1995; The School Page, 1996; Hurst, Wilson & Cramer, 1998; Moersch & Fisher III, 1995; Barrett, 1997; Barrett, 1998a). Hurst, Wilson & Cramer (1998) indicate that it is important to provide explanatory captions for the photographs used to explain their significance.
<b>Videos</b>	One of the main advantages of using an electronic portfolio, is that many multimedia components which would not be possible in a paper-based portfolio, can now be included. Digitised videos is one such a component which can be used to demonstrate certain skills and competencies which is not really possible on paper or any other medium (Kizlik & Associates, 1997-1999; Mt. Edgecumbe High School, 1999a; Wiedmer, 1998; Milone, 1995; Barrett, 1997; The School Page, 1996; Wolf, Whinery & Hagerty, 1995; Seldin, 1997; Moersch & Fisher III, 1995; Barrett, 1998a).

**Table 2.9: Different media that can be included in an electronic portfolio (continued)**

Medium	Description
<b>Videos (continued)</b>	An educator can use a video to demonstrate how a specific situation is handled in class, testimonials from other persons can also be included in this format (Wiedmer, 1998; GIHE, Griffith University, 1996). Barrett (1998a) indicates that this is the best medium to display non-verbal skills and communication.
<b>Sound</b>	Digitised sound can also be included in the electronic portfolio (Mt. Edgecumbe High School, 1999a; Wiedmer, 1998; Milone, 1995; Barrett, 1997). It can be samples of speaking to demonstrate communication skills or interviews with peers or educators (Barrett, 1998a).
<b>Animations</b>	Animation is another typical multimedia feature and it could be used to demonstrate specific processes or procedures (Wiedmer, 1998).

### 2.5.4.3 Table of contents

Each electronic portfolio should include a table of contents to inform the reader of all the different components of a particular portfolio (St. Norbert College, 1998). Tomkinson (1997) confirms the necessity of form and structure in a portfolio. Hurst, Wilson & Cramer (1998:580) indicate that the inclusion of a table of contents helps the developer to structure the material included and helps the reader to get a better understanding of the focus and content of a particular portfolio. Each work sample that is included should also be provided with an introductory page containing a short explanation or description of the sample and the reason for including it in the portfolio (Mt. Edgecumbe High School, 1999a; Hurst, Wilson & Cramer, 1998; St. Norbert College, 1996; Seldin, 1997; Tillema, 1998).

### 2.5.4.4 Personal data

It is necessary to include a personal cover page, including the name of the person whose portfolio it is, residential, work and e-mail addresses and telephone numbers (Mt. Edgecumbe High School, 1999a; Mt. Edgecumbe High School, 1999b; St. Norbert College, 1996; Hurst, Wilson & Cramer, 1998; Wolf, Whinery & Hagerty, 1995; The School Page, 1996). It is a good idea to include a personal photograph on this page because this is the stage where the reader "meets" the person whose portfolio is reviewed – it creates an idea of

the *person* behind the portfolio. A short family history and personal demographics can be included in a brief biographical sketch, including information regarding friends and family, can also be included (Mt. Edgecumbe High School, 1999a; Lankers, 1998; The School Page, 1996; Kalamazoo College, 1997b; Hurst, Wilson & Cramer, 1998; Untch, [s.a.]). A short account of the cultural and community background can also be included (Mt. Edgecumbe High School, 1999a; Seldin, 1997; Lankers, 1998).

It is important to keep this information short and to the point, one should remember that this page should not become the main focus of the portfolio – it only serves as an introduction to the reader.

#### **2.5.4.5 Academic record**

The aim of presenting this information is to provide the reader with an overview of the academic qualifications obtained by the educator. Academic records e.g. all the subjects passed per year, the marks obtained, as well as information regarding certificates, diplomas and degrees obtained should be included (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Garnhart, 1996; Mt. Edgecumbe High School, 1999b; Seldin, 1997; Untch, [s.a.]). Information regarding the institutions where the qualifications were obtained can also be given and if it is an Internet-based portfolio an active link to that institution's home page can also be included (Mt. Edgecumbe High School, 1999b).

If applicable some of the course materials of some or all of the courses taken can be included – mainly to provide the reader with evidence of specific skills mastered (Iowa State University, [s.a.]; Illinois State University, 1998b). Garnhart (1996) included in her portfolio information indicating to the reader what subjects she liked best/least and why. This information can however also be included on the pages where the different skills and competencies are presented.

#### **2.5.4.6 Skills**

One of the main features of an electronic portfolio is to provide the reader with evidence of specific skills and competencies mastered. It should serve as a showcase of what the compiler of the portfolio can do. Illinois State University (1998b) suggests that a description of the competency should be provided, with hyperlinks to specific assignments, essays, videos or other pieces of work addressing that specific skill or competency (Kalamazoo College, 1997a, Mt. Edgecumbe High School, 1999a; Lankers, 1998). Different types of

learning activities as well as materials showing the extent of learning by the learner should be included (Iowa State University, [s.a.]; Hurst, Wilson & Cramer, 1998). Kalamazoo College (1997b); Illinois State University (1998b); Garnhart (1996) as well as Pawluk (1999) indicate that it is important to provide the reader with a complete description of the particular skill and its demonstration by providing an example of work where this skill is applied. GIHE, Griffith University (1996) emphasises the presentation of examples and evidence of competencies.

#### **2.5.4.7 Projects**

On the project page information regarding any projects in which the compiler was involved, can be presented. This page can take many forms, including projects like research, team work, assignments or essays (Pawluk, 1999; Hurst, Wilson & Cramer, 1998; Barrett, 1998a; Mt. Edgecumbe High School, 1999a; Wolf, Whinery & Hagerty, 1995; Lankers, 1998). It should include a description of the nature and complexity of the projects and a hyperlink to the completed project (Kalamzoo College, 1997b; Mt. Edgecumbe High School, 1999a; Lankers, 1998). Pawluk (1999) indicates that "*models of excellent work*" should be included here and it should be used as standards by which other projects and work in progress can be judged. Other contributions to the work environment or academic institution (Iowa State University, [s.a.]) or even uncompleted projects can be included with indications on how and when the projects will be finished. Many researchers (Iowa State University, [s.a.]; Hurst, Wilson & Cramer, 1998) indicate that supervisor/educator evaluations should be included with the projects together with suggestions how it can be improved.

According to Iowa State University [s.a.] any "*...materials showing the extent of student learning...*" should be presented, including test scores, learners' workbooks, papers, essays or other creative assignments as well as graded work including written feedback from the supervisor or lecturer.

#### **2.5.4.8 Work experience**

An up-to-date résumé or record of employment and work experience is viewed as an essential part of any portfolio by many researchers (Mt. Edgecumbe High School, 1999a; Illinois State University, 1998b; Garnhart, 1996; Kalamazoo College, 1997b; Hurst, Wilson & Cramer, 1998; Untch, [s.a.]; Kalamazoo College, 1997a; The School Page, 1996; Advisory Centre for University Education, 1998; Kalamazoo College, 1997-98). It should contain the work history of the educator as well as the employer's details and period of employment (Mt.

Edgecumbe High School, 1999a; Lankers, 1998). This will provide the reader with an overview of the educators' exposure and experience in their field of expertise.

Iowa State University [s.a.] indicates that an educator should present "... *representative course materials* " including syllabi, course descriptions with details of content, objectives, methods and procedures for evaluating learning, reading lists, assignments, exams, handouts, descriptions and examples of visual materials used, descriptions of uses of computers and other technology in teaching. Evaluation of teaching in the working environment as presented by learner evaluations, written comments from learners on class evaluations, comments from peers, evaluations done by the head of the department or supervisor or other statements from the employer(s). Information regarding other contributions in the work place e.g. serving on committees, development of programmes, assistance to colleagues on teaching matters, reviews of textbooks and participation in training programmes should be included. Other activities to improve instruction or work methods e.g. participation in seminars or professional meetings on teaching, design of new courses, use of new methods of teaching and assessing of learner outcomes should also be included.

This is a very important part of the portfolio because it will provide the reader with an overview of the experience of the educator.

#### **2.5.4.9 Letters of reference**

When a portfolio is used to apply for a position it is good practice to include some letters of reference and recommendation from educators or former employers (Mt. Edgecumbe High School, 1999a; The School Page, 1996; Wolf, Whinery & Hagerty, 1995; Seldin, 1997; Hurst, Wilson & Cramer, 1998). Peer evaluations can also be included (The School Page, 1996).

#### **2.5.4.10 Goals/Career planning**

To include information regarding career planning and aspirations will provide the reader with an overview of the educator in training's objectives and goals for the future (Mt. Edgecumbe High School, 1999b; Iowa State University, [s.a.]; Barrett, 1998a; Lankers, 1998; Illinois State University, 1998b; Garnhart, 1996; Untch, [s.a.]; Kalamazoo College, 1997b; Kalamazoo College, 1997a). An indication of a commitment to lifelong learning should also be included (Untch, [s.a.]).

If the electronic portfolio is used to apply for a position, it is a good idea to include answers to commonly asked interview questions (Illinois State University, 1998b; Garnhart, 1996).

Garnhart (1996) suggested that answers to the following questions should be included in a portfolio:

- *"What do you see yourself doing in five years from now?"*
- *Do you have plans to continue study?*
- *What are the most important rewards you expect in your career?*
- *Why did you choose the career for which you are preparing/applying?*
- *What criteria do you use to evaluate the company for which you hope to work?"*

The School Page (1996); Hurst, Wilson & Cramer (1998) and Iowa State University [s.a.] suggest that a statement of the educator's teaching philosophy or a description of teaching roles: responsibilities, goals and approaches should also be included.

### **2.5.4.11 Achievements/Awards**

Although the emphasis in the electronic portfolio is on academic and professional achievements and objectives it is acceptable to include details of academic as well as non-academic achievements in one's portfolio (Mt. Edgecumbe High School, 1999a; Kalamazoo College, 1997b; Kalamazoo College, 1997a). Non-academic achievements may include personal achievements on the sports field, regarding hobbies or in community activities (Mt. Edgecumbe High School, 1999a; Lankers, 1998). Academic and professional achievements may include appointment in leadership roles (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Seldin, 1997; Untch, [s.a.]), honors presented by educational and other institutions for good work (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Mt. Edgecumbe High School, 1999b; Iowa State University, [s.a.]), teaching awards from the educator's profession (Iowa State University, [s.a.]), grants and fellowships (GIHE, Griffith University, 1996), invitations based on teaching reputation to consult, give workshops, write articles and requests for advice on teaching by committees or other organized groups (Hurst, Wilson & Cramer, 1998).

### **2.5.4.12 Self-reflection and self-evaluation**

Hurst, Wilson & Cramer (1998:581) indicates that "... *reflections are an important addition to a portfolio, in that they demonstrate reflective decision making ... how they have grown.*". An important feature of an electronic portfolio is the ability to demonstrate work done by the educator but also the inclusion of self-reflection or meta-cognition regarding that work.

Pawluk (1999:<http://homepages.wwc.edu/staff/PAWLST/portfol.htm>) indicates that self-evaluation and reflection regarding the strengths and weaknesses of each work sample are essential because it "... *will show their progress as well as the student's ability to evaluate his/her own learning.*" . Kalamazoo College (1997-98) confirms the importance of self-assessment and reflection on items included in the portfolio. Vizyak (1995) managed to teach grade 1 learners to reflect on their own learning while using portfolios. Tillema (1998:268) also emphasises the importance of the ability to recognise one's own strengths and weaknesses regarding a specific work sample or assignment as an essential part of self-evaluation. Hurst, Wilson & Cramer (1998:579) concludes that "... *this process allows teachers to reflect on their own growth as teachers and learners... can better understand their own development...*". Pawluk (1999); Wolf, Whinery & Hagerty (1995); Tillema (1998); Seldin (1997); Van Niekerk (1998); Baume [s.a.] and Kizlik & Associates (1997-1999) all emphasise the importance of self-evaluation of strengths and weaknesses, but reflections regarding the learning experience are equally important (Tillema, 1998; Hurst, Wilson & Cramer, 1998; Barrett, 1998a; Van Niekerk, 1998, Kizlik & Associates, 1997-1999; Mt Edgecumbe High School, 1999a; Advisory Centre for University Education, 1998; Fisher, 1994; Horry County Schools, 1998). Seldin ([s.a.]:a) asks the question whether one should include "bad" parts of your teaching experience in a portfolio. He indicates that it should be included in terms of self-reflection to indicate to the person reading the portfolio that the constructors recognize their weaknesses and can work on overcoming it.

According to Van Niekerk (1998:90) self-reflection indicates that learners returning to their work, "... *taking the stance of an informed critic ...*". Learner should question themselves about the specific piece of work and the answers should provide the following information:

- *"What is important and why;*
- *What is characteristic about their learning,*
- *What has changed with time;*
- *What still remains to be done;*
- *How different kinds of experiences have contributed to their growth and learning;*
- *What personal insights they have gained from the experience;*
- *What arguments held up in the light of their own evolving standards;*
- *How their opinions and ideas have changed, refined or not changed as they progress through the course."* (Van Niekerk, 1998:90).

In a sense self-reflection is a demonstration of the ability to assume responsibility for your own learning and become a life long learner. It should become an automatic activity in the

learning process (Van Niekerk, 1998). Self-assessment should also form part of the self-reflection activities and is a complicated skill that is developed over a period of time.

### **2.5.4.13 Community activities**

Evidence of involvement in community service projects and volunteer organisations presents the reader with some non-academic or professional information regarding the person behind the portfolio (Mt. Edgecumbe High School, 1999a; Lankers, 1998). It is essential for an educator to be involved in the community and accept social responsibilities within the community (Untch, [s.a.]; Kalamazoo College, 1997a).

### **2.5.4.14 Leisure activities**

As indicated above, it is important that the reader not only meet the "academic" behind the portfolio, but also the person. For this reason information regarding hobbies (Mt. Edgecumbe High School, 1999a; Lankers, 1998), sports (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Kalamazoo College, 1997a), membership to clubs and other social organizations (Mt. Edgecumbe High School, 1999b; Illinois State University, 1998b; Garnhart, 1996; Untch, [s.a.]; Kalamazoo College, 1997a) and other topics/activities of interest (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Mt. Edgecumbe High School, 1999b; Milone, 1995; Untch, [s.a.]; Kalamazoo College, 1997a) should be included in the portfolio.

## **2.5.5 Processes and procedures used in creating electronic portfolios**

According to Sweet (1993b) and Kizlik & Associates (1997-1999) "... *there is no single way to do it but in all of them (portfolios) students are expected to collect, select and reflect ...*". When creating a portfolio, it is important that learners should receive specific and clear guidelines about the minimum requirements that their portfolios should adhere to and what processes and procedures need to be followed to be able to deliver an acceptable end product. The main purpose of the electronic portfolio may determine the processes and procedures to a great extent (Barrett, [s.a.]).

According to the Colorado School of Mines (1999) a classroom incorporating the portfolio method should not necessarily differ much from a traditional classroom setting. Assignments

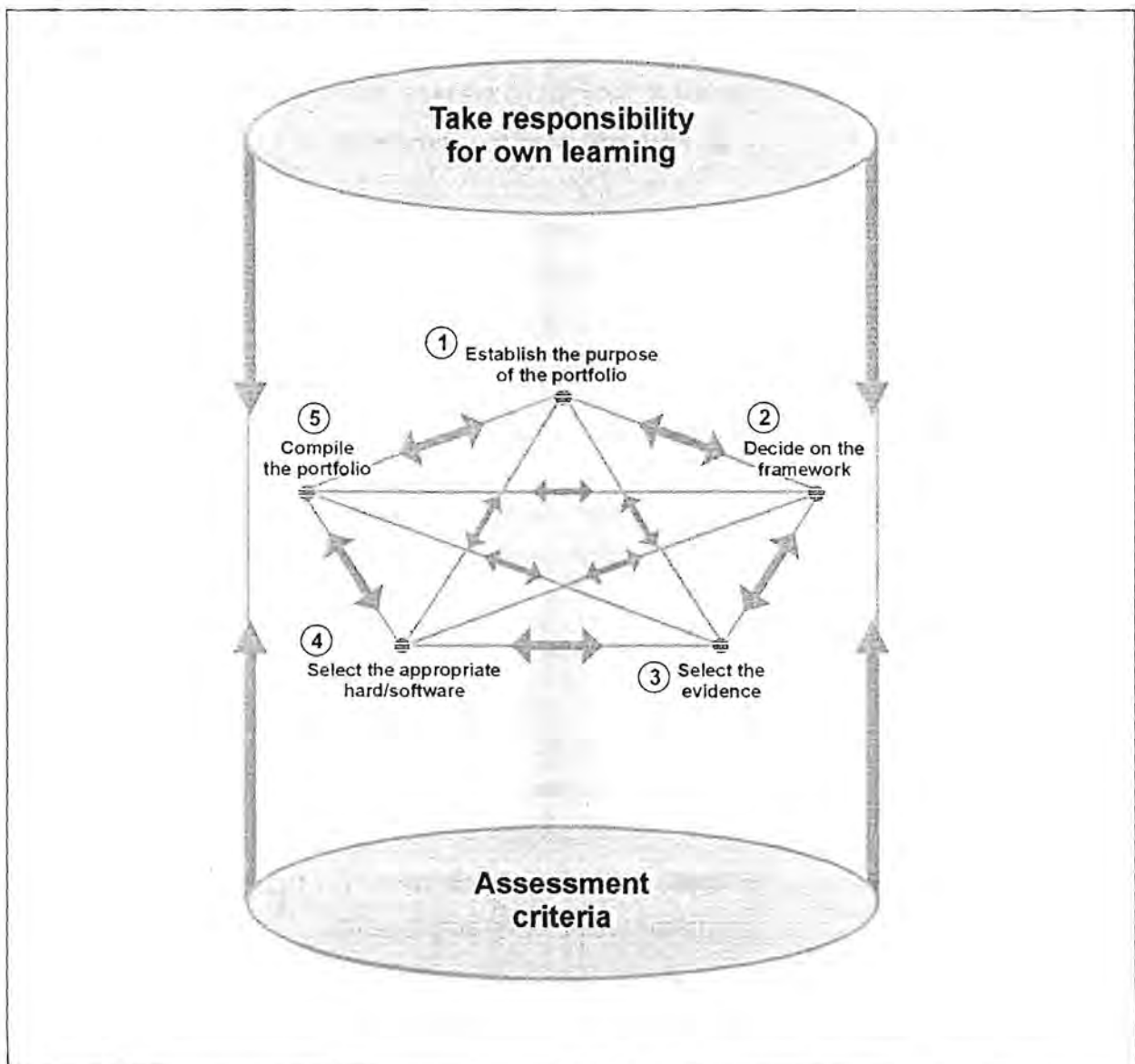


should be given regularly with due dates for drafts. It is important that learners be given the opportunity to revise their assignments before being assessed on the final product, although all the drafts could be reflected in the portfolio. Van Niekerk (1998) indicates that the process(es) followed when constructing a portfolio is equally important as the completed product.

It is very important to note that *"Everyone's portfolio is a unique picture of that person's learning, reflection and development in a course, so no two portfolios will be exactly alike."* (Van Niekerk, 1998:87).

The proposed processes and procedures that a learner has to follow, are graphically presented in Figure 2.5.

**Figure 2.5: Processes and procedures**



A pre-requisite for developing an electronic portfolio, is that learners should take responsibility for their own learning. It is also important that the learners should be aware of the assessment criteria that will be used for that specific portfolio and take that into consideration when compiling the portfolio. The pre-requisites for portfolio development are presented in Table 2.10.

**Table 2.10: Pre-requisites for portfolio development**

Concept	Description	Reference(s)
<b>Take responsibility for own learning</b>	<ul style="list-style-type: none"> <li>▪ Portfolio construction promotes the mindset that learners are responsible for their own learning.</li> <li>▪ Constructing an electronic portfolio already provides guidance and feedback about the process of learning, thus enabling a closer match between diagnosis of learning needs and progress made during training.</li> <li>▪ The electronic portfolio should be learner-centered and the framework used should enable learners to access a common electronic platform to create and continuously improve their personal portfolios.</li> </ul>	Tillema (1998:264); Mt Edgecumbe High School (1999a).
<b>Be aware of the assessment criteria</b>	<ul style="list-style-type: none"> <li>▪ If the portfolio is for assessment purposes, it is necessary that the learners will be informed beforehand regarding the assessment criteria that will be used.</li> <li>▪ The purpose of the electronic portfolio will determine the assessment criteria.</li> <li>▪ The learners can also be involved in the composition of the assessment criteria.</li> </ul>	Barton & Collins (1997:3)

Once the learners display their willingness to accept the responsibility for their own learning and are fully aware of the assessment criteria, certain procedures should be followed in order to compile and present an electronic portfolio. These processes and procedures are presented in Table 2.11.

**Table 2.11: Processes and Procedures**

Concept	Description	Reference(s)
<b>Establish the purpose of the portfolio</b>	<ul style="list-style-type: none"> <li>▪ The educator and/or the learner can determine the purpose of the portfolio.</li> <li>▪ The purpose of the portfolio will, to a large extent, determine the processes procedures followed to compile it.</li> </ul>	Barton & Collins (1997:3).
<b>Decide on the framework</b>	<ul style="list-style-type: none"> <li>▪ The educator and/or the learner can determine the framework before the portfolio is compiled.</li> <li>▪ This framework could determine the composition of the portfolio and can include one or a combination of frameworks, namely chronological, thematic and problem-oriented.</li> <li>▪ Each learner may decide on his/her own framework that best suits his/her circumstances.</li> </ul>	Van Niekerk (1998).
<b>Select evidence</b>	<ul style="list-style-type: none"> <li>▪ The purpose and the framework of the portfolio will determine the contents presented in the portfolio.</li> <li>▪ The learner will select appropriate evidence to demonstrate all the applicable skills and competencies that are specified in the outcomes of the module.</li> <li>▪ The way in which learners demonstrate their vision is limited only by their own creativity.</li> </ul>	Barton & Collins (1997:3); Illinois State University (1998a).

**Table 2.11: Processes and Procedures (continued)**

Concept	Description	Reference(s)
<b>Select appropriate hardware and software</b>	<ul style="list-style-type: none"> <li>▪ The selection of hardware and/or software may be prescribed by the educator, depending on what is available.</li> <li>▪ The selection of hardware may be influenced by:               <ul style="list-style-type: none"> <li>– the availability and accessibility thereof to the learner;</li> <li>– the level of skills regarding specific hardware components, e.g. not every learner may know how to use a scanner.</li> </ul> </li> <li>▪ The choice of software may be influenced by:               <ul style="list-style-type: none"> <li>– The availability and accessibility thereof to the learner;</li> <li>– the learner's level of computer skills;</li> <li>– the most applicable software to manage his/her files for present as well as future use;</li> <li>– the "delivery platform" of the portfolio and the computer skills needed to view the portfolio.</li> </ul> </li> </ul>	Barrett [s.a.]; Wiedmer (1998); Barrett (1999); Barrett (1994).
<b>Compile the portfolio</b>	<ul style="list-style-type: none"> <li>▪ The learner should select an appropriate tool to compile the portfolio.</li> <li>▪ The content as selected (based on the purpose of the portfolio) should be included.</li> <li>▪ The development of the electronic portfolio is the responsibility of the learner, but should be done in collaboration with the educator.</li> </ul>	Van Niekerk (1998); Seldin [s.a.] b; Wiedmer (1998).

**Table 2.11: Processes and Procedures (continued)**

Concept	Description	Reference(s)
<b>Compile the portfolio (continued)</b>	<ul style="list-style-type: none"> <li>▪ Personal growth and a consciousness of one's own development plays an important role in the construction process.</li> <li>▪ Self-reflection regarding skills, competencies, strengths and weaknesses should be a prominent part of the electronic portfolio.</li> </ul>	

It really doesn't matter what tools learners use to compile electronic portfolios, as long as the end-product presents an overview of their skills and capabilities. In order to achieve this, the above-mentioned procedures could be followed. Many educators agree with Barrett (1994) when she indicates that "*Some day, students will graduate from each level (elementary, middle and high school) with a compact disc that contains an entire portfolio.*" (Barrett,1994:12).

Kizlik & Associates (1997-1999) indicate that a possible drawback regarding the use of electronic portfolios could be the amount of time and effort needed from both the teacher and the learner to construct such an electronic portfolio. Educational institutions, lecturers and students are often not well prepared and are not aware of the additional demands portfolio development will place on them as well as on the available resources (Sweet, 1993a). Gillespie *et al* (1996) confirms this statement, indicating that less instruction time can be counter productive to the learning process. When deciding to implement portfolio development, learners as well as lecturers should keep in mind that it takes a great deal of effort and it places additional demands on resources. Portfolio construction may also present a feeling of never being finished. As long as one is in a career or in a learning environment, a portfolio will never be complete, which indicates that everybody should aspire towards becoming lifelong learners.

## **2.5.6 Electronic portfolio assessment**

Gillespie, *et al*, (1996:480) indicates that the purpose of assessment, is to instruct (the learner) while providing the learner, parents and administrators with precise and meaningful information regarding the progress of the learner. Seely (1994) indicates that portfolios are

more than just a collection of the learner's assignments, it is an instrument to provide information and feedback regarding the growth and development of a learner over a period of time. According to Gomez, Graue & Bloch (1991:620) portfolio assessment was initiated as a result of the growing need for additional and/or alternative assessment methods to the conventional testing methods that was commonly used in education.

Van Niekerk (1998: 82) indicates that although portfolio assessment in South Africa is not yet used extensively, it is not a new concept and especially in the United States of America and Britain research has been done in the field (Benoit & Yang, 1996; Fourali, 1997; Hoepfl, 1993). In these countries portfolio assessment is used widely in schools (primary as well as secondary schools) as well as colleges and specifically for educators (Richlin & Manning, 1996; Setteducati, 1995; Hurst, Wilson & Cramer, 1998; Iowa State University, [s.a.]; The School Page, 1996; Winsor & Ellefson, 1995.). She mentions that portfolio assessment is capable of testing the learner's "... *ability to apply what they have learned in realistic settings.*" (Van Niekerk, 1998:82).

Three dimensions of portfolio assessment can be identified, as is graphically presented in Figure 2.6.

**Figure 2.6: Three dimensions of portfolio assessment**



The lecturer/educator is the primary assessor of the learners' electronic portfolios. The assessment criteria should be set even before the learner develops the electronic portfolio. The educator is also responsible for the composition of the assessment instrument. Learners as well as colleagues can contribute to the assessment criteria and instrument. The responsibilities of the educator, namely to develop the assessment criteria and the assessment instrument, are presented in Table 2.12.

**Table 2.12: Responsibilities of the educator regarding portfolio assessment**

Concept	Description	Reference(s)
<b>Setting assessment criteria</b>	<ul style="list-style-type: none"> <li>▪ A list of standards, competencies and proficiencies against which all portfolios will be judged should be established, i.e. the assessment criteria.</li> <li>▪ Pre-determining the assessment criteria is a necessity to ensure that every learner's assessment is based on the same criteria.</li> <li>▪ The assessment criteria should clearly indicate <i>what</i> will be assessed.</li> <li>▪ All criteria should be defined clearly to provide the learner with an indication of weak or adequate and strong performances for each component that will be assessed.</li> <li>▪ Learners can be involved in the development of assessment criteria.</li> </ul>	Wiedmer (1998:589); Gibbs [s.a.]b; Courts & McInerney (1993:69); Kizlik & Associates (1997-1999); Mt Edgecumbe High School (1999a); Barrett (1998d).
<b>Creating an assessment instrument</b>	<ul style="list-style-type: none"> <li>▪ An assessment instrument, containing all the elements described in the assessment criteria, should be developed.</li> <li>▪ Such an instrument can take many different formats.</li> <li>▪ The "matrix format" can be used effectively and in different formats:</li> </ul>	Wiedmer (1998); Courts & McInerney (1993:69); Barrett (1998d).

**Table 2.12: Responsibilities of the educator regarding portfolio assessment (continued)**

Concept	Description	Reference(s)
<b>Creating an assessment instrument (continued)</b>	<ul style="list-style-type: none"> <li>– an analytic matrix can be used, breaking the portfolio into parts and rating each part on a scale;</li> <li>– a holistic matrix is used to consider the whole portfolio and rate overriding skills without doing a small scale analysis;</li> <li>– the primary trait matrix is used to assess the demonstrated performance in one or more major areas of emphasis.</li> </ul> <ul style="list-style-type: none"> <li>▪ Using an assessment instrument ensures that all the learners are assessed equally.</li> </ul>	

Learners and their peers can be identified as the secondary assessors of the electronic portfolio. Self-assessment is rated as a very valuable characteristic of portfolio development. Peer assessment is equally important – especially since it promotes discussions about learning. Self-assessment and peer assessment is described in Table 2.13.

**Table 2.13: Self-assessment and peer assessment of electronic portfolios**

Concept	Description	Reference(s)
<b>Self-assessment</b>	<ul style="list-style-type: none"> <li>▪ Electronic portfolios will guide the learners to keep track of their own development and provide continuous cognitive feedback, thereby promoting reflection on practice.</li> </ul>	Maclsaac & Jackson (1994); Van Niekerk (1998); Kizlik & Associates (1997-1999); Tillema (1998:263); Lamme & Smith (1991); Colorado School of Mines (1999).



**Table 2.13: Self-assessment and peer assessment of electronic portfolios  
(continued)**

Concept	Description	Reference(s)
<b>Self-assessment (continued)</b>	<ul style="list-style-type: none"> <li>▪ Assessing one's own electronic portfolio can enhance the awareness of the necessary strategies for thinking about and creating assignments.</li> <li>▪ Portfolio assessment shifts a part of the responsibility of assessment away from the educator to the learner.</li> <li>▪ The learner is responsible for continuous self-assessment and self-reflection.</li> <li>▪ Self-assessment provides learners with the opportunity to reflect on their own work and determine the growth that took place over a period of time.</li> <li>▪ The learners are active participants in the assessment process – they should supply evidence of their ability to solve problems, retrieve information, find new solutions to problems, be creative and analyse and solve problems.</li> <li>▪ The learners are made aware of the possible discrepancy between self-perceptions and external judgements about their work, and this can act as an incentive to motivate them to improve their assignments.</li> </ul>	

**Table 2.13: Self-assessment and peer assessment of electronic portfolios  
(continued)**

Concept	Description	Reference(s)
<b>Self-assessment (continued)</b>	<ul style="list-style-type: none"> <li>▪ Being responsible for the presentation of their own work, they will be encouraged to revise it often.</li> <li>▪ Learners will have a sense of control over the assessment of their work.</li> <li>▪ Learners will be more critical about their own work.</li> </ul>	
<b>Peer assessment</b>	<ul style="list-style-type: none"> <li>▪ Peer assessment forms part of the electronic portfolio assessment strategy.</li> <li>▪ Peer assessment is valued by the learners because the learners may feel that they have a better understanding of the value and content of the competencies demonstrated in the portfolio.</li> <li>▪ It promotes discussion about learning, the learning material and the compilation of the electronic portfolio.</li> </ul>	Tillema (1998:263); Gibbs [s.a.]a.

Electronic portfolio assessment encompasses much more than the assessment of basic knowledge and recall. The learner's ability to make decisions, evaluate and solve problems form the essence of what is assessed.

## 2.6 Summary

Educators' only involvement with OBE is not just in the classroom where they are the facilitators of outcomes-based learning, but also in their own education and lifelong learning process. The Department of Education (1997c:51) states that no requirements will be stated

in terms of time or content input, but "... *the emphasis will be on the acquisition of applied competencies which will be described using outcomes*". Teacher education is also supposed to be based on OBE and they should also be able to demonstrate their outcomes and skills at the end of any learning experience.

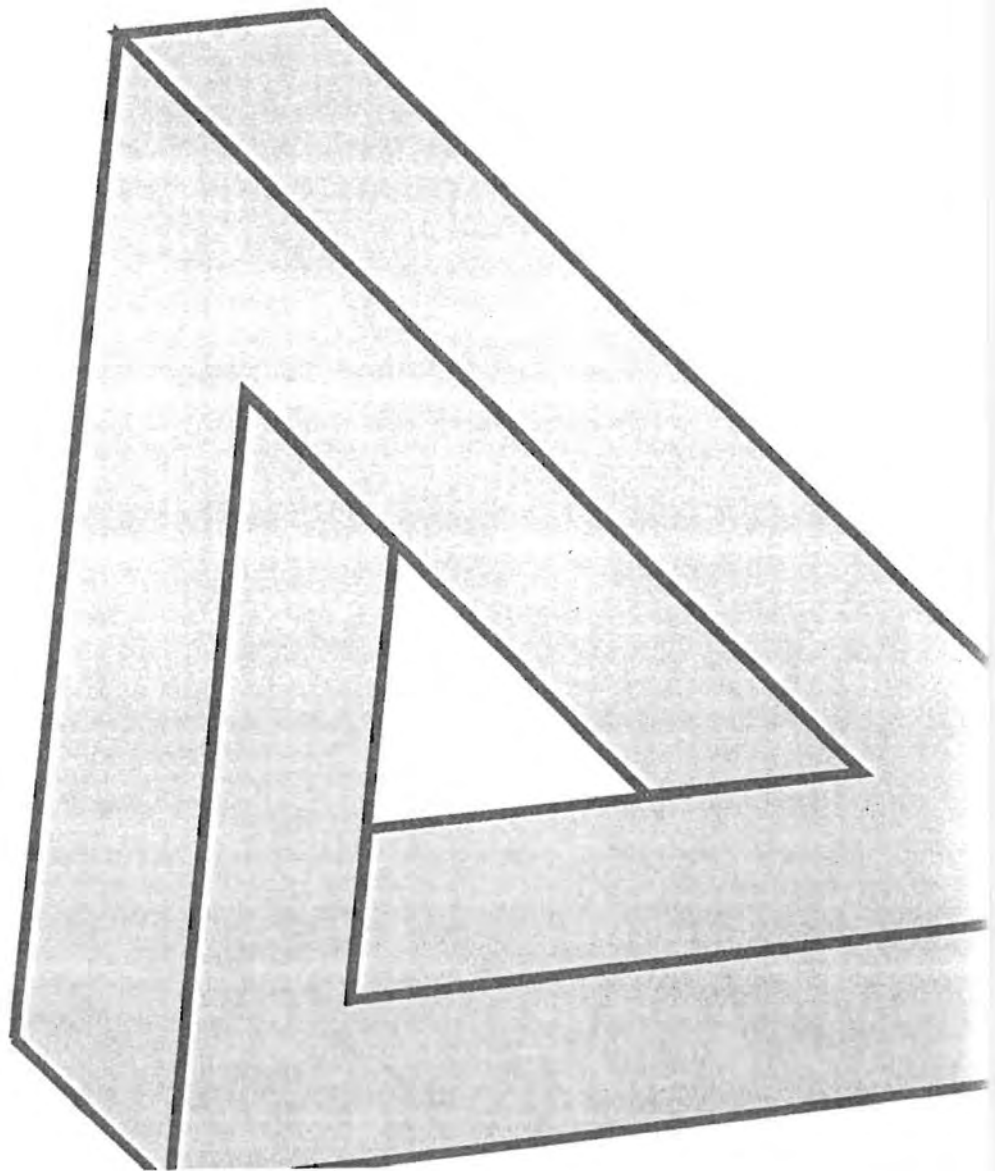
OBE has played a role in many professions for a long time already, although the term was never used e.g. pilots in obtaining a flying license. Now it is applicable to everybody and every field of study. It also applies to teachers – regarding their licensing by SACE.

