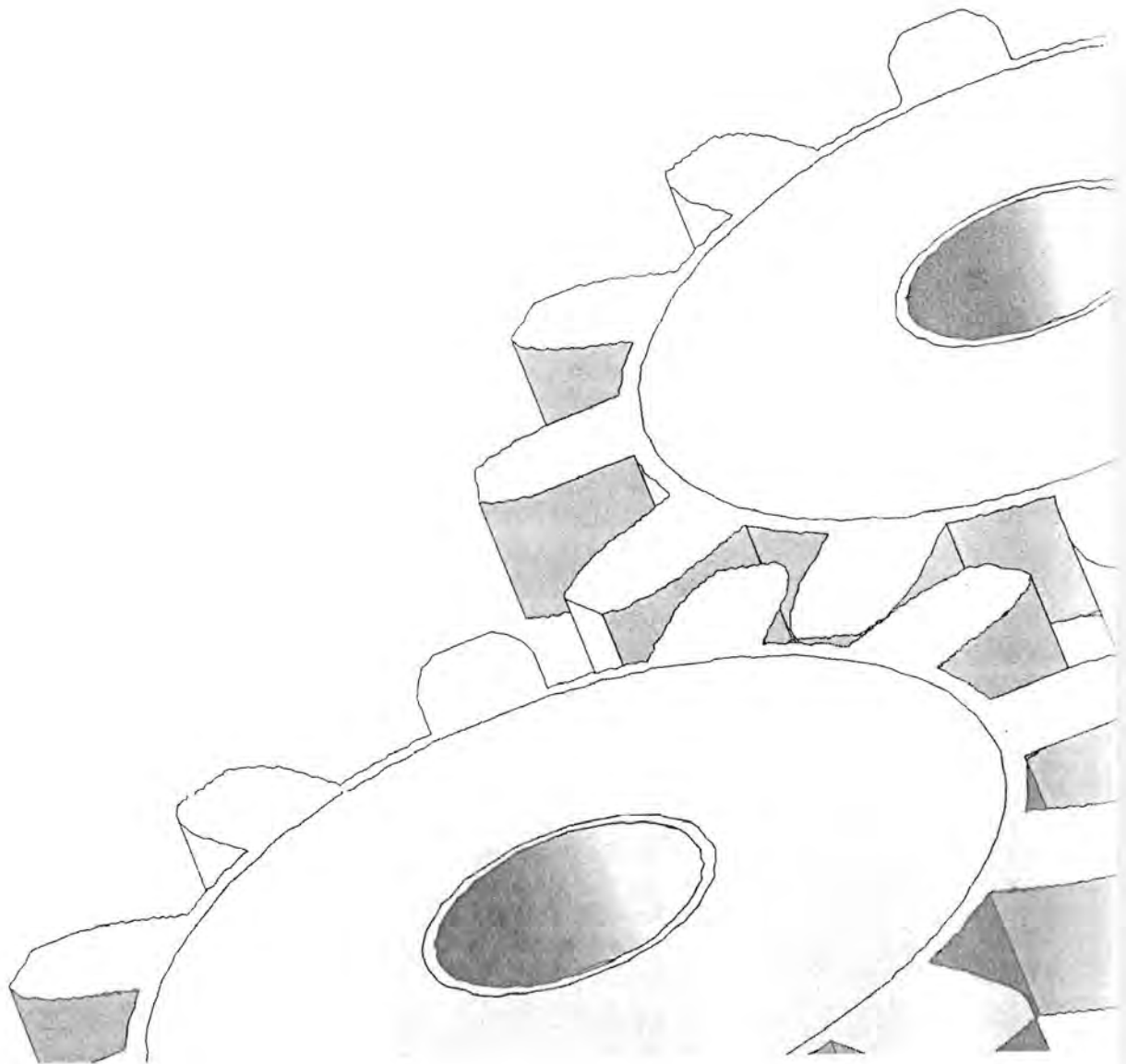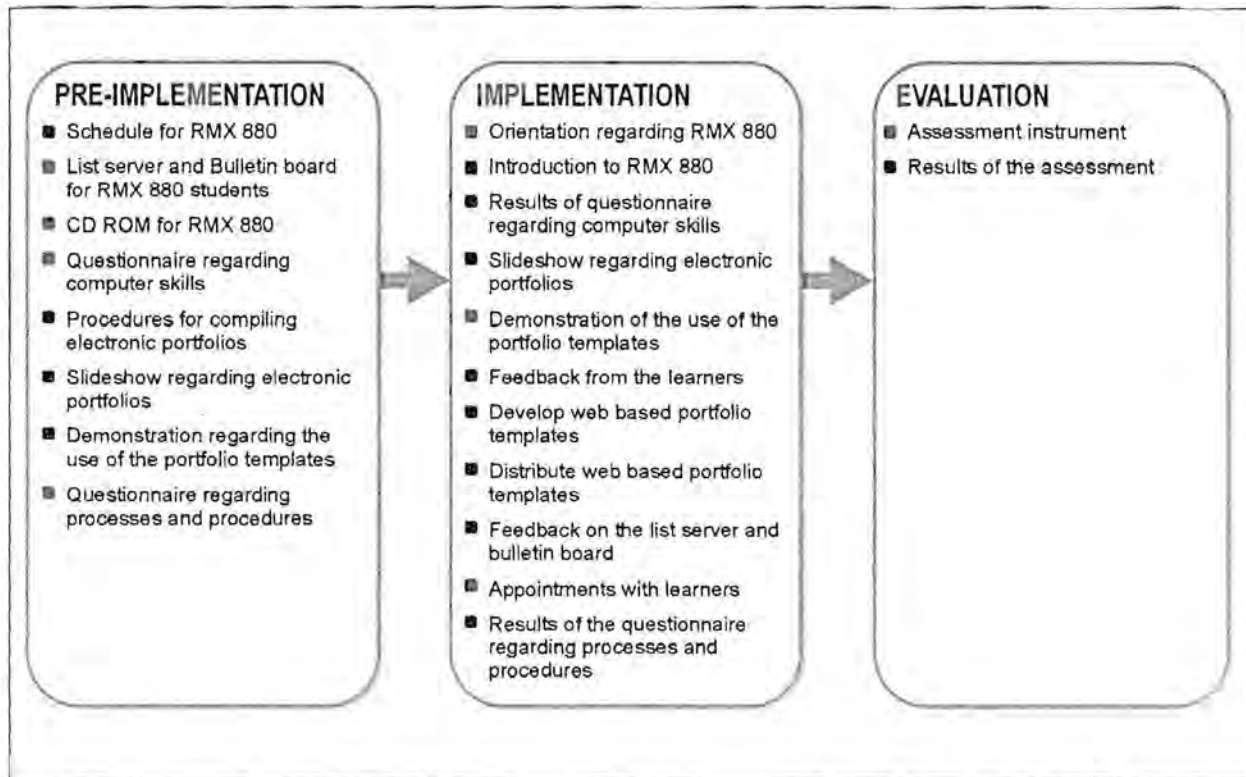# Pre-implementation, Implementation & Evaluation

# 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**



| PRE-IMPLEMENTATION | IMPLEMENTATION | EVALUATION |
|---|---|---|
| ▪ Schedule for RMX 880 | ▪ Orientation regarding RMX 880 | ▪ Assessment instrument |
| ▪ List server and Bulletin board for RMX 880 students | ▪ Introduction to RMX 880 | ▪ Results of the assessment |
| ▪ CD ROM for RMX 880 | ▪ Results of questionnaire regarding computer skills | |
| ▪ Questionnaire regarding computer skills | ▪ Slideshow regarding electronic portfolios | |
| ▪ Procedures for compiling electronic portfolios | ▪ Demonstration of the use of the portfolio templates | |
| ▪ Slideshow regarding electronic portfolios | ▪ Feedback from the learners | |
| ▪ Demonstration regarding the use of the portfolio templates | ▪ Develop web based portfolio templates | |
| ▪ Questionnaire regarding processes and procedures | ▪ Distribute web based portfolio templates | |
| | ▪ Feedback on the list server and bulletin board | |
| | ▪ Appointments with learners | |
| | ▪ Results of the questionnaire regarding processes and procedures | |

