THE EDUCATION AND TRAINING OF CATALOGUERS: A TRAINING RESOURCE PROGRAMME

by

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Doctor Philosophia (Information Science)

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Abstract

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Title: The education and training of cataloguers: a training resource programme

This thesis reports on a study designed to investigate the utilisation of an integrated training resource programme for the education and training of cataloguing students. The study is concerned with the problems and limitations in the education and training of cataloguers and with the provision of possible solutions. A number of specific subproblems and research questions could be distinguished and had to be addressed and investigated. The research questions can be divided into the following categories:

- Requirements of cataloguers
- The adult learner and learning theories related to the cataloguing student
- The problems/obstacles in training cataloguers
- Utilisation of a mix of appropriate media and technologies

The study comprises an analysis of reported research, the design, development and evaluation of a computer program and the evaluation of a training resource programme consisting of a mix of media and technologies. The training resource programme can be utilised in training cataloguing students in contact classes, distance education and in-service training.

The results of the research enabled the researcher to derive guidelines for the design and development of a training resource programme consisting of a mix of media and technologies.

The results of this study could lead to the following possible applications:

- A self-paced flexible learning course
- A training resource utilising a mix of media and technologies
- Interactive distance learning web utilisation
- A cataloguing laboratory or virtual classroom in the web environment

Key words

cataloguing; cataloguers; cataloguing training; computer-based learning; information studies; library studies; training resource programme; virtual campus; web-based learning; web-based technologies; web-based classrooms.

Samevatting

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Graad: D Phil (Inligtingkunde)

Titel: Die onderrig en opleiding van katalogiseerders: 'n opleidingshulpprogram

In hierdie proefskrif word verslag gedoen oor 'n ondersoek na die benutting van 'n geïntegreerde opleidingsprogram bestaande uit media en tegnologie vir die opleiding van katalogiseerders. Die studie spreek die probleme en beperkings rakende die opleiding van katalogiseerders aan en daar word gepoog om moontlike oplossings te vind. 'n Aantal spesifieke subprobleme en navorsingsvrae is geïdentifiseer. Die navorsingsvrae kan in die volgende kategorieë onderskei word:

- Vereistes van katalogiseerders
- Die volwasse leerder en leerteorieë met spesifieke verwysing na die katalogiseerder student
- Die probleme/struikelblokke in die opleiding van katalogiseerders
- Benutting van 'n kombinasie van geskikte media en tegnologie

Die studie behels 'n ontleding van verslae oor bestaande navorsing, die ontwerp, ontwikkelig en evaluering van 'n rekenaarprogram en die evaluering van 'n opleidingsprogram bestaande uit media en tegnologie. Die opleidingsprogram kan benut word vir die opleiding van katalogiseerders deur kontakonderrig, afstandsonderrig en indiensopleiding.

Die navorsingsresultate het die navorser instaat gestel om riglyne saam te stel vir die ontwerp en ontwikkeling van 'n opleidingsprogram bestaande uit 'n kombinasie van media en tegnologie.

Die resultate kan aanleiding gee tot die volgende moontlike toepassings:

- 'n Aanpasbare opleidingskurses
- 'n Opleidingsprogram bestaande uit 'n kombinasie van media en tegnologie
- Interaktiewe afstandsonderrig web benutting
- 'n Katalogiseringslaboratorium of virtuele klaskamer in die web omgewing

Sleutelwoorde:

biblioteekstudies; inligtingstudies; katalogisering; katalogiseerders; opleiding in katalogisering; rekenaargebaseerde onderrig; virtuele kampus; webgebaseerde leer; webgebaseerde tegnologieë; webgebaseerde klaskamers.

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The opinions expressed and conclusions arrived at in this study are those of the author and are not necessarily to be attributed to Technikon SA.

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Definition of terms

Active learning

The learner speaks, writes, performs, etc. as opposed to reads and listens to lectures (Brooks, 1997:185).

Bandwidth

The amount of electronic information that can be delivered per unit time (Brooks, 1997:185).

Browser

Software with graphical user interfaces used by the receiver on the Internet to view web pages, for example Internet Explorer and Netscape Navigator.

Contact class

A period during which the lecturer interacts with the students and the students interact with one another in a training situation.