Wiedmer (1998:589) describes the use of technology, and specifically the use of electronic portfolios, as an alternative method to demonstrate skills and competencies as a challenge to all learners and educators.

3

# Analysis, Design & Development

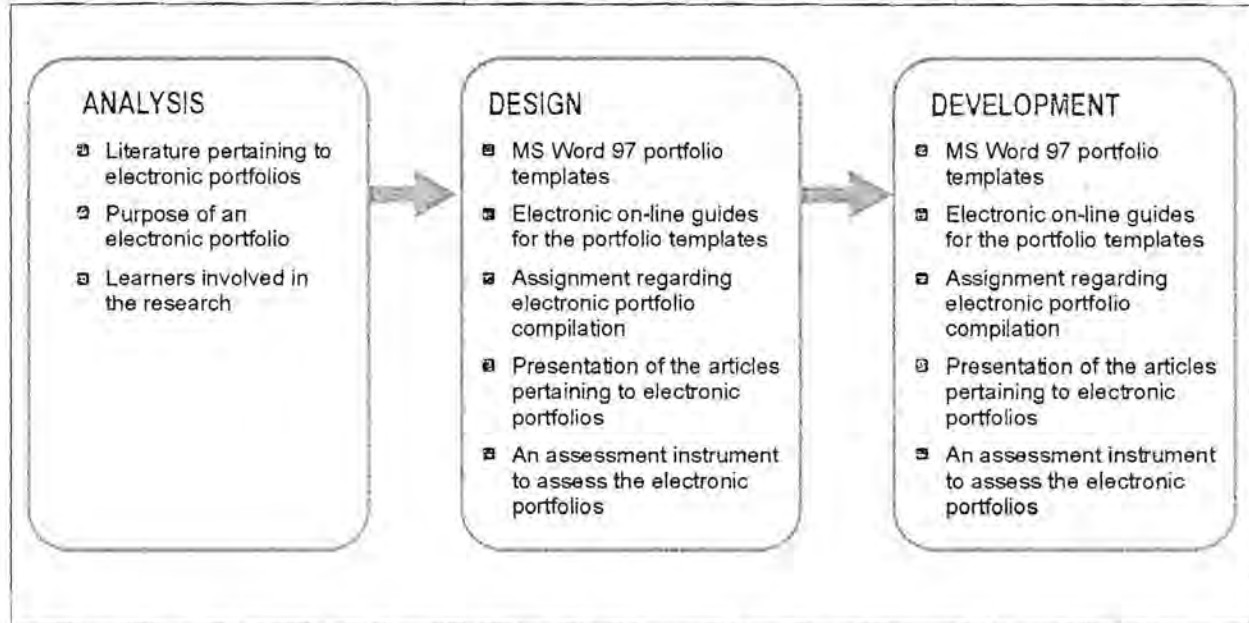
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## 3.1 Introduction

The processes preceding the design and development phases, as well as the techniques that will be used to design and develop the templates for the electronic professional developmental portfolio, will be described in this chapter. A summary of the contents of Chapter 3 is presented graphically in Figure 3.1.

**Figure 3.1: The analysis, design and development phases**



## 3.2 The analysis phase

An analysis of many different applicable aspects has to be implemented and completed preceding any design and/or development of educational programmes. In this case it was essential to analyse the literature regarding electronic portfolios, the purpose of an electronic developmental portfolio, as well as the target group of learners for whom the portfolio templates will be developed.

### 3.2.1 Analysis of relevant literature

The essential components that should be present in a developmental portfolio were identified during the literature study. Although a few variations existed, most authors agree on the basic components of an electronic developmental portfolio. A summary of the components as identified during the literature study, is presented in Table 3.1.

**Table 3.1: Components of an electronic portfolio as identified during the literature study**

Component	Description
<b>Interface</b>	<p>The interface of an electronic portfolio should comply with the following:</p> <ul style="list-style-type: none"> <li>▪ It should be a simple user-interface to ease use of the portfolio (Mt. Edgecumbe High School, 1999a).</li> <li>▪ A custom header should be used to present the information logically (Mt. Edgecumbe High School, 1999a).</li> <li>▪ The electronic portfolio should run mechanically and technically error-free (Mt. Edgecumbe High School, 1999a).</li> <li>▪ It should contain active links to applicable sources (Kalamazoo College, 1997a).</li> </ul>
<b>Multimedia Components</b>	<p>A variety of multimedia components could be included, namely:</p> <ul style="list-style-type: none"> <li>▪ Descriptive text (Wiedmer, 1998).</li> <li>▪ Scanned copies of applicable documents (The School Page, 1996).</li> <li>▪ Applicable graphics and photographs of relevance e.g. graduation photograph (Kizlik &amp; Associates, 1997-1999; Mt. Edgecumbe High School, 1999a; The School Page, 1996; Hurst, Wilson &amp; Cramer, 1998).</li> <li>▪ Digitised videos (Kizlik &amp; Associates, 1997-1999; Mt. Edgecumbe High School, 1999a; Wiedmer, 1998).</li> <li>▪ Voice over/sound (Mt. Edgecumbe High School, 1999a; Wiedmer, 1998).</li> <li>▪ Applicable animations (Wiedmer, 1998).</li> </ul>
<b>Table of Contents</b>	<p>The table of contents of the electronic portfolio can be presented in different formats, namely:</p> <ul style="list-style-type: none"> <li>▪ A traditional table of contents with a short explanation or description of the sample which explains the reason for including it (Mt. Edgecumbe High School, 1999a; Hurst, Wilson &amp; Cramer, 1998; St. Norbert College, 1996).</li> </ul>

**Table 3.1: Components of an electronic portfolio as identified during the literature study (continued)**

Component	Description
<b>Table of Contents (continued)</b>	<ul style="list-style-type: none"> <li>▪ An index and description of all items (Tillema, 1998).</li> <li>▪ An introductory letter or menu (St. Norbert College, 1996).</li> </ul>
<b>Personal Data</b>	<p>Depending on the circumstances, different types and levels of personal data can be included, namely:</p> <ul style="list-style-type: none"> <li>▪ A personal cover page including name, address, telephone number and e-mail address (Mt. Edgecumbe High School, 1999a; Mt. Edgecumbe High School, 1999b; St. Norbert College, 1996; Hurst, Wilson &amp; Cramer, 1998; The School Page, 1996).</li> <li>▪ Family history and personal demographics or a brief biographical sketch (Mt. Edgecumbe High School, 1999a; Lankers, 1998; The School Page, 1996; Kalamazoo College, 1997b).</li> <li>▪ Information regarding friends and family as well as cultural background, home and school community (Untch, [s.a.]; Kalamazoo College, 1997a; Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> </ul>
<b>Academic history/data</b>	<p>The academic history will provide the educator as well as learners with an overview of their progress and can include the following:</p> <ul style="list-style-type: none"> <li>▪ Academic records e.g. subjects passed per year (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Garnhart, 1996).</li> <li>▪ A history of education e.g. institutions attended and all qualifications (certificates/diplomas/degrees) obtained (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Mt. Edgecumbe High School, 1999b).</li> <li>▪ Progress reports regarding studies (Untch, [s.a.]).</li> <li>▪ Course materials of some or all of the subjects/courses taken (Iowa State University, [s.a.]).</li> </ul>

**Table 3.1: Components of an electronic portfolio as identified during the literature study (continued)**

Component	Description
<b>Skills</b>	<p>One of the main advantages of an electronic portfolio is that it enables learners to provide proof of specific skills and competencies. It can be done by including:</p> <ul style="list-style-type: none"> <li>▪ Examples of written/oral expressions as presented in assignments etc.(Kalamazoo College, 1997a).</li> <li>▪ Materials showing the extent of learning by the learner (Iowa State University, [s.a.]).</li> <li>▪ Samples of different learning activities (Hurst, Wilson &amp; Cramer, 1998).</li> <li>▪ A description and demonstration of skills and competencies (Kalamzoo College, 1997b; Illinois State University, 1998b; Garnhart, 1996; Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> </ul>
<b>Projects</b>	<p>Electronic portfolios should include examples of projects to demonstrate the applicable skills and competencies. Projects can be presented in different formats, including:</p> <ul style="list-style-type: none"> <li>▪ A description and demonstration of activities associated with applicable projects (Kalamazoo College, 1997b).</li> <li>▪ Work samples and models of excellent academic and other work (Pawluk, 1999; Hurst, Wilson &amp; Cramer, 1998; Barret, 1998; Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> <li>▪ Work-in-progress as well as completed projects (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> <li>▪ Evaluation reports of teaching/learning (Iowa State University, [s.a.]).</li> <li>▪ Examples of teamwork (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> </ul>
<b>Work experience</b>	<p>A record of the learners work experience is essential and can be presented as:</p> <ul style="list-style-type: none"> <li>▪ An up-to-date résumé (Mt. Edgecumbe High School, 1999a; Illinois State University, 1998b; Garnhart, 1996;</li> </ul>



**Table 3.1: Components of an electronic portfolio as identified during the literature study (continued)**

Component	Description
<b>Work experience (continued)</b>	Kalamazoo College, 1997b; Hurst, Wilson & Cramer, 1998; Untch, [s.a.]; Kalamazoo College, 1997a). <ul style="list-style-type: none"> <li>▪ An overview of work history and experiences including employer's details and period of employment (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> </ul>
<b>Letters of reference</b>	The following types of letters of reference can be included: <ul style="list-style-type: none"> <li>▪ Letters of reference and recommendation from educators or employers (Mt. Edgecumbe High School, 1999a; The School Page, 1996; Hurst, Wilson &amp; Cramer, 1998).</li> <li>▪ Peer evaluations (The School Page, 1996).</li> </ul>
<b>Goals/career planning</b>	Information regarding the learner's goals and career planning provides the reader with more information about that person may include: <ul style="list-style-type: none"> <li>▪ Objectives and goals for the future (Mt. Edgecumbe High School, 1999b; Iowa State University, [s.a.]; Barret, 1998).</li> <li>▪ Answers to commonly asked questions in interviews (Illinois State University, 1998b; Garnhart, 1996).</li> <li>▪ Information regarding professional career planning and readiness (Illinois State University, 1998b; Garnhart, 1996; Untch, [s.a.]; Kalamazoo College, 1997b; Kalamazoo College, 1997a).</li> <li>▪ The learner's commitment to lifelong learning (Untch, [s.a.]).</li> <li>▪ Career aspirations (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> </ul>
<b>Achievements/Awards</b>	Academic as well as non-academic achievements and awards received should be presented in the electronic portfolio, including: <ul style="list-style-type: none"> <li>▪ Leadership roles (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Untch, [s.a.]).</li> </ul>

**Table 3.1: Components of an electronic portfolio as identified during the literature study (continued)**

Component	Description
<b>Achievements/Awards (continued)</b>	<ul style="list-style-type: none"> <li>▪ Personal accomplishments (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> <li>▪ Recognition and awards presented for good work (Mt. Edgecumbe High School, 1999a; Mt. Edgecumbe High School, 1999b; Lankers, 1998; Iowa State University, [s.a.]).</li> <li>▪ Honors presented by educational and other institutions for outstanding achievements (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Mt. Edgecumbe High School, 1999b; Iowa State University, [s.a.]).</li> </ul>
<b>Self-reflections/evaluation</b>	<p>Self-reflection is one of the most important components of an electronic portfolio and should be included as:</p> <ul style="list-style-type: none"> <li>▪ Self-evaluation of strengths and weaknesses (Pawluk, 1999; Tillema, 1998; van Niekerk, 1998, Kizlik &amp; Associates, 1997-1999).</li> <li>▪ Reflections on all learning experiences (Tillema, 1998; Hurst, Wilson &amp; Cramer, 1998; Barret, 1998; van Niekerk, 1998, Kizlik &amp; Associates, 1997-1999; Mt Edgecumbe High School, 1999a).</li> <li>▪ Reflections on prior learning (van Niekerk, 1998).</li> <li>▪ Demonstrations of the ability to assume responsibility for learning (van Niekerk, 1998).</li> </ul>
<b>Community activities</b>	<p>Information about the learner's involvement in the community could be presented regarding:</p> <ul style="list-style-type: none"> <li>▪ Involvement in the community and accepting social responsibilities within the community (Untch, [s.a.]; Kalamazoo College, 1997a).</li> <li>▪ Involvement in community service projects and volunteer organisations (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> </ul>

**Table 3.1: Components of an electronic portfolio as identified during the literature study (continued)**

Component	Description
<b>Leisure activities</b>	Information regarding leisure and other activities should also be presented, including information regarding: <ul style="list-style-type: none"> <li>▪ Hobbies (Mt. Edgecumbe High School, 1999a; Lankers, 1998).</li> <li>▪ Sport and leisure activities (Mt. Edgecumbe High School, 1999a; Lankers, 1998; Mt. Edgecumbe High School, 1999b; Untch, [s.a.]; Kalamazoo College, 1997a).</li> <li>▪ Membership to clubs and organisations (Mt. Edgecumbe High School, 1999b).</li> <li>▪ Other aspects regarding student and social life (Illinois State University, 1998b; Garnhart, 1996; Untch, [s.a.]; Kalamazoo College, 1997a).</li> </ul>

### 3.2.2 Analysis of the purpose of developing an electronic professional developmental portfolio

The South African Council for Educators (SACE) has been established to act as the guardian of the professionalism of teachers. To be able to practice as a teacher in South Africa, registration to the SACE is compulsory. SACE has also set standards and criteria which teachers have to comply with in order to register and be licensed, as well as a code of conduct which they have to adhere to (see Appendix A on the CD ROM for the complete Code of Conduct of the SACE). Teachers who are licensed, have to renew their licenses regularly (every three years). Specific professional requirements will have to be fulfilled in order to qualify for re-licensing e.g. "... *successful completion of in-service programmes, performance appraisal for developmental purposes and demonstrated compliance with the Code of Conduct.*" (Department of Education, 1997b:43). However, logistical problems may arise as educators are expected to submit lengthy paper-based evidence that they qualify for re-licensing. It was suggested that the SACE be linked to the SAQA database to enable them to have access to a list of qualifications obtained by an educator. Another option of obtaining this information could be to make use of electronic portfolios. In an electronic

portfolio information regarding the educator's development will also be included. There are many advantages of using electronic portfolios although it requires a very high level of computer skills as well as many time consuming activities.

*Computer-assisted Aids for Education* (RMX 880) is one of the compulsory modules of the MEd (Computer-assisted Education (CAE)), MEd (Information Technology (IT)) and MA (Information Science (IS)) qualifications of the University of Pretoria. Students registered for any one of these qualifications are mostly educators who will have to comply with the licensing standards as set by the SACE. For this reason the presenter of this module for 1999 decided to use portfolio assessment to equip the learners with a tool that they can use to demonstrate to the SACE that they comply with the set requirements. The development of the electronic portfolio in this module (Computer-assisted Aids for Education) forms an integral part of the module. All the other assignments for this module will be included in the electronic developmental portfolio.

### **3.2.3 Analysis of the learners involved in the research**

The composition of the target population is an important factor that should be taken into consideration when planning the design, development and implementation of any programme. Assumptions regarding the composition of the group of learners, were based on the registration of previous years for the MEd (CAE) qualification. According to the presenter the level of computer skills of the learners varied considerably. They were all educators, but their levels of computer skills were in most cases, not very advanced. Most of the learners were able to use a word processing programme, but they did not have any experience regarding the world wide web or other computer applications. For this reason it was decided to develop a tool in a word processing programme and not to use a web based tool or html (hypertext markup language) application.

## **3.3 The design phase**

The main objective of the design phase was to design a set of *templates* that could be used by learners to construct an electronic professional developmental portfolio. Based on the assumption that the target group of learners will all be able to use a word processing programme, a suitable word processing programme for developing the set of templates, had to be selected. It was decided to use Microsoft Word 97 because the learners in this module

(RMX 880) had to create a series of newsletters using Microsoft Word 97 and this is also the only word processing programme supported by the University of Pretoria. Keeping in mind that regarding word processing programmes, the level of computer skills of learners may vary, it was decided to develop guides or manuals to accompany the templates, to provide the learners with on-line help regarding the use of the templates. Because the creation of the electronic portfolio is an integral part of the module, an assignment that requires the learners to develop an electronic portfolio had to be designed. It was also important that the learners received some theoretical background regarding electronic portfolios and portfolio assessment and for this reason a number of journal articles and web pages as references had to be included on the CD ROM containing all the study material. Each learner's electronic portfolio needs to be assessed after completion and for this purpose assessment criteria and an assessment instrument also had to be designed. The design specifications for the Microsoft Word 97 portfolio templates, the on-line guides, the assignment, the presentation of the articles, and the assessment instrument will be addressed in detail in Paragraphs 3.3.1 – 3.3.5.

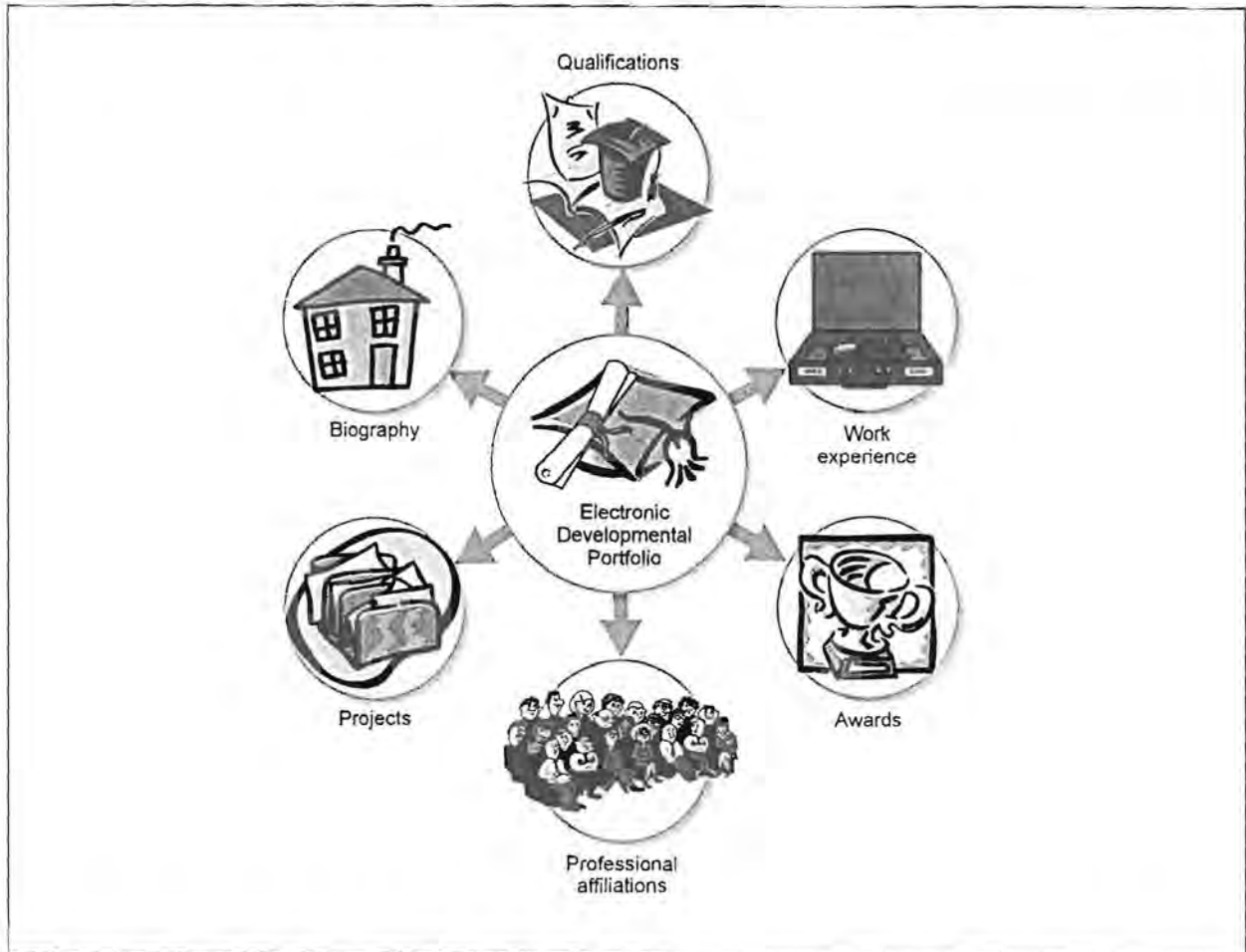
### **3.3.1 Design specifications for the Microsoft Word 97 portfolio templates**

Microsoft Word 97 can be used to develop esthetically pleasing documents, and in this case, templates. Once edited by the learner, the Microsoft Word 97 files will be converted to portable display format (pdf) using Adobe Acrobat Exchange. The same programme will be used to insert and activate hyperlinks between the different portfolio pages. Setting design specifications for the Microsoft Word 97 portfolio templates included designing the components of the electronic developmental portfolio as well as the look and feel.

#### **3.3.1.1 Designing the components of the Microsoft Word 97 portfolio templates**


Six components were identified to be essential components of the electronic professional developmental portfolio. These six components are graphically represented in Figure 3.2.

**Figure 3.2: The six essential components of the electronic professional developmental portfolio**






The design elements applicable to each component are indicated in Table 3.2.


**Table 3.2: Design elements regarding the components of the professional developmental portfolio**

Component	Description
<p data-bbox="232 1515 380 1543"><b>Biography</b></p> 	<p data-bbox="657 1515 1435 1594">This page will contain an area where the learners can insert biographical data, including:</p> <ul style="list-style-type: none"> <li data-bbox="657 1616 846 1645">▪ Full name;</li> <li data-bbox="657 1667 1013 1696">▪ Residential information;</li> <li data-bbox="657 1718 948 1747">▪ Postal information;</li> <li data-bbox="657 1769 1040 1798">▪ Occupational information;</li> <li data-bbox="657 1820 997 1849">▪ Recreational activities.</li> </ul> <p data-bbox="657 1871 1018 1900">The learners will be able to:</p> <ul style="list-style-type: none"> <li data-bbox="657 1922 1170 1950">▪ Insert their own photographs/clipart;</li> </ul>

**Table 3.2: Design elements regarding the components of the professional developmental portfolio (continued)**



Component	Description
<b>Biography (continued)</b>	<ul style="list-style-type: none"> <li>▪ Include any other applicable information;</li> <li>▪ Insert links to other pages, web pages or applicable documents.</li> </ul>
<b>Qualifications</b>  	<p>This page will contain an area where the learners can insert the different qualifications obtained under the following headings:</p> <ul style="list-style-type: none"> <li>▪ Name of the qualification;</li> <li>▪ Name of the institution;</li> <li>▪ Year;</li> <li>▪ Subjects;</li> <li>▪ Links to applicable pages/information.</li> </ul>
<b>Work experience</b>  	<p>This page will contain an area where learners can insert a summary of the their different work experiences under the following headings:</p> <ul style="list-style-type: none"> <li>▪ Name of the organisation;</li> <li>▪ Job description;</li> <li>▪ Duration/period;</li> <li>▪ Responsibilities;</li> <li>▪ Reference(s);</li> <li>▪ Links to applicable pages/information.</li> </ul>
<b>Projects</b>  	<p>This page will contain an area where learners can insert information regarding any projects that they were involved with, including:</p> <ul style="list-style-type: none"> <li>▪ Papers presented at conferences including the following information:             <ul style="list-style-type: none"> <li>- Title of the paper presented;</li> <li>- Author(s);</li> <li>- Year;</li> <li>- City;</li> <li>- Conference/workshop;</li> <li>- An abstract of the paper;</li> <li>- Other links to applicable pages/information.</li> </ul> </li> </ul>

**Table 3.2: Design elements regarding the components of the professional developmental portfolio (continued)**

Component	Description
<p data-bbox="224 296 513 327"><b>Projects (continued)</b></p> 	<ul style="list-style-type: none"> <li data-bbox="657 296 1372 378">▪ Articles published in periodicals/magazines/journals including the following information:               <ul style="list-style-type: none"> <li data-bbox="699 400 1175 431">- Title of the articles published;</li> <li data-bbox="699 451 927 482">- Author(s);</li> <li data-bbox="699 502 867 533">- Year;</li> <li data-bbox="699 553 1040 583">- Periodical/Journal;</li> <li data-bbox="699 603 1122 634">- An abstract of the article;</li> <li data-bbox="699 654 1360 685">- Other links to applicable pages/information.</li> </ul> </li> <li data-bbox="657 707 1349 789">▪ Research reports compiled including the following information:               <ul style="list-style-type: none"> <li data-bbox="699 811 1149 842">- Title of the report compiled;</li> <li data-bbox="699 862 927 893">- Author(s);</li> <li data-bbox="699 913 867 944">- Year;</li> <li data-bbox="699 964 878 995">- Place;</li> <li data-bbox="699 1015 927 1046">- Publisher;</li> <li data-bbox="699 1066 1122 1097">- An abstract of the report;</li> <li data-bbox="699 1117 1360 1148">- Other links to applicable pages/information.</li> </ul> </li> <li data-bbox="657 1170 1289 1251">▪ Technology developed including the following information:               <ul style="list-style-type: none"> <li data-bbox="699 1274 1049 1305">- Title of the product;</li> <li data-bbox="699 1324 1240 1355">- Goal of the technology developed;</li> <li data-bbox="699 1375 987 1406">- Self-reflection;</li> <li data-bbox="699 1426 1040 1457">- Link to the product</li> </ul> </li> <li data-bbox="657 1479 1372 1561">▪ Community service rendered including the following information:               <ul style="list-style-type: none"> <li data-bbox="699 1583 1321 1614">- Descriptive title for the service rendered;</li> <li data-bbox="699 1634 1175 1665">- Goal of the service rendered;</li> <li data-bbox="699 1685 1349 1716">- Community where the service is rendered;</li> <li data-bbox="699 1736 1003 1767">- Type of activity;</li> <li data-bbox="699 1787 987 1818">- Self-reflection.</li> </ul> </li> </ul>



**Table 3.2: Design elements regarding the components of the professional developmental portfolio (continued)**

Component	Description
<p><b>Professional affiliation</b></p> 	<p>This page will contain an area where learners can insert a summary of their professional affiliations under the following headings:</p> <ul style="list-style-type: none"> <li>▪ Name of the organisation;</li> <li>▪ Position;</li> <li>▪ Duration/period;</li> <li>▪ Goal/objectives;</li> <li>▪ Links to applicable pages/information.</li> </ul>
<p><b>Awards</b></p> 	<p>This page will contain an area where learners can insert a summary of awards/bursaries awarded to them under the following headings:</p> <ul style="list-style-type: none"> <li>▪ Name of the award;</li> <li>▪ Institution;</li> <li>▪ Year;</li> <li>▪ Criteria;</li> <li>▪ Links to applicable pages/information.</li> </ul>

### 3.3.1.2 Designing the *look and feel* of the Microsoft Word 97 portfolio templates

An applicable look and feel will have to be established in order to create continuity between the different pages of the portfolio. It is important that the designed look and feel is meant to be an example for the learners – they could use it as is, but it must also allow them to change the pages according to their own personal preferences.

The look and feel of any programme refer to the standard "*look*" set out in the design phase. Aspects like the font size, type, colour and layout of text and the use of graphics and colour will be addressed. The design specifications for the look and feel of the Microsoft Word 97 portfolio templates are presented in Table 3.3.

**Table 3.3: Design specifications for the look and feel of the Microsoft Word 97 portfolio templates**

Design element	Description
<b>Text and text layout</b>	<ul style="list-style-type: none"> <li>▪ A sans serif font type (Arial Narrow) will be used because it is aesthetically pleasing and very legible.</li> <li>▪ The font type and size, position of headings, labels and descriptive information will be used consistently.</li> <li>▪ Tables will be used with dedicated positions for headings and descriptive text.</li> <li>▪ Each page will contain a header and a footer, which will serve as navigation bars.</li> </ul>
<b>Colour</b>	<ul style="list-style-type: none"> <li>▪ Colour will be used in the header (navigation bar) and in the graphics.</li> <li>▪ Different shades of blue will be used for the different navigation buttons – this use of colour will be functional, the lighter blue buttons will be clicked to move from one page to another and the darker blue button will indicate the page being viewed.</li> <li>▪ Text on the buttons will be white for legibility.</li> <li>▪ The blue and white border on top of the page are purely for aesthetic purposes.</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>▪ Graphics will be used to create an informal look.</li> <li>▪ On top of each page the cap and roll (symbols of learning and qualifications) will be displayed.</li> <li>▪ Each page will display an appropriate, descriptive graphic next to the heading.</li> <li>▪ The biography page will display appropriate pictures for every section of the page e.g. a post box for the postal address.</li> </ul>
<b>Navigation bars</b>	<ul style="list-style-type: none"> <li>▪ The navigation bars will be contained in the header and footer of each page, to ease editing of the templates by the learners.</li> <li>▪ The navigation tools will appear at the top as well as the bottom of the page for easy navigation by the user.</li> <li>▪ The header will consist of six navigation buttons.</li> </ul>

**Table 3.3: Design specifications for the look and feel of the Microsoft Word 97 portfolio templates (continued)**

Design element	Description
<b>Navigation bars (continued)</b>	<ul style="list-style-type: none"> <li>▪ Different shades of blue will be used for the different navigation buttons as described under <i>Colour</i>.</li> <li>▪ The footer will consist of six navigation text buttons, the text within a frame will indicate the active page.</li> </ul>

### 3.3.2 Design specifications for the on-line guides accompanying the Microsoft Word 97 portfolio templates

Although it is assumed that all the learners will be able to use a word processing programme, the learners will be provided with assistance regarding the use of the templates. An on line help function is perceived as a workable solution and such help pages or guides will be developed. It will be available either on-screen or a printed copy can be made. The design principles regarding the components of the on-line guides as well as the look and feel is described in the following paragraph.

#### 3.3.2.1 Designing the components of the on-line guides

An on-line guide has to be developed for each individual template page. Depending on the content of the template page, a suitable on-line guide page has to be created. Design principles regarding the components included in the on-line guides had to be set and are presented in Table 3.4.

**Table 3.4: Design specifications for the components in the on-line guides**

Component	Description
<b>Purpose of the specific page</b>	The purpose and information contained on that specific page will be described.
<b>How to use the specific page</b>	A description of how to use the specific page and all its components of will be provided.

**Table 3.4: Design specifications for the components in the on-line guides  
(continued)**

Component	Description
<b>How to enter data to the specific page</b>	The difference between the label and content parts of the information elements on the pages will be described. Step-by-step instructions regarding the entering of data will be provided.
<b>How to insert additional rows into tables</b>	Step-by-step instructions regarding the inserting of additional rows into the tables will be provided.
<b>How to delete rows from tables</b>	Step-by-step instructions regarding the deleting of rows from the tables will be provided.
<b>How to insert additional tables</b>	Step-by-step instructions regarding the inserting of additional tables on the page will be provided.
<b>How to enter previous and next page bars</b>	The navigation component of the electronic portfolio is very important and therefore step-by-step instructions regarding the inserting of navigation bars on the pages will be provided.
<b>How to save the page</b>	The templates will be developed as template files (*.dot). It is important that the learners will save it as Microsoft Word 97 files (*.doc) and therefore instructions regarding the saving of the page as a Microsoft Word 97 file will be provided.
<b>Additional information</b>	Some pages need additional information which will be supplied for that specific page for example the biography page will need more information regarding the inserting of the learner's photograph.

### 3.3.2.2 Designing the *look and feel* of the on-line guides

An applicable "look and feel" has to be established for the on-line guides. Each portfolio template page will have an on-line guide indicating to the learner exactly how to use that page and this on-line guide will be accessible from the template page by clicking on a "Guide" button on the tool bar. The same graphic that will be used on the template page, will be used on the accompanying on-line guide to establish continuity. The design specifications for the look and feel of the on-line guides are presented in Table 3.5.


**Table 3.5: Design specifications for the look and feel of the on-line guides**

Design element	Description
<b>Text and text layout</b>	<ul style="list-style-type: none"> <li>▪ A sans serif font type (Arial Narrow) will be used to ease legibility.</li> <li>▪ The font type and size, position of headings, labels and descriptive information will be used consistently.</li> <li>▪ Each page will contain a header and a footer that will serve as navigation bars to scroll the document.</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>▪ The same clipart graphic that will be used on the portfolio template page, will be used on the on-line Guide page to indicate to the student to which template page the specific on-line guide is referring.</li> </ul>

### 3.3.3 Design specifications for the assignment regarding the compilation of an electronic portfolio

The development of an electronic portfolio is an integral part of the RMX module and not just an add-on. The assignment pertaining to the compilation of the electronic portfolio will be in exactly the same format as the other assignments for this module (RMX 880). Assignment 1, as an example of the format of the assignments, is presented in Figure 3.3.