# 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**
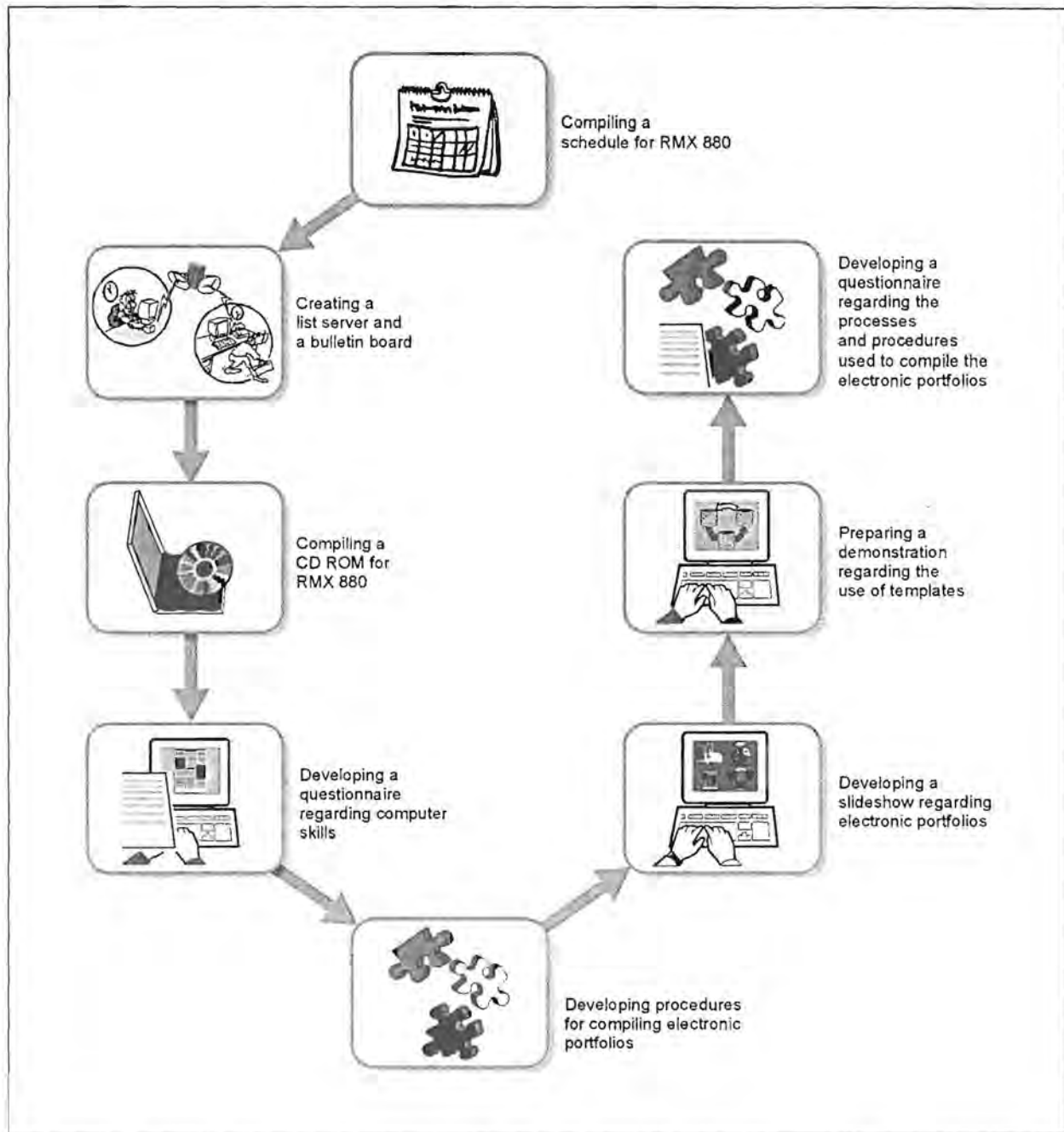


## 4.2.1 Compiling a schedule for RMX 880

The learners registered for RMX 880 were required to attend lectures at the University of Pretoria on the 27th and 28th 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 Developmental Portfolios with Microsoft Word 97 templates. | Edu/Law 3-60 |
| 28 January 1999 | 11:15-12:15 | Creating Professional Developmental 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 |
|---|---|
| A home page | ▪ This is the first page, from where all the information on the CD ROM can be accessed. <br> ▪ It contains active hyperlinks to all the other pages. <br> ▪ Other information on these pages is as follows: <br>   – A word of welcome; <br>   – A description of the instructional approach for this module; <br>   – Information on how to use the CD ROM. |

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

| Information | Description |
|---|---|
| **The lecturers** | ▪ Information regarding the lecturers of this module is presented on this page. The information includes the following:<br>   – Academic qualifications;<br>   – Professional experience;<br>   – Telephone numbers;<br>   – E-mail addresses;<br>   – Postal addresses. |
| **Unit standard** | ▪ A description of the unit standard according to SAQA and NQF requirements is presented and contains the following information:<br>   – Unit number;<br>   – Field;<br>   – Level;<br>   – Credits;<br>   – Purpose;<br>   – Learning assumed;<br>   – Specific outcomes;<br>   – Assessment criteria;<br>   – Range statements;<br>   – Critical outcomes;<br>   – Embedded knowledge. |
| **Assignments** | ▪ Hyperlinks to the following assignments were inserted:<br>   – Assignment 1: Newsletters pertaining to Outcomes-based Education in South Africa;<br>   – Assignment 2: Electronic communication pertaining to Outcomes-based Education in South Africa;<br>   – Assignment 3: Computer-based management system for Adult Basic Education and Training;<br>   – Assignment 4: Professional developmental portfolios. |
| **Assessment** | ▪ The assessment criteria for all the assignments are presented on this page. |

| Information | Description |
|---|---|
| Schedule | • A schedule for the Module RMX 880 (see Table 4.1) and due dates. |
| Bulletin board | • Instructions regarding access to the bulletin board and a hyperlink to the bulletin board are presented on this page. |
| List server | • Instructions regarding the use of the list server is presented on this page, including the following information:<br>– The aim of the list server;<br>– The list server address;<br>– How to subscribe to the list server;<br>– How to submit messages to the list server;<br>– How to reply to messages;<br>– How to unsubscribe to the list server. |
| Resource list | • An alphabetical resource list containing all the resources referred to on this CD ROM is presented on this page. |
| Centres | • Information regarding all the learning centres of the University of Pretoria is presented on this page. |

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**



Orientation regarding the Master's courses

Introduction to RMX 880

Results of the questionnaire regarding computer skills

Presentation of the slideshow regarding electronic portfolios

Demonstration of the MS Word 97 portfolio templates and conversion to PDF

Feedback from the learners

Development of the web based portfolio templates

Distribution of the web based portfolio templates

Feedback from the list server and bulletin board

Appointments with the learners to complete their electronic portfolios

Completion and handing in of the electronic portfolios

Results of the questionnaire regarding processes and procedures

## 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.
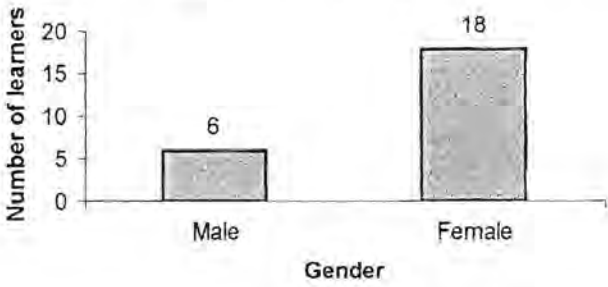
## 4.3.3 Results of the questionnaire regarding computer skills

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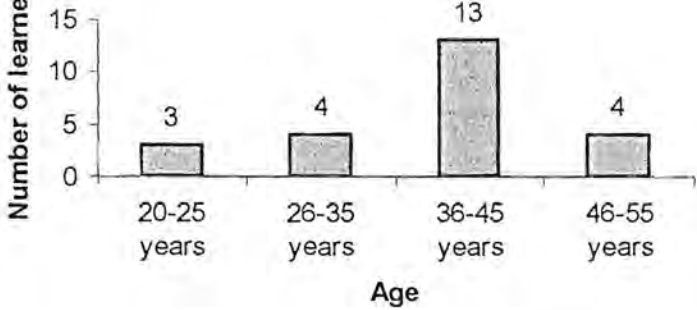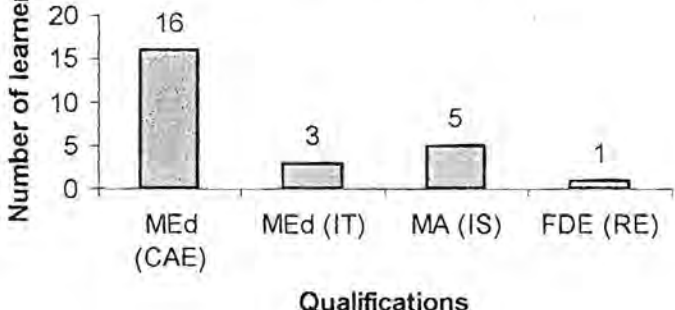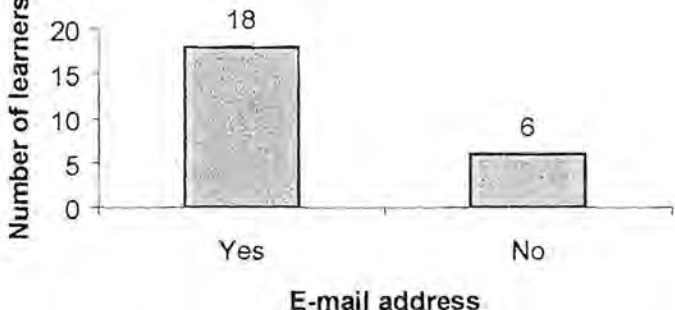
The results of the questionnaire are presented in Tables 4.3 - 4.11.

Table 4.3: Logistical information

| Description | Results |
|---|---|
| Two thirds of the learners were female. | **Gender of learners**<br><br>Male: 6<br>Female: 18<br>(Number of learners) |
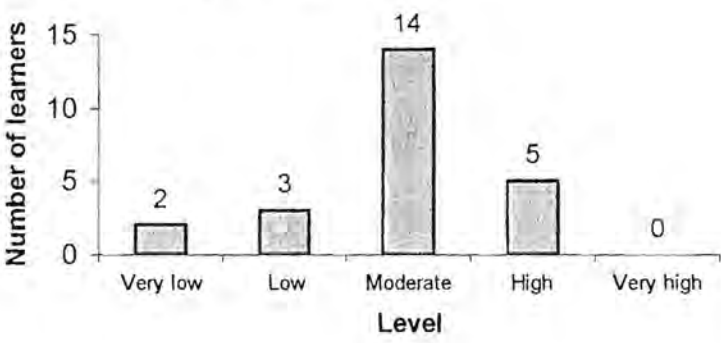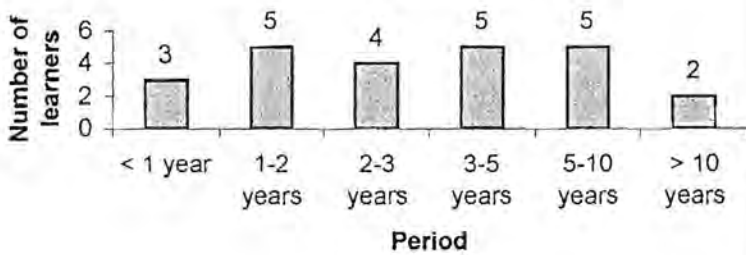
## Table 4.3: Logistical information (continued)

| Description | Results |
|---|---|
| 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. | **Age groups**<br><br>Number of learners (y-axis): 20-25 years = 3, 26-35 years = 4, 36-45 years = 13, 46-55 years = 4<br>X-axis: Age |
| 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)). | **Qualifications registered for**<br><br>Number of learners (y-axis): MEd (CAE) = 16, MEd (IT) = 3, MA (IS) = 5, FDE (RE) = 1<br>X-axis: Qualifications |
| 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. | **E-mail adresses**<br><br>Number of learners (y-axis): Yes = 18, No = 6<br>X-axis: E-mail address |

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

| Description | Results |
|---|---|
| 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. | **Category of occupation**<br><br>Number of learners vs. Occupation:<br>Primary education: 1<br>Secondary education: 5<br>Higher education: 12<br>Training: 4<br>Student: 1<br>Houswife: 1 |

**Table 4.4:    Level of computer skills**

| Description | Results |
|---|---|
| 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. | **Level of computer skills**<br><br>Number of learners vs. Level:<br>Very low: 2<br>Low: 3<br>Moderate: 14<br>High: 5<br>Very high: 0 |
| 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. | **Period utilising a computer**<br><br>Number of learners vs. Period:<br>< 1 year: 3<br>1-2 years: 5<br>2-3 years: 4<br>3-5 years: 5<br>5-10 years: 5<br>> 10 years: 2 |