Co-operative education

A form of tertiary education in which the educational institution and occupational field co-operate to provide a joint educational programme with alternate attendance in both the educational institution and work (Technikon SA, 2001:4).

Distance education

The organisational framework and process of providing learning at a distance. Distance education takes place when the lecturer and learners are physically separated and technology (including sound, video, print) is used as a bridge for communication (French, et al. 1999:198).

Distance learner

Someone who is studying within a defined framework, but away from formal classes, often with frequent tutor support (Bamber, 1995:1).

Distance learning

Study by means of correspondence, telecommunication media or computer programs. Courses are self-instructional and two-way communication takes place between students and the institution (Technikon SA, 2001:8).

Downloading

An electronic procedure for transferring or retrieving a file from a distant computer or network and placing it on your own (French, et al., 1999:198).

E-mail

Electronic mail delivered and received over an electronic network such as the Internet. A popular method of distributing digitised information among individuals or members of a large organisation (Erickson & Vonk, 1994:268).

Experiential learning

Learning that begins with experience and transforms it into knowledge, skill, attitude, emotions, values, beliefs and senses (Technikon SA, 2001:8).

Facilitator

Someone who assists and guides in taking the knowledge and learning forward without being directly involved in the learning process. The emphasis is on learning rather than teaching/lecturing (learning-centred approach) and on outcomes (what the learner becomes and understands) (Technikon SA, 2001:8).

Flexible learner

Learner who studies at his or her own pace, but who is also able to follow an organised study programme (Bamber, 1995:1).

Formative evaluation

The process of undertaking a preliminary evaluation exercise, usually during the process of the course, to improve the ongoing teaching and learning process (Technikon SA, 2001:9).

Hypermedia

A combination of video, music, sound effects, voice and animated graphics in hypertext creates hypermedia (Erickson & Vonk, 1994:269). Hypermedia can be linked to permit branching from one place to another.

Hypertext

Text linked so that the user can jump from one idea to another, usually by clicking on text (Brooks, 1997:187).

Independent learner

Learner who seeks to determine his or her own patterns of study and does not assume reliance on any specific study materials or tutor support.

Internet

Worldwide, dynamic, electronic network for exchanging information and communication (Brooks, 1997:187).

Learning outcome

The end product of a learning process or the learning result that one intends to achieve by the end of the learning process (Technikon SA, 2001:11).

Listserv
An automatic mailing system whereby messages are automatically sent to all participants.

Media
The output form of information; implies the nature of the medium, e.g. text, audio, video, or graphics as well as the format (Fisher, 1994:261).

Mentor
A person who guides and supports, more especially a newly appointed or newly promoted individual; a trusted adviser (Technikon SA, 2001:12).

Multimedia
The combination of many different information display media, typically text, sound, graphics and video, in a single output. Most multimedia applications require specialised hardware and software to provide the display.
An integration of video, animation and sound into presentation graphics (Erickson & Vonk, 1994:274 ; Vaughan, 1998:5).

Online delivery
Transmission of information by means of the Internet (Technikon SA, 2001:13).

Open learner
Learner who studies in order to achieve a recognised qualification and often uses material which has been specially prepared for this purpose and which does not depend on tutor support. No attendance of formal classes is required. Previous qualifications are not necessarily assumed and timescales for completion of the programme are not set.

Outcomes-based education and training (OBET)

A design for education which is learner-centred and oriented towards results or outcomes (Technikon SA, 2001:13).

Summative evaluation

The process of evaluating the outcome of a course or a programme of courses (Technikon SA, 2001:16).

Virtual teaching

The educational process of learning over the Internet without face-to-face contact. Learners use self-directed learning principles to master content at their own rate, at convenient times and a location of their preference (French, et al., 1999:202).

Webify

Preparing material for delivery over the Internet (Brooks, 1997:190).

World Wide Web (WWW)

A scheme for using the Internet to exchange information in hypermedia formats (Brooks, 1997:190).

Chapter 1

Overview and orientation

Contents

1.1 Introduction

This thesis reports on a study designed to investigate the utilisation of an integrated training resource programme for the education and training of cataloguing students. Results from the study will lead to the development of a training programme in cataloguing presented via an appropriate mix of media and technologies. The mix would include:

- printed study texts
- a computer program
- virtual campus facilities
- communication channels such as e-mail
- contact classes

The training programme can be utilised in training cataloguing students in contact classes, distance education and in-service training.