Figure 3.3: Assignment 1



**Landulani Secondary School**

PO Box 16540  
Landulani  
6167

Telephone: 045 567-9684  
Fax: 045 567-9685

**Chairperson:** Inservice Education and Training Committee  
Landulani Secondary School

27 January 1999

Dear Colleague

**INSERVICE: NEW EDUCATION SYSTEM**

On 26 October 1998 the school governing body decided that the staff should be trained in OBE in South Africa, as part of the inservice training programme. It was decided unanimously that a series of newsletters should be developed which can be used as information resources during the training sessions.

Would you be so kind to develop a series of newsletters which will address the following topics:

- ◆ Transformational OBE
- ◆ Transformational OBE and the learner
- ◆ Transformational OBE and the educator
- ◆ Transformational OBE and the School
- ◆ Transformational OBE, the parent and the community
- ◆ Transformational OBE and School governing bodies

You are requested to use a word processor (preferably MS Word 97).

The series of newsletters should be submitted to the school governing body for discussion and evaluation.

Yours sincerely

**Prof JG Knoetze**  
Chairperson: School Governing Body

### 3.3.4 Design specifications for the presentation of the articles

For most learners portfolio development and specifically electronic portfolio development is a new concept. For this reason it is important that the learners be provided with journal articles, web pages and other sources providing more information regarding the development and use of electronic developmental portfolios. These resources will be provided on the RMX 880 CD ROM which will contain all the study material. Uniform Resource Locators

(URL's) for the applicable web pages will be provided, but the complete journal articles will be provided on the CD ROM. Although no changes regarding the layout or content of the articles are permitted, the processes and procedures to present the articles in an electronic format to the learners as well as navigation of on-line articles had to be designed. The design specifications for the presentation of the articles are presented in Table 3.6.

**Table 3.6: Design specifications for the presentation of the articles**

Design element	Description
<b>Content</b>	<ul style="list-style-type: none"> <li>▪ No changes regarding the layout or appearance of the articles are allowed in terms of copyright legislation.</li> </ul>
<b>Navigation</b>	<ul style="list-style-type: none"> <li>▪ Each page of each article will contain a header and a footer that will serve as navigation bars to ease scrolling of the document.</li> <li>▪ The following navigation buttons will be present on each page:               <ul style="list-style-type: none"> <li>– Back to assignments</li> <li>– Back to assignment # (indicating the assignment number)</li> <li>– Back to resources</li> <li>– Next page</li> <li>– Previous page</li> </ul> </li> </ul>

### **3.3.5 Design specifications for the assessment instrument**

Van Niekerk (1998) set some guidelines for assessment of portfolios based on the demonstration of specific abilities by the learner using a portfolio. These guidelines cover a very wide range of applicable competencies and were adapted for an electronic developmental portfolio that the learners have to develop in RMX 880. The assessment criteria, on which the assessment instrument will be based, is presented in Table 3.7. The assessment instrument is presented in Table 3.13.

**Table 3.7: Assessment criteria for the assessment instrument (Adapted from Van Niekerk, 1998)**

Ability	Description
<b>The ability to communicate content effectively</b>	<ul style="list-style-type: none"> <li>▪ Structure work logically:               <ul style="list-style-type: none"> <li>– Select an appropriate framework for the assignment;</li> <li>– A logical flow of ideas;</li> </ul> </li> <li>▪ Use academically acceptable language, regarding:               <ul style="list-style-type: none"> <li>– Grammar;</li> <li>– Avoid slang or informal language;</li> <li>– Provide additional supporting details, examples or information to prevent confusion;</li> <li>– Avoid subjective statements.</li> </ul> </li> </ul>
<b>Mechanical ability</b>	<ul style="list-style-type: none"> <li>▪ Format the content by the correct and consistent use of:               <ul style="list-style-type: none"> <li>– Table of contents;</li> <li>– Titles/headings;</li> <li>– Numbering/bullets;</li> <li>– Emphasising text e.g. underlining, italics, bold, colour;</li> <li>– Upper and lower case;</li> <li>– Navigation.</li> </ul> </li> </ul>
<b>Creative ability</b>	<ul style="list-style-type: none"> <li>▪ Come up with new ideas and insights.</li> </ul>
<b>The ability to make experience an integral part of learning</b>	<ul style="list-style-type: none"> <li>▪ Focus on the process of learning as well as the products of learning by including reflective items which indicate awareness of:               <ul style="list-style-type: none"> <li>– The value of the learning process and knowledge gained.</li> </ul> </li> </ul>
<b>The ability to reflect on prior learning</b>	<ul style="list-style-type: none"> <li>▪ Make the link between prior knowledge and the newly acquired knowledge:               <ul style="list-style-type: none"> <li>– Including items which indicate a building on existing or prior knowledge.</li> </ul> </li> </ul>
<b>The ability to reflect on strengths and weaknesses as a learner</b>	<ul style="list-style-type: none"> <li>▪ Recognise strengths and weaknesses and reflect on these:               <ul style="list-style-type: none"> <li>– Including reflective items to identify strengths and weaknesses regarding learning.</li> </ul> </li> </ul>



**Table 3.7: Assessment criteria for the assessment instrument (Adapted from Van Niekerk, 1998) (continued)**

Ability	Description
The ability to keep track of learning	<ul style="list-style-type: none"> <li>▪ Keep track of learning:               <ul style="list-style-type: none"> <li>– Include items of reflection and revision on a continuous basis.</li> </ul> </li> </ul>
The ability to assume responsibility for learning	<ul style="list-style-type: none"> <li>▪ Demonstrate a willingness to assume responsibility for learning:               <ul style="list-style-type: none"> <li>– Include items which indicate a willingness to do more than expected.</li> </ul> </li> </ul>
The willingness to take risks while developing creative solutions	<ul style="list-style-type: none"> <li>▪ Take risks in the search for solutions:               <ul style="list-style-type: none"> <li>– Include items which indicate a boldness to explore, take chances and to come up with unique solutions to problems.</li> </ul> </li> </ul>
The ability to work meaningfully with concepts and content	<ul style="list-style-type: none"> <li>▪ Interpret, analyse apply, compare, distinguish between and critically evaluate concepts and content:               <ul style="list-style-type: none"> <li>– Include items such as summaries and reflection on the meaning of concepts and critical evaluation.</li> </ul> </li> </ul>
The ability to assess and value own learning	<ul style="list-style-type: none"> <li>▪ Assess own learning in terms of quality of learning:               <ul style="list-style-type: none"> <li>– Complete and include self assessment activities.</li> </ul> </li> </ul>
The ability to make practical applications of theory	<ul style="list-style-type: none"> <li>▪ Use the theory in practice:               <ul style="list-style-type: none"> <li>– Include items which indicate an ability to apply what was learned in own life world.</li> </ul> </li> </ul>

### 3.4 The development phase



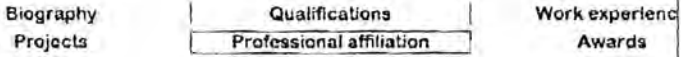

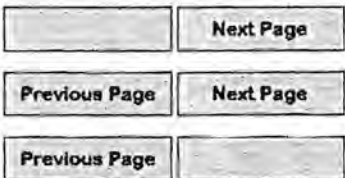
During the development phase all the design specifications that were presented in Paragraph 3.3 will be implemented. These design specifications refer to:

- The Microsoft Word 97 portfolio templates,
- The on-line guides accompanying these templates;
- An assignment in which the development of the electronic portfolio is set out;
- Articles providing information regarding electronic portfolios;
- The assessment instrument.

### 3.4.1 Development of the Microsoft Word 97 portfolio templates

The Microsoft Word 97 portfolio templates were developed according to the design specifications in Tables 3.2 and 3.3. Before the individual pages could be developed certain components that have to be present on each page, had to be developed. These components are described and a graphic representation thereof is presented in Table 3.8.

**Table 3.8: Development of the Microsoft Word 97 portfolio templates**



Description of component	Graphic
A suitable heading for the electronic professional developmental portfolio is selected and inserted.	<p style="text-align: center;"><b>Professional Developmental Portfolio</b></p> 
The applicable header, containing the navigation buttons as well as the decorative border (the same one used by the developers of the RMX 880 module) are on each page.	
The applicable footer, containing the navigation buttons is inserted on each page.	
A tool bar is inserted on every template page, allowing learners to access the on-line guide and insert the top and bottom navigation bars on their portfolio pages. If <i>View Guide</i> option is selected, the on-line guides (see Table 3.10) can be viewed.	
If <i>Insert top bar</i> or <i>Insert bottom bar</i> is selected, the learner have an option of three different navigational bars to insert in the specific page. The navigation bars are automatically inserted in the correct position on the top or the bottom of the specified page.	

Appropriate graphics were selected for each template page. Tables were created to enter the relevant information on each page – this was done to ensure that the labels and content the learners enter, will always be in the applicable positions.





The files were saved as Microsoft Word 97 template files (\*.dot) to ensure that learners can use it as a template but not overwrite it while editing. They have to save it as a Microsoft Word 97 file (\*.doc).

The Microsoft Word 97 portfolio templates are presented in Appendix B on the CD ROM. A description of the templates and a graphic representation thereof are presented in Table 3.9.





**Table 3.9: The Microsoft Word 97 portfolio templates**

Description of the template pages	Page
<p>The biographical information is presented on two separate pages. On page one there is an area for a photograph, full name, ID number, SACE registration number as well as residential and postal addresses.</p>	
<p>On page two of the Biography template there are areas for occupational information (organisation, address, telephone and fax numbers and e-mail address) and also for recreational activities e.g. sports, hobbies and others.</p>	

**Table 3.9: The Microsoft Word 97 portfolio templates (continued)**

Description of the template pages	Page
<p>The qualifications template provides areas to include information regarding qualifications obtained chronologically from the most recent to the first qualification obtained. Information regarding the institution where the qualification was obtained, can also be inserted.</p>	
<p>The work experience template provides areas to insert information regarding the current as well as previous occupations of the user. Information pertaining to the organisation, job description, duration, responsibilities and references are presented. Provision for inserting links to applicable web pages has been made.</p>	
<p>This page serves as a menu of all the projects that the user has completed. Provision is made for different types of projects: papers presented, articles published, research reports compiled, technology developed and community service rendered. More types of projects could be added with ease.</p>	
<p>The paper menu page serves as a menu page for all the papers presented at conferences and workshops. Links to the descriptions of the different papers are inserted here.</p>	




**Table 3.9: The Microsoft Word 97 portfolio templates (continued)**

Description of the template pages	Page
<p>The paper description page serves as a summary of a specific paper. This page contains information regarding the paper: the title, author(s), year, city where presented, an abstract of the paper and a link to the complete paper.</p>	
<p>The article menu page serves as a menu page for all the articles published in journals and other publications. Links to the descriptions of the different articles are inserted here.</p>	
<p>The article description page serves as a summary of a specific article. This page contains information regarding the article: the title, author(s), year, publication, an abstract of the paper and a link to the complete article.</p>	
<p>The report menu page serves as a menu page for all the research reports compiled by the user. Links to the descriptions of the different reports are inserted here.</p>	

**Table 3.9: The Microsoft Word 97 portfolio templates (continued)**

Description of the template pages	Page
<p>The research report description page serves as a summary of a specific research report. This page contains information regarding the report: the title, author(s), year, place, an abstract of the paper and a link to the complete research report.</p>	
<p>The technology menu page serves as a menu page for all the technology developed by the user. Links to the descriptions of the different technologies are inserted here.</p>	
<p>The technology description page serves as a summary of specific products developed. This page contains information regarding the product: the title, goal, self-reflection and a link to the complete product. In this case, Assignments 1, 2 and 3 of RMX 880 will be included on this page.</p>	
<p>The community service menu page serves as a menu page for all the community projects that the user is/was involved with. Links to the descriptions of the different community projects are inserted here.</p>	

**Table 3.9: The Microsoft Word 97 portfolio templates (continued)**

Description of the template pages	Page
<p>The community service description page serves as a summary of a specific community service project. This page contains information regarding the project: the title, goal, community, type of activity and self-reflection.</p>	
<p>The professional affiliations pages provide areas to insert the name of the organisation the user is affiliated with/to, position, duration, goal and a link to a relevant pages.</p>	
<p>The awards page provides areas to insert information regarding any awards or presentations received by the learner – the name of the award, the institution presenting it, the year, criteria and an applicable link.</p>	

### 3.4.2 Development of the on-line guides

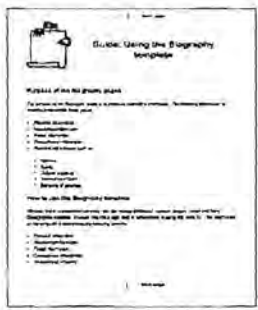


The on-line guides for the Microsoft Word 97 portfolio templates were developed according to the design specifications in Tables 3.4 and 3.5. The on-line guides were developed in Microsoft Word 97 and all the applicable information and graphics were inserted on each page. Applicable navigation buttons was inserted at the top and the bottom of each page.

Adobe Acrobat Exchange was used to convert the on-line guides files (developed in Microsoft Word 97) to portable display format (\*.pdf) and to activate the navigation links to

enable the learner to page through the documents. The files were accessible from the template pages and the learners needed Adobe Acrobat Reader to access the documents when they click on the *View Guide* toolbar. Adobe Acrobat Reader allows the learners to read the document on the screen or to print it. The on-line guides are presented in Appendix C on the CD ROM.





A description of the on-line guides and a graphic representation of the first page of each on-line guide are presented in Table 3.10.

**Table 3.10: The on-line guides accompanying the Microsoft Word 97 portfolio templates**





Description of the on-line guide	Page
<p>This is the first page of the on-line guide to the biography template. This on-line guide consists of four pages and contains the following information: purpose of the biography pages and how to use it. Other information contained in this document includes: how to enter data, how to insert a photograph, how to insert additional rows in tables, how to delete rows in tables, how to enter previous page/next page bars and how to save the biography page.</p>	
<p>This is the first page of the on-line guide to the qualifications template. This on-line guide consists of three pages and contains the following information: purpose of the qualification page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the qualifications page.</p>	
<p>This is the first page of the on-line guide to the work experience template. This on-line guide consists of three pages and contains the following information: purpose of the work experience page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the work experience page.</p>	



**Table 3.10: The on-line guides accompanying the Microsoft Word 97 portfolio templates (continued)**

Description of the on-line guide	Page
<p>This is the first page of the on-line guide to the projects template. This on-line guide consists of two pages and contains the following information: purpose of the projects page(s), how to use it and how to insert additional rows in a table. Other information contained in this document includes: how to delete rows in tables, how to insert additional tables, how to enter previous page/next page bars and how to save the projects page.</p>	
<p>This is the first page of the on-line guide to the papers menu template. This on-line guide consists of two pages and contains the following information: purpose of the papers menu page, how to use it, how to insert additional rows in tables and how to delete rows in tables. Other information contained in this document includes: how to enter previous page/next page bars and how to save the papers menu page.</p>	
<p>This is the first page of the on-line guide to the papers description template. This on-line guide consists of three pages and contains the following information: purpose of the papers description page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the papers description page.</p>	
<p>This is the first page of the on-line guide to the articles menu template. This on-line guide consists of two pages and contains the following information: purpose of the articles menu page, how to use it, how to insert additional rows in the table and how to delete rows in tables. Other information contained in this document includes: how to enter previous page/next page bars and how to save the articles menu page.</p>	


**Table 3.10: The on-line guides accompanying the Microsoft Word 97 portfolio templates (continued)**

Description of the on-line guide	Page
<p>This is the first page of the on-line guide to the articles description template. This on-line guide consists of three pages and contains the following information: purpose of the articles description page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the articles description page.</p>	
<p>This is the first page of the on-line guide to the reports menu template. This on-line guide consists of two pages and contains the following information: purpose of the reports menu page, how to use it, how to insert additional rows in the table and how to delete rows in tables. Other information contained in this document includes: how to enter previous page/next page bars and how to save the reports menu page.</p>	
<p>This is the first page of the on-line guide to the reports description template. This on-line guide consists of three pages and contains the following information: purpose of the reports description page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables, how to enter previous page/next page bars and how to save the reports description page.</p>	
<p>This is the first page of the on-line guide to the technology menu template. This on-line guide consists of two pages and contains the following information: purpose of the technology menu page, how to use it, how to insert additional rows in the table and how to delete rows in tables. Other information contained in this document includes: how to enter previous page/next page bars and how to save the technology menu page.</p>	

**Table 3.10: The on-line guides accompanying the Microsoft Word 97 portfolio templates (continued)**

Description of the on-line guide	Page
<p>This is the first page of the on-line guide to the technology description template. This on-line guide consists of three pages and contains the following information: purpose of the technology description page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the technology description page.</p>	
<p>This is the first page of the on-line guide to the community service menu template. This on-line guide consists of two pages and contains the following information: purpose of the community service menu page, how to use it, how to insert additional rows in the table and how to delete rows in tables. Other information contained in this document includes: how to enter previous page/next page bars and how to save the community service menu page.</p>	
<p>This is the first page of the on-line guide to the community service description template. This on-line guide consists of three pages and contains the following information: purpose of the community service description page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the community service description page.</p>	
<p>This is the first page of the on-line guide to the professional affiliations template. This on-line guide consists of three pages and contains the following information: purpose of the professional affiliations page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the professional affiliations page.</p>	

**Table 3.10: The on-line guides accompanying the Microsoft Word 97 portfolio templates (continued)**

Description of the on-line guide	Page
<p>This is the first page of the on-line guide to the awards template. This on-line guide consists of three pages and contains the following information: purpose of the awards page(s), how to use it and how to enter data. Other information contained in this document includes: how to insert additional rows in tables, how to delete rows in tables, how to insert additional tables; how to enter previous page/next page bars and how to save the awards page.</p>	

### 3.4.3 Development of the assignment pertaining to the development of the electronic portfolio

The assignment was developed according to the design specifications in Table 3.6. It was presented as a letter to the learners enrolled for the module RMX 880, from the SACE to remind them that they should apply for re-registration and renewal of their SACE license. A fictitious letter head for the SACE was created.

The letter contains the following information:

- A very short description of the functions of the SACE;
- A reminder that registration is compulsory and should be renewed every three years;
- The importance of adhering to the criteria and standards of the SACE in order to register;
- The existence of the Code of conduct all educators should adhere to;
- Examples of what the educator should present to the SACE in order to be re-registered and issued with a license;
- A notification to the educator that he/her license should be renewed;
- A request to the educator to send the applicable registration forms, electronic portfolio and registration fees to the SACE before a specific date.

The letter is presented in Figure 3.4.

Figure 3.4: Assignment pertaining to the development of the electronic portfolio






### 3.4.4 Development of the presentation of the articles

The presentation of the journal articles in an electronic format was developed according to the design specifications in Table 3.6. The text of each article was scanned and inserted in Microsoft Word 97. The graphics of each article were scanned separately and inserted in the Microsoft Word 97 document containing the text. Each article document was edited and the final product was an exact replica of the article as it appeared in the journal. This was done



not to violate copyright laws. Applicable navigation text was inserted at the top and the bottom of each page in order to ease paging through the articles.

Adobe Acrobat Exchange was used to convert the files to portable display format (pdf) and insert the links to the navigation text. These \*.pdf files were accessible on the RMX 880 CD ROM. The learners needed Adobe Acrobat Reader to view and/or print the articles. The references to the articles and the first page of each article which were available to the learners are presented in Table 3.11.

**Table 3.11: The Journal articles**

Reference	Article
<p>Barret, H.C. 1998. Strategic Questions. What to Consider When Planning for Electronic Portfolios. Learning &amp; Leading with Technology, 26(2), pp 6-13.</p>	
<p>Herbert, E.A. 1998. Lessons Learned About Student Portfolios. PHI DELTA KAPPAN, 79(8), pp 583-585.</p>	
<p>Hurst, B., Wilson, C. &amp; Cramer, G. 1998. Professional Teaching Portfolios. Tools for Reflection, Growth, And Advancement. PHI DELTA KAPPAN, 79(8), pp 578-582.</p>	

**Table 3.11: The Journal articles (continued)**

Reference	Article
Tillema, H.H. 1998. Design and Validity of a Portfolio Instrument for Professional Training. <i>Studies in Educational Evaluation</i> , 24(3), pp 263-265, 275-276.	
Wiedmer, T.L. 1998. Digital Portfolios. Capturing and Demonstrating Skills and Levels of Performance. <i>PHI DELTA KAPPAN</i> , 79(8), pp 586-589.	

These articles were not the only resources regarding professional electronic portfolios that were available to the learners. The Uniform Resource Locators (URL's) of web pages containing useful information regarding electronic portfolio development, were also provided on the RMX 880 CD ROM and are presented in Table 3.12.

**Table 3.12: The Uniform Resource Locators (URL's) of applicable resources regarding electronic portfolio development**

Description	URL
Illinois State University. 1998b. Student Portfolio: System News.	<a href="http://www.acc.ilstu.edu/portnews.htm">http://www.acc.ilstu.edu/portnews.htm</a>
Kalamazoo College. 1997d. Frequently Asked Questions About the Development and Implementation of the Kalamazoo Portfolio.	<a href="http://www.kzoo.edu/pfolio/FAQ.html">http://www.kzoo.edu/pfolio/FAQ.html</a>
Kalamazoo College. 1997b. The Kalamazoo Portfolio: Reflections. Connections. Life.	<a href="http://www.kzoo.edu/pfolio/description.html">http://www.kzoo.edu/pfolio/description.html</a>
UTC Arizona. 1998. The Teaching Portfolio.	<a href="http://www.utc.arizona.edu/tact2-2.html">http://www.utc.arizona.edu/tact2-2.html</a>

### 3.4.5 Development of the assessment instrument

The assessment criteria as indicated in Table 3.7 were used to develop the assessment instrument that will be used to assess the electronic developmental portfolios created by the learners. The mark allocation is indicated in the instrument which is presented in Table 3.13.

**Table 3.13: The assessment instrument of the professional electronic developmental portfolio (Adapted from Van Niekerk, 1998)**

Ability	Description	Very high 5	High 4	Medium 3	Low 2	Very low 1	Not shown 0	
<b>The ability to communicate content effectively</b>	Structure work logically:							
	<ul style="list-style-type: none"> <li>Select an appropriate framework for the assignment;</li> <li>a logical flow of ideas;</li> </ul>							
	Use academically acceptable language:							
	<ul style="list-style-type: none"> <li>grammar;</li> <li>avoid slang or informal language;</li> </ul>							
	<ul style="list-style-type: none"> <li>provide additional supporting details, examples or information if something may be confusing or not clear;</li> <li>avoid subjective statements.</li> </ul>							
	<b>Average:</b>							
<b>Mechanical ability</b>	Format the content by the correct and consistent use of:							
	<ul style="list-style-type: none"> <li>table of contents;</li> <li>titles/headings;</li> </ul>							
	<ul style="list-style-type: none"> <li>numbering/bullets;</li> <li>emphasizing text e.g. underlining, italics, bold, colour;</li> <li>upper and lower case;</li> </ul>							
	<ul style="list-style-type: none"> <li>navigation.</li> </ul>							
	<b>Average:</b>							



**Table 3.13: The assessment instrument of the professional electronic developmental portfolio (Adapted from Van Niekerk, 1998) (continued)**

Ability	Description	Very high	High	Medium	Low	Very low	Not shown
		5	4	3	2	1	0
<b>Creative ability</b>	<ul style="list-style-type: none"> <li>Come up with new ideas and insights.</li> </ul>						
<b>Average:</b>							
<b>The ability to make experience an integral part of learning</b>	Focus on the process of learning as well as the products of learning by including reflective items which indicate awareness of: <ul style="list-style-type: none"> <li>the value of the learning process and knowledge gained.</li> </ul>						
<b>The ability to reflect on prior learning</b>	Make the link between prior knowledge and the newly acquired knowledge: <ul style="list-style-type: none"> <li>including items which indicate a building on existing or prior knowledge.</li> </ul>						
<b>The ability to reflect on strengths and weaknesses as a learner</b>	Recognise strengths and weaknesses and reflect on these: <ul style="list-style-type: none"> <li>including reflective items to identify strengths and weaknesses regarding learning.</li> </ul>						
<b>The ability to keep track of learning</b>	Keep track of learning: <ul style="list-style-type: none"> <li>include items of reflection and revision on a continuous basis.</li> </ul>						
<b>The ability to assume responsibility for learning</b>	Demonstrate a willingness to assume responsibility for learning: <ul style="list-style-type: none"> <li>include items which indicate a willingness to do more than expected.</li> </ul>						
<b>The willingness to take risks while developing creative solutions</b>	Take risks in the search for solutions: <ul style="list-style-type: none"> <li>include items which indicate a boldness to explore, take chances and to come up with unique solutions to problems.</li> </ul>						
<b>The ability to work meaningfully with concepts and content</b>	Interpret, analyse, apply, compare, distinguish between and critically evaluate concepts and content: <ul style="list-style-type: none"> <li>include items such as summaries and reflection on the meaning of concepts and critical evaluation.</li> </ul>						
<b>The ability to assess and value own learning</b>	Assess own learning in terms of quality of learning: <ul style="list-style-type: none"> <li>complete and include self assessment activities.</li> </ul>						

**Table 3.13: The assessment instrument of the professional electronic developmental portfolio (Adapted from Van Niekerk, 1998)**  
 (continued)

Ability	Description	Very high	High	Medium	Low	Very low	Not shown
		5	4	3	2	1	0
<b>The ability to make practical applications of theory</b>	Use the theory in practice: <ul style="list-style-type: none"> <li>include items which indicate an ability to apply what was learned in own life world.</li> </ul>						
	<b>Average:</b>						
	<b>TOTAL (5):</b>						
	<b>TOTAL (30):</b>						

### 3.5 Summary

An analysis of the applicable literature was done, based on the information presented in Chapter 2. The purpose of electronic development portfolios in this specific study was determined and the "characteristics" of the learners involved in this study, were established. Based on the results of the analysis, the following was designed and developed:

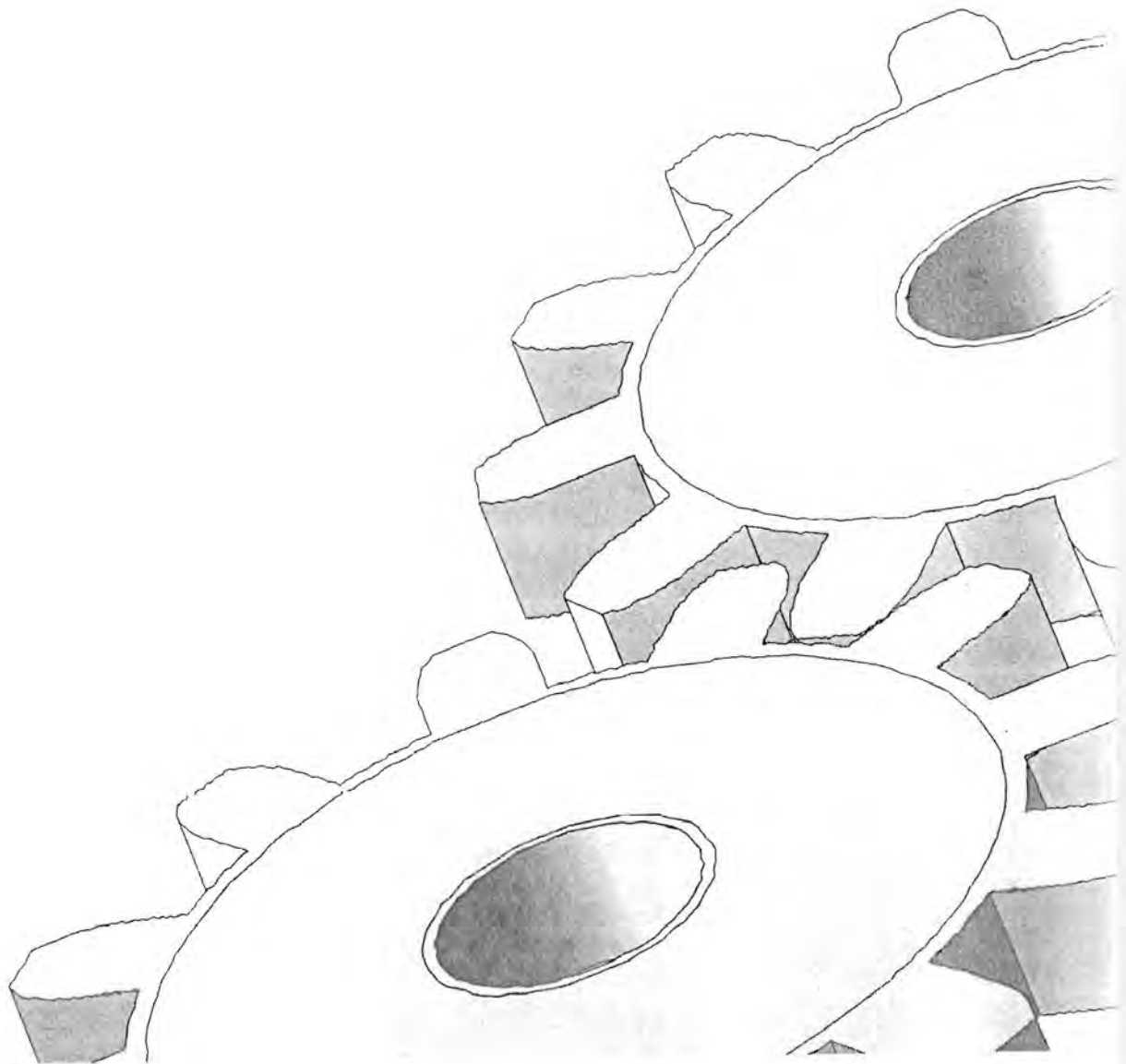
- Microsoft Word 97 portfolio templates;
- On-line guides to the Microsoft Word 97 portfolio templates;
- An assignment pertaining to the compilation of electronic portfolios;
- Presentation of articles relating to electronic portfolios;
- An assessment instrument.

This was prepared to be ready for implementation during January 1999.

# Pre-implementation, Implementation & Evaluation

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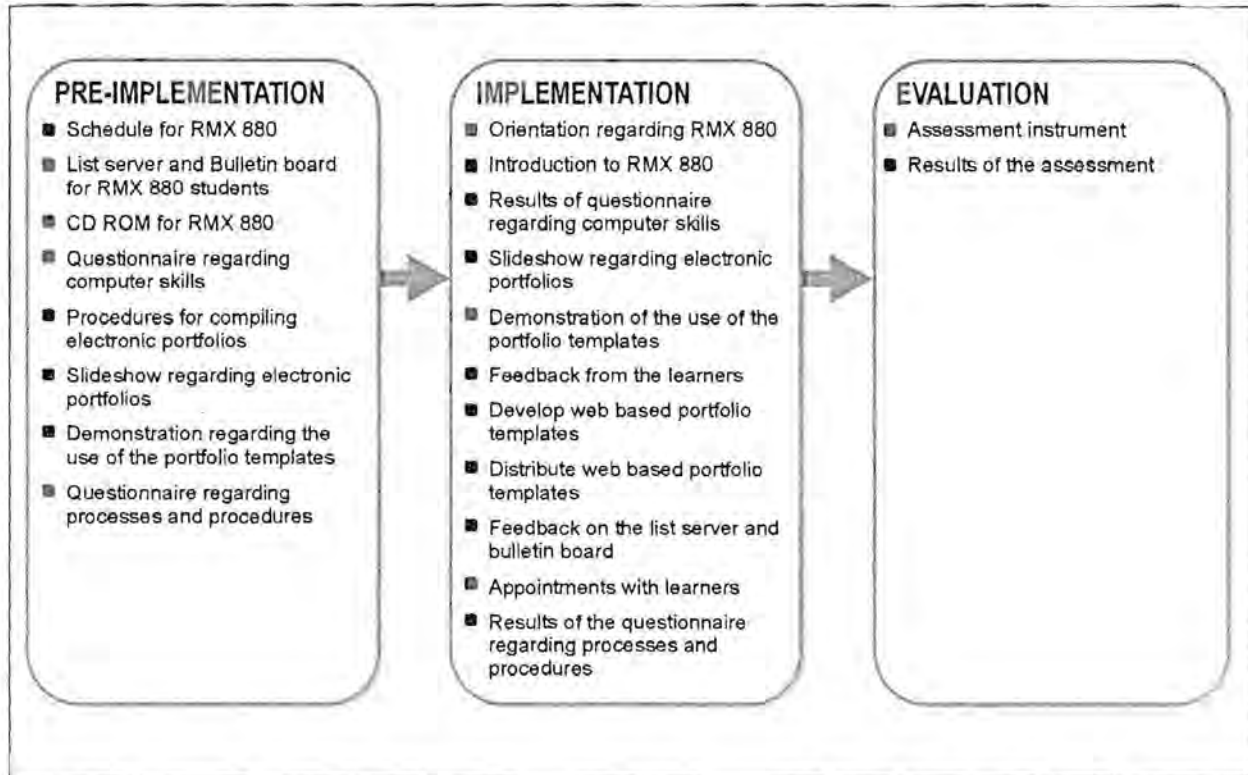
# 4



## 4.1 Introduction

The next three phases namely the pre-implementation, implementation and evaluation phases will be presented in this chapter. A summary of the contents of Chapter 4 is presented graphically in Figure 4.1.