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

| Description | Results |
|---|---|
| Nearly 20% of the learners did not own a computer. Technology and computers are the essence of this module and therefore each learner should own a computer. | **Access to a computer**<br><br>A bar chart titled "Access to a computer". Y-axis: Number of learners (0–20). Friend's: 1, Workplace: 4, Own: 19. X-axis: Access. |
| 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. | **Access to Internet**<br><br>A bar chart titled "Access to Internet". Y-axis: Number of learners (0–10). Friend's: 4, Workplace: 8, Home: 9, No access: 3. X-axis: Access. |
| Only six learners indicated that they accessed the Internet daily while 26% never accessed the Internet. | **Frequency of Internet access**<br><br>A bar chart titled "Frequency of Internet access". Y-axis: Number of learners (0–10). Daily: 6, Weekly: 2, 3 times a week: 2, 5 times a week: 2, Monthly: 5, Never: 7. X-axis: Frequency. |

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

| Description | Results |
|---|---|
| The learners who indicated that they accessed the Internet, do so mainly to retrieve information (13 out of 17 learners). | **Main purpose of Internet access**<br><br>Bar chart: Number of learners vs Purpose. General browsing: 1, Work-related: 3, Retrieve information: 13 |

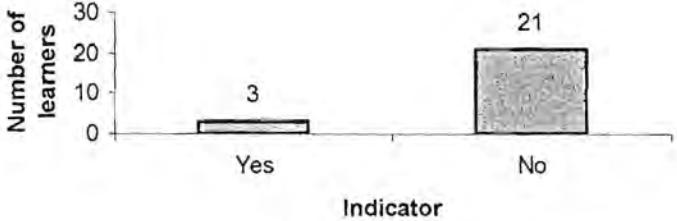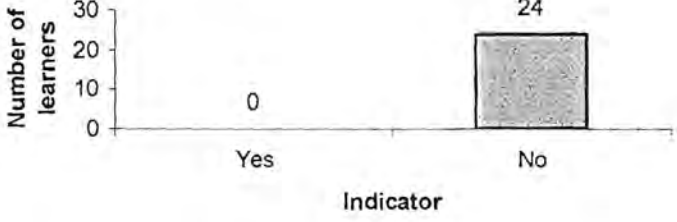**Table 4.6:    Level of Microsoft Office 97 skills**

| Description | Results |
|---|---|
| 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. | **Level of Microsoft Word 97 skills**<br><br>Bar chart: Number of learners vs Level. Very low: 4, Low: 3, Moderate: 11, High: 4, Very high: 2 |
| 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. | **Level of Microsoft Excel skills**<br><br>Bar chart: Number of learners vs Level. Very low: 7, Low: 6, Moderate: 9, High: 1, Very high: 1 |

| Description | Results |
|---|---|
| No learner indicated a high or very high level of Microsoft Access 97 skills, 88% indicated a low to very low level of skills. | **Level of Microsoft Access 97 skills**<br><br>Number of learners — Very low: 10, Low: 11, Moderate: 3, High: 0, Very high: 0 (Level) |
| 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. | **Level of Microsoft Powerpoint 97 skills**<br><br>Number of learners — Very low: 5, Low: 10, Moderate: 8, High: 1, Very high: 0 (Level) |
| The majority of learners (71%) had never used macros previously. | **Have you ever used macros?**<br><br>Number of learners — Yes: 7, No: 17 (Indicator) |
| One third of the learners indicated that they had never used clipart before. | **Clipart**<br><br>Number of learners — Yes: 16, No: 8 (Indicator) |

## Table 4.7:  Level of Adobe Acrobat skills
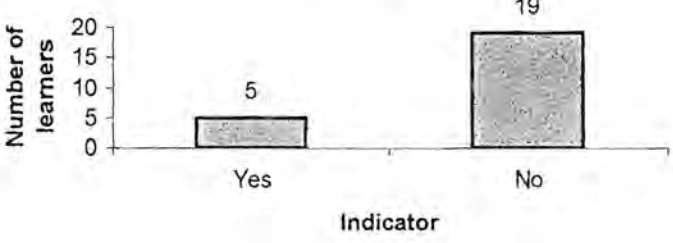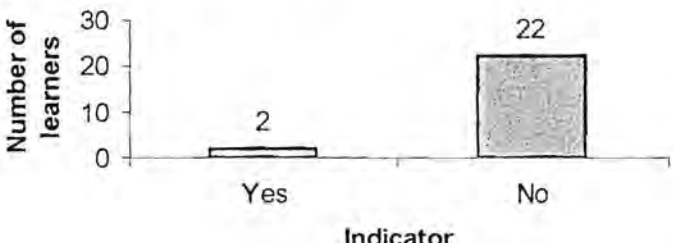
| Description | Results |
|---|---|
| Only three learners had used Adobe Acrobat Reader previously. | **Adobe Acrobat Reader**<br><br>Number of learners — Yes: 3, No: 21 (y-axis 0–30; x-axis: Indicator) |
| None of the learners had used Adobe Acrobat Exchange previously. | **Adobe Acrobat Exchange**<br><br>Number of learners — Yes: 0, No: 24 (y-axis 0–30; x-axis: Indicator) |

## 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. | **E-mail**<br><br>Number of learners — Yes: 18, No: 6 (y-axis 0–20; x-axis: Indicator) |
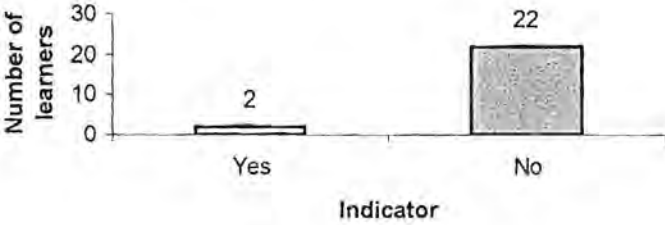
**Table 4.8:** Level of skills regarding e-mail, list servers and bulletin boards (continued)

| Description | Results |
|---|---|
| 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. | **Listserver**<br><br>Number of learners — Yes: 5, No: 19<br>Indicator |
| Only two learners indicated that they had used a bulletin board previously. | **Bulletin board**<br><br>Number of learners — Yes: 2, No: 22<br>Indicator |

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

| Description | Results | |
|---|---|---|
| | Reply | Frequency |
| 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. | ▪ South African Council for Educators | 3 |
| | ▪ I don't know | 3 |
| | ▪ SAQA | 1 |
| | ▪ South Africa College of Education | 1 |
| | ▪ South Africa Computer Education | 1 |

**Table 4.9: Level of knowledge regarding the SACE and SAQA (continued)**
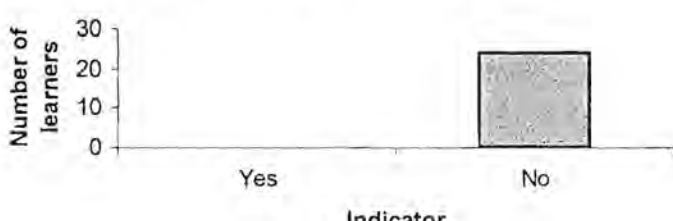
| Description | Results | |
|---|---|---|
| Only two learners indicated that they were registered with the SACE. All 24 learners indicated that they were neither aware of the conditions of re-licensing with the SACE, nor the format in which competencies should be presented to the SACE. | **Registration with the SACE**<br><br>Number of learners: 30, 22 (No), 2 (Yes) — bar chart, Indicator axis with Yes and No | |

| When asked to provide the equivalent for the acronym SAQA, 17 learners provided answers of which ten were correct. | **Reply** | **Frequency** |
| | ▪ South African Qualifications Authority | 10 |
| | ▪ South African Qualifications | 2 |
| | ▪ South African Qualifications Association | 4 |
| | ▪ South African Quality Assessment | 1 |

| 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. | **Reply** | **Frequency** |
| | ▪ Work out a standardisation system for all the qualifications presented in South Africa at educational/training institutions. | 7 |
| | ▪ Defining admission criteria to education/training programmes. | 4 |
| | ▪ Evaluation of programmes/qualifications. | 2 |
| | ▪ Accreditation of programmes/qualifications. | 2 |
| | ▪ Coordinate and regulate all qualifications. | 1 |

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

| Description | Results | |
|---|---|---|
| | **Reply** | **Frequency** |
| When asked to explain the policies of the new education system 17 learners replied. Their responses are summarised in this table. | ▪ It is based on Outcomes-based Education. | 6 |
| | ▪ Continuous assessment is important. | 9 |
| | ▪ Co-operative learning. | 2 |
| | ▪ Self-assessment. | 2 |
| | ▪ Different assessment techniques. | 6 |
| | ▪ Technology education. | 1 |
| | ▪ Mastery learning. | 1 |

**Table 4.11:** Compilation of an electronic portfolio
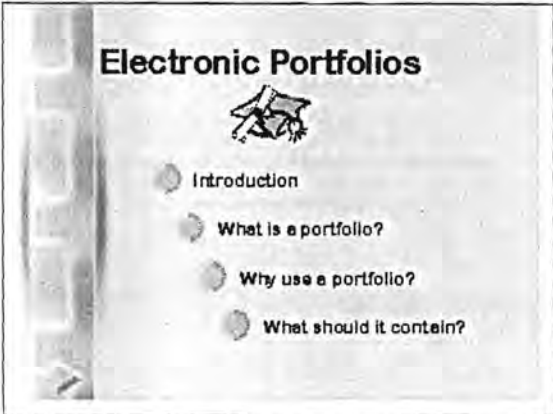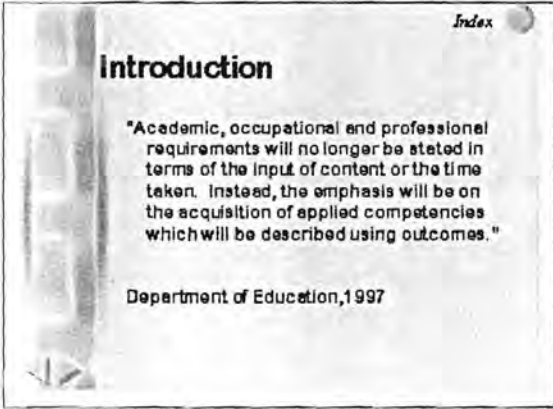
| Description | Results |
|---|---|
| None of the learners indicated that they had ever developed an electronic portfolio before. |  |