This study investigates the factors that would determine the selection of media for such a training resource and the design of the training resource. To determine these factors, the problems and limitations in the education and training of cataloguers had to be established.

The following diagram illustrates all the different components of the research:

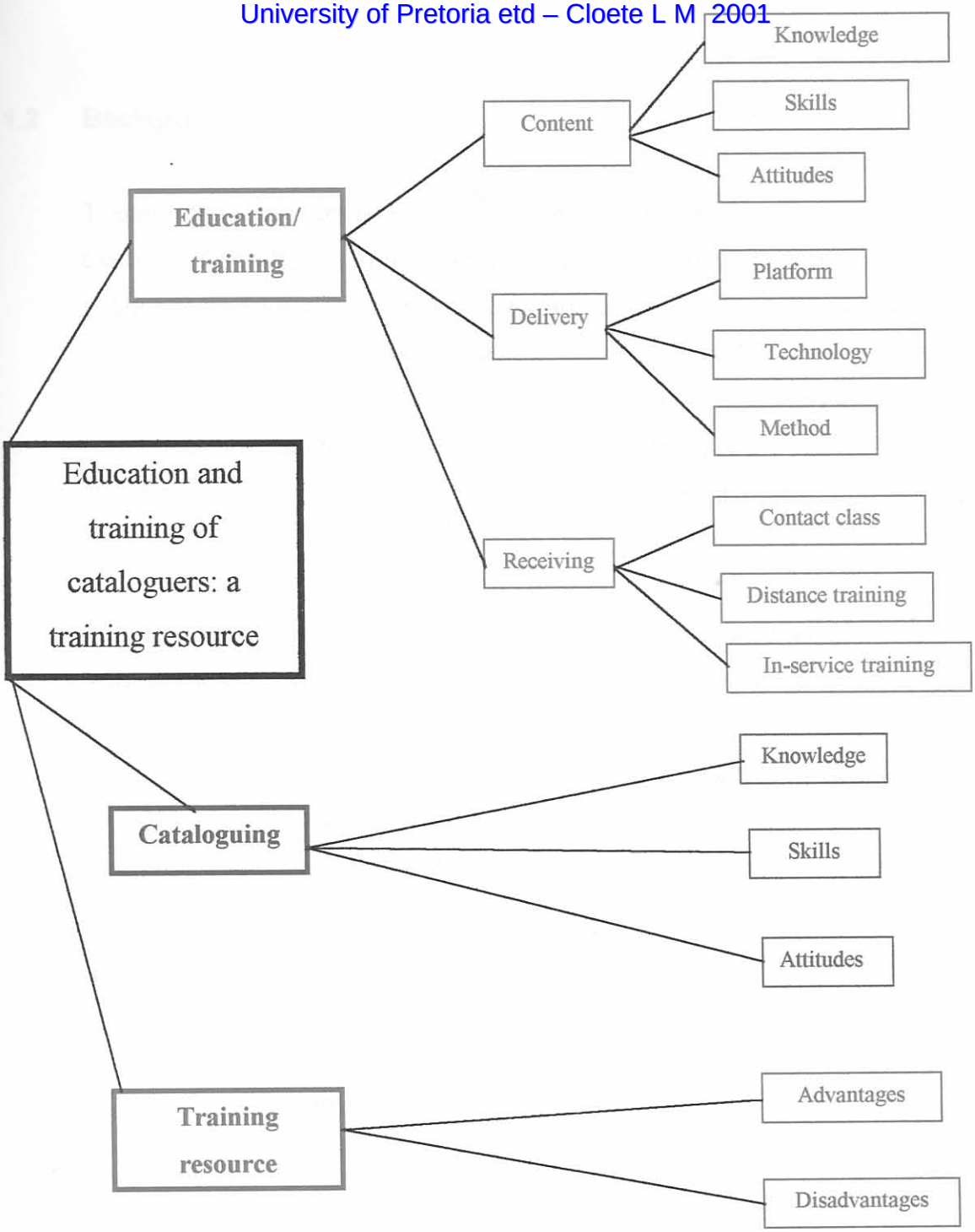


Figure 1.1: Components of the research

1.2 Background

The education and training of cataloguers forms part of the education and training of librarians. The cataloguing course is usually completed as a subject in one year's full-time studies and in two or three years' part-time studies. Traditionally, there have been two possible routes that a prospective student in Library and Information Science could follow:

- Full-time contact study at a university or technikon
- Part-time study through distance education, also at a university or technikon

In the full-time contact education and training situation there is usually a clear distinction between theoretical work and practical work. Students are taught the theoretical background information through lectures presented to them by a lecturer. The theory is applied during practical sessions when the students have to do certain practical exercises under the guidance of the lecturer or senior student (student assistant). They are evaluated through both theoretical and practical tests and examinations. At the contact training institutions it is not, however, always possible to expose students to sufficient practical training. Lecturers' time is restricted to the lecturing periods and student assistants are usually not experienced enough to conduct all the required practical training sessions effectively.

In the traditional distance education framework students are presented with printed course material consisting of study guides that provide theoretical information and practical workbooks. Students have to learn the theory on their own and perform certain practical tasks under the guidance of a mentor (senior library staff member). They are evaluated through assignments that include theoretical questions as well as practical exercises, projects and examinations.

The education and training of Library and Information Science students through distance education is becoming more popular, since an increasing number of students are unable to afford the luxury of full-time studies at a contact class institution. After school greater numbers of people have to enter the working world and obtain further qualifications through part-time studies, especially through distance education (Stanford, 1997:181). This is also very much the case in libraries and information centres. Library assistants or administrative assistants with a senior certificate are appointed. Many of these employees wish to further their qualifications in Library and Information Science to pursue a career as a professional librarian, library technician or information specialist (Stanford, 1997:181). Although part-time courses are offered at contact class institutions, many students prefer to study through distance education, since it allows students of diverse educational backgrounds and accomplishments to move at different paces.

Distance education has traditionally been provided through paper-based correspondence. In distance education as a method of tuition the written word is the main medium of instruction. Interaction between the lecturer and student is limited to course material and books, completed assignments from the students and projects related to their work experience. This low level of interaction between lecturer and student has led to a number of problems in the education and training of cataloguers. Students often need an immediate answer to a question or problem in a practical exercise for them to continue to the next step. With paper-based distance education they usually have to wait weeks to receive an answer to problems encountered during the study of a particular skill. Other delivery modes such as audio, video and computer technologies are also utilised in distance education (Steiner, 1998), but the time delay in interaction between the student and lecturer still exists. This asynchronous instruction has the advantage that students may choose their own

instructional time, but there is no real-time interaction and immediate feedback from the lecturer. Developments from the traditional paper-based methods in distance education to virtual campuses are taking place (Herther, 1997). Developments at Technikon SA, especially virtual campuses and online training, are described by Lazenby (1998). (Since 1998, amendments to the online training options at Technikon SA have been made. The utilisation of these options in a training resource for cataloguers will be discussed in more detail in chapter 4.)

Education and training at tertiary level usually only prepares students in general and not for the specific library or information centre, where the student will eventually work, with its specific needs and work procedures. Through career-oriented education, efforts are being made to overcome this limitation. The aim of career-oriented education is to enable qualified people to immediately enter employment in a specific field. This is possible through close collaboration between the training institution and organised commerce, industry and individual employers.

Usually, when graduates enter cataloguing posts, they need a refresher course in cataloguing conducted by the supervisor or senior staff member of the department. They also need in-service training to understand and master the specific procedures at the library where they are employed. Library assistants or clerks (without any formal library education or training) are often employed in cataloguing departments to perform certain routine, administrative cataloguing tasks. They are given in-service training by the supervisor or senior staff member. These in-service training periods take about six to nine months to complete. During that period the trainee cataloguer is not very productive as far as work output is concerned. Moreover, the supervisor or senior staff member conducting the training has to perform this function, which includes evaluating the trainee's work and discussing problems, on a full-time basis. This means

that this senior staff member does not perform other cataloguing tasks for which he/she has originally been appointed.