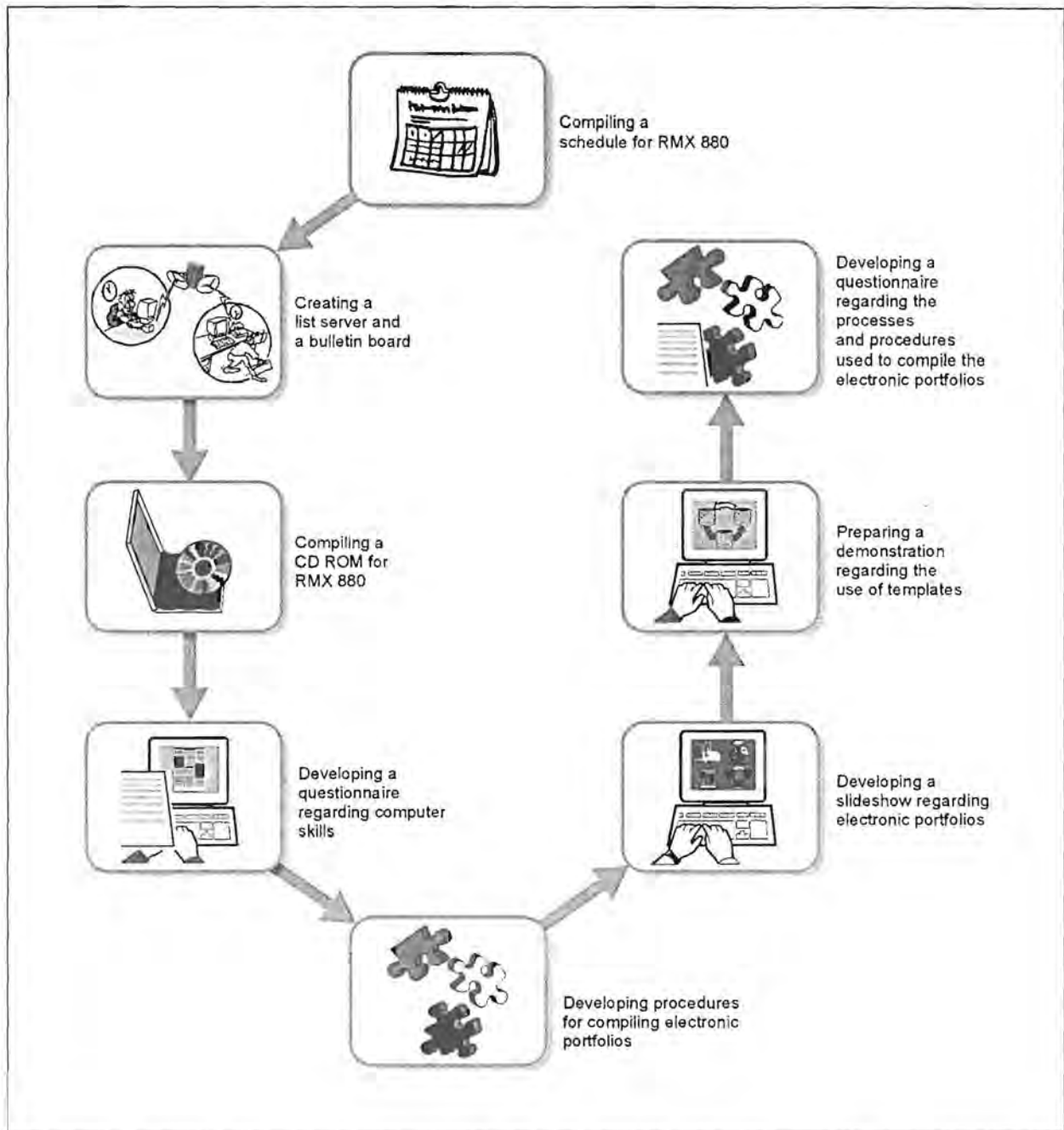
**Figure 4.1: The pre-implementation, implementation and evaluation phases**



## 4.2 The pre-implementation phase

The Module RMX 880 would be presented *telematically* for the first time in 1999 as part of the MEd (CAE), MEd (IT) and MA (IS) qualifications. One of the implications of this mode of instruction is that learners don't have many formal lectures and structured contact with the lecturers and/or other learners in a class situation. They are expected to work independently and for this reason they should have access at all times to all the relevant information they need to successfully complete this module. Much preparation had to be done before the Module RMX 880 could be presented and the portfolio development implemented. The period during which this was done, is called the pre-implementation phase and the series of structures that this phase consists of, is presented graphically in Figure 4.2.

Figure 4.2: The pre-implementation phase



### 4.2.1 Compiling a schedule for RMX 880

The learners registered for RMX 880 were required to attend lectures at the University of Pretoria on the 27<sup>th</sup> and 28<sup>th</sup> of January 1999. This was the only formal contact session regarding this module and a well-structured schedule for the two days had to be compiled.

The schedule is presented in Table 4.1.

**Table 4.1: The schedule for RMX 880**

Date	Time	Topic	Venue
27 January 1999	13:30-14:30	Instructional approach: Computer Assisted Aids for Education	Edu/Law 3-60
27 January 1999	14:30-15:00	Questionnaire: Computer experience	Edu/Law 3-53
27 January 1999	15:15-16:15	Creating newsletters with Microsoft Word 97	Edu/Law 3-60
27 January 1999	16:15-17:15	Creating electronic presentations with Microsoft PowerPoint 97	Edu/Law 3-60
28 January 1999	09:00-10:00	Relational databases and Microsoft Access 97	Edu/Law 3-60
28 January 1999	10:00-11:00	Creating Professional Development Portfolios with Microsoft Word 97 templates.	Edu/Law 3-60
28 January 1999	11:15-12:15	Creating Professional Development Portfolios with Adobe Acrobat Exchange	Edu/Law 3-60

The programme is also available on the RMX 880 CD ROM.

## 4.2.2 Creating a list server and a bulletin board

The presenter/lecturer of the module had to make arrangements with the webmaster of the University of Pretoria to set up a bulletin board on a server of the university and to arrange access for all the learners registered for this module. The webmaster was also responsible for creating a list server.

The purpose of a bulletin board is to serve as a communication platform for the learners and the lecturers – important information of general concern will be submitted to the bulletin board and it is the responsibility of all involved to access it regularly and submit messages. A bulletin board is an electronic tool by which messages are submitted but not delivered to all the subscribers. It is the responsibility of each subscriber to access the bulletin board and read all the messages and respond by submitting messages to the bulletin board.

A list server was also created for RMX 880. The list server, just like the bulletin board, serves as a communication platform – with the difference that messages submitted to the list server are automatically distributed to the e-mail addresses of everybody who is subscribed to this specific list server. This means that messages submitted are also “delivered” to the e-mail addresses of the subscribers. This mode of communication ensures that all the learners, provided they are subscribed to the list server, would receive all the information and messages submitted by the lecturers and fellow learners. This is in a sense a more interactive communication platform than the bulletin board.

### 4.2.3 Compiling the CD ROM for RMX 880

Telematic education can be presented in many different modes, for example, using the Internet, using CD ROM, using paper based instruction or using a combination of these modes of instruction. It was decided to use the CD ROM mode for the module RMX 880 – some of the reasons being that the lecturers were not sure whether all the learners had access to the Internet, and because of the high cost of on-line teaching. The masters qualifications (MEd and MA), of which this module is a part, concern computer technology and for this reason it makes sense to use computer technology to present it. The lecturers of RMX 880 had to prepare a CD ROM containing all the relevant study material for every learner registered for this module. A summary of the information contained on the CD ROM is presented in Table 4.2.

**Table 4.2: Information contained on the CD ROM**

Information	Description
<b>A home page</b>	<ul style="list-style-type: none"> <li>▪ This is the first page, from where all the information on the CD ROM can be accessed.</li> <li>▪ It contains active hyperlinks to all the other pages.</li> <li>▪ Other information on these pages is as follows:               <ul style="list-style-type: none"> <li>– A word of welcome;</li> <li>– A description of the instructional approach for this module;</li> <li>– Information on how to use the CD ROM.</li> </ul> </li> </ul>

**Table 4.2: Information contained on the CD ROM (continued)**

Information	Description
<b>The lecturers</b>	<ul style="list-style-type: none"> <li>▪ Information regarding the lecturers of this module is presented on this page. The information includes the following:               <ul style="list-style-type: none"> <li>– Academic qualifications;</li> <li>– Professional experience;</li> <li>– Telephone numbers;</li> <li>– E-mail addresses;</li> <li>– Postal addresses.</li> </ul> </li> </ul>
<b>Unit standard</b>	<ul style="list-style-type: none"> <li>▪ A description of the unit standard according to SAQA and NQF requirements is presented and contains the following information:               <ul style="list-style-type: none"> <li>– Unit number;</li> <li>– Field;</li> <li>– Level;</li> <li>– Credits;</li> <li>– Purpose;</li> <li>– Learning assumed;</li> <li>– Specific outcomes;</li> <li>– Assessment criteria;</li> <li>– Range statements;</li> <li>– Critical outcomes;</li> <li>– Embedded knowledge.</li> </ul> </li> </ul>
<b>Assignments</b>	<ul style="list-style-type: none"> <li>▪ Hyperlinks to the following assignments were inserted:               <ul style="list-style-type: none"> <li>– Assignment 1: Newsletters pertaining to Outcomes-based Education in South Africa;</li> <li>– Assignment 2: Electronic communication pertaining to Outcomes-based Education in South Africa;</li> <li>– Assignment 3: Computer-based management system for Adult Basic Education and Training;</li> <li>– Assignment 4: Professional developmental portfolios.</li> </ul> </li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>▪ The assessment criteria for all the assignments are presented on this page.</li> </ul>



**Table 4.2: Information contained on the CD ROM (continued)**

Information	Description
<b>Schedule</b>	<ul style="list-style-type: none"> <li>▪ A schedule for the Module RMX 880 (see Table 4.1) and due dates.</li> </ul>
<b>Bulletin board</b>	<ul style="list-style-type: none"> <li>▪ Instructions regarding access to the bulletin board and a hyperlink to the bulletin board are presented on this page.</li> </ul>
<b>List server</b>	<ul style="list-style-type: none"> <li>▪ Instructions regarding the use of the list server is presented on this page, including the following information:               <ul style="list-style-type: none"> <li>– The aim of the list server;</li> <li>– The list server address;</li> <li>– How to subscribe to the list server;</li> <li>– How to submit messages to the list server;</li> <li>– How to reply to messages;</li> <li>– How to unsubscribe to the list server.</li> </ul> </li> </ul>
<b>Resource list</b>	<ul style="list-style-type: none"> <li>▪ An alphabetical resource list containing all the resources referred to on this CD ROM is presented on this page.</li> </ul>
<b>Centres</b>	<ul style="list-style-type: none"> <li>▪ Information regarding all the learning centres of the University of Pretoria is presented on this page.</li> </ul>

For all the information, see the RMX 880 CD ROM.

#### **4.2.4 Developing a questionnaire regarding computer skills**

In order to assess whether the assumptions made regarding the level of computer skills of the learners registered for this module were correct, a questionnaire had to be completed by the learners. The questionnaire was also used to ascertain what their level of knowledge regarding the SACE, SAQA and the new educational system were. The purpose of the questionnaire was to establish the following:

- Some biographical information about the learners;
- How the learners rate their level of computer skills;
- Their access to computers and the Internet;
- How the learners rate their level of Microsoft Office 97 skills;
- Whether they have used Adobe Acrobat;
- Whether they have used e-mail, list servers and bulletin boards;
- Their knowledge regarding the functions and roles of the SACE and SAQA;

- Their knowledge regarding the policies and procedures of the new education system;
- Whether they have previously compiled an electronic portfolio.

The questionnaire regarding the computer skills of the learners, is presented in Appendix D on the CD ROM.

A computer-based test programme (Question Mark 3.0) will be used to present and administer the questionnaire.

## **4.2.5 Developing procedures for developing electronic portfolios**

Procedures on handling the converting of the learner's Microsoft Word 97 documents to pdf format and inserting hyperlinks, had to be developed. It was assumed that none of the learners would have access to Adobe Acrobat Exchange and for this reason provision had to be made for the learners to use the programme of the University of Pretoria. Unfortunately it was not available on a network or a single dedicated computer for use by the learners on their own, and therefore alternative arrangements had to be made. It was decided that the learners will have to make a personal appointment with the lecturer responsible for the electronic portfolios, well in advance for assistance with the conversion and completion of the electronic portfolios.

## **4.2.6 Developing a slideshow regarding electronic portfolios**

A Microsoft Powerpoint 97 slideshow was developed to provide the learners with the background regarding the use of Electronic Professional Developmental Portfolios and how it fits in with the requirements for licensing and re-licensing with the SACE. This slideshow will be presented to the learners on the second day of the contact session. The purpose of the slideshow was to present the learners with the following information:

- The need for educators to demonstrate competencies;
- The requirements of licensing with the SACE;
- The characteristics of an electronic portfolio;

- The different uses of an electronic portfolio;
- The content of an electronic portfolio.

The slideshow is presented in Table 4.12.

### **4.2.7 Preparing a demonstration using the Microsoft Word 97 portfolio templates and Adobe Acrobat Exchange**

Although extensive on-line guides were developed to provide learners with directions on using the Microsoft Word 97 templates, taking into consideration the varying levels of computer skills of the learners, the lecturer responsible for assisting the learners in compiling the electronic portfolios, assumed that the learners may need a practical demonstration of the complete process. The process that will be demonstrated includes the following:

- Opening a template file (\*.dot);
- Inserting personal information;
- Saving it as a word document (\*.doc);
- Using Adobe Acrobat Exchange to convert it to pdf format (\*.pdf);
- Using Adobe Acrobat Exchange to insert links to other pages;
- Publishing the completed portfolio to CD ROM.

A step-by-step demonstration on this process was prepared. This demonstration will be presented on the second day of the contact session as indicated on the programme in Table 4.1.

### **4.2.8 Developing a questionnaire regarding processes and procedures used to compile the electronic portfolio**

A questionnaire, to be administered after the learners had completed their electronic professional developmental portfolios, was developed. The aim with this questionnaire was to obtain more information regarding the processes and procedures utilised by the learners during the development of their electronic portfolios.

The purpose of the questionnaire was to establish the following:

- How the learners rated their level of computer skills after completing the assignments (including portfolio);
- Communication levels between students as well as students and lecturers;
- Whether they completed the portfolio;
- What templates, if any, they had used;
- Other comments regarding the development of the portfolio.

The questionnaire is presented in Appendix E on the CD ROM. This questionnaire will be presented when the learners hand in their portfolios for evaluation.

## 4.3 The implementation phase

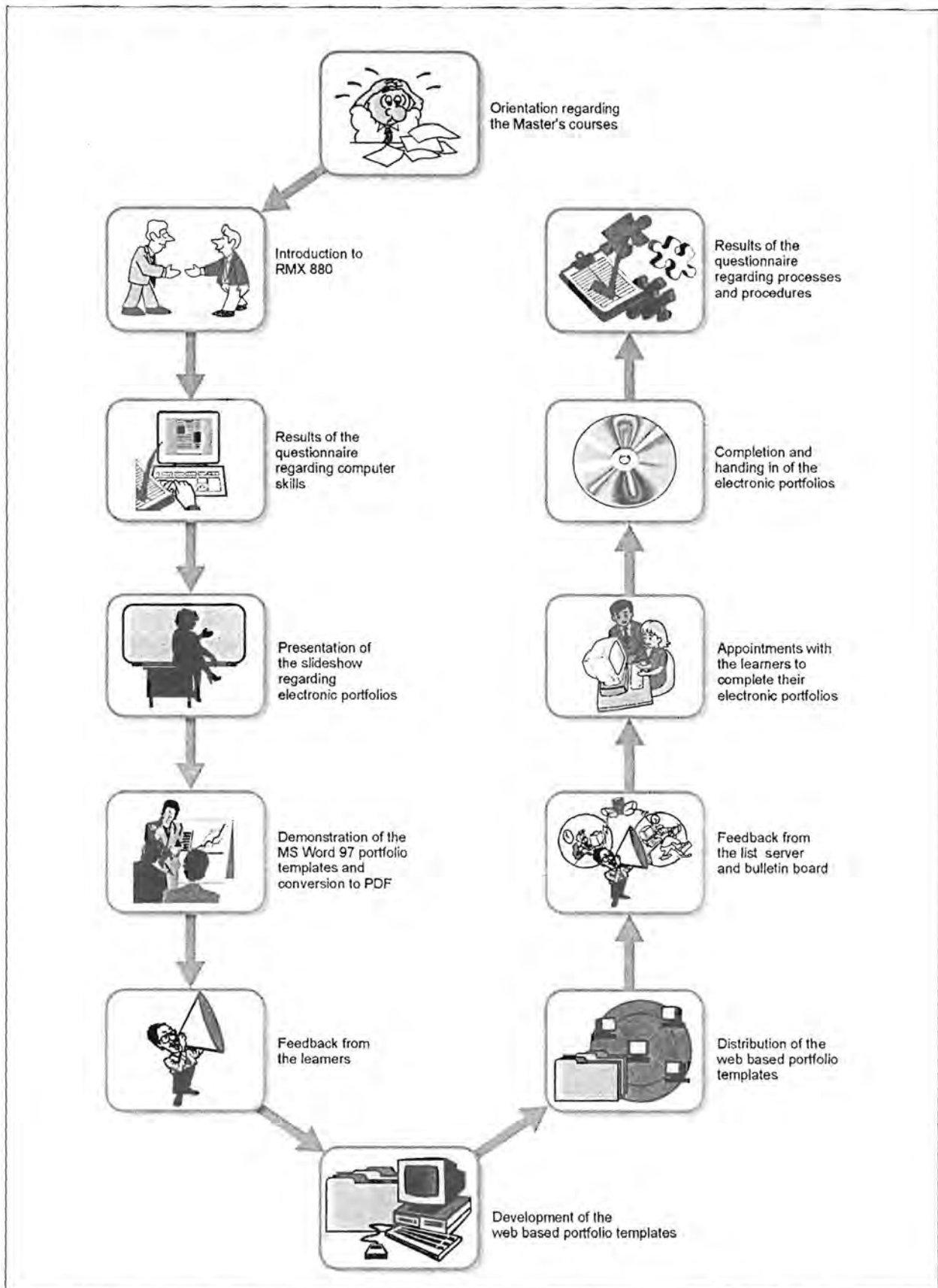
The implementation phase commenced once the learners were registered and received the study material for the module Computer-assisted Aids for Education (RMX 880). A chronological description of the different activities of the implementation phase is presented graphically in Figure 4.3.

### 4.3.1 Orientation regarding the master's qualifications: MEd (CAE), MEd (IT) and MA (IS)

Learners from various parts of the country who were registered for the MEd (CAE), MEd (IT) and MA (IS) qualifications at the University of Pretoria attended the orientation lecture for these qualifications. The qualifications consist of different modules that are presented mostly telematically i.e. learners receive all the study material electronically, either on CD ROM or via the World Wide Web (WWW), and a contact session (1-2 days), per module is scheduled. The learners attended two days of orientation – the morning of the first day allowed time for administration regarding registration at the faculty and also served as an orientation regarding the presentation of the qualifications (MEd and MA). Learners received the Yearbook/Calendar book/Timetable booklet to inform them about the composition of the qualifications and all other administrative information they needed.

The learners completed the questionnaire regarding computer skills (see Appendix D on the CD ROM), using the computer-based test programme, Question Mark 3.0.

Figure 4.3: The implementation phase



### 4.3.2 Introduction to Computer-assisted Aids for Education (RMX 880)

After the orientation regarding the instructional approach of this module, the questionnaire regarding computer skills were administered. The learners received the RMX 880 CD ROM containing all the study material for this module on day one (27 January 1999).

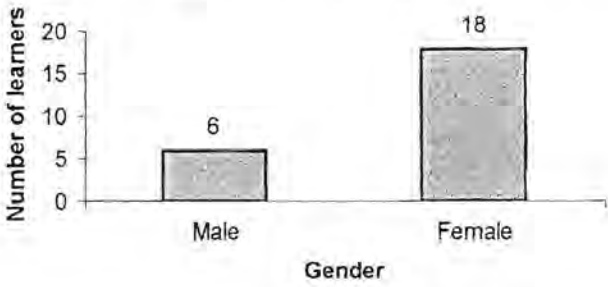
Demonstrations regarding the creating of newsletters with Microsoft Word 97 and electronic presentations with Microsoft Powerpoint 97 were also presented.

### 4.3.3 Results of the questionnaire regarding computer skills

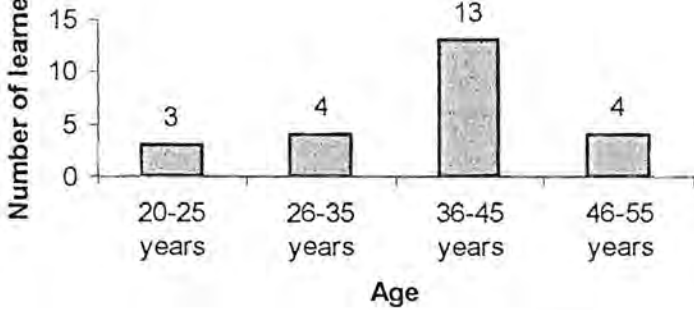
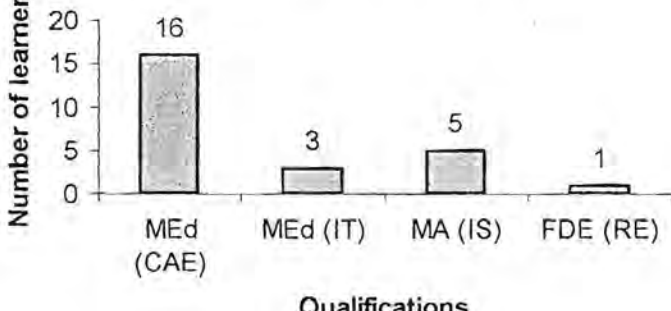
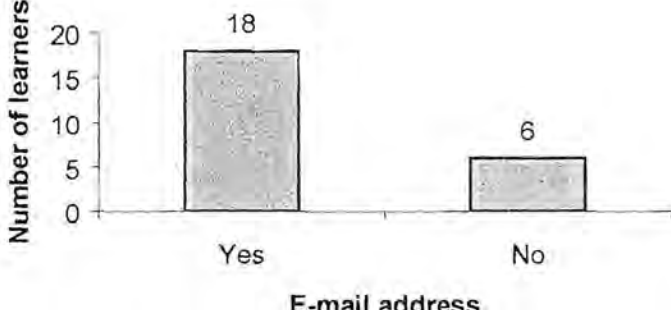
The purpose of the questionnaire is presented in Paragraph 4.2.4. The questionnaire was completed by 24 learners. At this stage it was already obvious that some of the learners had little or no knowledge of computers. To administer the questionnaire electronically, only a basic knowledge regarding the keyboard was required - some learners had difficulty completing the questionnaire. This was an indication of the diversity regarding computer skills that the lecturers had to take into consideration when implementing the development of the electronic portfolios.

The results of the questionnaire are presented in Tables 4.3 - 4.11.


**Table 4.3: Logistical information**

Description	Results						
Two thirds of the learners were female.	<p style="text-align: center;"><b>Gender of learners</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Gender of learners</caption> <thead> <tr> <th>Gender</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Male</td> <td>6</td> </tr> <tr> <td>Female</td> <td>18</td> </tr> </tbody> </table>	Gender	Number of learners	Male	6	Female	18
Gender	Number of learners						
Male	6						
Female	18						

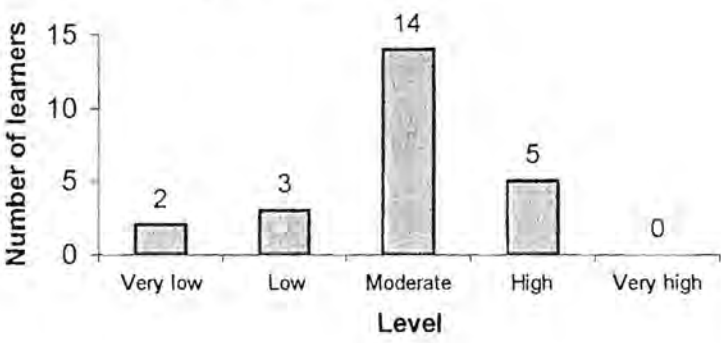
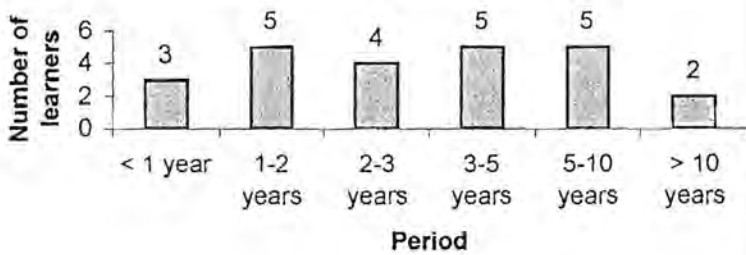
**Table 4.3: Logistical information (continued)**

Description	Results										
<p>More than 50% of the learners were in the age group between 36-45 years, while only 17% were older, the rest were between 20 and 35 years old.</p>	<p style="text-align: center;"><b>Age groups</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Age</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>20-25 years</td> <td>3</td> </tr> <tr> <td>26-35 years</td> <td>4</td> </tr> <tr> <td>36-45 years</td> <td>13</td> </tr> <tr> <td>46-55 years</td> <td>4</td> </tr> </tbody> </table>	Age	Number of learners	20-25 years	3	26-35 years	4	36-45 years	13	46-55 years	4
Age	Number of learners										
20-25 years	3										
26-35 years	4										
36-45 years	13										
46-55 years	4										
<p>Two thirds of the learners were registered for the MEd (CAE). Five learners (21%) were registered for the MA (Information Science) while one learner was registered for both MEd (CAE) and the Further Diploma in Education (Remedial Education) (FDE (RE)).</p>	<p style="text-align: center;"><b>Qualifications registered for</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Qualifications</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>MEd (CAE)</td> <td>16</td> </tr> <tr> <td>MEd (IT)</td> <td>3</td> </tr> <tr> <td>MA (IS)</td> <td>5</td> </tr> <tr> <td>FDE (RE)</td> <td>1</td> </tr> </tbody> </table>	Qualifications	Number of learners	MEd (CAE)	16	MEd (IT)	3	MA (IS)	5	FDE (RE)	1
Qualifications	Number of learners										
MEd (CAE)	16										
MEd (IT)	3										
MA (IS)	5										
FDE (RE)	1										
<p>Only 18 learners (75%) had an e-mail address. This had implications on the mode of communication because this module is presented telematically. The use of the list server and bulletin board will also be influenced by this fact.</p>	<p style="text-align: center;"><b>E-mail addresses</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>E-mail address</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>18</td> </tr> <tr> <td>No</td> <td>6</td> </tr> </tbody> </table>	E-mail address	Number of learners	Yes	18	No	6				
E-mail address	Number of learners										
Yes	18										
No	6										

**Table 4.3: Logistical information (continued)**

Description	Results														
<p>Note that 50% of the learners were employed in higher education institutions while another four learners were employed by training institutions. Only one learner was employed by a primary education institution while five learners were employed by secondary education institutions.</p>	<p style="text-align: center;"><b>Category of occupation</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Category of occupation</caption> <thead> <tr> <th>Occupation</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Primary education</td> <td>1</td> </tr> <tr> <td>Secondary education</td> <td>5</td> </tr> <tr> <td>Higher education</td> <td>12</td> </tr> <tr> <td>Training</td> <td>4</td> </tr> <tr> <td>Student</td> <td>1</td> </tr> <tr> <td>Housewife</td> <td>1</td> </tr> </tbody> </table>	Occupation	Number of learners	Primary education	1	Secondary education	5	Higher education	12	Training	4	Student	1	Housewife	1
Occupation	Number of learners														
Primary education	1														
Secondary education	5														
Higher education	12														
Training	4														
Student	1														
Housewife	1														

**Table 4.4: Level of computer skills**

Description	Results														
<p>About 20% of the learners indicated a very low to low level of computer skills and another 20% indicated a high level of computer skills. The majority of learners indicated their level of computer skills as moderate.</p>	<p style="text-align: center;"><b>Level of computer skills</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Level of computer skills</caption> <thead> <tr> <th>Level</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>2</td> </tr> <tr> <td>Low</td> <td>3</td> </tr> <tr> <td>Moderate</td> <td>14</td> </tr> <tr> <td>High</td> <td>5</td> </tr> <tr> <td>Very high</td> <td>0</td> </tr> </tbody> </table>	Level	Number of learners	Very low	2	Low	3	Moderate	14	High	5	Very high	0		
Level	Number of learners														
Very low	2														
Low	3														
Moderate	14														
High	5														
Very high	0														
<p>The period utilising a computer is quite diverse with one learner indicating that he/she was using a computer for less than one year. This gives an indication of the diversity of the level of computer skills of the learners.</p>	<p style="text-align: center;"><b>Period utilising a computer</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Period utilising a computer</caption> <thead> <tr> <th>Period</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>&lt; 1 year</td> <td>3</td> </tr> <tr> <td>1-2 years</td> <td>5</td> </tr> <tr> <td>2-3 years</td> <td>4</td> </tr> <tr> <td>3-5 years</td> <td>5</td> </tr> <tr> <td>5-10 years</td> <td>5</td> </tr> <tr> <td>&gt; 10 years</td> <td>2</td> </tr> </tbody> </table>	Period	Number of learners	< 1 year	3	1-2 years	5	2-3 years	4	3-5 years	5	5-10 years	5	> 10 years	2
Period	Number of learners														
< 1 year	3														
1-2 years	5														
2-3 years	4														
3-5 years	5														
5-10 years	5														
> 10 years	2														



**Table 4.5: Access to computers and the Internet**

Description	Results														
<p>Nearly 20% of the learners did not own a computer.</p> <p>Technology and computers are the essence of this module and therefore each learner should own a computer.</p>	<p style="text-align: center;"><b>Access to a computer</b></p> <table border="1"> <caption>Access to a computer</caption> <thead> <tr> <th>Access</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Friend's</td> <td>1</td> </tr> <tr> <td>Workplace</td> <td>4</td> </tr> <tr> <td>Own</td> <td>19</td> </tr> </tbody> </table>	Access	Number of learners	Friend's	1	Workplace	4	Own	19						
Access	Number of learners														
Friend's	1														
Workplace	4														
Own	19														
<p>Because this qualification is presented telematically it is important that all learners should have access to the Internet. Three learners indicated that they had no access to the Internet at all.</p>	<p style="text-align: center;"><b>Access to Internet</b></p> <table border="1"> <caption>Access to Internet</caption> <thead> <tr> <th>Access</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Friend's</td> <td>4</td> </tr> <tr> <td>Workplace</td> <td>8</td> </tr> <tr> <td>Home</td> <td>9</td> </tr> <tr> <td>No access</td> <td>3</td> </tr> </tbody> </table>	Access	Number of learners	Friend's	4	Workplace	8	Home	9	No access	3				
Access	Number of learners														
Friend's	4														
Workplace	8														
Home	9														
No access	3														
<p>Only six learners indicated that they accessed the Internet daily while 26% never accessed the Internet.</p>	<p style="text-align: center;"><b>Frequency of Internet access</b></p> <table border="1"> <caption>Frequency of Internet access</caption> <thead> <tr> <th>Frequency</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Daily</td> <td>6</td> </tr> <tr> <td>Weekly</td> <td>2</td> </tr> <tr> <td>3 times a week</td> <td>2</td> </tr> <tr> <td>5 times a week</td> <td>2</td> </tr> <tr> <td>Monthly</td> <td>5</td> </tr> <tr> <td>Never</td> <td>7</td> </tr> </tbody> </table>	Frequency	Number of learners	Daily	6	Weekly	2	3 times a week	2	5 times a week	2	Monthly	5	Never	7
Frequency	Number of learners														
Daily	6														
Weekly	2														
3 times a week	2														
5 times a week	2														
Monthly	5														
Never	7														

**Table 4.5: Access to computers and the Internet (continued)**

Description	Results								
<p>The learners who indicated that they accessed the Internet, do so mainly to retrieve information (13 out of 17 learners).</p>	<p style="text-align: center;"><b>Main purpose of Internet access</b></p> <table border="1"> <caption>Main purpose of Internet access</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>General browsing</td> <td>1</td> </tr> <tr> <td>Work-related</td> <td>3</td> </tr> <tr> <td>Retrieve information</td> <td>13</td> </tr> </tbody> </table>	Purpose	Number of learners	General browsing	1	Work-related	3	Retrieve information	13
Purpose	Number of learners								
General browsing	1								
Work-related	3								
Retrieve information	13								

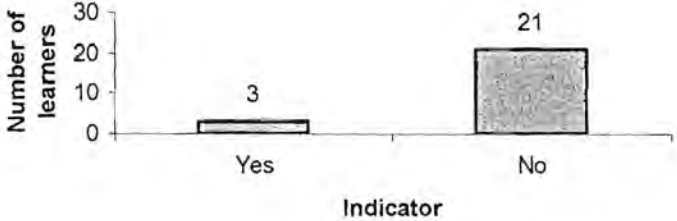
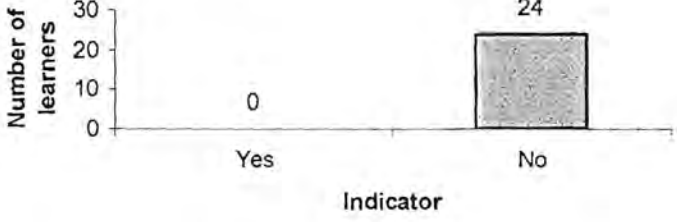
**Table 4.6: Level of Microsoft Office 97 skills**