Portfolio development

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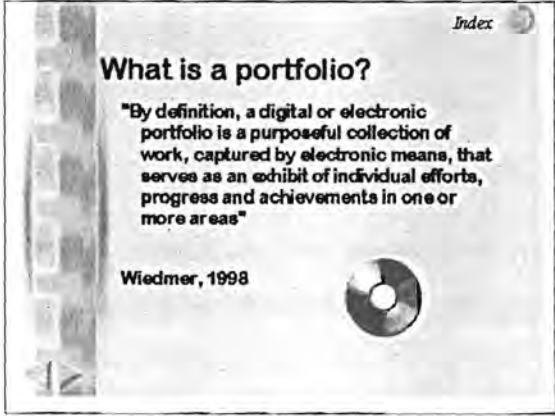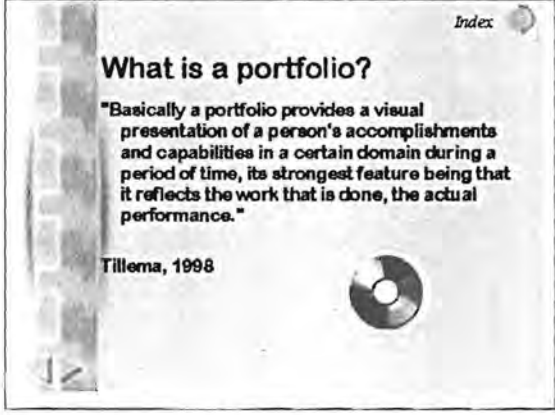
The orientation regarding the development of the electronic developmental portfolio (Assignment 4) was presented using a Microsoft Powerpoint 97 slideshow. The slideshow as well as a description of the information provided to the learners, are presented in Table 4.12.

**Table 4.12: Description of the Microsoft Powerpoint 97 slideshow**
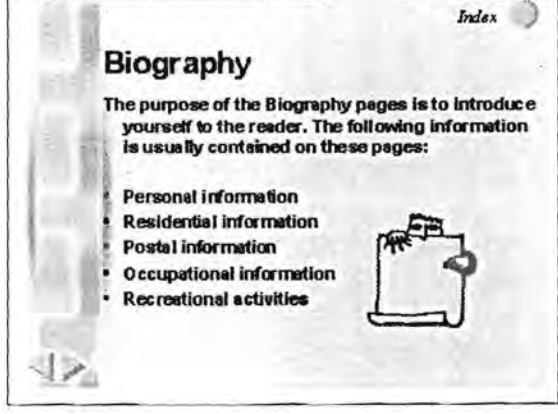
| Description | Slide |
|---|---|
| This is the main menu screen and it indicates the topics that will be presented, regarding electronic portfolios. | **Electronic Portfolios**<br><br>○ Introduction<br>○ What is a portfolio?<br>○ Why use a portfolio?<br>○ What should it contain? |
| As an introduction, 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. | *Index*<br>**Introduction**<br><br>"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."<br><br>Department of Education,1997 |
| 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. | *Index*<br>**Introduction**<br>**South African Council for Educators:**<br><br>• Registration is compulsory<br>• Standards and criteria<br>• Code of conduct<br>• Renewal of licensing<br>• SAQA database<br>• Electronic portfolios |

| Description | Slide |
|---|---|
| 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. | **What is a portfolio?**  *Index*  "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"  Wiedmer, 1998 |
| Some of the characteristics of an electronic portfolio is presented with this quotation. | **What is a portfolio?**  *Index*  "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."  Tillema, 1998 |
| The importance of portfolios as assessment tools for the learner as well as the educator, is stressed in this slide. | **Why use a portfolio?**  *Index*  Portfolios have gained widespread interest as an alternative assessment tool:  • for the learner - to inform him/her about his/her actual competence levels  • for the educator - to obtain physical proof of a learner's competencies |

| Description | Slide |
|---|---|
| The advantages of using portfolios, and specifically electronic portfolios, are presented in this slide. |  |
| 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. |  |
| The purpose of the biography page and the different components that should be present on such a page, are described in this slide. |  |

| Description | Slide |
|---|---|
| The purpose of the qualifications page and the different components that should be present on such a page, are described in this slide. | **Qualifications**<br><br>*Index*<br><br>The purpose of the Qualifications page(s) is to present to the reader a list of qualifications you have attained.<br><br>It is customary to present it chronologically, starting with the most recent achievement going backwards in time to the first achievement. |
| The purpose of the work experience page and the different components that should be present on such a page, are described in this slide. | **Work experience**<br><br>*Index*<br><br>The purpose of the Work experience page(s) is to present to the reader a list of institutions and types of work that you have done.<br><br>It is customary to present it chronologically, starting with your current occupation, going backwards in time to your first occupation. |
| The purpose of the projects page and the different components that should be present on such a page, are described in this slide. | **Projects**<br><br>*Index*<br><br>The purpose of the Projects page(s) is to present to the reader a list of projects you completed.<br><br>Different types of projects are listed, including:<br>• Papers presented at conferences<br>• Articles published in journals<br>• Research reports compiled<br>• Technology developed<br>• Community service rendered |

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

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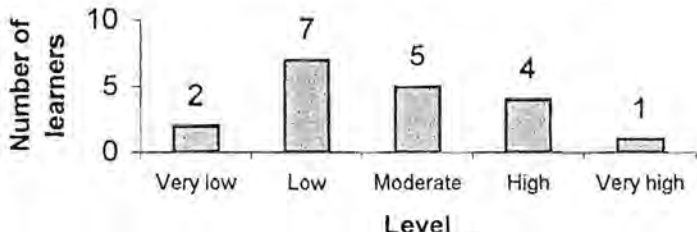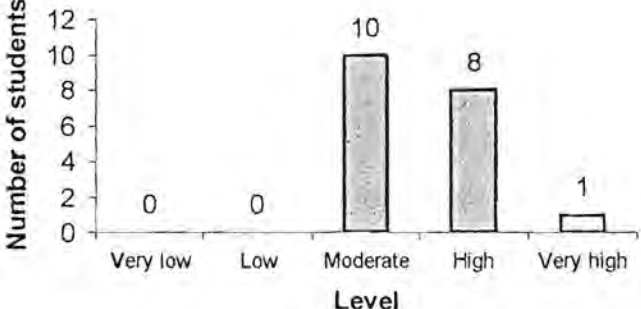
## 4.3.11 Completion and results of the questionnaire regarding processes and procedures

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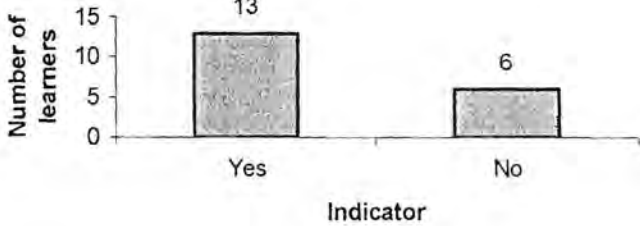
followed to create their professional developmental electronic portfolios. The questionnaire is presented in Appendix E on the CD ROM and the results of the questionnaire are presented in Tables 4.13 - 4.19.

**Table 4.13:  Computer skills**
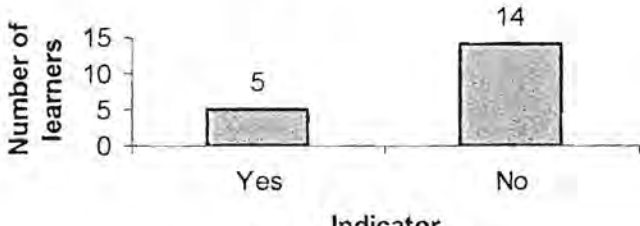
| Description | Results |
| --- | --- |
| Although nine learners (47%) indicated that their level of computer skills were low to very low before they started the module, 20% (five learners) indicated a low to very low level of computer skills in the first questionnaire they completed.  In the first questionnaire 58 % indicated a moderate level of computer skills while only 26% of the learners indicated their level as moderate in this questionnaire. | **Level of computer skills before they started the module**<br><br>Number of learners<br>Very low: 2, Low: 7, Moderate: 5, High: 4, Very high: 1<br>Level |
| 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. | **Present level of computer skills**<br><br>Number of students<br>Very low: 0, Low: 0, Moderate: 10, High: 8, Very high: 1<br>Level |
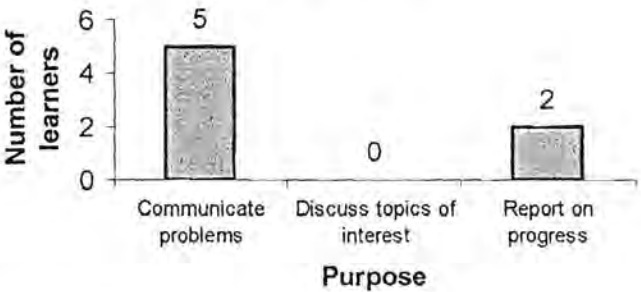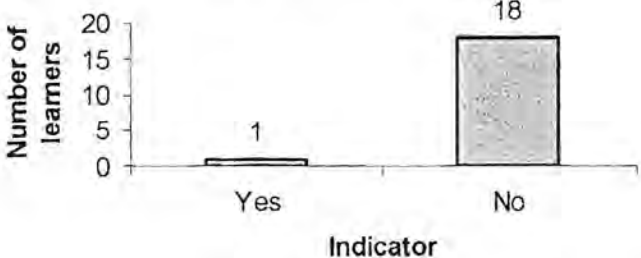
### Table 4.13: Computer skills (continued)

| 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. | **Additional training**<br><br>Number of learners: Yes = 13, No = 6<br>(Indicator) |

| Description | Reply | Frequency |
|---|---|---|
| With regard to additional activities performed to improve their level of computer skills the replies of the learners are categorised in the next column: | • Consulted experts | 5 |
| | • Studied computer manuals/textbooks | 3 |
| | • Registered for a computer course | 1 |

| Description | Reply | Frequency |
|---|---|---|
| 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: | • Time constraints | 4 |
| | • Workload | 1 |
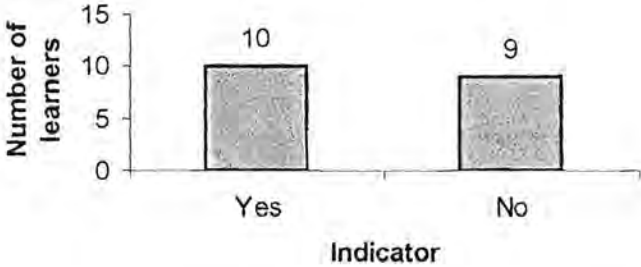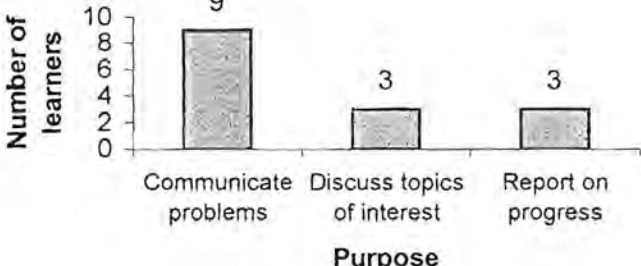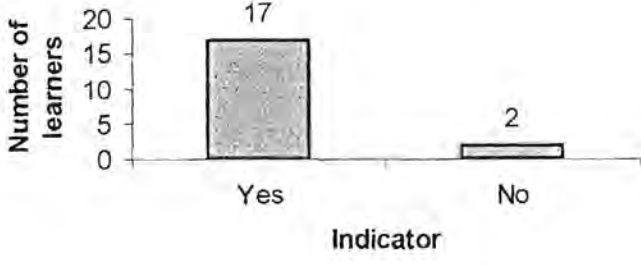
### Table 4.14: Communication with lecturers

| Description | Results |
|---|---|
| Only 26 % (five learners) indicated communication with lecturers using the list server. | **Listserver: Communication with lecturers**<br><br>Number of learners: Yes = 5, No = 14<br>(Indicator) |