Description	Results												
<p>Nearly 50% of the learners indicated a moderate level of Microsoft Word 97 skills, while the skill level of 25% ranged from low to very low and the other 25% from high to very high. This illustrates the diversity of the group of learners regarding their levels of computer skills.</p>	<p style="text-align: center;"><b>Level of Microsoft Word 97 skills</b></p> <table border="1"> <caption>Level of Microsoft Word 97 skills</caption> <thead> <tr> <th>Level</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>4</td> </tr> <tr> <td>Low</td> <td>3</td> </tr> <tr> <td>Moderate</td> <td>11</td> </tr> <tr> <td>High</td> <td>4</td> </tr> <tr> <td>Very high</td> <td>2</td> </tr> </tbody> </table>	Level	Number of learners	Very low	4	Low	3	Moderate	11	High	4	Very high	2
Level	Number of learners												
Very low	4												
Low	3												
Moderate	11												
High	4												
Very high	2												
<p>Only two learners indicated a high to very high level of Microsoft Excel 97 skills, the majority (about 54%) indicated a low to very low level of skills.</p>	<p style="text-align: center;"><b>Level of Microsoft Excel skills</b></p> <table border="1"> <caption>Level of Microsoft Excel skills</caption> <thead> <tr> <th>Level</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>7</td> </tr> <tr> <td>Low</td> <td>6</td> </tr> <tr> <td>Moderate</td> <td>9</td> </tr> <tr> <td>High</td> <td>1</td> </tr> <tr> <td>Very high</td> <td>1</td> </tr> </tbody> </table>	Level	Number of learners	Very low	7	Low	6	Moderate	9	High	1	Very high	1
Level	Number of learners												
Very low	7												
Low	6												
Moderate	9												
High	1												
Very high	1												

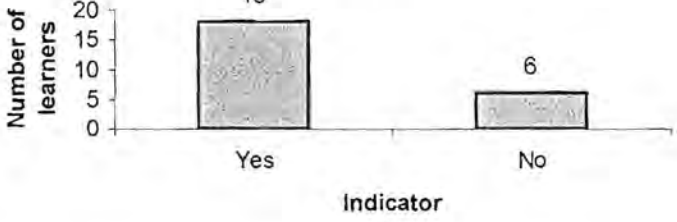
**Table 4.6: Level of Microsoft Office 97 skills (continued)**

Description	Results												
<p>No learner indicated a high or very high level of Microsoft Access 97 skills, 88% indicated a low to very low level of skills.</p>	<p style="text-align: center;"><b>Level of Microsoft Access 97 skills</b></p> <table border="1"> <thead> <tr> <th>Level</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>10</td> </tr> <tr> <td>Low</td> <td>11</td> </tr> <tr> <td>Moderate</td> <td>3</td> </tr> <tr> <td>High</td> <td>0</td> </tr> <tr> <td>Very high</td> <td>0</td> </tr> </tbody> </table>	Level	Number of learners	Very low	10	Low	11	Moderate	3	High	0	Very high	0
Level	Number of learners												
Very low	10												
Low	11												
Moderate	3												
High	0												
Very high	0												
<p>Only one learner rated his/her skills at a high level while 63% of the learners indicated a low to very low level of Microsoft Powerpoint 97 skills.</p>	<p style="text-align: center;"><b>Level of Microsoft Powerpoint 97 skills</b></p> <table border="1"> <thead> <tr> <th>Level</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>5</td> </tr> <tr> <td>Low</td> <td>10</td> </tr> <tr> <td>Moderate</td> <td>8</td> </tr> <tr> <td>High</td> <td>1</td> </tr> <tr> <td>Very high</td> <td>0</td> </tr> </tbody> </table>	Level	Number of learners	Very low	5	Low	10	Moderate	8	High	1	Very high	0
Level	Number of learners												
Very low	5												
Low	10												
Moderate	8												
High	1												
Very high	0												
<p>The majority of learners (71%) had never used macros previously.</p>	<p style="text-align: center;"><b>Have you ever used macros?</b></p> <table border="1"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>7</td> </tr> <tr> <td>No</td> <td>17</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	7	No	17						
Indicator	Number of learners												
Yes	7												
No	17												
<p>One third of the learners indicated that they had never used clipart before.</p>	<p style="text-align: center;"><b>Clipart</b></p> <table border="1"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>16</td> </tr> <tr> <td>No</td> <td>8</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	16	No	8						
Indicator	Number of learners												
Yes	16												
No	8												

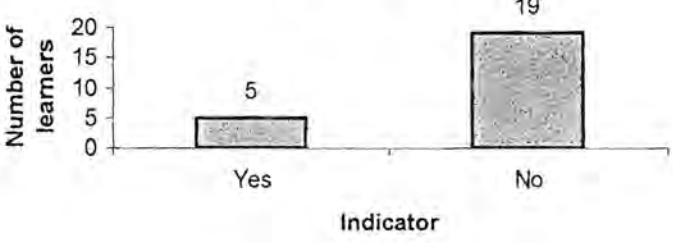
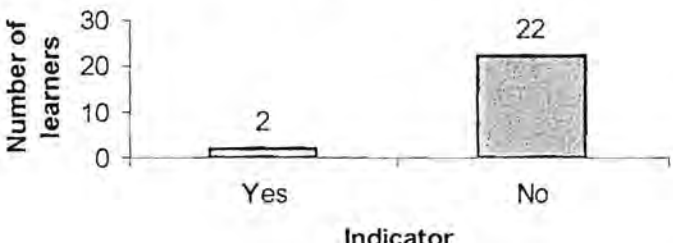
**Table 4.7: Level of Adobe Acrobat skills**

Description	Results						
Only three learners had used Adobe Acrobat Reader previously.	<p style="text-align: center;"><b>Adobe Acrobat Reader</b></p>  <p>A bar chart titled 'Adobe Acrobat Reader' showing the number of learners for two indicators: 'Yes' and 'No'. The y-axis is labeled 'Number of learners' and ranges from 0 to 30 in increments of 10. The 'Yes' bar has a value of 3, and the 'No' bar has a value of 21. The x-axis is labeled 'Indicator'.</p> <table border="1"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>3</td> </tr> <tr> <td>No</td> <td>21</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	3	No	21
Indicator	Number of learners						
Yes	3						
No	21						
None of the learners had used Adobe Acrobat Exchange previously.	<p style="text-align: center;"><b>Adobe Acrobat Exchange</b></p>  <p>A bar chart titled 'Adobe Acrobat Exchange' showing the number of learners for two indicators: 'Yes' and 'No'. The y-axis is labeled 'Number of learners' and ranges from 0 to 30 in increments of 10. The 'Yes' bar has a value of 0, and the 'No' bar has a value of 24. The x-axis is labeled 'Indicator'.</p> <table border="1"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>0</td> </tr> <tr> <td>No</td> <td>24</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	0	No	24
Indicator	Number of learners						
Yes	0						
No	24						

**Table 4.8: Level of skills regarding e-mail, list servers and bulletin boards**

Description	Results						
Six learners (25%) had never used e-mail before. This presented a problem as e-mail was intended to be used as one of the main modes of communication between learners and between learners and lecturers.	<p style="text-align: center;"><b>E-mail</b></p>  <p>A bar chart titled 'E-mail' showing the number of learners for two indicators: 'Yes' and 'No'. The y-axis is labeled 'Number of learners' and ranges from 0 to 20 in increments of 5. The 'Yes' bar has a value of 18, and the 'No' bar has a value of 6. The x-axis is labeled 'Indicator'.</p> <table border="1"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>18</td> </tr> <tr> <td>No</td> <td>6</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	18	No	6
Indicator	Number of learners						
Yes	18						
No	6						

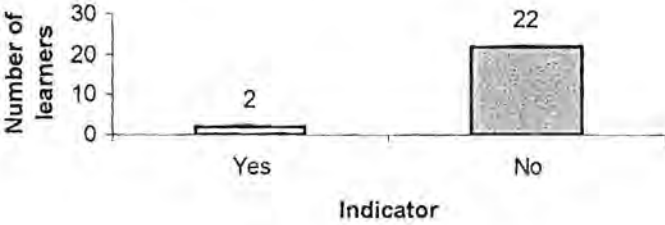
**Table 4.8: Level of skills regarding e-mail, list servers and bulletin boards (continued)**

Description	Results
<p>Only five learners indicated that they had used a list server previously – this was also considered to be an important mode of communication for this module.</p>	<p style="text-align: center;"><b>Listserver</b></p>  <p style="text-align: center;">Indicator</p>
<p>Only two learners indicated that they had used a bulletin board previously.</p>	<p style="text-align: center;"><b>Bulletin board</b></p>  <p style="text-align: center;">Indicator</p>

**Table 4.9: Level of knowledge regarding the SACE and SAQA**

Description	Results	
<p>When asked to provide the equivalent for the acronym SACE, only nine learners provided an answer of which only three were correct namely the South African Council for Educators.</p>	Reply	Frequency
	<ul style="list-style-type: none"> <li>▪ South African Council for Educators</li> <li>▪ I don't know</li> <li>▪ SAQA</li> <li>▪ South Africa College of Education</li> <li>▪ South Africa Computer Education</li> </ul>	<p style="text-align: center;">3</p> <p style="text-align: center;">3</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>

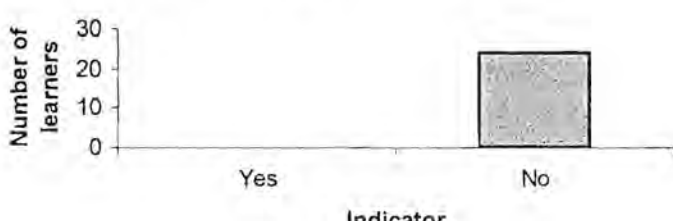
**Table 4.9: Level of knowledge regarding the SACE and SAQA (continued)**

Description	Results							
<p>Only two learners indicated that they were registered with the SACE. All 24 learners indicated that they were neither aware of the conditions of re-licensing with the SACE, nor the format in which competencies should be presented to the SACE.</p>	<p style="text-align: center;"><b>Registration with the SACE</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Registration with the SACE Data</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>2</td> </tr> <tr> <td>No</td> <td>22</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	2	No	22
Indicator	Number of learners							
Yes	2							
No	22							
<p>When asked to provide the equivalent for the acronym SAQA, 17 learners provided answers of which ten were correct.</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ South African Qualifications Authority</li> <li>▪ South African Qualifications</li> <li>▪ South African Qualifications Association</li> <li>▪ South African Quality Assessment</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">10</p> <p style="text-align: center;">2</p> <p style="text-align: center;">4</p> <p style="text-align: center;">1</p>						
<p>When asked to explain the functions of SAQA about 50% of the learners (13) indicated that they were aware of the functions of SAQA. Their responses are summarised in this table.</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ Work out a standardisation system for all the qualifications presented in South Africa at educational/training institutions.</li> <li>▪ Defining admission criteria to education/training programmes.</li> <li>▪ Evaluation of programmes/qualifications.</li> <li>▪ Accreditation of programmes/qualifications.</li> <li>▪ Coordinate and regulate all qualifications.</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">7</p> <p style="text-align: center;">4</p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <p style="text-align: center;">1</p>						

**Table 4.10: Level of knowledge regarding policies and procedures of the new education system**

Description	Results	
When asked to explain the policies of the new education system 17 learners replied. Their responses are summarised in this table.	Reply	Frequency
	<ul style="list-style-type: none"> <li>▪ It is based on Outcomes-based Education.</li> </ul>	6
	<ul style="list-style-type: none"> <li>▪ Continuous assessment is important.</li> </ul>	9
	<ul style="list-style-type: none"> <li>▪ Co-operative learning.</li> </ul>	2
	<ul style="list-style-type: none"> <li>▪ Self-assessment.</li> </ul>	2
	<ul style="list-style-type: none"> <li>▪ Different assessment techniques.</li> </ul>	6
	<ul style="list-style-type: none"> <li>▪ Technology education.</li> <li>▪ Mastery learning.</li> </ul>	1 1

**Table 4.11: Compilation of an electronic portfolio**

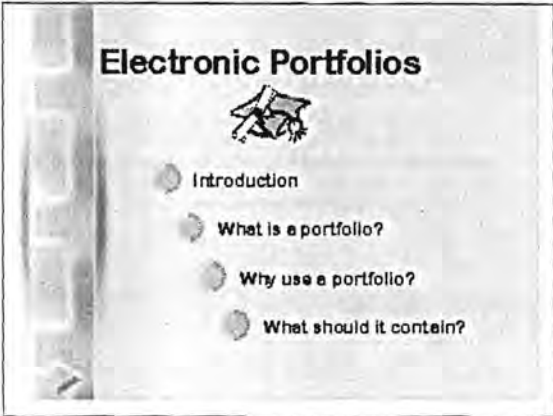
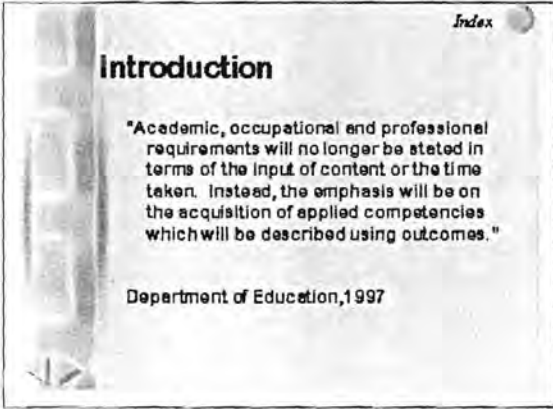

Description	Results						
None of the learners indicated that they had ever developed an electronic portfolio before.	<div style="text-align: center;"> <p><b>Portfolio development</b></p>  <table border="1" style="margin: 0 auto; border-collapse: collapse;"> <caption>Data for Portfolio Development Chart</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>0</td> </tr> <tr> <td>No</td> <td>20</td> </tr> </tbody> </table> </div>	Indicator	Number of learners	Yes	0	No	20
Indicator	Number of learners						
Yes	0						
No	20						

#### 4.3.4 Presentation of the slideshow regarding electronic development portfolios

The second day was used to present the learners with more information and demonstrations regarding relational databases using Microsoft Access 97 and the electronic developmental portfolio (see the schedule for the day in Table 4.1).

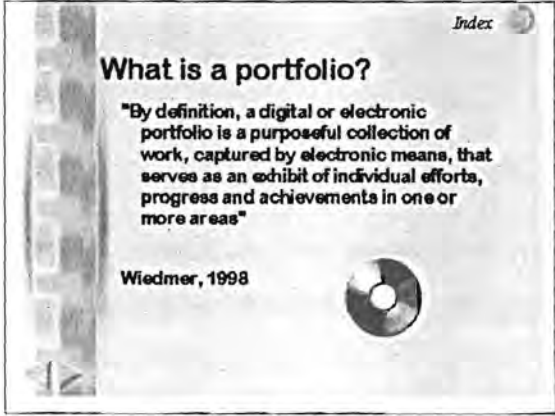
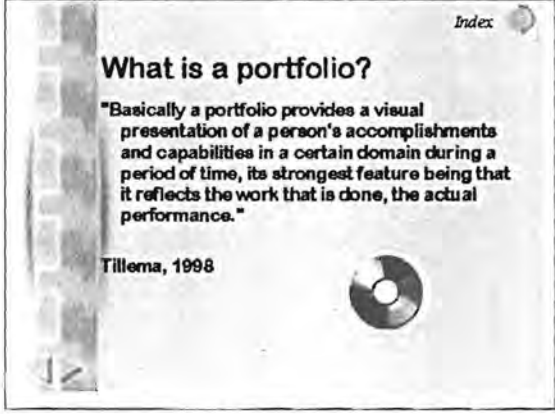

The orientation regarding the development of the electronic developmental portfolio (Assignment 4) was presented using a Microsoft Powerpoint 97 slideshow. The slideshow as well as a description of the information provided to the learners, are presented in Table 4.12.

**Table 4.12: Description of the Microsoft Powerpoint 97 slideshow**

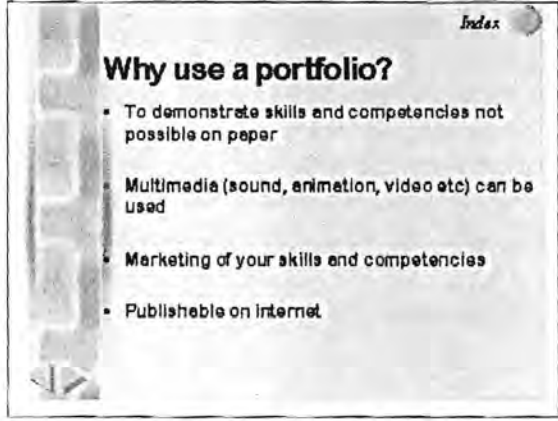

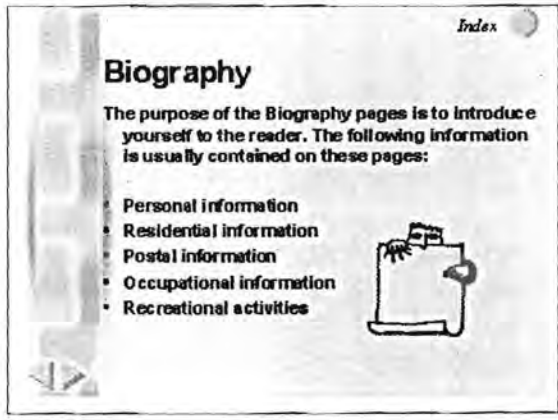
Description	Slide
<p>This is the main menu screen and it indicates the topics that will be presented, regarding electronic portfolios.</p>	 <p>The slide is titled "Electronic Portfolios" and features a small graphic of a person sitting at a desk. Below the title, there is a list of four topics, each preceded by a small circular icon:</p> <ul style="list-style-type: none"> <li>● Introduction</li> <li>● What is a portfolio?</li> <li>● Why use a portfolio?</li> <li>● What should it contain?</li> </ul>
<p>As an introduction, the policies of the Department of Education regarding competencies and outcomes are explained to the learners, using a quotation from an official document of the department.</p>	 <p>The slide is titled "Introduction" and includes a quotation from the Department of Education, 1997. The text of the quotation is: "Academic, occupational and professional requirements will no longer be stated in terms of the input of content or the time taken. Instead, the emphasis will be on the acquisition of applied competencies which will be described using outcomes." The source "Department of Education, 1997" is listed at the bottom. An "Index" button is visible in the top right corner.</p>
<p>Judging the results of the questionnaire that was administered the previous day, not many learners were aware of the existence, role or functions of the SACE. Information regarding this organisation, and the implications thereof for all educators, was presented in this slide.</p>	 <p>The slide is titled "Introduction" and focuses on the South African Council for Educators (SACE). It lists several key points:</p> <ul style="list-style-type: none"> <li>• Registration is compulsory</li> <li>• Standards and criteria</li> <li>• Code of conduct</li> <li>• Renewal of licensing</li> <li>• SAQA database</li> <li>• Electronic portfolios</li> </ul> <p>An "Index" button is visible in the top right corner.</p>



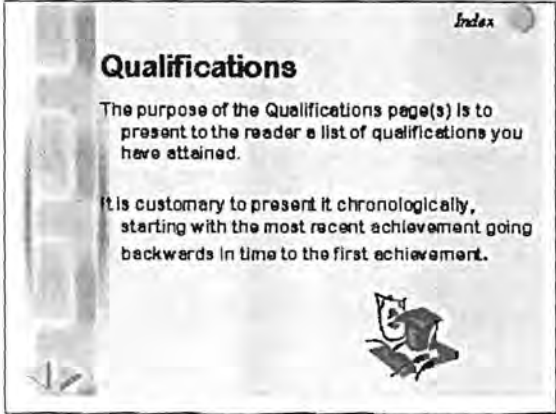

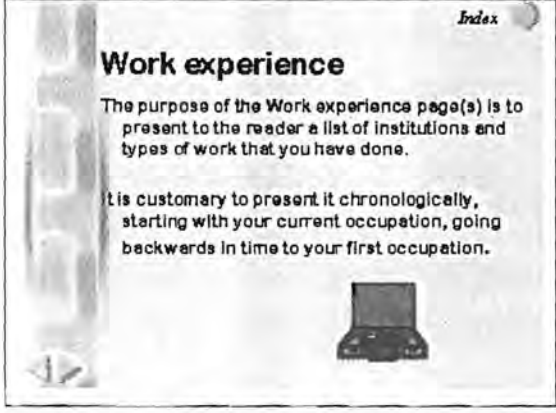

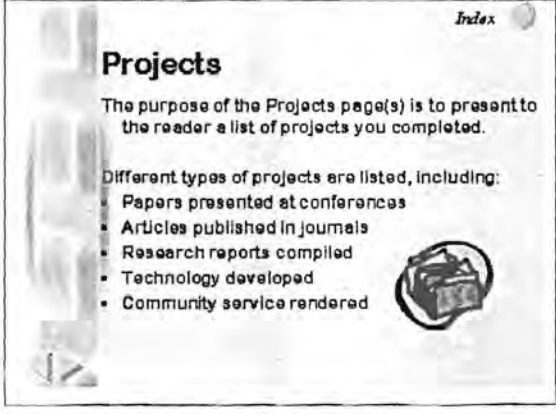

**Table 4.12: Description of the Microsoft Powerpoint 97 slideshow (continued)**

Description	Slide
<p>None of the learners have ever created an electronic portfolio previously. The essence of such a portfolio is presented in this slide and it is discussed with the learners.</p>	 <p><i>Index</i></p> <h3>What is a portfolio?</h3> <p><b>"By definition, a digital or electronic portfolio is a purposeful collection of work, captured by electronic means, that serves as an exhibit of individual efforts, progress and achievements in one or more areas"</b></p> <p>Wiedmer, 1998</p>
<p>Some of the characteristics of an electronic portfolio is presented with this quotation.</p>	 <p><i>Index</i></p> <h3>What is a portfolio?</h3> <p><b>"Basically a portfolio provides a visual presentation of a person's accomplishments and capabilities in a certain domain during a period of time, its strongest feature being that it reflects the work that is done, the actual performance."</b></p> <p>Tillema, 1998</p>
<p>The importance of portfolios as assessment tools for the learner as well as the educator, is stressed in this slide.</p>	 <p><i>Index</i></p> <h3>Why use a portfolio?</h3> <p>Portfolios have gained widespread interest as an alternative assessment tool:</p> <ul style="list-style-type: none"> <li>• for the learner - to inform him/her about his/her actual competence levels</li> <li>• for the educator - to obtain physical proof of a learner's competencies</li> </ul>

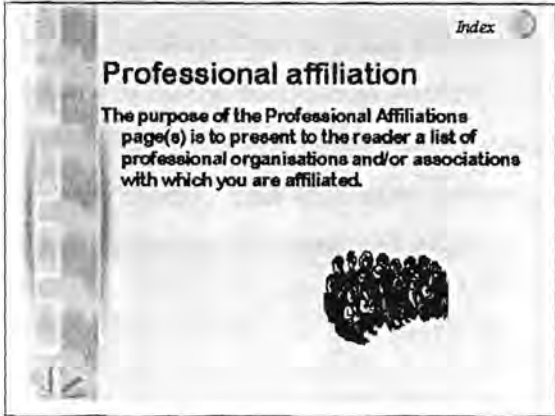

**Table 4.12: Description of the Microsoft Powerpoint 97 slideshow (continued)**

Description	Slide
<p>The advantages of using portfolios, and specifically electronic portfolios, are presented in this slide.</p>	 <p><b>Why use a portfolio?</b></p> <ul style="list-style-type: none"> <li>• To demonstrate skills and competences not possible on paper</li> <li>• Multimedia (sound, animation, video etc) can be used</li> <li>• Marketing of your skills and competencies</li> <li>• Publishable on Internet</li> </ul>
<p>A summary of the components that a professional electronic developmental portfolio should contain, is presented in this slide. This information is presented in detail in Table 3.2.</p>	 <p><b>What should it contain?</b></p> <ul style="list-style-type: none"> <li>• Biography</li> <li>• Qualifications</li> <li>• Work experience</li> <li>• Projects</li> <li>• Professional affiliation</li> <li>• Awards/grants</li> </ul>
<p>The purpose of the biography page and the different components that should be present on such a page, are described in this slide.</p>	 <p><b>Biography</b></p> <p>The purpose of the Biography pages is to introduce yourself to the reader. The following information is usually contained on these pages:</p> <ul style="list-style-type: none"> <li>• Personal information</li> <li>• Residential information</li> <li>• Postal information</li> <li>• Occupational information</li> <li>• Recreational activities</li> </ul>

**Table 4.12: Description of the Microsoft Powerpoint 97 slideshow (continued)**

Description	Slide
<p>The purpose of the qualifications page and the different components that should be present on such a page, are described in this slide.</p>	 <p><i>Index</i></p> <h3>Qualifications</h3> <p>The purpose of the <b>Qualifications page(s)</b> is to present to the reader a list of qualifications you have attained.</p> <p>It is customary to present it chronologically, starting with the most recent achievement going backwards in time to the first achievement.</p> 
<p>The purpose of the work experience page and the different components that should be present on such a page, are described in this slide.</p>	 <p><i>Index</i></p> <h3>Work experience</h3> <p>The purpose of the <b>Work experience page(s)</b> is to present to the reader a list of institutions and types of work that you have done.</p> <p>It is customary to present it chronologically, starting with your current occupation, going backwards in time to your first occupation.</p> 
<p>The purpose of the projects page and the different components that should be present on such a page, are described in this slide.</p>	 <p><i>Index</i></p> <h3>Projects</h3> <p>The purpose of the <b>Projects page(s)</b> is to present to the reader a list of projects you completed.</p> <p>Different types of projects are listed, including:</p> <ul style="list-style-type: none"> <li>• Papers presented at conferences</li> <li>• Articles published in journals</li> <li>• Research reports compiled</li> <li>• Technology developed</li> <li>• Community service rendered</li> </ul> 

**Table 4.12: Description of the Microsoft Powerpoint 97 slideshow (continued)**

Description	Slide
<p>The purpose of the professional affiliation page and the different components that should be present on such a page, are described in this slide.</p>	
<p>The purpose of the awards/grants page and the different components that should be present on such a page, are described in this slide.</p>	

The purpose of this slideshow was to orientate the learners towards using an electronic developmental portfolio to demonstrate their competencies and skills.

### 4.3.5 Demonstration of the Microsoft Word 97 portfolio templates and conversion to pdf using Adobe Acrobat Exchange

A step-by-step demonstration using the Microsoft Word 97 portfolio templates to construct an electronic portfolio was presented. Each page as suggested in the templates, was constructed – demonstrating each step that had to be followed, as well as the use of the on-line guides. As ordinary Microsoft Word 97 documents, these pages were not "active" yet, and the next step was to demonstrate the conversion of these documents to pdf, using

Adobe Acrobat Exchange. Once the files were converted to pdf, it was possible to insert applicable hyperlinks between the pages – creating an "active" electronic portfolio. The main advantage of using pdf files, is that anybody with the Adobe Acrobat Reader can access it and the document will appear exactly as developed. It was established for certain now, that none of the learners owns the Adobe Acrobat Exchange, or has access to it and therefore the learners have to make appointments with the lecturer to do the conversion as well as the insertion of links. The administrative organisation was emphasised – learners had to make appointments well in advance of the due date for the assignment. Learners were invited to contact the lecturer regarding any queries on uncertainties via any of the modes of communication that was available to them.

### **4.3.6 Feedback from the learners regarding the Microsoft Word 97 portfolio templates**

Feedback from learners during the contact session and information gathered with the questionnaire indicated that the level of computer skills of the group were widely diverse. After the demonstration of the Microsoft Word 97 portfolio templates and Adobe Acrobat Exchange, some learners indicated that they would prefer to develop their electronic portfolios using html-tools to create web based portfolios. They were granted permission to do so.

It occurred to the lecturers that not all learners had the skills to use html-tools independently although many learners expressed the desire to do so. After the demonstration of the Microsoft Word 97 templates and the feedback from the learners, it was decided to develop another set of templates in html format for the learners who preferred to use an html-tool but did not have the skills to develop the portfolio on their own.

### **4.3.7 Development of the web based templates**

As a result of the decision to develop another set of templates, it was unrealistic to expect the new set of templates to be available to the learners in time for the set due dates. Therefore it was decided to extend the due date with a month to provide the lecturer responsible for the electronic portfolios with enough time to develop a new set of templates and provide the learners with enough time to complete the assignments.

Netscape Composer, a part of Netscape 4.5, was selected as the tool to develop the templates, because it is accessible to most learners who have Internet access. The same design principles for the components as well as the *look and feel* of the Microsoft Word 97 portfolio templates were used, as presented in Tables 3.2 and 3.3. All the necessary hyperlinks were already inserted in the web based templates and the learners could use the templates on their own with no or very little assistance from the lecturers. The set of web based templates is presented in Appendix F on the CD ROM.

### **4.3.8 Distribution of the web based templates to the learners**

The list server was used to notify the learners that another set of templates was developed. The list server was initially also used to distribute this new set of templates to all the learners that were subscribed to it. Distribution of the templates to the learners proved problematic due to the specific file structure that had to be used to ensure that all the links would be active. Winzip 7.0 was used to compress the files as well as the file structure and create a self-extracting file containing all the necessary files as well as the structure. This file (portfolio.exe) was attached to a message sent to the RMX 880 list server. The message to which the template file was attached, contained information regarding the following:

- Confirmation that the Microsoft Word 97 portfolio templates and Adobe Acrobat Exchange could still be used to develop an electronic portfolio;
- Development of the new set of templates;
- Downloading the attached set of templates;
- The file structure used;
- Downloading Netscape 4.5 from Internet;
- Downloading Winzip 7.0 from Internet;
- Editing the templates;
- Submission of the final product.

For the complete message, see Appendix G on the CD ROM.

It was soon established that all the learners received the message but none of them received the attachment. Another message informing all the learners that the lecturer was aware of the fact that they did not receive the attachment, was submitted to the list server. After a second unsuccessful attempt, it appeared that the list server was unable to distribute an

attachment to all its subscribers. It was therefore decided to e-mail the attachment to each learner's personal e-mail address – and this was done successfully.

As indicated in the message, the learners could decide which set of templates they wanted to use, but they could also create their own.

### **4.3.9 Feedback on the list server and bulletin board**

The bulletin board was only used by a few learners who submitted messages of general interest. The list server was used more often - many learners used it to communicate problems with regards to the attachment that they did not receive, or problems that they experienced with the other assignments. All the messages submitted to the list server are presented in Appendix H on the CD ROM.

### **4.3.10 Appointments with the learners**

As expected – based on the general level of computer skills of the learners – the majority (11 learners) preferred to use the Microsoft Word 97 portfolio templates while seven learners opted to use the Netscape Composer templates. The learners who used the Microsoft Word 97 portfolio templates made appointments with the lecturer responsible for the electronic portfolios, to compile their electronic portfolios. Only two learners using the Netscape Composer templates needed assistance in developing their electronic portfolios.

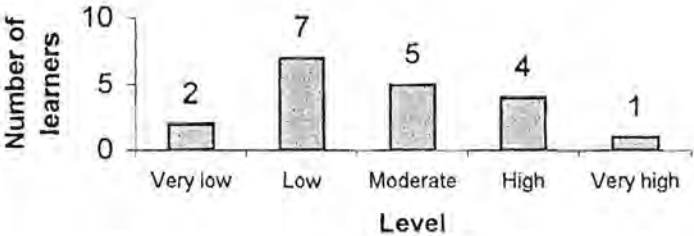
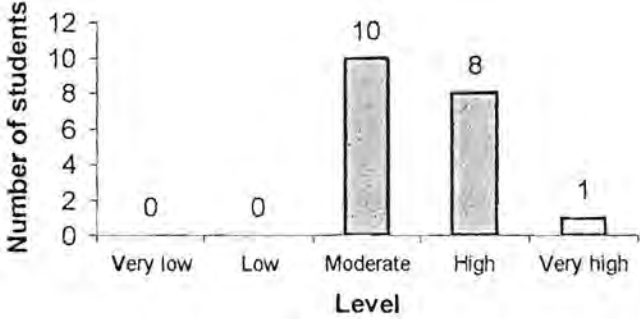
A few learners submitted their files as e-mail attachments to the lecturer responsible for the electronic portfolios, but the majority saved it on micro diskettes. These files were inserted in the specified file structure on the hard drive of the lecturer's computer and then converted to pdf. The applicable hyperlinks to the different pages as well as hyperlinks to the assignments were inserted during the appointment. After completion, the learners provided the lecturer with a recordable CD ROM used to create a copy of their portfolio.

### **4.3.11 Completion and results of the questionnaire regarding processes and procedures**

After learners submitted their electronic portfolios during the start of the next module, they were requested to complete the questionnaire regarding the processes and procedures

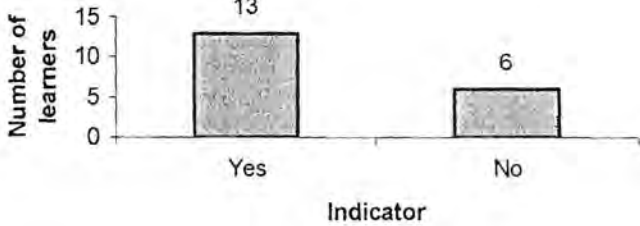
followed to create their professional developmental electronic portfolios. The questionnaire is presented in Appendix E on the CD ROM and the results of the questionnaire are presented in Tables 4.13 - 4.19.

**Table 4.13: Computer skills**

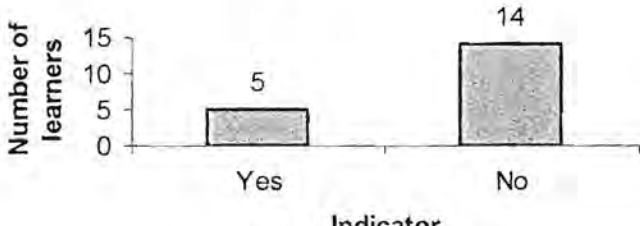
Description	Results												
<p>Although nine learners (47%) indicated that their level of computer skills were low to very low before they started the module, 20% (five learners) indicated a low to very low level of computer skills in the first questionnaire they completed. In the first questionnaire 58 % indicated a moderate level of computer skills while only 26% of the learners indicated their level as moderate in this questionnaire.</p>	<p style="text-align: center;"><b>Level of computer skills before they started the module</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Level of computer skills before they started the module</caption> <thead> <tr> <th>Level</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>2</td> </tr> <tr> <td>Low</td> <td>7</td> </tr> <tr> <td>Moderate</td> <td>5</td> </tr> <tr> <td>High</td> <td>4</td> </tr> <tr> <td>Very high</td> <td>1</td> </tr> </tbody> </table>	Level	Number of learners	Very low	2	Low	7	Moderate	5	High	4	Very high	1
Level	Number of learners												
Very low	2												
Low	7												
Moderate	5												
High	4												
Very high	1												
<p>There is still only one learner indicating a very high level of computer skills but 53% (ten learners) indicated a moderate level, 42% (nine learners) a high level and no learner indicated low or very low.</p>	<p style="text-align: center;"><b>Present level of computer skills</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Present level of computer skills</caption> <thead> <tr> <th>Level</th> <th>Number of students</th> </tr> </thead> <tbody> <tr> <td>Very low</td> <td>0</td> </tr> <tr> <td>Low</td> <td>0</td> </tr> <tr> <td>Moderate</td> <td>10</td> </tr> <tr> <td>High</td> <td>8</td> </tr> <tr> <td>Very high</td> <td>1</td> </tr> </tbody> </table>	Level	Number of students	Very low	0	Low	0	Moderate	10	High	8	Very high	1
Level	Number of students												
Very low	0												
Low	0												
Moderate	10												
High	8												
Very high	1												



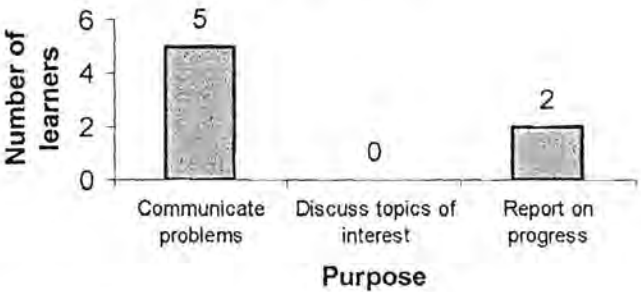
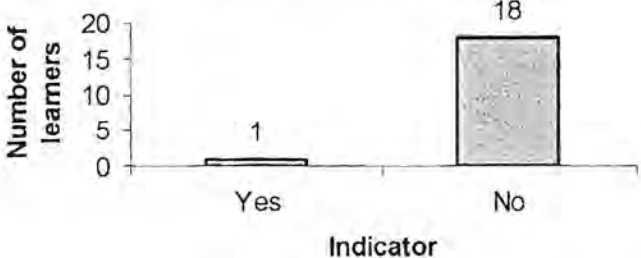
**Table 4.13: Computer skills (continued)**

Description	Results									
Thirteen learners indicated that they performed additional activities to improve their level of computer skills besides the module. A summary of the activities follows.	<div style="text-align: center;"> <b>Additional training</b>  <table border="1" style="margin: 10px auto;"> <caption>Additional training data</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>13</td> </tr> <tr> <td>No</td> <td>6</td> </tr> </tbody> </table> </div>		Indicator	Number of learners	Yes	13	No	6		
Indicator	Number of learners									
Yes	13									
No	6									
With regard to additional activities performed to improve their level of computer skills the replies of the learners are categorised in the next column:	<table border="1"> <thead> <tr> <th data-bbox="639 621 1239 676">Reply</th> <th data-bbox="1239 621 1442 676">Frequency</th> </tr> </thead> <tbody> <tr> <td data-bbox="639 676 1239 721"> <ul style="list-style-type: none"> <li>▪ Consulted experts</li> </ul> </td> <td data-bbox="1239 676 1442 721">5</td> </tr> <tr> <td data-bbox="639 721 1239 765"> <ul style="list-style-type: none"> <li>▪ Studied computer manuals/textbooks</li> </ul> </td> <td data-bbox="1239 721 1442 765">3</td> </tr> <tr> <td data-bbox="639 765 1239 931"> <ul style="list-style-type: none"> <li>▪ Registered for a computer course</li> </ul> </td> <td data-bbox="1239 765 1442 931">1</td> </tr> </tbody> </table>	Reply	Frequency	<ul style="list-style-type: none"> <li>▪ Consulted experts</li> </ul>	5	<ul style="list-style-type: none"> <li>▪ Studied computer manuals/textbooks</li> </ul>	3	<ul style="list-style-type: none"> <li>▪ Registered for a computer course</li> </ul>	1	
Reply	Frequency									
<ul style="list-style-type: none"> <li>▪ Consulted experts</li> </ul>	5									
<ul style="list-style-type: none"> <li>▪ Studied computer manuals/textbooks</li> </ul>	3									
<ul style="list-style-type: none"> <li>▪ Registered for a computer course</li> </ul>	1									
The learners that indicated that they did nothing in addition to the module to improve their computer skills, presented the following reasons as indicated in the next column:	<table border="1"> <thead> <tr> <th data-bbox="639 931 1239 986">Reply</th> <th data-bbox="1239 931 1442 986">Frequency</th> </tr> </thead> <tbody> <tr> <td data-bbox="639 986 1239 1030"> <ul style="list-style-type: none"> <li>▪ Time constraints</li> </ul> </td> <td data-bbox="1239 986 1442 1030">4</td> </tr> <tr> <td data-bbox="639 1030 1239 1282"> <ul style="list-style-type: none"> <li>▪ Workload</li> </ul> </td> <td data-bbox="1239 1030 1442 1282">1</td> </tr> </tbody> </table>	Reply	Frequency	<ul style="list-style-type: none"> <li>▪ Time constraints</li> </ul>	4	<ul style="list-style-type: none"> <li>▪ Workload</li> </ul>	1			
Reply	Frequency									
<ul style="list-style-type: none"> <li>▪ Time constraints</li> </ul>	4									
<ul style="list-style-type: none"> <li>▪ Workload</li> </ul>	1									

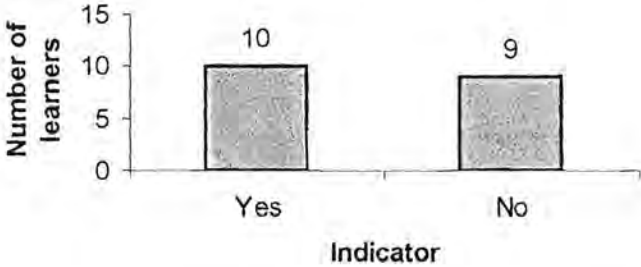
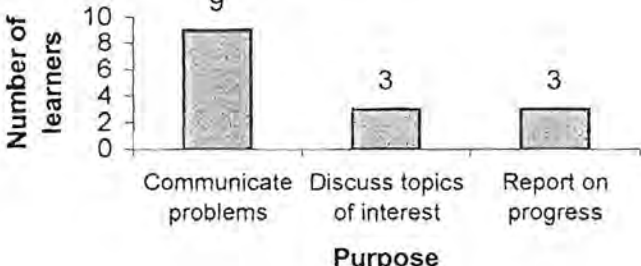
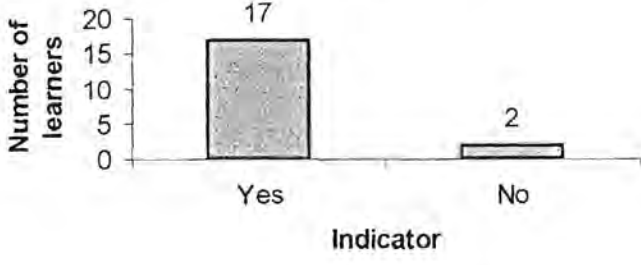
**Table 4.14: Communication with lecturers**

Description	Results							
Only 26 % (five learners) indicated communication with lecturers using the list server.	<div style="text-align: center;"> <b>Listserver: Communication with lecturers</b>  <table border="1" style="margin: 10px auto;"> <caption>Listserver: Communication with lecturers data</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>5</td> </tr> <tr> <td>No</td> <td>14</td> </tr> </tbody> </table> </div>		Indicator	Number of learners	Yes	5	No	14
Indicator	Number of learners							
Yes	5							
No	14							

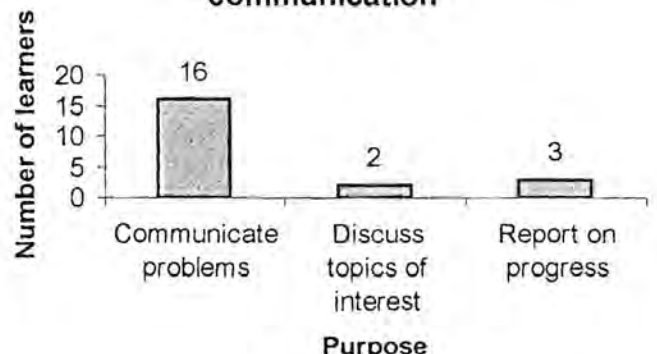
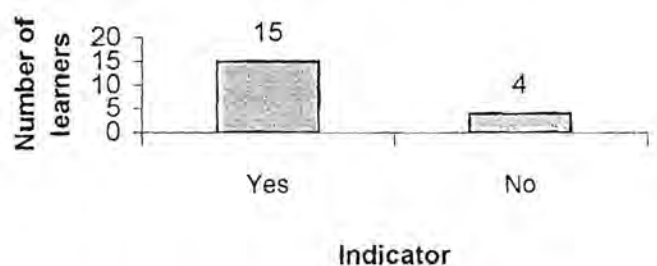
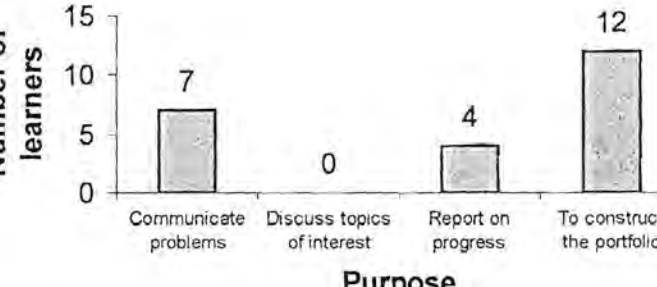
**Table 4.14: Communication with lecturers (continued)**

Description	Results									
<p>All the learners using the list server to communicate with the lecturers, did so to communicate problems. Two learners indicated that they reported on their progress as well.</p>	<p style="text-align: center;"><b>Purpose of communication using the list server</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Purpose of communication using the list server</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>5</td> </tr> <tr> <td>Discuss topics of interest</td> <td>0</td> </tr> <tr> <td>Report on progress</td> <td>2</td> </tr> </tbody> </table>		Purpose	Number of learners	Communicate problems	5	Discuss topics of interest	0	Report on progress	2
Purpose	Number of learners									
Communicate problems	5									
Discuss topics of interest	0									
Report on progress	2									
<p>The learners that indicated that they did not use the list server for communication with the lecturers provided reasons as indicated in the next column:</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ Concerns were too personal</li> <li>▪ No need to use it</li> <li>▪ Technical problems</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">2</p> <p style="text-align: center;">3</p> <p style="text-align: center;">4</p>								
<p>Only one learner used the bulletin board to communicate with the lecturers and the purpose was to communicate problems.</p>	<p style="text-align: center;"><b>Bulletin board: Communication with lecturers</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Bulletin board: Communication with lecturers</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>1</td> </tr> <tr> <td>No</td> <td>18</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	1	No	18		
Indicator	Number of learners									
Yes	1									
No	18									
<p>The learners that indicated that they did not use the bulletin board for communication with the lecturers provided reasons as indicated in the next column:</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ No need to use it</li> <li>▪ No time to use it</li> <li>▪ No access to Internet</li> <li>▪ Don't know how it works</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p>								

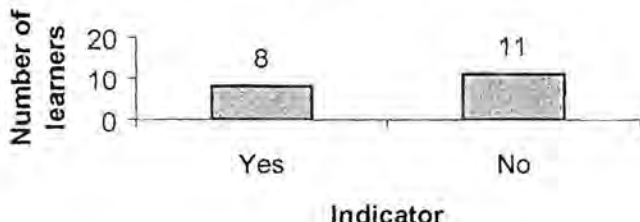
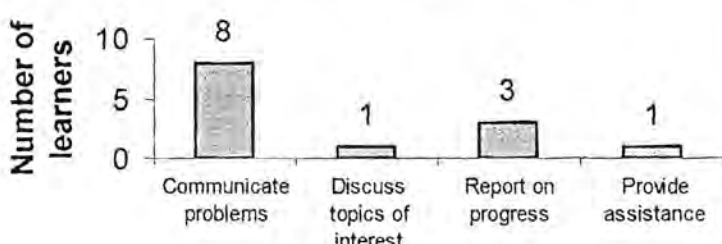
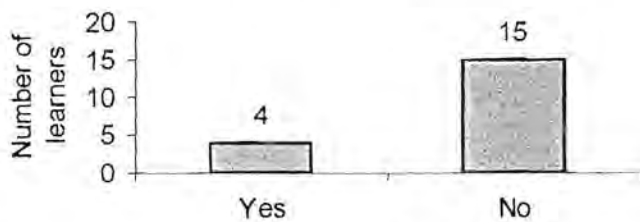
**Table 4.14: Communication with lecturers (continued)**

Description	Results									
About 50 % (ten learners) indicated that they used e-mail to communicate with the lecturers.	<p style="text-align: center;"><b>E-mail: Communication with lecturers</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>10</td> </tr> <tr> <td>No</td> <td>9</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	10	No	9		
Indicator	Number of learners									
Yes	10									
No	9									
The main purpose of e-mail with the lecturers was to communicate problems.	<p style="text-align: center;"><b>Purpose of communication using e-mail</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>9</td> </tr> <tr> <td>Discuss topics of interest</td> <td>3</td> </tr> <tr> <td>Report on progress</td> <td>3</td> </tr> </tbody> </table>		Purpose	Number of learners	Communicate problems	9	Discuss topics of interest	3	Report on progress	3
Purpose	Number of learners									
Communicate problems	9									
Discuss topics of interest	3									
Report on progress	3									
The learners that indicated that they did not use e-mail for communication with the lecturers provided reasons as indicated in the next column:	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ No need to use it</li> <li>▪ Personal appointment or telephone</li> <li>▪ Technical problems</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">3</p>								
It seems that telephonic communication is still the most popular with the learners, 90% (17 learners) indicated that they communicated telephonically with lecturers.	<p style="text-align: center;"><b>Telephonic communication with the lecturers</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>17</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	17	No	2		
Indicator	Number of learners									
Yes	17									
No	2									

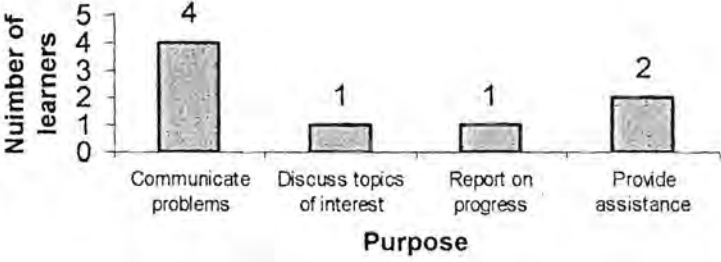
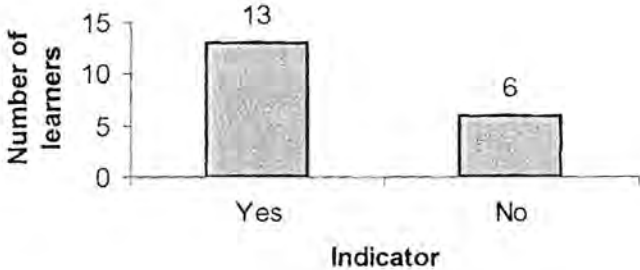
**Table 4.14: Communication with lecturers (continued)**

Description	Results										
<p>Once again the main purpose of the communication is to communicate problems to the lecturers.</p>	<p style="text-align: center;"><b>Purpose of telephonic communication</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>16</td> </tr> <tr> <td>Discuss topics of interest</td> <td>2</td> </tr> <tr> <td>Report on progress</td> <td>3</td> </tr> </tbody> </table>	Purpose	Number of learners	Communicate problems	16	Discuss topics of interest	2	Report on progress	3		
Purpose	Number of learners										
Communicate problems	16										
Discuss topics of interest	2										
Report on progress	3										
<p>Only 21% indicated that they did not make a personal appointment with the lecturer.</p>	<p style="text-align: center;"><b>Personal appointments with lecturer</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>15</td> </tr> <tr> <td>No</td> <td>4</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	15	No	4				
Indicator	Number of learners										
Yes	15										
No	4										
<p>The majority of learners indicated that the purpose of the personal appointment with the lecturers was to construct the portfolio.</p>	<p style="text-align: center;"><b>Purpose of personal appointments</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>7</td> </tr> <tr> <td>Discuss topics of interest</td> <td>0</td> </tr> <tr> <td>Report on progress</td> <td>4</td> </tr> <tr> <td>To construct the portfolio</td> <td>12</td> </tr> </tbody> </table>	Purpose	Number of learners	Communicate problems	7	Discuss topics of interest	0	Report on progress	4	To construct the portfolio	12
Purpose	Number of learners										
Communicate problems	7										
Discuss topics of interest	0										
Report on progress	4										
To construct the portfolio	12										

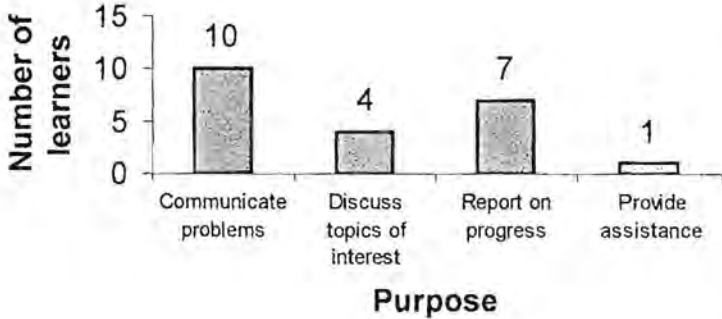
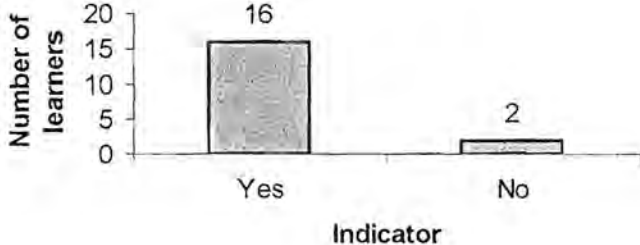
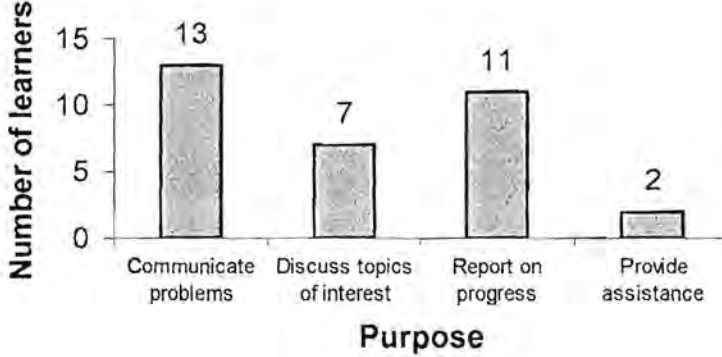
**Table 4.15: Communication with fellow learners**

Description	Results											
<p>Fourty percent (eight learners) indicated that they utilised the list server to communicate with fellow learners.</p>	<p style="text-align: center;"><b>List server: Communication with fellow learners</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for List server: Communication with fellow learners</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>8</td> </tr> <tr> <td>No</td> <td>11</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	8	No	11				
Indicator	Number of learners											
Yes	8											
No	11											
<p>Although most learners used the list server to communicate problems, one learner indicated that he/she provided assistance to a fellow learner on the list server.</p>	<p style="text-align: center;"><b>Purpose of communication using the list server</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Purpose of communication using the list server</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>8</td> </tr> <tr> <td>Discuss topics of interest</td> <td>1</td> </tr> <tr> <td>Report on progress</td> <td>3</td> </tr> <tr> <td>Provide assistance</td> <td>1</td> </tr> </tbody> </table>		Purpose	Number of learners	Communicate problems	8	Discuss topics of interest	1	Report on progress	3	Provide assistance	1
Purpose	Number of learners											
Communicate problems	8											
Discuss topics of interest	1											
Report on progress	3											
Provide assistance	1											
<p>The learners that indicated that they did not use the list server for communication with their fellow learners provided reasons as indicated in the next column:</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ Formed a study group</li> <li>▪ Don't know how it works</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">2</p> <p style="text-align: center;">2</p>										
<p>Only four learners indicated that they used the bulletin board to communicate with fellow learners.</p>	<p style="text-align: center;"><b>Bulletin board: Communication with fellow learners</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Bulletin board: Communication with fellow learners</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>4</td> </tr> <tr> <td>No</td> <td>15</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	4	No	15				
Indicator	Number of learners											
Yes	4											
No	15											

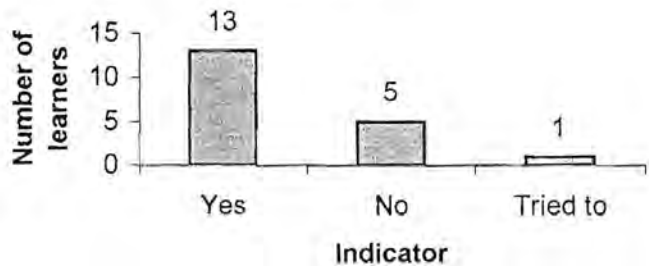
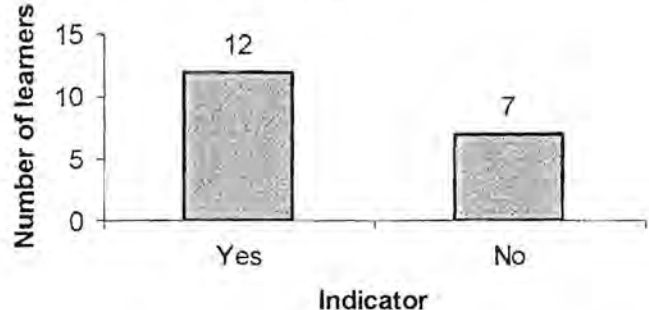
**Table 4.15: Communication with fellow learners (continued)**

Description	Results											
<p>The main purpose of communication on the bulletin board was to communicate problems, but also to provide assistance to fellow learners.</p>	<p style="text-align: center;"><b>Purpose of communication using the bulletin board</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Purpose of communication using the bulletin board</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>4</td> </tr> <tr> <td>Discuss topics of interest</td> <td>1</td> </tr> <tr> <td>Report on progress</td> <td>1</td> </tr> <tr> <td>Provide assistance</td> <td>2</td> </tr> </tbody> </table>		Purpose	Number of learners	Communicate problems	4	Discuss topics of interest	1	Report on progress	1	Provide assistance	2
Purpose	Number of learners											
Communicate problems	4											
Discuss topics of interest	1											
Report on progress	1											
Provide assistance	2											
<p>The learners that indicated that they did not use the bulletin board for communication with their fellow learners provided reasons as presented in the next column:</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ No need to use it</li> <li>▪ No time to use it</li> <li>▪ Technical problems</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">2</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>										
<p>Nearly 70% of the learners used e-mail to communicate with each other.</p>	<p style="text-align: center;"><b>E-mail: Communication with fellow learners</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>E-mail: Communication with fellow learners</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>13</td> </tr> <tr> <td>No</td> <td>6</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	13	No	6				
Indicator	Number of learners											
Yes	13											
No	6											

**Table 4.15: Communication with fellow learners (continued)**

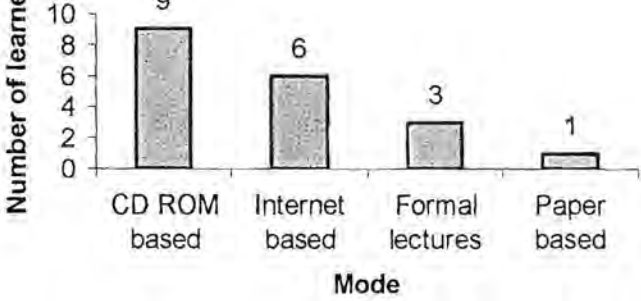
Description	Results										
<p>The main purpose of the e-mail communication between learners was to communicate problems and report on progress. Most of the learners that did not use e-mail indicated that it was due to technical problems or lack of e-mail facilities.</p>	<p style="text-align: center;"><b>Purpose of communication using e-mail</b></p>  <table border="1"> <caption>Purpose of communication using e-mail</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>10</td> </tr> <tr> <td>Discuss topics of interest</td> <td>4</td> </tr> <tr> <td>Report on progress</td> <td>7</td> </tr> <tr> <td>Provide assistance</td> <td>1</td> </tr> </tbody> </table>	Purpose	Number of learners	Communicate problems	10	Discuss topics of interest	4	Report on progress	7	Provide assistance	1
Purpose	Number of learners										
Communicate problems	10										
Discuss topics of interest	4										
Report on progress	7										
Provide assistance	1										
<p>Once again almost 90% of the learners used the telephone to communicate with fellow learners.</p>	<p style="text-align: center;"><b>Telephonic: Communication with fellow students</b></p>  <table border="1"> <caption>Telephonic: Communication with fellow students</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>16</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	16	No	2				
Indicator	Number of learners										
Yes	16										
No	2										
<p>They did so mainly to communicate problems and report on progress.</p>	<p style="text-align: center;"><b>Purpose of telephonic communication</b></p>  <table border="1"> <caption>Purpose of telephonic communication</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Communicate problems</td> <td>13</td> </tr> <tr> <td>Discuss topics of interest</td> <td>7</td> </tr> <tr> <td>Report on progress</td> <td>11</td> </tr> <tr> <td>Provide assistance</td> <td>2</td> </tr> </tbody> </table>	Purpose	Number of learners	Communicate problems	13	Discuss topics of interest	7	Report on progress	11	Provide assistance	2
Purpose	Number of learners										
Communicate problems	13										
Discuss topics of interest	7										
Report on progress	11										
Provide assistance	2										

**Table 4.15: Communication with fellow learners (continued)**

Description	Results									
Thirteen learners indicated that they made appointments with fellow learners, mainly to communicate problems and form study groups.	<p style="text-align: center;"><b>Personal appointments with fellow learners</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Personal appointments with fellow learners</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>13</td> </tr> <tr> <td>No</td> <td>5</td> </tr> <tr> <td>Tried to</td> <td>1</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	13	No	5	Tried to	1
Indicator	Number of learners									
Yes	13									
No	5									
Tried to	1									
Study groups were formed by 12 learners (63%).	<p style="text-align: center;"><b>Study group</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Study group</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>12</td> </tr> <tr> <td>No</td> <td>7</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	12	No	7		
Indicator	Number of learners									
Yes	12									
No	7									
The learners that indicated that they formed study groups explained their function in the next column:	<b>Reply</b>	<b>Frequency</b>								
	▪ Discussed assignments	5								
	▪ Shared resources	3								
	▪ Motivation/support	2								
The learners that indicated that they did not form study groups provided reasons in the next column:	<b>Reply</b>	<b>Frequency</b>								
	▪ Logistic difficulties	2								
	▪ Time limitations	1								



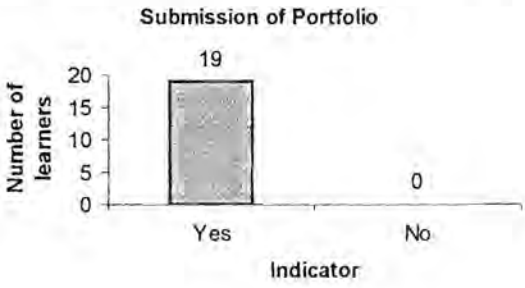
**Table 4.15: Communication with fellow learners (continued)**

Description	Results										
<p>It is interesting to note, that although this was presumably the first time that these learners were exposed to CD ROM based learning, nine learners (47%) indicated that they preferred this mode of instruction.</p>	<p style="text-align: center;"><b>Preferred mode of instruction</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Preferred mode of instruction</caption> <thead> <tr> <th>Mode</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>CD ROM based</td> <td>9</td> </tr> <tr> <td>Internet based</td> <td>6</td> </tr> <tr> <td>Formal lectures</td> <td>3</td> </tr> <tr> <td>Paper based</td> <td>1</td> </tr> </tbody> </table>	Mode	Number of learners	CD ROM based	9	Internet based	6	Formal lectures	3	Paper based	1
Mode	Number of learners										
CD ROM based	9										
Internet based	6										
Formal lectures	3										
Paper based	1										
<p>The learners that indicated that they preferred CD ROM based instruction provided reasons as presented in the next column:</p>	<ul style="list-style-type: none"> <li>▪ CD ROM mode seems to be well planned and organised. There is no major problems with gaining access to resources etc.</li> <li>▪ Flexibility.</li> <li>▪ It is easy to access with less problems and it is less expensive.</li> <li>▪ Quicker.</li> <li>▪ I find it easy to retrieve the data from a disc, as it is simple to access it onto the computer.</li> <li>▪ I am still not fluent enough on Internet. I get lost between the links and find myself printing stacks of notes, as I don't have the (Internet) time to read everything. I find the CD quite focused and to the point.</li> <li>▪ CD ROM or Internet is equally good. The Internet is sometimes unreliable in terms of speed and accessibility.</li> <li>▪ All the information we needed was at hand and accessible.</li> <li>▪ All the relevant information is on the CD. It can be very expensive to print everything on the CD.</li> </ul>										

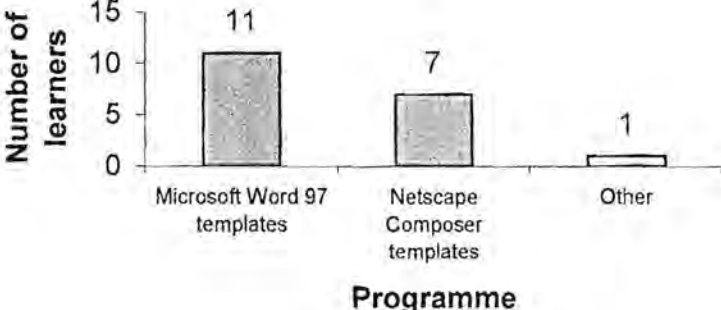
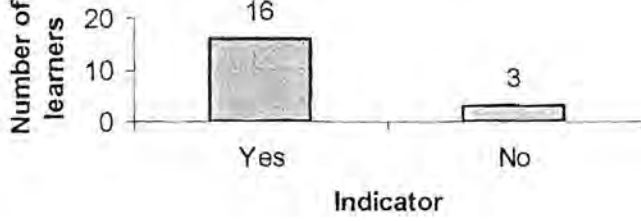
**Table 4.15: Communication with fellow learners (continued)**

Description	Results
The learners that indicated that they preferred Internet based instruction provided reasons in the next column:	<ul style="list-style-type: none"> <li>▪ Internet based makes it possible for one to study at one's convenient time.</li> <li>▪ I felt this to be more immediate and changes could be made easily.</li> <li>▪ The resources are very rich and visual with some interaction. Student motivation is high and material has more impact than text books.</li> <li>▪ Internet based instruction is not limited by the quantity of material on the CD ROM.</li> <li>▪ It is easier and using it regularly helps one to know more about it.</li> <li>▪ CD ROM gives more flexibility but Internet should provide more interactivity.</li> </ul>
The learners that indicated that they preferred formal lectures provided reasons in the next column:	<ul style="list-style-type: none"> <li>▪ It is less expensive, one can ask as many questions as one likes, the lecturer can repeat and elaborate more on our work and offer more exercises.</li> <li>▪ A personal touch, questions and uncertainties can be solved within the class period.</li> <li>▪ Can get answers to problems directly and specifically.</li> </ul>
The learner that indicated that he/she preferred paper based instruction provided reasons in the next column:	<ul style="list-style-type: none"> <li>▪ I can work at my own pace and read more and then do the assignment.</li> </ul>

**Table 4.16: Professional developmental portfolio**

Description	Results						
All the learners indicated that they submitted their electronic portfolios. One should however keep in consideration that 24 learners started the module, but only 19 submitted the assignments.	<p style="text-align: center;"><b>Submission of Portfolio</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Submission of Portfolio</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>19</td> </tr> <tr> <td>No</td> <td>0</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	19	No	0
Indicator	Number of learners						
Yes	19						
No	0						

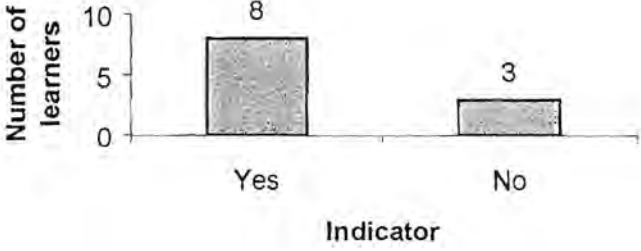
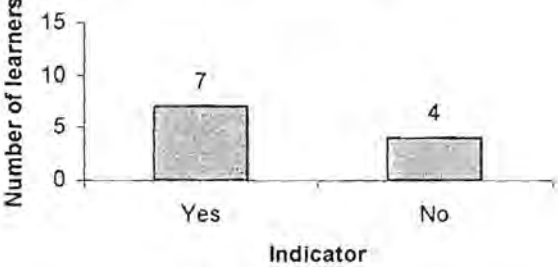
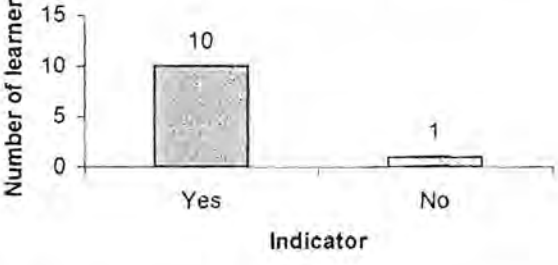
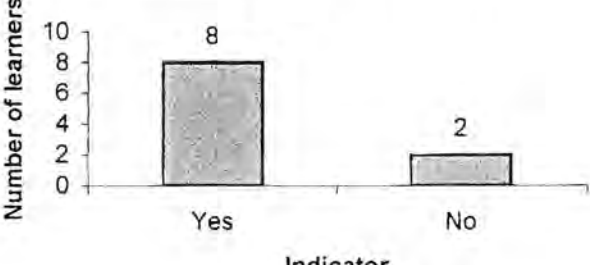
**Table 4.16: Professional developmental portfolio (continued)**