**Table 4.14: Communication with lecturers (continued)**
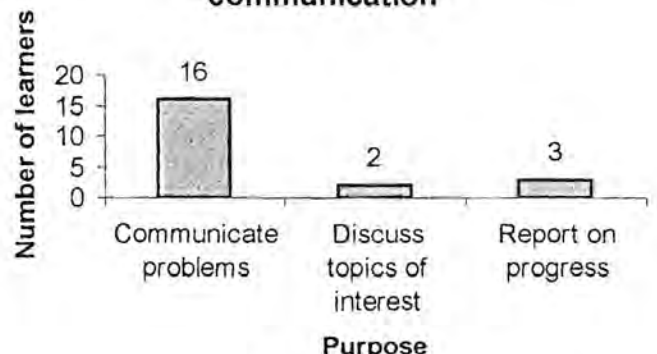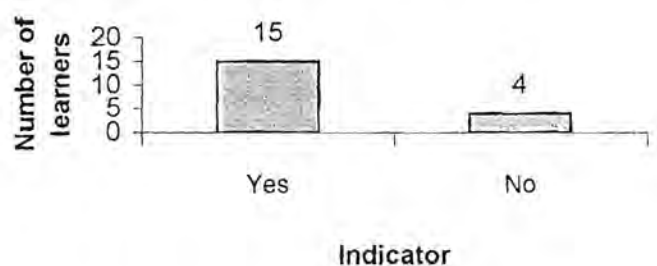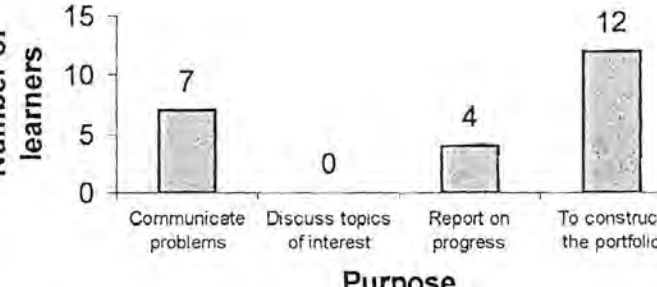
| Description | Results |
|---|---|
| All the learners using the list server to communicate with the lecturers, did so to communicate problems. Two learners indicated that they reported on their progress as well. | **Purpose of communication using the list server**<br><br>Number of learners (Y-axis: 0, 2, 4, 6)<br>Communicate problems: 5<br>Discuss topics of interest: 0<br>Report on progress: 2<br>Purpose |

| Description | Reply | Frequency |
|---|---|---|
| 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: | • Concerns were too personal | 2 |
| | • No need to use it | 3 |
| | • Technical problems | 4 |

| Description | Results |
|---|---|
| Only one learner used the bulletin board to communicate with the lecturers and the purpose was to communicate problems. | **Bulletin board: Communication with lecturers**<br><br>Number of learners (Y-axis: 0, 5, 10, 15, 20)<br>Yes: 1<br>No: 18<br>Indicator |

| Description | Reply | Frequency |
|---|---|---|
| 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: | • No need to use it | 2 |
| | • No time to use it | 2 |
| | • No access to Internet | 2 |
| | • Don't know how it works | 2 |

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

| Description | Results |
|---|---|
| About 50 % (ten learners) indicated that they used e-mail to communicate with the lecturers. | **E-mail: Communication with lecturers**<br><br>Number of learners (Yes = 10, No = 9)<br>Indicator |
| The main purpose of e-mail with the lecturers was to communicate problems. | **Purpose of communication using e-mail**<br><br>Number of learners (Communicate problems = 9, Discuss topics of interest = 3, Report on progress = 3)<br>Purpose |

| The learners that indicated that they did not use e-mail for communication with the lecturers provided reasons as indicated in the next column: | **Reply** | **Frequency** |
|---|---|---|
| | • No need to use it | 1 |
| | • Personal appointment or telephone | 1 |
| | • Technical problems | 3 |

| Description | Results |
|---|---|
| It seems that telephonic communication is still the most popular with the learners, 90% (17 learners) indicated that they communicated telephonically with lecturers. | **Telephonic communication with the lecturers**<br><br>Number of learners (Yes = 17, No = 2)<br>Indicator |
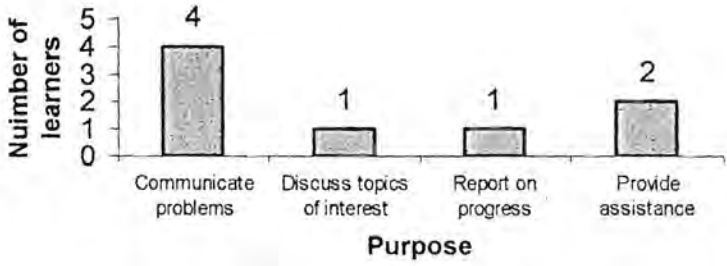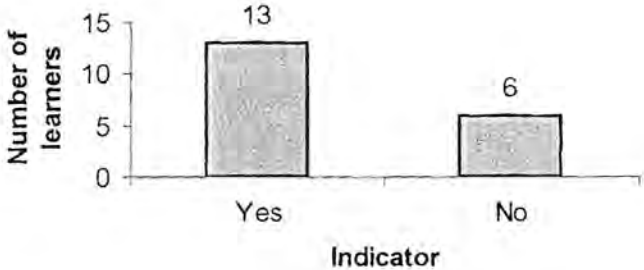
**Table 4.14:   Communication with lecturers (continued)**

| Description | Results |
|---|---|
| Once again the main purpose of the communication is to communicate problems to the lecturers. | **Purpose of telephonic communication**<br><br>Number of learners: Communicate problems = 16, Discuss topics of interest = 2, Report on progress = 3 |
| Only 21% indicated that they did not make a personal appointment with the lecturer. | **Personal appointments with lecturer**<br><br>Number of learners: Yes = 15, No = 4 |
| The majority of learners indicated that the purpose of the personal appointment with the lecturers was to construct the portfolio. | **Purpose of personal appointments**<br><br>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**
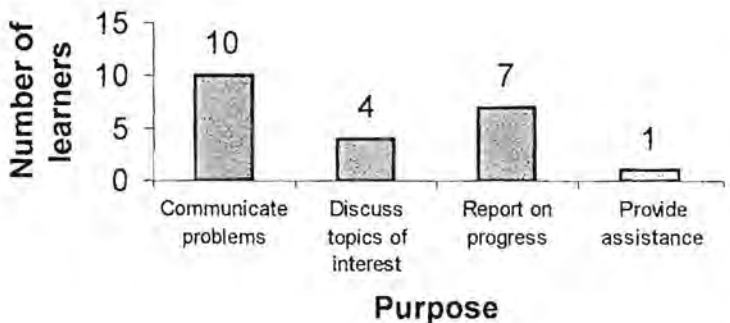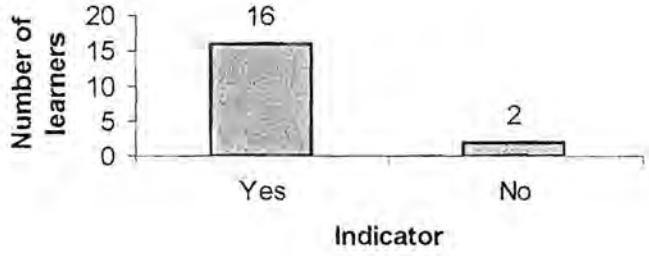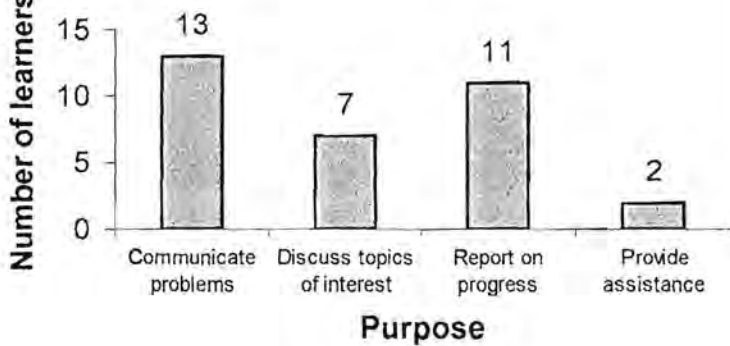
| Description | Results |
|---|---|
| Fourty percent (eight learners) indicated that they utilised the list server to communicate with fellow learners. | **List server: Communication with fellow learners**<br><br>Number of learners<br>20<br>10 — 8 (Yes), 11 (No)<br>0<br>Yes    No<br>**Indicator** |
| 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. | **Purpose of communication using the list server**<br><br>Number of learners<br>10 — 8 (Communicate problems)<br>5 — 1 (Discuss topics of interest), 3 (Report on progress), 1 (Provide assistance)<br>0<br>**Purpose** |

| Description | Reply | Frequency |
|---|---|---|
| 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: | ▪ Formed a study group<br>▪ Don't know how it works | 2<br>2 |

| Description | Results |
|---|---|
| Only four learners indicated that they used the bulletin board to communicate with fellow learners. | **Bulletin board: Communication with fellow learners**<br><br>Number of learners<br>20<br>15 — 15 (No)<br>10<br>5 — 4 (Yes)<br>0<br>Yes    No<br>**Indicator** |