Description	Results									
<p>Only one learner did not make use of any portfolio templates, but used another programme to create his electronic portfolio. The Microsoft Word 97 portfolio templates were used by 11 learners (60%) while seven learners (37%) used the Netscape Composer templates.</p>	<p style="text-align: center;"><b>Programme used to create portfolio</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Programme used to create portfolio</caption> <thead> <tr> <th>Programme</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Microsoft Word 97 templates</td> <td>11</td> </tr> <tr> <td>Netscape Composer templates</td> <td>7</td> </tr> <tr> <td>Other</td> <td>1</td> </tr> </tbody> </table>		Programme	Number of learners	Microsoft Word 97 templates	11	Netscape Composer templates	7	Other	1
Programme	Number of learners									
Microsoft Word 97 templates	11									
Netscape Composer templates	7									
Other	1									
<p>The learners that indicated that they used the Microsoft Word 97 portfolio templates provided reasons in the next column:</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ It is user friendly, easy to use.</li> <li>▪ Only templates available due to a lack of Internet access.</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">6</p> <p style="text-align: center;">5</p>								
<p>The learners that indicated that they used the Netscape Composer templates provided reasons in the next column:</p>	<p style="text-align: center;"><b>Reply</b></p> <ul style="list-style-type: none"> <li>▪ Less complicated procedure and easy to use for a novice.</li> <li>▪ I have a high knowledge of html.</li> </ul>	<p style="text-align: center;"><b>Frequency</b></p> <p style="text-align: center;">5</p> <p style="text-align: center;">2</p>								
<p>About 85% of the learners indicated that they familiarised themselves with the different components that should be part of an electronic developmental portfolio.</p>	<p style="text-align: center;"><b>Familiarise with the different components as stated in the articles</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Familiarise with the different components</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>16</td> </tr> <tr> <td>No</td> <td>3</td> </tr> </tbody> </table>		Indicator	Number of learners	Yes	16	No	3		
Indicator	Number of learners									
Yes	16									
No	3									

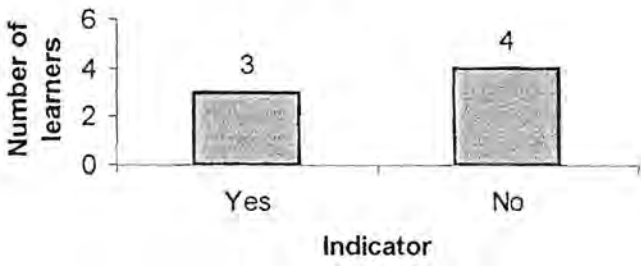
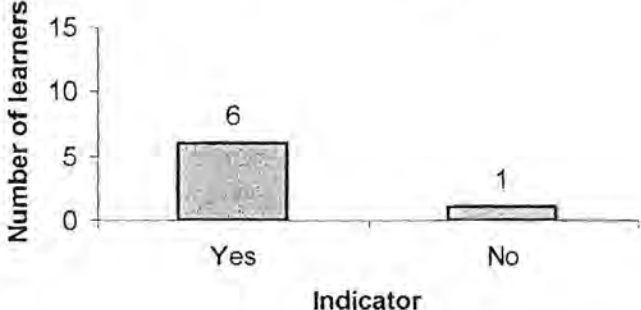
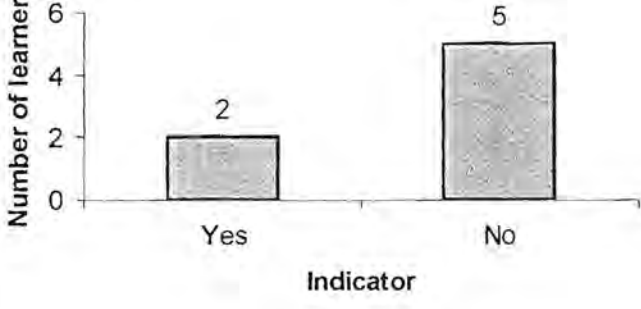
**Table 4.16: Professional developmental portfolio (continued)**

Description	Results														
<p>Of the 16 learners that indicated that they familiarised themselves with the components necessary for an electronic developmental portfolio, nine learners indicated that they included some of those components in their portfolios. One learner indicated that he/she was under the impression that the templates met all the requirements.</p>	<p style="text-align: center;"><b>Inclusion of components</b></p> <table border="1"> <caption>Data for Inclusion of components</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>9</td> </tr> <tr> <td>No</td> <td>7</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	9	No	7								
Indicator	Number of learners														
Yes	9														
No	7														
<p>Almost all the learners (16) indicated that they included a demonstration of their skills in their portfolios. Insight, self-reflection and knowledge were also indicated by five learners. Only one learner indicated that solutions for problems were included in his/her portfolio.</p>	<p style="text-align: center;"><b>Components incorporated</b></p> <table border="1"> <caption>Data for Components incorporated</caption> <thead> <tr> <th>Purpose</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Insight</td> <td>5</td> </tr> <tr> <td>Solutions</td> <td>1</td> </tr> <tr> <td>Reflection</td> <td>5</td> </tr> <tr> <td>Knowledge</td> <td>5</td> </tr> <tr> <td>Strengths</td> <td>4</td> </tr> <tr> <td>Skills</td> <td>16</td> </tr> </tbody> </table>	Purpose	Number of learners	Insight	5	Solutions	1	Reflection	5	Knowledge	5	Strengths	4	Skills	16
Purpose	Number of learners														
Insight	5														
Solutions	1														
Reflection	5														
Knowledge	5														
Strengths	4														
Skills	16														
<p>All the students indicated that they would like to expand their portfolios to include information/assignments regarding other modules of the master's qualification.</p>	<p style="text-align: center;"><b>Expand portfolio</b></p> <table border="1"> <caption>Data for Expand portfolio</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>19</td> </tr> <tr> <td>No</td> <td>0</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	19	No	0								
Indicator	Number of learners														
Yes	19														
No	0														

**Table 4.17: Microsoft Word 97 portfolio templates**

Description	Results						
<p>Eight learners indicated that they used the Microsoft Word 97 portfolio templates exactly as designed. Three learners indicated that they made some changes to these templates, but the changes were largely restricted to colour and/or clipart changes.</p>	<p style="text-align: center;"><b>Microsoft Word 97 portfolio templates exactly as designed</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>8</td> </tr> <tr> <td>No</td> <td>3</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	8	No	3
Indicator	Number of learners						
Yes	8						
No	3						
<p>Seven of the 11 learners found the demonstration during the contact session sufficient to explain to them how to use the Microsoft Word 97 portfolio templates.</p>	<p style="text-align: center;"><b>Demonstration sufficient</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>7</td> </tr> <tr> <td>No</td> <td>4</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	7	No	4
Indicator	Number of learners						
Yes	7						
No	4						
<p>Ten learners indicated that they used the on-line guides.</p>	<p style="text-align: center;"><b>Did you use the on-line guides?</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>10</td> </tr> <tr> <td>No</td> <td>1</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	10	No	1
Indicator	Number of learners						
Yes	10						
No	1						
<p>Of the ten learners that indicated that they used the on-line guides, eight found it sufficient to explain to them how to use the Microsoft Word 97 portfolio templates.</p>	<p style="text-align: center;"><b>Sufficiency of on-line guides</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>8</td> </tr> <tr> <td>No</td> <td>2</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	8	No	2
Indicator	Number of learners						
Yes	8						
No	2						

**Table 4.18: Netscape Composer templates**

Description	Results						
<p>Four of the seven learners indicated that they did not use the Netscape Composer templates exactly as designed. Two of these four learners indicated that it included substantial changes and it was obvious that these two learners had a fundamental knowledge of html.</p>	<p style="text-align: center;"><b>Netscape templates exactly as designed</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Netscape templates exactly as designed</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>3</td> </tr> <tr> <td>No</td> <td>4</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	3	No	4
Indicator	Number of learners						
Yes	3						
No	4						
<p>Most of the learners, six out of seven, indicated that the instructions were sufficient to explain how to use the Netscape Composer templates.</p>	<p style="text-align: center;"><b>Instructions sufficient</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Instructions sufficient</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6</td> </tr> <tr> <td>No</td> <td>1</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	6	No	1
Indicator	Number of learners						
Yes	6						
No	1						
<p>Only two learners used the help function and they indicated that it was sufficient to explain to them how to use the programme.</p>	<p style="text-align: center;"><b>Did you use the help function?</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Did you use the help function?</caption> <thead> <tr> <th>Indicator</th> <th>Number of learners</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>2</td> </tr> <tr> <td>No</td> <td>5</td> </tr> </tbody> </table>	Indicator	Number of learners	Yes	2	No	5
Indicator	Number of learners						
Yes	2						
No	5						

**Table 4.19: Other comments**

Description	Results	
Other comments by the learners are categorised in the next column:	Reply	Frequency
	▪ The development of the electronic portfolio was a worthwhile experience.	3
	▪ The assignments were not clear enough.	1
	▪ More contact time with the lecturers was needed.	2
	▪ More time to complete the assignments was needed.	3
	▪ Appreciation for what was learnt in this module.	4
	▪ The presentation of the study material (the CD ROM) was very good.	3

The feedback was mostly positive, but it is clear that the learners are not yet used to the telematic mode of education.

## 4.4 The evaluation phase

All the assignments were evaluated, and the results were sent to each learner's personal e-mail address.

All the electronic portfolios that the learners presented for assessment were saved on a CD ROM. Examples of the electronic portfolios are presented in Appendix I on the CD ROM. The assessment of the professional electronic developmental portfolios was done according to the criteria set in the assessment instrument in Table 3.13, based on the following:

- The ability to communicate content effectively;
- Mechanical ability;
- Creative ability;
- The ability to make experience an integral part of learning;
- The ability to reflect on prior learning;
- The ability to reflect on strengths and weaknesses as a learner;
- The ability to keep track of learning;
- The ability to assume responsibility for learning;

- The willingness to take risks while developing creative solutions;
- The ability to work meaningfully with concepts and content;
- The ability to assess and value own learning;
- The ability to apply the theory to the practice.

The frequency and average marks that the learners received are presented in Table 4.20.

**Table 4.20: The frequency and average marks of the learners for the professional electronic developmental portfolio**

Ability	Description	Very high	High	Medium	Low	Very low	Not shown
		5	4	3	2	1	0
The ability to communicate content effectively	Structure work logically: • Select an appropriate framework for the assignment;	*4	15				
	• a logical flow of ideas;	2	10	3	4		
	Use academically acceptable language: • grammar;	8	5	2	4		
	• avoid slang or informal language;	19					
	• provide additional supporting details, examples or information if something may be confusing or not clear;	1	2	1	2	6	7
	• avoid subjective statements.	18	1				
<b>Average:</b>		3,82/5					
Mechanical ability	Format the content by the correct and consistent use of:	19					
	• table of contents;	10	9				
	• numbering/bullets;	6	12	1			
	• emphasizing text e.g. underlining, italics, bold, colour;	17	1		1		
	• upper and lower case;	17			2		
	• navigation.	5	11	2	1		
<b>Average:</b>		4,55/5					

\* This figure indicates the number of learners that received 5 marks for this aspect



**Table 4.20: The frequency and average marks of the learners for the professional electronic developmental portfolio (continued)**

Ability	Description	Very high	High	Medium	Low	Very low	Not shown
		5	4	3	2	1	0
<b>Creative ability</b>	<ul style="list-style-type: none"> <li>Come up with new ideas and insights.</li> </ul>	1	4	2		12	
<b>Average:</b>		2,05					
<b>The ability to make experience an integral part of learning</b>	Focus on the process of learning as well as the products of learning by including reflective items which indicate awareness of: <ul style="list-style-type: none"> <li>the value of the learning process and knowledge gained.</li> </ul>	1		1		17	
<b>The ability to reflect on prior learning</b>	Make the link between prior knowledge and the newly acquired knowledge: <ul style="list-style-type: none"> <li>including items which indicate a building on existing or prior knowledge.</li> </ul>		1		1		17
<b>The ability to reflect on strengths and weaknesses as a learner</b>	Recognise strengths and weaknesses and reflect on these: <ul style="list-style-type: none"> <li>including reflective items to identify strengths and weaknesses regarding learning.</li> </ul>						19
<b>The ability to keep track of learning</b>	Keep track of learning: <ul style="list-style-type: none"> <li>include items of reflection and revision on a continuous basis.</li> </ul>						19
<b>The ability to assume responsibility for learning</b>	Demonstrate a willingness to assume responsibility for learning: <ul style="list-style-type: none"> <li>include items which indicate a willingness to do more than expected.</li> </ul>	1	1				17
<b>The willingness to take risks while developing creative solutions</b>	Take risks in the search for solutions: <ul style="list-style-type: none"> <li>include items which indicate a boldness to explore, take chances and to come up with unique solutions to problems.</li> </ul>	1	1				17
<b>The ability to work meaningfully with concepts and content</b>	Interpret, analyse apply, compare, distinguish between and critically evaluate concepts and content: <ul style="list-style-type: none"> <li>include items such as summaries and reflection on the meaning of concepts and critical evaluation.</li> </ul>			1			18
<b>The ability to assess and value own learning</b>	Assess own learning in terms of quality of learning: <ul style="list-style-type: none"> <li>complete and include self assessment activities.</li> </ul>						19

**Table 4.20: The frequency and average marks of the learners for the professional electronic developmental portfolio (continued)**

Ability	Description	Very high	High	Medium	Low	Very low	Not shown
		5	4	3	2	1	0
<b>The ability to make practical applications of theory</b>	Use the theory in practice: <ul style="list-style-type: none"> <li>include items which indicate an ability to apply what was learned in own life world.</li> </ul>	1	1				17
	<b>Average:</b>	0,35/5					
	<b>TOTAL (5):</b>	2,69					
	<b>TOTAL (30):</b>	16,14					

For the complete assessment results for each learner, see Appendix J on the CD ROM.

The average for the learner's ability to communicate the content effectively was 3,82/5, which indicates that there still are some areas which need attention. Their mechanical ability was very good (4,55/5), but creative ability was lacking (2,05/5). In the assessment of the areas regarding experience as a part of learning, self-reflection and new initiatives, all except one learner performed very poor and the average was 0,35/5.

For most learners their mechanical ability was the main reason for the average of 16,14/30. It is very clear that their skills in the last few categories need urgent attention.

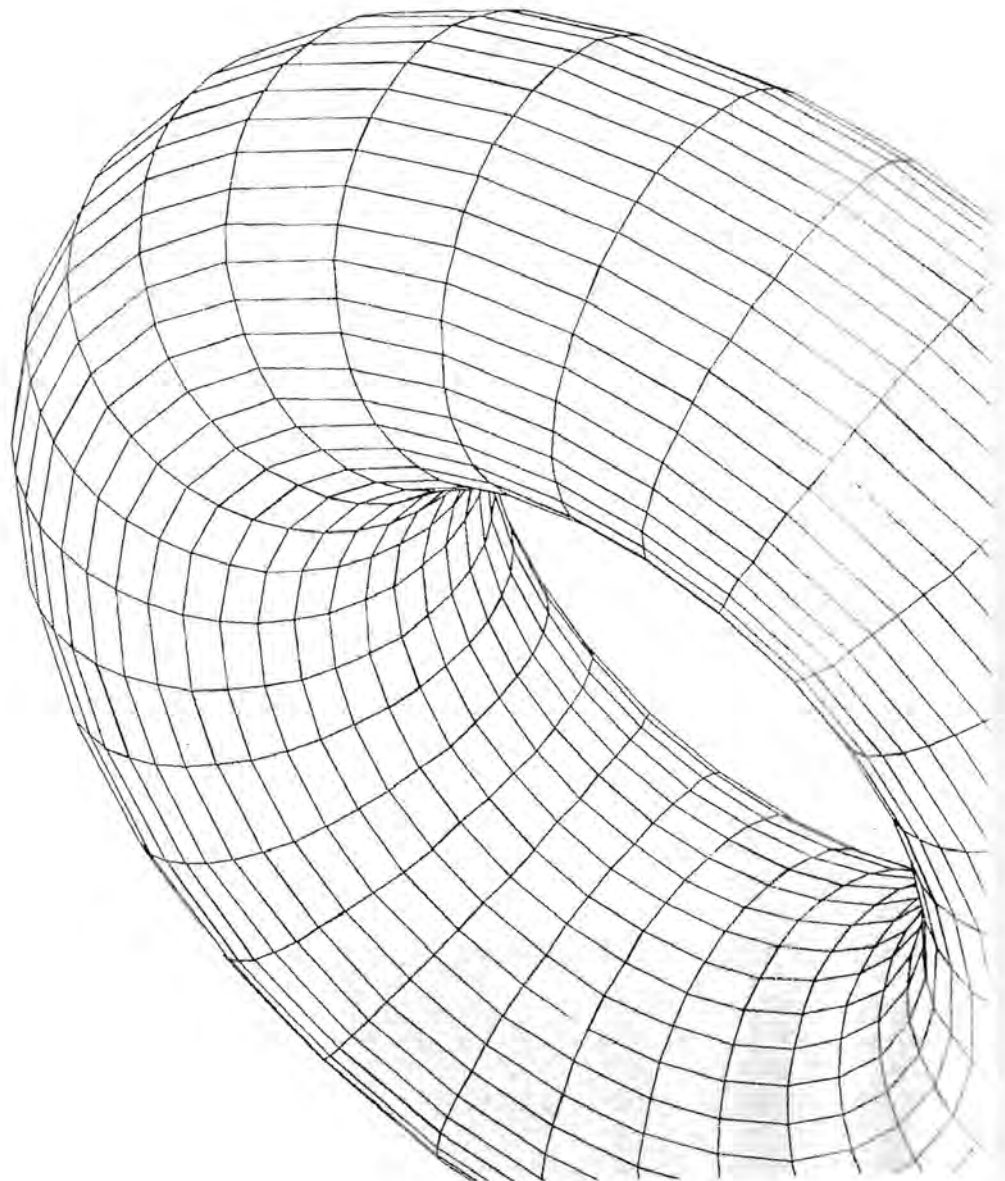
## 4.5 Summary

Although this was the first experience of the development of electronic portfolios (or any portfolio for that matter) for this specific group of learners, they regarded it as a positive experience. One should also keep in mind that it was their first experience of telematic education. The level of the computer skills of the group differed, and this resulted in the development of a second set of templates, which was not envisaged at the beginning of the project. It was encouraging to learn that all the learners wanted to expand their electronic portfolios to include assignments of all the modules of the master's degree qualification, because they realized the value of this type of electronic developmental portfolios.

# **A model for the implementation of electronic portfolio assessment in education**

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# 5



## 5.1 Introduction

The implementation of portfolio assessment strategies in the education and training environment is a time consuming process that should be performed within a specified framework, structure or model. The suggested model (see Figure 5.1) comprises of the following components:

- The analysis phase;
- The design and development phase;
- The sensitising phase;
- The compilation phase;
- The assessment phase.

Continuous evaluation and assessment of each phase should be performed and this may influence the actions of the educator and the learners during each phase.

These phases will be discussed in the following paragraphs.

## 5.2 The analysis phase

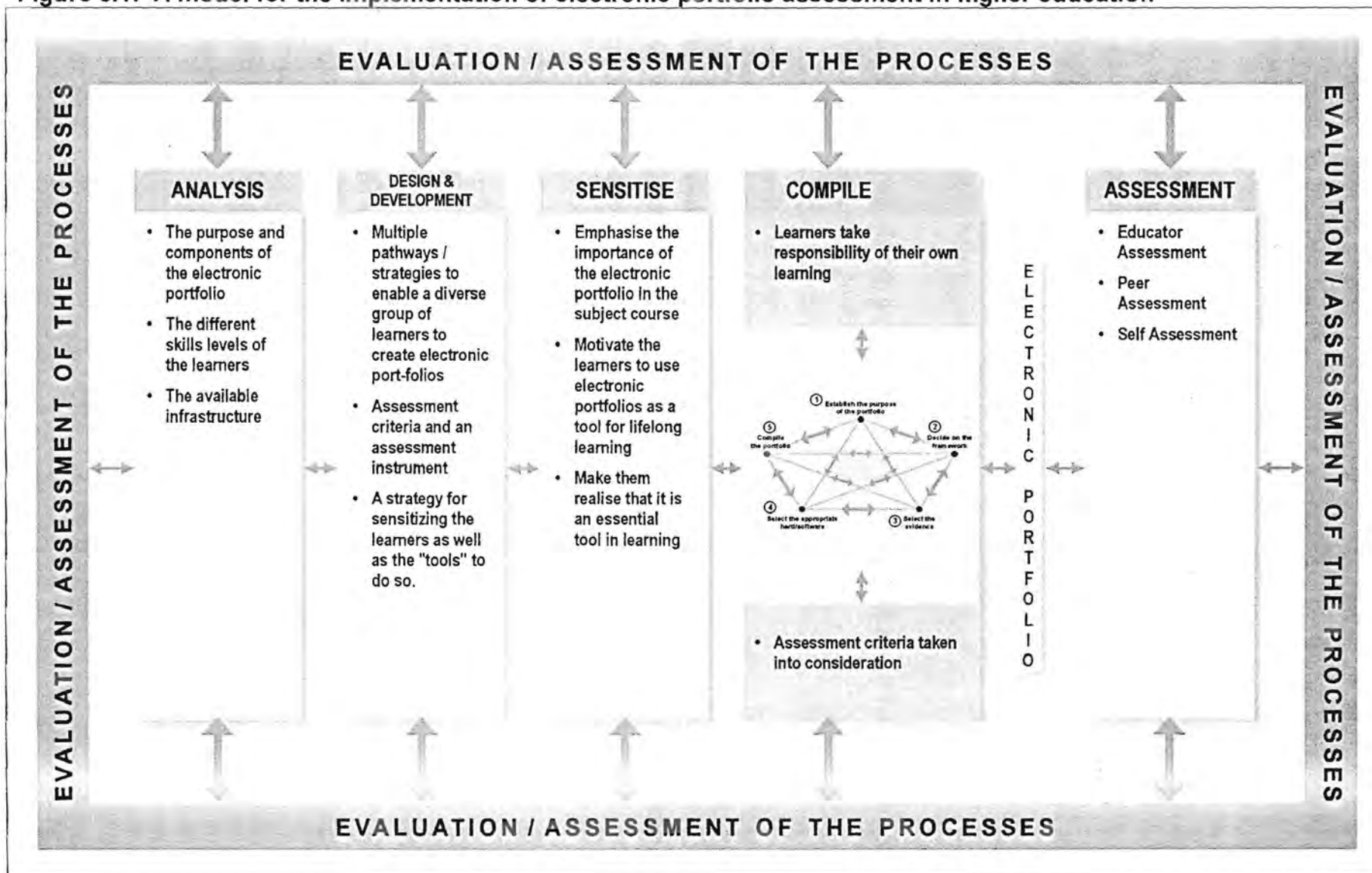
During the analysis phase a thorough study of all the relevant factors which may influence the success, or failure of the implementation of electronic portfolio assessment in the learning environment should be initiated. It is the responsibility of the educator to perform this detailed analysis. The results of such an investigation should be assessed seeing that it may influence the course of the implementation process. The following are factors that may determine the success rate of the implementation of electronic portfolios and portfolio assessment:

- The purpose and components of electronic portfolio assessment in a module;
- The skills levels of the learners;
- The availability and accessibility of an appropriate infrastructure.

### 5.2.1 The purpose and components of electronic portfolios in a module

The introduction of electronic portfolios and electronic portfolio assessment in education has many advantages for the learner and the educator. The educator will be able to supply the Education and Training Qualification Authorities (ETQAs), whose responsibility it is to

Figure 5.1: A model for the implementation of electronic portfolio assessment in higher education



accredit, promote quality and monitor providers of learning programmes, with records of the outcomes reached by the learners enrolled for this module. The learners are provided with the opportunity to develop a lifelong learning career tool and it will encourage them to take full responsibility for their own learning. Both the educator and the learner benefit by having a history or track record, which will assist both to keep track of their progress.

The components included in an electronic portfolio, will be determined by the purpose of the portfolio, which will in turn be determined by:

- The outcomes of the module;
- The content of the module;
- The type of skills that should be demonstrated in the electronic portfolio;
- The level of the learners (GET/FET/HET);
- The "audience" for whom the electronic portfolio is developed.

Different research methods can be combined to examine and determine the purpose and components of the electronic portfolio. The educator could:

- Study policy documents pertaining to higher education and training, with special reference to educator training;
- Study literature pertaining to the different types of electronic portfolios ;
- Study literature pertaining to the different components of electronic portfolios;
- Confer with educators from other subjects areas, or educators from other institutions regarding the purpose and components of electronic portfolios;
- Join discussion groups on the Internet regarding the implementation of portfolios in education and training.

## 5.2.2 The skills levels of the learners

The compilation of an electronic portfolio requires specific skills from the learner that are not necessarily *directly* related to the skills developed in a specific module. These skills include:

- Computer skills;
- Critical thinking skills;
- Creative ability;
- Communication skills;
- Problem-solving skills.

The analysis of the learners' skills levels should provide the educator with the necessary information to plan and administer a suitable implementation strategy for the specific group of learners.

### **5.2.2.1 Computer skills of the learners**

A certain level of computer skills is required to construct an electronic portfolio. Each group of learners is unique - it is possible to work with a group of learners, who have no knowledge of computers or a very low level of computer skills, as well as with learners who are competent to use computer programming languages. The learners' level of computer skills will, to a large extent, determine the processes and procedures followed, as well as the tools used to create electronic portfolios. The levels of computer/technology skills should be analysed in order to make provision for the diverse groups of learners.

The educator can do the analysis by:

- Administering a questionnaire which requires the learners to indicate their level of computer skills;
- Assigning the learners to a task which requires a specific computer skill level which will indicate to the educator the learner's level of computer skills on completion of the task.

### **5.2.2.2 Critical thinking skills, creative ability, communication skills and problem-solving skills of the learners**

The additional skills that one requires to develop an electronic portfolio, include critical thinking skills, creative ability and communication skills. These skills are more complicated to define, assess and analyse. These skills are defined in Table 5.1.

**Table 5.1: Definitions of the required skills**

Skill	Definition
Critical thinking skills	A high level of <i>critical thinking skills</i> means that the learner is able to make adverse comments using thought or rational judgements (Tulloch, 1993:340,1624).
Creative ability	<i>Creative ability</i> in education and training is characterised by the capacity of inventive and imaginative work delivered by the learner (Tulloch, 1993:3,336).
Communication skills	<i>Communication skills</i> refer to the ability to transmit information, using different media (Tulloch, 1993:287).
Problem-solving skills	<i>Problem-solving skills</i> refer to the ability to find an answer to a doubtful or difficult matter which requires a solution (Tulloch, 1993:1212,1478).

To enable the educator to assess the learner's levels of the skills defined in Table 5.1, the educator could:

- Evaluate the results of problem-solving tasks assigned to the learners. These tasks should require high levels of critical thinking skills, creative ability and communication skills;
- Evaluate written assignments, which require high levels of critical thinking skills, creative ability with special emphasis on communication skills;
- Evaluate prepared and unprepared oral assignments to acquire knowledge regarding the learner's level of critical thinking skills, creative ability and communication skills;
- Evaluate the learner's ability to develop new ideas/concepts in various assignments.

### **5.2.3 The availability and accessibility of an appropriate infrastructure**

The availability of an infrastructure not only refers to the existence of such an infrastructure, but also to the accessibility thereof to the learner. The infrastructure needed by the learners to be able to compile electronic portfolios include:

- Hardware;
- Software (programmes);
- Internet access.



### 5.2.3.1 Hardware requirements

Without the necessary hardware, no electronic portfolio can be developed. The specifications of the available hardware will also determine the parameters within which learners will be required to develop their electronic portfolios. Hardware includes components such as the processor of the computer, the monitor, scanners, CD ROM drives, CD ROM writers and printers.

The educator needs to analyse the available hardware as follows:

- Making an inventory of all the hardware available to the learners at the educational institution. This should be done in conjunction with the information technology (IT) department of the institution;
- Administering a questionnaire, which requires the learners to provide information regarding the hardware available to them in their personal capacity;
- Administering a questionnaire that provides an indication of the hardware available to the learners at private institutions, should the learners indicate that they use such private institutions.

### 5.2.3.2 Software requirements

The availability of appropriate software (programmes) to create an electronic portfolio is of equal importance. The educator could recommend suitable software to which the learners have access to develop the electronic portfolios. Applicable software can include word processors, electronic presentation programmes, graphics programmes, multimedia authoring programmes, off-the shelf portfolio programmes as well as Internet applications.

It is the responsibility of the educator to analyse the availability of appropriate software, and it could be done by:

- Making an inventory of all the software available to the learners at the educational institution. This should also be done in conjunction with the information technology (IT) department of the institution;
- Administering a questionnaire which indicates the software/programmes that are available to them in their personal capacity, including appropriate freeware/shareware software;
- Administering a questionnaire that provides an indication of the software/programmes available at private institutions, should the learners indicate that they may make use of such private institutions.

### 5.2.3.3 Internet access

Access to the Internet and the World Wide Web (WWW) can play a major role in deciding on the "tools" to create an electronic portfolio. Publishing portfolios on the Internet has gained popularity and has many advantages to the learners, seeing that it provides them with the opportunity for national as well as international exposure.

If publishing an electronic portfolio on the Internet is an option, the educator needs to analyse the learner's access to the Internet as follows:

- Determine the level of Internet access provided to the learners by the educational institution from the Information Technology (IT) department of the institution;
- Administer a questionnaire to gather information regarding the learners' Internet access in their personal capacity as provided by Internet Service Providers (IPs);
- Administer a questionnaire which indicates the Internet access of learners as provided by private institutions e.g. Internet cafes.

A combination of the purpose and components of the electronic portfolio, the skills of the learners and the availability of an infrastructure will influence the design and development phase.

## 5.3 The design and development phase

On completion of the analysis, the educator should design and develop an implementation strategy, which should include the design and development of:

- Multiple pathways for a diverse group of learners;
- Assessment criteria and an assessment instrument;
- A sensitising strategy to create an awareness amongst learners regarding the importance of electronic portfolios in education.

### 5.3.1 Multiple pathways

The educator may have a diverse group of learners and should therefore design and develop multiple pathways to enable each learner within the diverse group to develop an electronic portfolio. By providing the learners with multiple pathways to construct their electronic portfolios, each learner should be able to compile an electronic portfolio by utilising different

software at their disposal. Some of the software that can be used to construct an electronic portfolio, include:

- Portfolio templates developed by the educator;
- Off-the-shelf software;
- Multimedia authoring software;
- Electronic presentation software;
- Internet applications.

If the educator insists that the learners use a specific programme, learners may spend a lot of time on mastering that programme. As a result of this approach, the learner spends a lot of time mastering the programme and is left with very little time to develop the electronic portfolio. This may lead to the learner presenting a portfolio which is aesthetically pleasing, but the content and presentation may not be educationally sound or a true reflection of the skills and competencies of the learner. The emphasis when developing an electronic portfolio, should be on the content of the portfolio, the presentation of the content, and the learner's self-reflection.

A user-friendly portfolio template, specifically designed to include all the information needed by the specific group of learners could be particularly useful to learners with basic levels of computer/technology skills. These learners would find it very convenient to be provided with a tool that will enable them to create electronic portfolios, and by using this tool a feeling of accomplishment and success will be established. This can motivate the learner to attempt to use some of the other (more advanced) tools to improve or reconstruct his/her portfolio.

The ideal tool for learners with a very low level of computer skills would be one that presents the learner with the option to type in all the information required in the portfolio, at prompts presented by the programme. The programme should, for example prompt the learner to type in his name, address and telephone number. The learner should also be able to insert links to specified assignments in the same user-friendly manner. When the learner has provided all the necessary information, the electronic portfolio is constructed by clicking on one button.

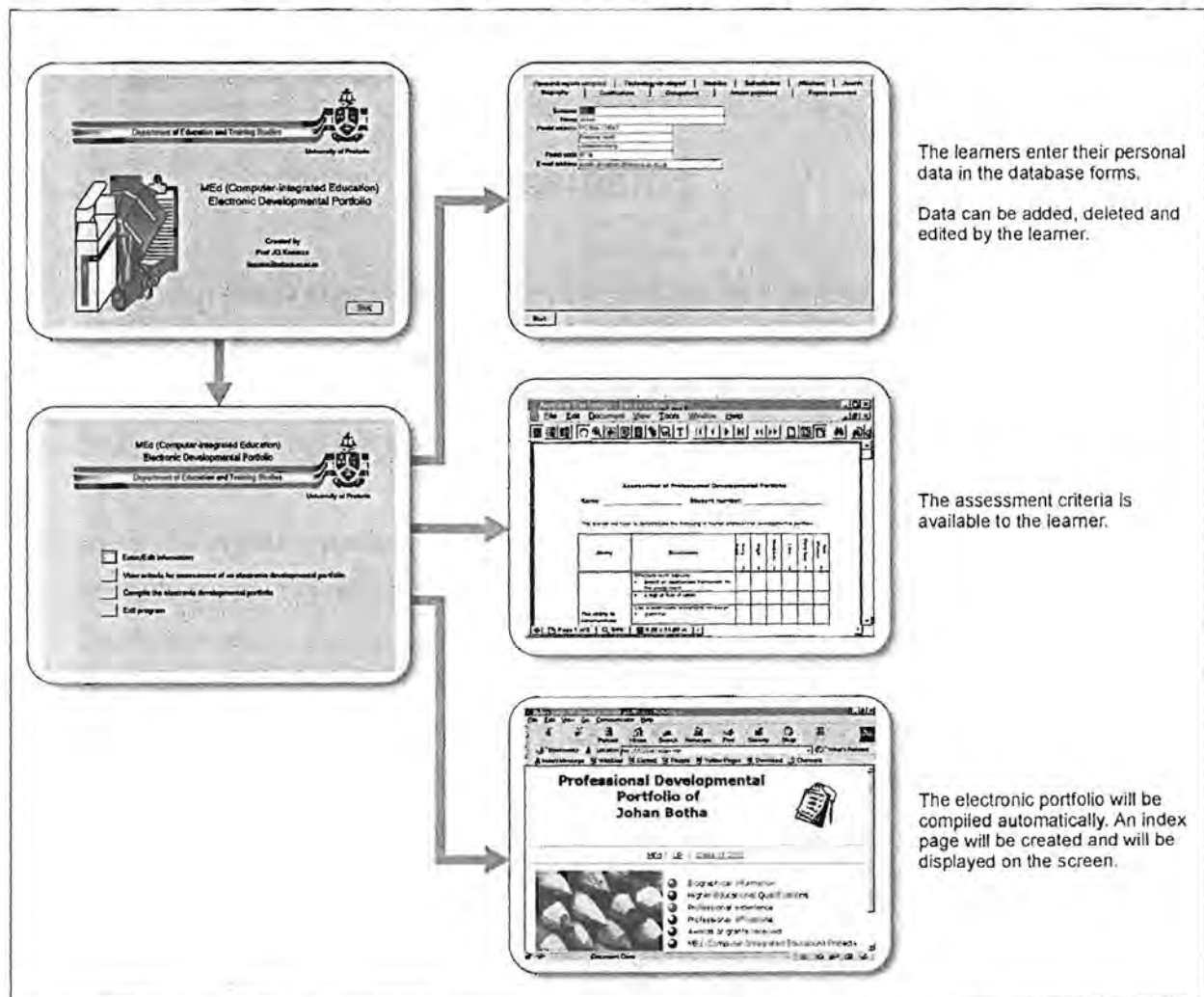
Such a programme was developed in Microsoft Access and provides the learners with a tool to create their own electronic portfolio by entering their personal data in a database form. The learners are able to add, delete or edit data and they are provided with the assessment criteria that will be applied in assessing their electronic portfolios. Once the learner is satisfied that all the data entered is correct, a web based electronic portfolio, consisting of the

different html pages, is constructed. A first (index.html) page with links to all the other applicable pages, is created when the learner click on the "*Compile the electronic developmental portfolio*" button.