**Table 4.15:   Communication with fellow learners (continued)**
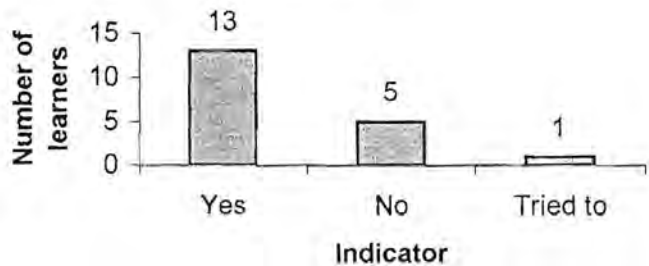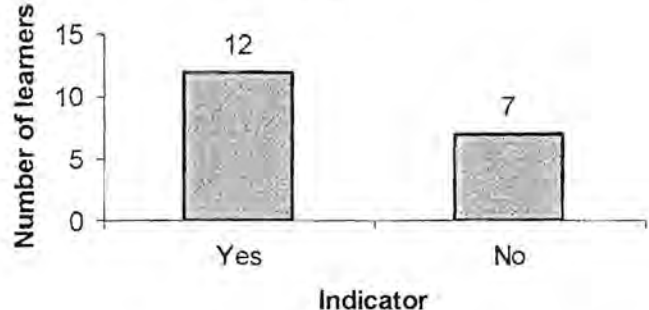
| Description | Results |
|---|---|
| The main purpose of communication on the bulletin board was to communicate problems, but also to provide assistance to fellow learners. | **Purpose of communication using the bulletin board**<br><br>Bar chart — "Nuimber of learners" (y-axis, 0 to 5) vs "Purpose" (x-axis):<br>Communicate problems: 4<br>Discuss topics of interest: 1<br>Report on progress: 1<br>Provide assistance: 2 |

| Description | Reply | Frequency |
|---|---|---|
| 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: | ▪ No need to use it | 2 |
| | ▪ No time to use it | 1 |
| | ▪ Technical problems | 1 |

| Description | Results |
|---|---|
| Nearly 70% of the learners used e-mail to communicate with each other. | **E-mail:  Communication with fellow learners**<br><br>Bar chart — "Number of learners" (y-axis, 0 to 15) vs "Indicator" (x-axis):<br>Yes: 13<br>No: 6 |

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

| Description | Results |
|---|---|
| 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 facillities. | **Purpose of communication using e-mail**<br><br>Communicate problems: 10<br>Discuss topics of interest: 4<br>Report on progress: 7<br>Provide assistance: 1<br>(Number of learners vs Purpose) |
| Once again almost 90% of the learners used the telephone to communicate with fellow learners. | **Telephonic: Communication with fellow students**<br><br>Yes: 16<br>No: 2<br>(Number of learners vs Indicator) |
| They did so mainly to communicate problems and report on progress. | **Purpose of telephonic communication**<br><br>Communicate problems: 13<br>Discuss topics of interest: 7<br>Report on progress: 11<br>Provide assistance: 2<br>(Number of learners vs Purpose) |

## 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. | **Personal appointments with fellow learners**<br><br>Number of learners: Yes = 13, No = 5, Tried to = 1 |
| Study groups were formed by 12 learners (63%). | **Study group**<br><br>Number of learners: Yes = 12, No = 7 |

| The learners that indicated that they formed study groups explained their function in the next column: | Reply | Frequency |
|---|---|---|
| | • Discussed assignments | 5 |
| | • Shared resources | 3 |
| | • Motivation/support | 2 |
| | • Shared understanding/insight | 2 |

| The learners that indicated that they did not form study groups provided reasons in the next column: | Reply | Frequency |
|---|---|---|
| | • Logistic difficulties | 2 |
| | • Time limitations | 1 |

**Table 4.15: Communication with fellow learners (continued)**
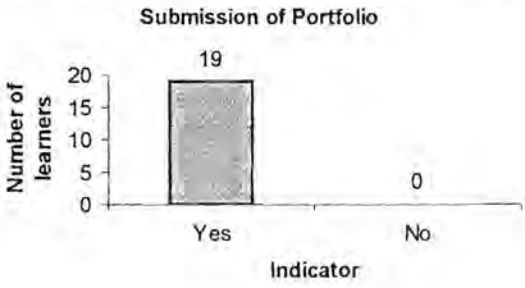
| Description | Results |
|---|---|
| It is interesting to note, that although this was presumably the first time that these learners were exposed to CD ROM based learning, nine learners (47%) indicated that they preferred this mode of instruction. | **Preferred mode of instruction**<br><br>Number of learners (y-axis, scale 0 to 10)<br>CD ROM based: 9<br>Internet based: 6<br>Formal lectures: 3<br>Paper based: 1<br>Mode (x-axis) |
| The learners that indicated that they preferred CD ROM based instruction provided reasons as presented in the next column: | • CD ROM mode seems to be well planned and organised. There is no major problems with gaining access to resources etc.<br>• Flexibility.<br>• It is easy to access with less problems and it is less expensive.<br>• Quicker.<br>• I find it easy to retrieve the data from a disc, as it is simple to access it onto the computer.<br>• 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 focussed and to the point.<br>• CD ROM or Internet is equally good. The Internet is sometimes unreliable in terms of speed and accessibility.<br>• All the information we needed was at hand and accessible.<br>• All the relevant information is on the CD. It can be very expensive to print everything on the CD. |
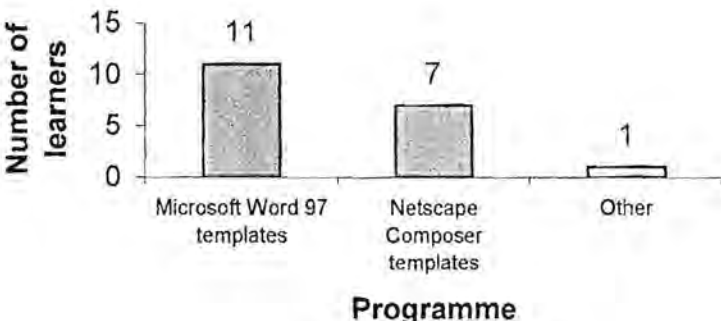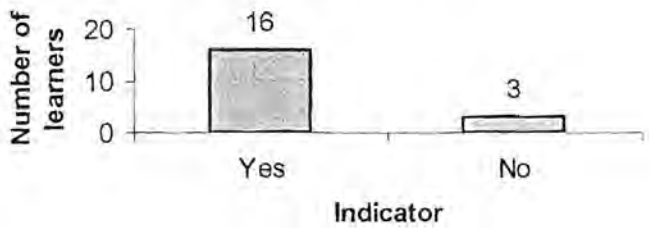
**Table 4.15: Communication with fellow learners (continued)**

| Description | Results |
|---|---|
| The learners that indicated that they preferred Internet based instruction provided reasons in the next column: | • Internet based makes it possible for one to study at one's convenient time.<br>• I felt this to be more immediate and changes could be made easily.<br>• The resources are very rich and visual with some interaction. Student motivation is high and material has more impact than text books.<br>• Internet based instruction is not limited by the quantity of material on the CD ROM.<br>• It is easier and using it regularly helps one to know more about it.<br>• CD ROM gives more flexibility but Internet should provide more interactivity. |
| The learners that indicated that they preferred formal lectures provided reasons in the next column: | • 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.<br>• A personal touch, questions and uncertainties can be solved within the class period.<br>• Can get answers to problems directly and specifically. |
| The learner that indicated that he/she preferred paper based instruction provided reasons in the next column: | • I can work at my own pace and read more and then do the assignment. |

**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. |  |

## Table 4.16: Professional developmental portfolio (continued)

| Description | Results |
|---|---|
| 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. | **Programme used to create portfolio**<br><br>Number of learners: Microsoft Word 97 templates = 11, Netscape Composer templates = 7, Other = 1<br><br>Programme |

| The learners that indicated that they used the Microsoft Word 97 portfolio templates provided reasons in the next column: | Reply | Frequency |
|---|---|---|
| | ▪ It is user friendly, easy to use. | 6 |
| | ▪ Only templates available due to a lack of Internet access. | 5 |

| The learners that indicated that they used the Netscape Composer templates provided reasons in the next column: | Reply | Frequency |
|---|---|---|
| | ▪ Less complicated procedure and easy to use for a novice. | 5 |
| | ▪ I have a high knowledge of html. | 2 |