This is the ideal tool for learners with a low or moderate level of computer skills that enable them to create their first electronic developmental portfolio with ease. This should motivate them to expand and edit this portfolio, as they gain more computer skills and competencies.

See Appendix K on the CD ROM for an example of an electronic portfolio created by this programme. A graphic presentation of the functions available in this programme is presented in Figure 5.2.

**Figure 5.2: The functions of the portfolio programme**



## 5.3.2 Assessment criteria and an assessment instrument

The educator who decides to implement electronic portfolio assessment in teaching and training, should identify assessment criteria and use it to design and develop an assessment instrument. The learners should be briefed about the criteria and presented with the assessment instrument. This is essential to ensure that learners know exactly how their electronic portfolios will be assessed and that all the learners' assessment is based on the same criteria.

The assessment criteria will be determined by:

- The purpose of the portfolio;
- The components of the portfolio;
- The pre-set outcomes of a module.

## 5.3.3 Strategy for sensitising

The sensitising phase should be used "to make the learners sensitive about" the use and importance of electronic portfolios in education, and specifically in the current module. A sensitising strategy, as well as tools that the educator can use to sensitise the learners, should be designed and developed.

The aims of sensitising the learners are to:

- Promote a sense of responsibility for one's own learning;
- Create a need for lifelong learning;
- Emphasise the importance and value of using electronic portfolios;
- Motivate them to play a leading role in implementing electronic portfolios in education;
- Make them realise that using electronic portfolios in education, is a necessity.

Different tools can be designed and developed to reach these aims. Some of the tools that can be applied in the sensitising phase are:

- An electronic slideshow explaining the theory and uses of electronic portfolios;
- A demonstration and description of the advantages and uses of electronic portfolios;
- Examples of completed electronic portfolios of learners from a previous group;
- A step-by-step demonstration of the process of compiling an electronic portfolio, using different software e.g. templates or electronic presentation software;

- Applicable references and literature regarding the uses, advantages and development of electronic portfolios and portfolio assessment;
- Computer-based tutorials, explaining the theory, advantages and uses of electronic portfolios and electronic portfolio assessment.

It is important that the sensitising phase should be well planned to ensure that the learners will have a positive attitude towards developing electronic portfolios and electronic portfolio assessment.

## 5.4 The sensitising phase

The sensitising phase entails the implementation of a sensitising strategy that was developed during the design and development phase. The learners should be motivated to such an extent that they are enthusiastic and *want to* develop the electronic portfolio. If the sensitising is done effectively, learners will experience electronic portfolio development and assessment as a positive strategy in their learning process.

The sensitising phase can be seen as the opportunity to inform and motivate the learners regarding the use of electronic portfolios in education with emphasis on the role it can play in presenting themselves to others. The educator should use a combination of the tools mentioned in Paragraph 5.3.3 during this phase. The learners should now be motivated to use electronic portfolios and develop their own unique portfolios. A successful sensitising phase will enhance the sense of responsibility for one's own learning, including the need for lifelong learning.

## 5.5 The compilation phase

The learner should compile an electronic portfolio in collaboration with the educator. The compilation phase consists of the following steps:

- Establishing the purpose of the portfolio;
- Selecting a framework for presentation;
- Selecting evidence to include in the portfolio;
- Selecting the appropriate and available hardware and software;
- Compiling the electronic portfolio.

Due to the interdependency of the various steps, decisions made regarding one of the steps, will impact on all the others. The compiling of an electronic portfolio is therefore not a linear process, but it is a flowing process, each step influencing the others.

### **5.5.1 Establishing the purpose of the portfolio**

When an educator decides to implement electronic portfolio assessment in the teaching and training environment, the purpose of the electronic portfolio has already been established - it will mainly be used for assessment purposes. In some instances the educator may allow the learners to develop variations e.g. to use their assessment portfolio as a base to construct a showcase portfolio as well, but the main emphasis in the teaching environment will be on assessment. The purpose of the electronic portfolio should be communicated to the learners, either during the sensitising phase or it can be included in a study guide.

### **5.5.2 Selecting a framework for presentation**

The educator and/or the learner can determine the framework within which the portfolio will be presented. This framework will determine the composition of the portfolio and can allow the learner to present the portfolio chronological, thematic or problem-oriented. The educator and the learner should decide on the framework which best suits the circumstances, but it will be determined by the tools used to compile the electronic portfolio e.g. if the educator developed a set of templates, the framework will already be incorporated in the templates.

### **5.5.3 Selecting evidence to include in the portfolio**

The purpose of the electronic portfolio and the framework within which it will be presented will determine the contents presented in the electronic portfolio. If the electronic portfolio is used as a part of the assessment strategy in a specific module, pre-set skills and competencies should be demonstrated by the contents of the electronic portfolio. Selecting the evidence should be done by the learner in collaboration with the educator.

## 5.5.4 Selecting the appropriate hardware and software

The selection of hardware and software may be prescribed by the educator, based on the availability and accessibility of the necessary infrastructure to the learners. The learners' level of computer skills may also influence the selection of hardware and software. The learners do not have to use the same hardware and software, each learner's personal circumstances may influence the selection.

## 5.5.5 Compiling the electronic portfolio

All the steps mentioned in Paragraphs 5.5.1 – 5.5.4 will influence the compilation of the electronic portfolio. The work samples presented in the electronic portfolio, have to be prescribed by the educator in order to be able to assess the specific outcomes of the module. Learners can however decide to include additional information or work samples to demonstrate personal growth and a consciousness of their own development.

Each step will be influenced by the next, and may change as circumstances in the educational environment change e.g. the availability of new technology for instance a video camera, may allow the learner to include video footage to demonstrate a skill that might have been described before. It is important to remember that these steps do not occur in isolation; there are other factors that will also constantly influence the compilation of the electronic portfolio, namely the learner's willingness to accept the responsibility for own learning and the pre-set assessment criteria as indicated by the educator.

## 5.5.6 Other factors influencing the compilation of electronic portfolios

A pre-requisite for electronic portfolio development is the learners' willingness to take responsibility for their own learning and learning processes. Although portfolio development enhances collaboration and cooperation between the educator and the learner, the responsibility to *learn* remains that of the learner.

Because the electronic portfolio will mainly be used for assessment purposes, the learners need to take the assessment criteria into consideration while compiling the electronic



portfolio. Learners should ensure that their electronic portfolios contain all the elements described in the assessment instrument.

## 5.6 The assessment phase

Three types of assessment can be identified in electronic portfolio assessment:

- Educator assessment;
- Peer assessment;
- Self-assessment.

### 5.6.1 Educator assessment

The lecturer is the primary assessor – the mark or grade that the learner will receive, depends on the educator's assessment of the electronic portfolio. This is the formal assessment of the electronic portfolio and will be done according to the assessment criteria which was incorporated in the assessment instrument. This is to ensure that all the learners are assessed equally and objectively. It is important that the educator should provide the learner with feedback, especially regarding the weaknesses of the portfolio, and allow the learner to improve it.

### 5.6.2 Peer assessment

Peer assessment is a much more informal means of assessment – learners are more prepared to share their experiences and show their efforts to their peers if it is included in an electronic portfolio. Because it is informal, it sometimes happens spontaneously – learners may share their views and display their portfolios to a group of peers, before presenting it for formal evaluation, to get their opinion regarding certain aspects of the electronic portfolio. They don't feel threatened by peers because they are all in the same situation, and regard the views of the peers as valuable and useful.

### 5.6.3 Self-assessment

Self-assessment is one of the most important features of portfolio assessment and it provides the learners with the opportunity to reflect on their work and determine personal growth over a period of time. It also provides learners with the opportunity to be active

participants in the assessment process by supplying evidence of their ability to analyse and solve problems, retrieve information, find new solutions to problems and to be creative. When self-assessment is done in the context of electronic portfolio development, learners tend to be more willing to be critical about their own work.

Self-assessment can be presented as statements regarding the learner's experience of the learning processes, with special emphasis and reflection on their own skills, capabilities and competencies. Learners could e.g. reflect on their strengths and weaknesses, and by identifying these can improve on the weaknesses and use the strengths to their advantage.

Much emphasis is placed on the formal educator assessment, but it is important that educators should encourage informal assessment by peers and the learners themselves.

## **5.7 The evaluation and assessment of the implementation processes**

The development of an electronic portfolio can never be a linear process. It is a dynamic, interactive process and each phase will influence the next. Each phase should constantly be evaluated and the processes should be assessed – this may result in the changing of some of the processes and procedures in order to comply with the conditions of a specific situation. The educator and the learners should be involved in this process and should act on the continuous evaluation, i.e. change or adapt when necessary – this way electronic portfolio development will remain an interactive, dynamic process.

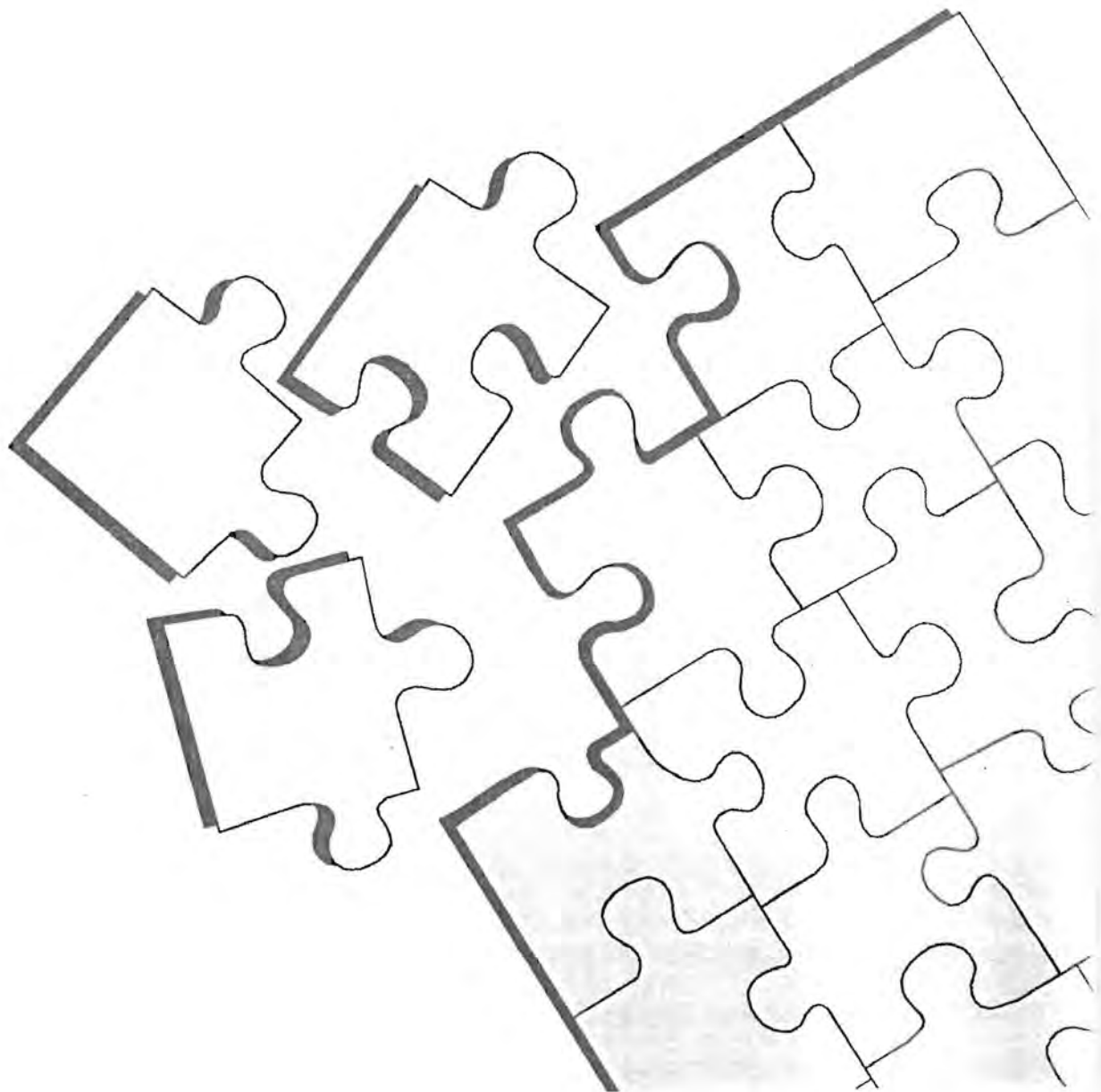
## **5.8 Summary**

The implementation of electronic portfolio assessment in the teaching and training environment can only be successful if it is based on a specific model/framework. However, it can never be a static process and continuous evaluation is necessary. The educator and learner are equal partners in this process and success will be achieved if a high level of collaboration and co-operation exists between them.

# Summary, Conclusion & Recommendations

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# 6



## 6.1 Introduction

This chapter contains a summary of the research regarding the design, development and implementation of electronic professional portfolios for educators. The purpose of this research was to establish a model for the implementation of electronic portfolio assessment in higher education. A few remarks in conclusion as well as recommendations regarding the results of the research will be presented.

## 6.2 Summary

A brief account of the contents of each chapter will be presented in Paragraphs 6.2.1 – 6.2.5.

### 6.2.1 Orientation

Chapter 1 is the orientation to the research and contains a background regarding the educational environment in which electronic portfolio assessment can be implemented. The presenter of the module Computer-assisted Aids for Education (RMX 880) decided to implement electronic portfolio assessment in the module, but needed a specific framework or model to do so. Due to the lack of such a model this research was initiated, focussing on the following:

- The processes and procedures to be followed when implementing electronic portfolio assessment in educator training, while taking in consideration the diverse group of learners registered for this module;
- The input of the presenter before the implementation phase;
- The presenter's role regarding the provision of applicable tools, to enhance electronic portfolio compilation;
- The assessment criteria and assessment instrument(s) an educator will need to develop to assess the electronic portfolios.

The purpose of this research was to establish a model for the implementation of electronic portfolio assessment in higher education by establishing the following:

- The processes and procedures that need to be followed when implementing electronic portfolio assessment for educators, taking into consideration the diverse group of learners;
- The input of the presenter before implementing electronic portfolio assessment;

- The presenter's role in providing instruments/tools for the learners, to ensure successful implementation of electronic portfolio assessment;
- The development of assessment criteria and an assessment instrument for electronic portfolio assessment.

The research programme consisted of the following phases:

- Analysis of the context and the training environment, including analysis of the purpose of the module, the skills levels of the learners and the relevant literature;
- Construction of tools for compiling electronic portfolios including the design and development of templates for this purpose, on-line reference guides to accompany the templates, an assignment and the presentation of applicable journal articles;
- Implementation of strategies pertaining to electronic portfolios assessment, consisting of two phases, namely the pre-implementation phase that included the development of different instruments needed for the development phase and the implementation phase that consisted of the implementation of all the instruments that were developed;
- Revision of the tools used for compiling electronic portfolios based on the feedback from the learners;
- Designing of a model for implementing electronic portfolio assessment.

## 6.2.2 Literature study

Chapter 2 reflects the literature study and contains information regarding the new education system of South Africa, Outcomes-based Education (OBE), teacher education in South Africa and electronic portfolios. South Africa's education system has changed considerably since 1995 and is still in a process of change. As a result of these changes National Qualifications Framework (NQF) and the South African Qualifications Authority (SAQA) were established. The purpose of the National Qualifications Authority is to provide a framework for the urgent reform needed in the South African education system. The function of the South African Qualifications Authority is mainly to oversee the development and implementation of the National Qualifications Framework.

The new education system is based mainly on Outcomes-based Education. One of the principles of Outcomes-based Education is that all individuals can learn, and that learners should be able *to do* something at the end of the learning process. Outcomes can be described as the result of a learning programme, not only what the learner *knows*, but what the learner *can do*. The purpose of Outcomes-based Assessment (OBA) is to assess the performance and achievements of the learner. Portfolios can be used in Outcomes-based

Assessment because it provides the educator with visible proof of the learner's accomplishments. Different types of portfolios are distinguished, namely developmental portfolios, professional portfolios, assessment portfolios and showcase portfolios.

There are several advantages to using portfolios in education. It promotes collaborative learning and assessment between the educator and the learner, assists both the educator and the learner to keep track of the learner's progress and it allows the learner to include experience and self-reflection as parts of learning. Learners are guided to take responsibility for their own learning and in the process develop a career tool for lifelong learning. When an assessment portfolio is developed, the assessment should be done according to pre-set guidelines or criteria. The criteria may include aspects such as the ability to:

- Communicate content effectively;
- Be creative;
- Make experience an integral part of learning;
- Reflect on prior learning as well as strengths and weaknesses;
- Assess and value own learning and make practical applications of theory.

Teacher education in South Africa is part of the Higher Education and Training Band and should be based on Outcomes-based Education. Three types of requirements are applicable to teacher qualifications, namely professional, occupational and academic requirements. These requirements include the three types of applied competencies, namely reflexive, practical and foundational competencies. The South African Council for Educators (SACE) is a body that has been established to act as the guardian body of professional educators and has a code of conduct that all educators should adhere to. All practising educators in South Africa should be registered with the SACE and will possibly be required to apply for re-registration every three years. To qualify for re-registration, an educator should provide proof of professional development and the improvement of skills and competencies during the three years. An educator should become a lifelong learner.

Electronic portfolios can possibly be useful tools in the process of becoming a lifelong learner. An electronic portfolio is a purposeful collection of work that is presented by electronic means and displays an individual's efforts, progress and achievements in one or more areas. Physical proof of the abilities, skills and competencies, as well as self-reflection of these abilities, skills and competencies can be presented. The use of electronic portfolios is gaining popularity because it is a portable and accessible tool, which can include multimedia components to demonstrate specific skills and competencies. It is very easy to manage and update and is saved in a very safe storage medium.

Different tools can be used to compile electronic portfolios, amongst others off-the shelf software, multimedia authoring programs, electronic presentation programs and even Internet applications. During the literature study different components that should be present in the electronic portfolio were identified namely a user-friendly interface, the inclusion of multimedia components such as text, graphics, video, sound and animations. A table of contents, personal data, an academic record, descriptions and demonstrations of skills, descriptions and examples of projects, work experience, letters of reference, goals and career planning, achievements and awards, self-reflection and self-evaluation, involvement in community activities and leisure activities were identified.

Specific processes and procedures that should be followed when compiling an electronic portfolio were identified. It is important that the learners should take responsibility for their own learning, while also taking the evaluation criteria into consideration when developing the electronic portfolio. The educator could determine the purpose of the electronic portfolio and can decide, in collaboration with the learner, which framework to use to present the electronic portfolio. Selecting the evidence can also be done collaboratively, but the selection of the hardware and programmes may be determined by the availability of the necessary infrastructure. The learner should compile the portfolio, using one of the tools available. Three dimensions of portfolio assessment can be identified: educator assessment – using an assessment instrument, peer assessment – informal discussions between peers about their electronic portfolios and self-assessment – the learners assessing their own performance.

The implementation of Outcomes-based Education (OBE) changed the philosophy upon which the South African education system is based. Learners are expected to *demonstrate* their skills and competencies and electronic portfolios can be the ideal tool to fulfil this function.

### **6.2.3 Analysis, design and development**

Chapter 3 is a description of the analysis, design and development phases of the research regarding the design, development and implementation of electronic portfolios for educators. Based on the literature study, it was decided to design and develop a set of templates for the learners to use in developing their portfolios. Before these templates could be developed, an analysis of the literature, the purpose of the electronic portfolio and an analysis of the learners were undertaken.

It was decided to use the learners who registered for the master's qualification in Computer-assisted Education at the University of Pretoria for this research. Portfolio assessment was incorporated as part of this module of Computer-assisted Aids for Education (RMX 880) of the master's qualification. The learners were presented with electronic portfolio templates that could be classified as tools for lifelong learning. An exact analysis of the target population could not be done beforehand as the learners were not registered for the qualification at that stage. Assumptions regarding the composition of the group of learners were based on the registration of previous years, and according to the presenter of the module, the level of computer skills varied. Most of the learners were expected to be able to use a word processing programme and for this reason it was decided to develop portfolio templates, using a word processing programme.

The main objective of the design phase was to design a set of templates that could be used to construct an electronic portfolio. Because Microsoft Word 97 is the word processing programme supported by the University of Pretoria, it was decided to use this programme to develop the templates. Design specifications for the Microsoft Word 97 portfolio templates had to be established. First of all the components to be included in the templates, had to be identified. Based on the analysis of the literature, it was decided to include the components under the following headings:

- Biography;
- Qualifications;
- Work experience;
- Projects – this included papers presented, articles published and research reports compiled, technology developed – this included the assignments for the module Computer-assisted Aids for Education (RMX 880);
- Community service;
- Professional affiliations;
- Awards.

Although it was assumed that all the learners would be able to use a word processing programme, an on-line help function for each page was developed. These help pages or on-line guides contained information regarding the purpose of the specific page e.g. how to enter data and how to save it.

A suitable look and feel for the templates and the on-line guides were developed. The use of colour, text type, size and layout, graphics and suitable navigation instruments were taken into consideration while designing the look and feel of the portfolio templates and the on-line



guides. The journal articles regarding the use of electronic portfolios were presented to the learners in an electronic format – design specifications for the insertion of navigation bars were developed. Design specifications for the assessment instrument were developed based on the work of Van Niekerk (1998).

During the development phase all the design specifications were implemented. The Microsoft Word 97 portfolio templates were developed as well as the accompanying on-line guides. An assignment pertaining to the compilation of an electronic portfolio was developed, the articles were presented in an electronic format and the assessment instrument was developed.

The three phases described in this chapter were important to ensure the successful implementation of electronic portfolio development for the learner educators.

## **6.2.4 Pre-implementation, implementation and evaluation**

Chapter 4 describes the pre-implementation, implementation and evaluation phases of the research. The pre-implementation phase was necessary because preparation work had to be done before electronic portfolios could be implemented in this module. This was the first time that this module (RMX 880) was presented telematically (electronically and as a distance education module). The learners attended structured sessions at the university for two days, and a schedule for these two days was developed. Arrangements were made with the webmaster of the University of Pretoria to create a list server and bulletin board for these learners – to allow them to easily communicate with each other as well as with the lecturers. All the relevant study material for this module was presented on a CD ROM which contained information regarding the lecturers, the unit standard, assignments, assessment criteria, the list server and bulletin board, a resource list and information regarding the learning centres of the University of Pretoria.

A questionnaire regarding the level of computer skills of the learners was developed, to be able to assess whether the assumptions made regarding their level of skills were correct. The questionnaire was used to retrieve biographical information, the learners rating of their level of computer skills, specifically regarding Microsoft Office 97, Adobe Acrobat, e-mail, list servers and bulletin boards as well as information regarding the learners, level of access to computers and the Internet. Questions to obtain information regarding the learners'

knowledge regarding the South African Council for Educators (SACE), the South African Qualifications Framework (SAQA) and the policies and procedures of the new education system of South Africa, were also included in this questionnaire.

A slideshow regarding electronic portfolios was developed to provide the learners with background regarding the use of electronic portfolios and how it fits in with the requirements for licensing and re-licensing with the South African Council for Educators. A demonstration of how to use the Microsoft Word 97 portfolio templates and Adobe Acrobat Exchange, was developed. A second questionnaire was developed, to assess the processes and procedures followed by the learners to compile their electronic portfolios. This questionnaire was also developed to establish the learners rating of their level of computer skills after completing the assignments, the levels of communication between learners and learners and lecturers and also to establish which tools or templates the learners used to compile their electronic portfolios.

The implementation phase commenced once the learners were registered. Because the master's qualification was presented telematically and the learners came from many different parts of the country, an administrative orientation session was needed. An introduction to the module RMX 880 followed and the learners were requested to complete the questionnaire regarding their level of computer skills. The slideshow regarding the development of electronic portfolios was presented and a demonstration of the use of the Microsoft Word 97 portfolio templates and the conversion to portable disk format (pdf) using Adobe Acrobat Exchange, followed.

The results of this questionnaire indicated that the majority of learners rated themselves to be on a moderate level of computer skills, and not all the learners had access to Internet or e-mail. In spite of this, some of the learners immediately enquired about the possibility to develop their electronic portfolios by using hypertext markup language (html) which is an Internet application. It occurred to the lecturers that not all the learners had the skills to use html independently and decided to develop a set of templates for the learners who would like compile a web based portfolio. The list server was used to notify the learners about the second set of templates that was being developed and e-mail was used to distribute the templates in a compressed format (a zip file) to the learners.

The bulletin board and the list server were not used to its full potential, only a few learners utilised it to communicate problems regarding some of the assignments. The majority of learners decided to use the Microsoft Word 97 portfolio templates, and each of these

learners made an appointment with the educator to assist them with the conversion to portable disk format and inserting hyperlinks, to complete their electronic portfolios. After completion of the electronic portfolios, the learners were requested to complete the questionnaire regarding the processes and procedures followed. The results of this questionnaire indicated that the majority of learners preferred the CD ROM mode of instruction. The Microsoft Word 97 portfolio templates were used by the majority, while only one learner did not make use of either set of templates, but used another programme to construct an electronic portfolio. All of them indicated that they would like to expand their electronic portfolios to include information and assignments regarding the other modules of the master's qualification.

During the evaluation phase, the electronic portfolios were assessed according to the assessment instrument that was developed and learners' detailed results were e-mailed to them. Although this was the first experience concerning the development of electronic portfolios for this specific group of learners, they indicated that it was a positive experience for them.

## **6.2.5 Model for the implementation of electronic portfolio assessment in education**

Chapter 5 contains the suggested model for the implementation of electronic portfolio assessment in the education environment. The model comprises of five phases namely analysis, design and development, sensitising, compilation and assessment phases.

An analysis of the purpose and components of the electronic portfolio, the different skills levels of the learners and the available infrastructure should be made when an educator decides to implement electronic portfolio assessment in education. During the design and development phase multiple pathways or strategies to enable a diverse group of learners to compile electronic portfolios should be developed as well as assessment criteria and a suitable assessment instrument. It is important to develop a strategy and tools for sensitising the learners regarding the use of electronic portfolios in the education and training environment. The sensitising phase should be used to emphasise the importance of the use of electronic portfolios to the learners and motivate them to utilise it as a tool for lifelong learning.

The compilation phase describes the processes and procedures that should be followed to compile an electronic portfolio. Although it is a collaborative activity between the learner and the educator, the learners need to accept the responsibility for their own learning. The assessment criteria should also be taken into consideration while compiling the electronic portfolio. The purpose of the electronic portfolios should be established by the educator, who will, in conjunction with the learner and based on the tools developed, select an appropriate framework. Selecting the evidence is the learners responsibility but will also be done in collaboration with the educator. The decision regarding the use of specific hardware or programmes to compile the electronic portfolio will depend largely on the available infrastructure. This is not a static process, but a dynamic one, as one phase will influence the procedure of the next one.

After completion of the electronic portfolio, assessment will take place. Three types of assessment were identified namely the formal educator assessment using an assessment instrument, the more informal peer assessment which stimulates discussions between the learners regarding the learning processes and self-assessment where the learner is expected to assess him/herself, commenting on all aspects of the learning process.

The implementation of electronic portfolio assessment in the educational environment will only be successful if it is based on a specified model or framework. The model suggested here was developed, based on literature available on the topic, but also on the practical experience gained during the research.

## 6.3 Conclusion

In conclusion it should be mentioned that the learners experienced a variety of problems, depending in some cases on their level of computer skills. Some of the problems encountered by the learners, include:

- Those with a low level of computer skills still found it very difficult to use the templates;
- Everybody did not have access to the Internet and e-mail, which hampered communication with fellow learners and the educator, with special reference to the list server and the bulletin board;
- Even learners who had e-mail and Internet access, did not utilise the functions of the list server and bulletin board as a communication tool;
- They experienced a lot of problems to present self-reflection, and most learners did not even include it, they just deleted the space for self-reflection that was built into the templates.

In spite of these problems experienced by the learners, electronic portfolio development can be an enriching experience for both the educator and the learner. The following should be taken into consideration:

- Portfolio assessment in the educational environment is a viable strategy, which should be promoted to educators in all different fields;
- There are many advantages to using electronic portfolio development and assessment in education, but one of the most valuable, is the potential of the electronic portfolio to be a tool for lifelong learning for each learner;
- The availability of different pathways and tools to create electronic portfolios is necessary because of the diverse learner groups an educator will need to deal with;
- The well-structured sensitising phase is important because it will determine the attitude of the learners towards electronic portfolio development, and will in turn determine the quality of the electronic portfolios the learners create;
- Learners' level of computer skills are diverse and therefore multiple pathways should be available to enable each learner to develop an electronic portfolio;
- Learners preferred to use the electronic portfolio templates as is, only learners with a high level of skills changed it somewhat or created their own;
- Learners were positive about the use of the electronic portfolios, they wanted to expand it.

## 6.4 Recommendations

Based on the results of the research, the following is recommended:

- Train educators to enable them to implement electronic portfolio assessment in their professional development;
- The educator will need to plan the implementation of electronic portfolio assessment carefully and it is essential to use a pre-set framework, structure or model;
- The availability of a user-friendly template is important – learners experience a sense of accomplishment if they are able to create an electronic portfolio using the templates, which bring about a positive attitude, and will encourage them to expand and change it according to their personal preferences;
- Learners should be "trained" on how to do self-reflection;
- The educator should plan the sensitising phase very well, if that is done well, the learners will have a positive attitude;
- The availability of multiple pathways, especially for learners who are not on the same level of computer skills. To allow them to select a way/method that suits him/her best;

- The use of electronic communication should be encouraged, including communication with the educators as well as peers.

Hopefully, this research project and its presentation in this thesis have demonstrated the outstanding merit of the developing and implementing of electronic, professional portfolios for educators; especially in the light of the fact that educator training in a new and different dispensation in South Africa, necessitates access to educators' qualifications in terms of their competencies and proficiencies, the models presented in this study will certainly be of great value to every serious educator. It can also be derived from this study that the electronic, professional portfolio is an authentic tool to document teaching excellence!

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*Adobe Acrobat Reader* and a web browser (*Netscape Communicator* will give the best results) are needed to view this CD ROM. To install *Adobe Acrobat Reader* see the instructions for the RMX 880 CD ROM. If you do not have *Netscape Communicator* on your computer, follow the installation instructions to install it from the CD ROM.

### **Installation instructions for Netscape Communicator:**

- Insert the CD ROM into the CD ROM drive.
- Select **Start, Run**.
- Browse to select the applicable CD ROM drive on your computer e.g. **d:**.
- Select the file **d:\appendices\browser\cp32e45(1).exe** on the CD ROM (d: represents the CD ROM drive on your computer) and click **OK**.
- Follow the instructions on the screen to complete the installation of *Netscape Communicator*.

### **To view the Appendices CD ROM:**

- Insert the CD ROM into the CD ROM drive.
- Select **Start, Programs, Netscape Communicator, Netscape Navigator** or select **Netscape Communicator** from the desktop.
- Select **File, Open page, Choose file** and select **d:\appendices\index.html** (d: represents the CD ROM drive on your computer).
- Click **Open** to view the first page of the Appendices CD ROM.
- Click on the Appendix that you want to view.

## RMX 880

*Adobe Acrobat Reader* is needed to view this CD ROM. If you do not have this programme on your computer, it can be installed from the CD ROM by following the installation instructions.

### **Installation instructions for Adobe Acrobat Reader:**

- Insert the CD ROM into the CD ROM drive.
- Select **Start, Run**.
- Browse to select the applicable CD ROM drive on your computer e.g. **d:**.
- Select the file **d:\32BIT\Setup.exe** on the CD ROM (d: represents the CD ROM drive on your computer) and click **OK**.
- Follow the instructions on the screen to complete the installation of *Adobe Acrobat Reader*.

### **To view the RMX 880 CD ROM:**

- Insert the CD ROM into the CD ROM drive.
- Select **Start, Programs, Windows Explorer**.
- Click on the CD ROM drive and double click on the file **homepage.pdf**.