| About 85% of the learners indicated that they familiarised themselves with the different components that should be part of an electronic developmental portfolio. | **Familiarise with the different components as stated in the articles**<br><br>Number of learners: Yes = 16, No = 3<br><br>Indicator |
|---|---|
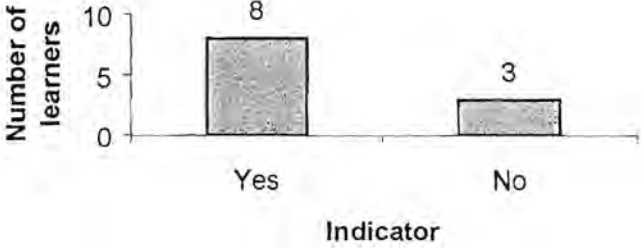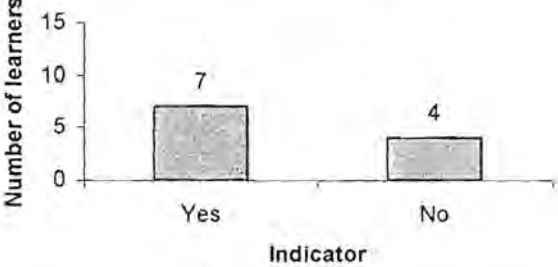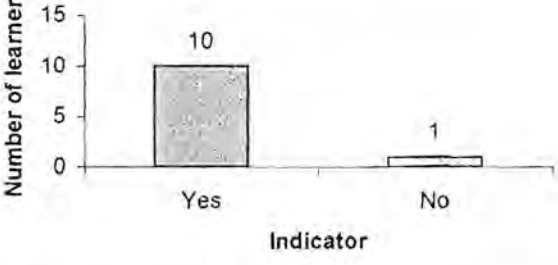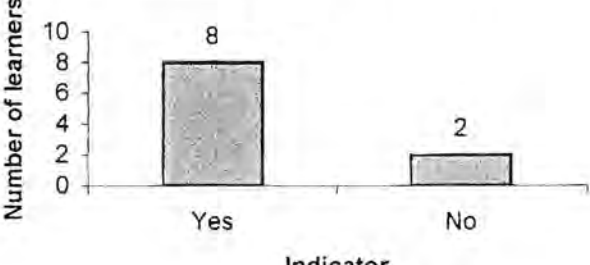
## Table 4.16: Professional developmental portfolio (continued)
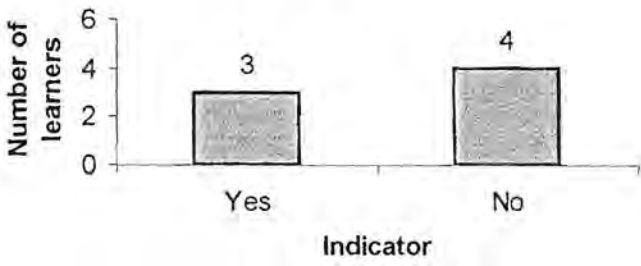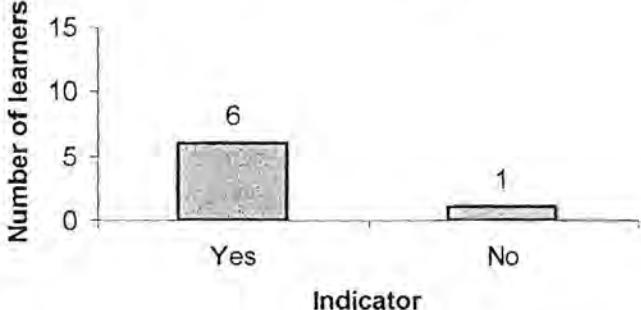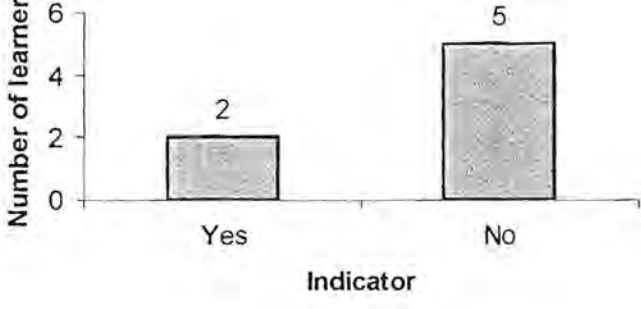
| Description | Results |
|---|---|
| Of the 16 learners that indicated that they familiarised themselves with the components necessary for an electronic developmental portfolio, nine learners indicated that they included some of those components in their portfolios. One learner indicated that he/she was under the impression that the templates met all the requirements. | **Inclusion of components**<br><br>Yes: 9, No: 7 (Number of learners by Indicator) |
| 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. | **Components incorporated**<br><br>Insight: 5, Solutions: 1, Reflection: 5, Knowledge: 5, Strengths: 4, Skills: 16 (Number of learners by Purpose) |
| All the students indicated that they would like to expand their portfolios to include information/assignments regarding other modules of the master's qaulification. | **Expand portfolio**<br><br>Yes: 19, No: 0 (Number of learners by Indicator) |

## Table 4.17:  Microsoft Word 97 portfolio templates

| Description | Results |
|---|---|
| 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. | **Microsoft Word 97 portfolio templates exactly as designed**<br><br>Number of learners — Yes: 8, No: 3 (Indicator) |
| 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. | **Demonstration sufficient**<br><br>Number of learners — Yes: 7, No: 4 (Indicator) |
| Ten learners indicated that they used the on-line guides. | **Did you use the on-line guides?**<br><br>Number of learners — Yes: 10, No: 1 (Indicator) |
| 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. | **Sufficiency of on-line guides**<br><br>Number of learners — Yes: 8, No: 2 (Indicator) |

**Table 4.18:   Netscape Composer templates**

| Description | Results |
|---|---|
| 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. | **Netscape templates exactly as designed**<br><br>A bar chart titled "Netscape templates exactly as designed." Y-axis: Number of learners (0 to 6). Yes = 3, No = 4. X-axis: Indicator. |
| Most of the learners, six out of seven, indicated that the instructions were sufficient to explain how to use the Netscape Composer templates. | **Instructions sufficient**<br><br>A bar chart titled "Instructions sufficient." Y-axis: Number of learners (0 to 15). Yes = 6, No = 1. X-axis: Indicator. |
| Only two learners used the help function and they indicated that it was sufficient to explain to them how to use the programme. | **Did you use the help function?**<br><br>A bar chart titled "Did you use the help function?" Y-axis: Number of learners (0 to 6). Yes = 2, No = 5. X-axis: Indicator. |

**Table 4.19: Other comments**

| Description | Results | |
| --- | --- | --- |
| | **Reply** | **Frequency** |
| Other comments by the learners are categorised in the next column: | • 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 5 | High 4 | Medium 3 | Low 2 | Very low 1 | Not shown 0 |
|---|---|---|---|---|---|---|---|
| **The ability to communicate content effectively** | Structure work logically:<br>• Select an appropriate framework for the assignment; | *4 | 15 | | | | |
| | • a logical flow of ideas; | 2 | 10 | 3 | 4 | | |
| | Use academically acceptable language:<br>• 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 | | | | |
| | **Average:** | | | 3,82/5 | | | |
| **Mechanical ability** | Format the content by the correct and consistent use of:<br>• table of contents; | 19 | | | | | |
| | • titles/headings; | 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 | | |
| | **Average:** | | | 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 5 | High 4 | Medium 3 | Low 2 | Very low 1 | Not shown 0 |
|---|---|---|---|---|---|---|---|
| Creative ability | • Come up with new ideas and insights. | 1 | 4 | 2 | | 12 | |
| | Average: | | | 2,05 | | | |
| The ability to make experience an integral part of learning | Focus on the process of learning as well as the products of learning by including reflective items which indicate awareness of:<br>• the value of the learning process and knowledge gained. | 1 | | 1 | | 17 | |
| The ability to reflect on prior learning | Make the link between prior knowledge and the newly acquired knowledge:<br>• including items which indicate a building on existing or prior knowledge. | | 1 | | 1 | | 17 |
| The ability to reflect on strengths and weaknesses as a learner | Recognise strengths and weaknesses and reflect on these:<br>• including reflective items to identify strengths and weaknesses regarding learning. | | | | | | 19 |
| The ability to keep track of learning | Keep track of learning:<br>• include items of reflection and revision on a continuous basis. | | | | | | 19 |
| The ability to assume responsibility for learning | Demonstrate a willingness to assume responsibility for learning:<br>• include items which indicate a willingness to do more than expected. | 1 | 1 | | | | 17 |
| The willingness to take risks while developing creative solutions | Take risks in the search for solutions:<br>• include items which indicate a boldness to explore, take chances and to come up with unique solutions to problems. | 1 | 1 | | | | 17 |
| The ability to work meaningfully with concepts and content | Interpret, analyse apply, compare, distinguish between and critically evaluate concepts and content:<br>• include items such as summaries and reflection on the meaning of concepts and critical evaluation. | | | | 1 | | 18 |
| The ability to asses and value own learning | Assess own learning in terms of quality of learning:<br>• complete and include self assessment activities. | | | | | | 19 |

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

| Ability | Description | Very high 5 | High 4 | Medium 3 | Low 2 | Very low 1 | Not shown 0 |
|---|---|---|---|---|---|---|---|
| The ability to make practical applications of theory | Use the theory in practice:<br>• include items which indicate an ability to apply what was learned in own life world. | 1 | 1 | | | | 17 |
| | Average: | 0,35/5 | | | | | |
| | TOTAL (5): | 2,69 | | | | | |
| | TOTAL (30): | 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

5
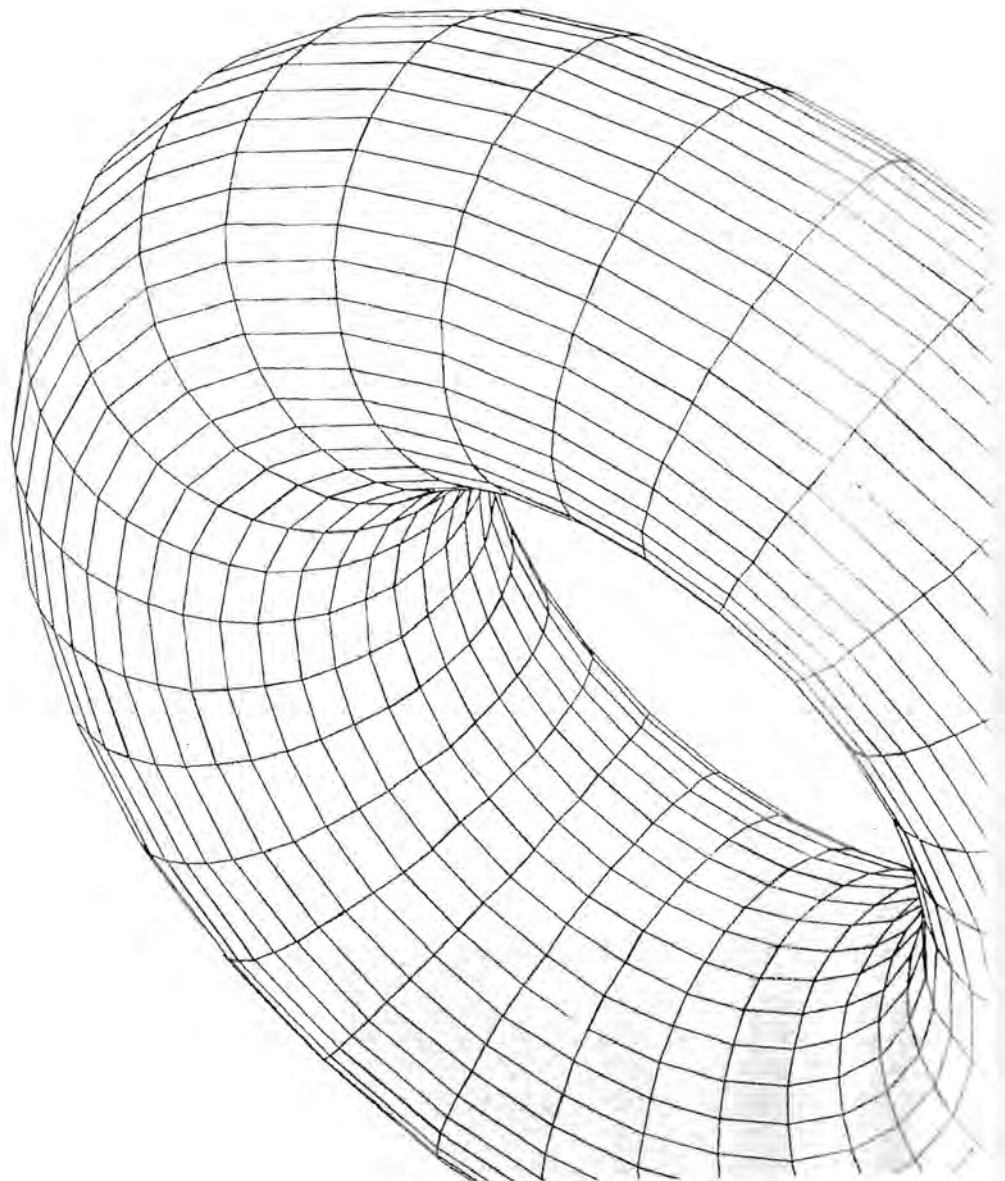
# 5.1 Introduction

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**



EVALUATION / ASSESSMENT OF THE PROCESSES

EVALUATION / ASSESSMENT OF THE PROCESSES

EVALUATION / ASSESSMENT OF THE PROCESSES

**ANALYSIS**

- The purpose and components of the electronic portfolio
- The different skills levels of the learners
- The available infrastructure

**DESIGN & DEVELOPMENT**

- Multiple pathways / strategies to enable a diverse group of learners to create electronic port-folios
- Assessment criteria and an assessment instrument
- A strategy for sensitizing the learners as well as the "tools" to do so.

**SENSITISE**

- Emphasise the importance of the electronic portfolio in the subject course
- Motivate the learners to use electronic portfolios as a tool for lifelong learning
- Make them realise that it is an essential tool in learning

**COMPILE**

- Learners take responsibility of their own learning

- Assessment criteria taken into consideration

ELECTRONIC PORTFOLIO

**ASSESSMENT**

- Educator Assessment
- Peer Assessment
- Self Assessment

EVALUATION / ASSESSMENT OF THE PROCESSES

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 *critical thinking skills* means that the learner is able to make adverse comments using thought or rational judgements (Tulloch, 1993:340,1624). |
| Creative ability | *Creative ability* in education and training is characterised by the capacity of inventive and imaginative work delivered by the learner (Tulloch, 1993:3,336). |
| Communication skills | *Communication skills* refer to the ability to transmit information, using different media (Tulloch, 1993:287). |
| Problem-solving skills | *Problem-solving skills* 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.

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### 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 (IPSs);
- 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**
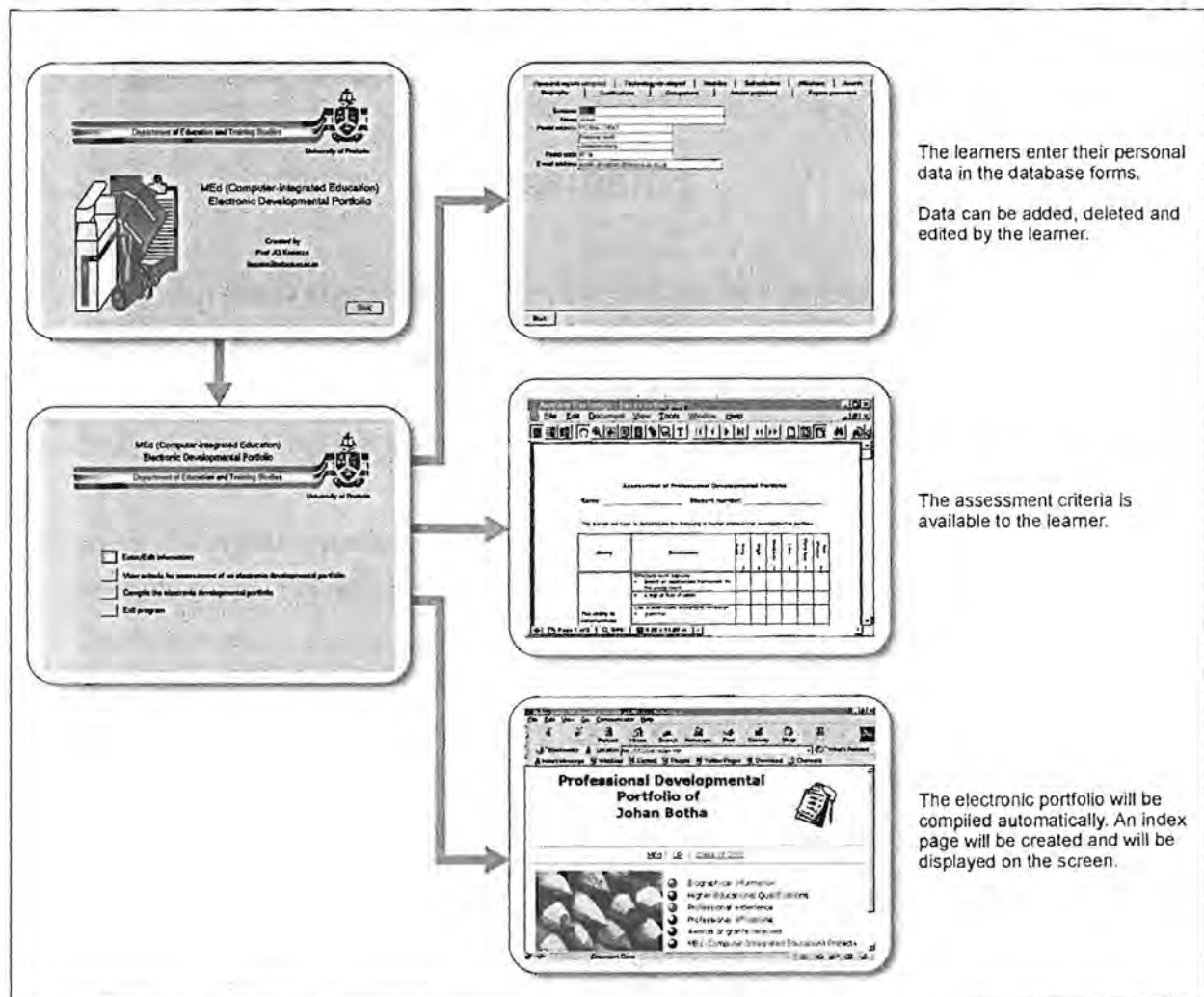
## 5.3.2   Assessment criteria and an assessment instrument

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 sensitsing 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

6
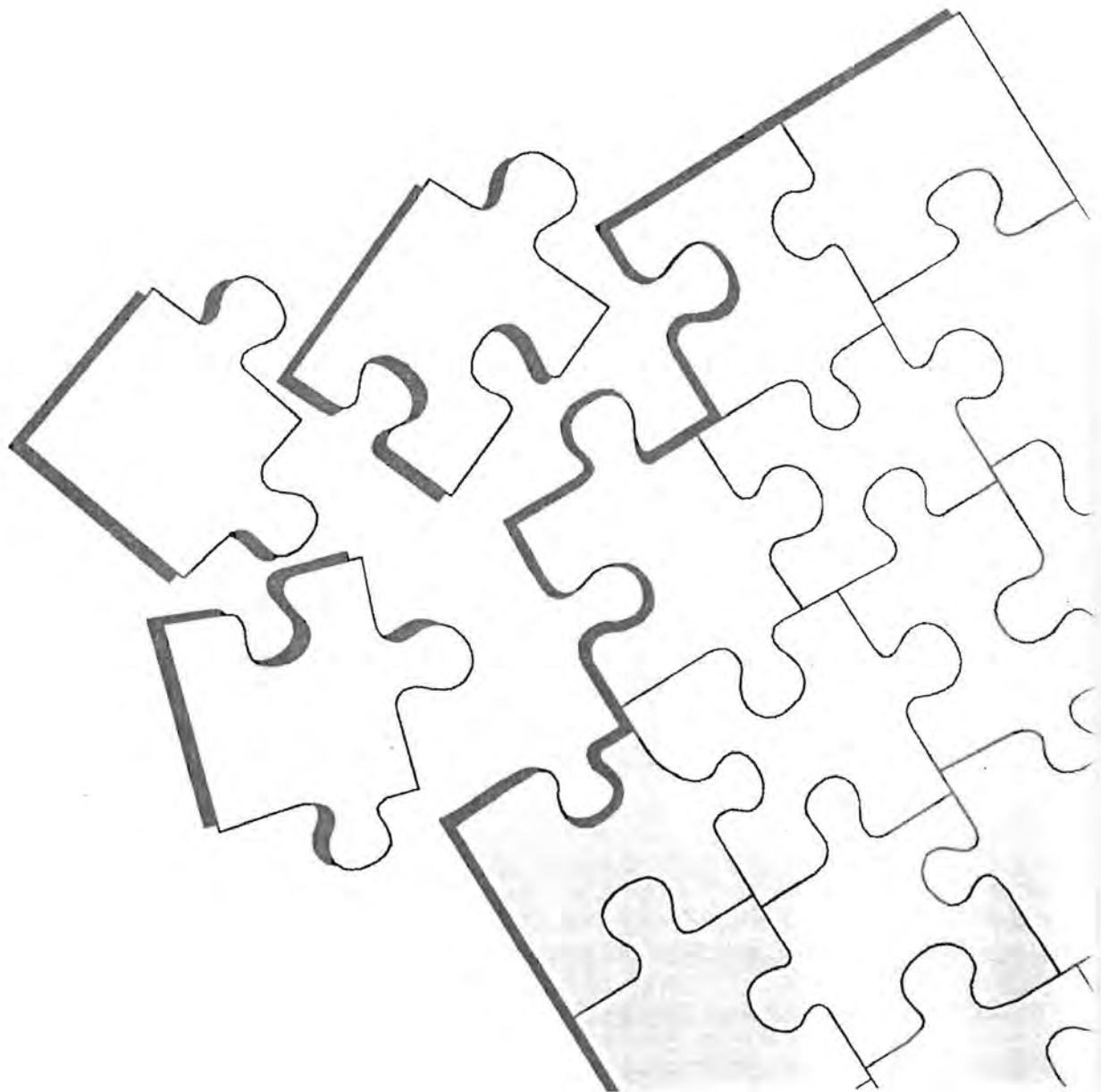
# 6.1 Introduction

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!