From the above description it is possible to identify three education and training fields and, indeed, needs for cataloguing training:

- The contact training institution
- The distance training institution
- In-service training in cataloguing departments

Cataloguing and reference work are still considered the core of Library and Information Science courses (Smith, 1985:35; Stieg, 1992:109; Clack, 1993:27). Bender (cited in Bearman, 1987:29) mentions that "traditional skills associated with acquiring, organizing, and disseminating information will still be needed by tomorrow's information professional at the entry level". One of the most important skills for organising information is cataloguing. The automation of libraries has also changed the nature of the work in cataloguing departments. The functions and tasks of librarians in cataloguing departments have changed. However, bibliographic work can never be completely computerised. Human input, especially with regard to authority control, is very important (Snyman, 1998). Co-operative cataloguing has become an important function amongst libraries. Copy cataloguing is now one of the most important tasks of cataloguers. To adapt and utilise a copy record for a library's own purposes, it is very important that the cataloguer have a sound knowledge of cataloguing principles. This can only be achieved though proper education and training in cataloguing. Zyroff (1996:47) mentions a number of valid reasons why training in cataloguing should now, even in the age of automation, co-operative cataloguing and shared cataloguing, still be considered a core competency. Her statement that "[t]hose who have not spent time applying and creating subject and name headings, authority records, descriptive

cataloging and classification codes, and indexing norms don't have in-depth perspective on the structure of information" captures the essence of organising information. It has therefore become more important than ever that cataloguers receive appropriate education and training through all possible modes.

There is a greater demand from employers for librarians who are immediately employable with the minimum in-service training (Hill, 1985:728). This requirement also coincides with the expectations of outcomes-based education. In addition, already qualified librarians are required to be trained in the latest cataloguing developments and skills (CCS Task Force on Education and Recruitment for Cataloging Report, 1986:71), as is often the case when a librarian who has not been cataloguing for a while is transferred to a cataloguing department.

1.3 Motivation for the study

The motivation for this study is based on the lack of previous research, the necessity of cataloguing courses, the limitations in the current presentation of cataloguing courses and the shortage of qualified cataloguing instructors.

1.3.1 Lack of previous research

A preliminary literature search indicated that no research had yet been conducted in the education and training of cataloguers through computer-assisted training, specifically the World Wide Web. The only reference is made by Weihs (1997:48), who mentions that "[s]ome programs are considering offering courses by Internet". No specific details are given and this reference is applicable to technical services education in general and not specifically to cataloguing. The expansion of access to educational

opportunities for Library and Information Science students through technology is generally recognised (Stanford, 1997:181).

Research pertaining to cataloguing courses concentrates on the inherent problems of teaching cataloguing, teaching the courses at residential tertiary institutions, the influences of library automation, bibliographic networks and co-operative cataloguing on cataloguing courses, and the training of cataloguers at the workplace itself (Smith, 1985:33-35; Romero, 1994:210).

An Internet search revealed that a number of training institutions present so-called online or web-based courses in cataloguing. After further enquiry it became clear that these courses are still only print-based, i.e. students submit only written assignments. There is no utilisation of interactivity or multimedia in the presentation of the courses. The web and e-mail facilities are used merely as alternative delivery modes for print-based study material and assignments.

A detailed overview of the literature findings is presented in chapter 2.

1.3.2 Necessity of cataloguing courses

The necessity of cataloguing courses has been debated extensively in the literature and other forums. The conclusion of these debates is that cataloguing courses are now, in the age of automation, as important as ever (Clack, 1993:33). Bibliographic control, of which cataloguing forms an integral part, is considered "the heart of librarianship and should be taught as such" (Gorman, 1992:694). However, few suggestions are made on the improvement of these courses in order to fully train cataloguers that can enter the working world with limited in-service training. Library training institutions are criticised for the inadequate cataloguing training they

provide (Sellberg, 1988:30). Even today, supervisory staff at libraries where cataloguing is performed complain that cataloguers are not adequately qualified to meet the needs of a cataloguing department. The researcher's experience as a supervisor/in-service trainer at a cataloguing department (1996-1997) was that newly appointed cataloguing staff needed extensive in-service training before they could work on their own. Table 1.1 indicates the arguments both for maintaining and reducing cataloguing courses:

Table 1.1: Necessity of cataloguing courses

Arguments for maintaining cataloguing courses	Arguments for reducing cataloguing courses
Core of the library and information profession	Cataloguing is an expensive process
Cataloguing organises information to enable retrieval of information sources	Shared cataloguing means less need for individual cataloguers at libraries
Co-operation necessitates high international cataloguing standards	Automation means less human intellectual input in the cataloguing process
Automation makes cataloguing more sophisticated and complex and therefore necessitates training	
Wide variety of information-carrying media necessitates more advanced training in cataloguing these media	
Unorganised volume of especially web-based information reinforces the need for training in information packaging skills	

1.3.3 Limitations in the presentation of cataloguing courses

Cataloguing courses have also been criticised because of their dull classroom presentations (CCS Task Force on Education and Recruitment for Cataloging Report, 1986:75; Saye, 1987:34; Clack, 1993:30). Real meaningful learning does not take place in the classroom setting, but only when students have the opportunity to apply the instruction. Students should have the opportunity to work on real problems under real conditions (Zuber-Skerritt, 1993:45). This is also referred to as active learning, where the students approach the course content through problem-solving exercises (Romero, 1995:7). Apart from problem-solving skills, analytical thinking and decision-making skills form an important part of cataloguing (Connaway, 1997:38; Olson, 1997:52). Activities such as simulations, case studies and small group activities could all form part of active learning. This is especially applicable to a cataloguing course.

Practical work, fieldwork, internship and experiential training have always been considered to be an integral part of cataloguing courses (Stieg, 1992:120). Supervision and quality control are, however, two problematic aspects of these practical components. Libraries find it increasingly difficult to participate in these programmes in collaboration with the education and training institutions because of their own staff constraints.

Henderson (1987:20) suggests that cataloguing students should be presented with sound educational experiences and that enthusiasm for the subject should be fostered. Hill (1985:730) states that too few students are exposed to the fun of cataloguing and do not appreciate the intellectual exercise. A training resource that includes interactive instruction with the utilisation of multimedia could provide this meaningful learning opportunity.

According to Clack (1993:35), cataloguing teachers and trainers "must be innovative in their teaching strategies and methodologies". Training should not only be done for present practice, but also for the future.

The time in the curriculum allotted to cataloguing is not enough to train students thoroughly in all the required cataloguing skills. Usually only one academic year is spent on cataloguing training. Clack (1993:36) recommends that the training time be extended to develop knowledge and theoretical and practical skills in a specialised field such as cataloguing.

1.3.4 Shortage of qualified cataloguing instructors

Finding cataloguing instructors or lecturers in the field is also problematic (CCS Task Force on Education and Recruitment for Cataloging Report, 1986:75; Henderson, 1987:14). Experienced cataloguers are often not qualified in the education field (Clack, 1993:32) and do not wish to abandon cataloguing for a training position. People with an education background, on the other hand, are often not experienced enough in cataloguing.

The purpose of this study is to investigate the improvement of cataloguing courses, especially by utilising computer-assisted training and web-based training applications such as a virtual campus.

1.4 Research problem and research questions

This study is concerned with the problems and limitations in the education and training of cataloguers and with the provision of possible solutions. Special reference is made to the implications of utilising a training resource in which a mix of media and technologies is applied as a training mode.

A number of specific subproblems and research questions can be distinguished and need to be addressed and investigated. The research questions can be divided into the following categories (Table 1.2):

Table 1.2: Research questions

Category	Research question
Category 1: ***Requirements of cataloguers***	**Question 1**: What are the requirements from industry (library and information practice) of newly qualified cataloguers?
	Question 2: What are the requirements set by outcomes-based education and training?
	Question 3: What are the requirements regarding the experiential training component of a cataloguing course?
Category 2: ***The adult learner and learning theories related to the cataloguing student***	**Question 4**: What are the characteristics of the adult learner, especially the cataloguing student?
	Question 5: How can learning theories be applied in the education and training of cataloguers?
	Question 6: What are the inherent problems of teaching a cataloguing course?
Category 3: ***The problems/obstacles in training cataloguers***	**Question 7**: What are the problems and limitations in the education and training of cataloguers in distance education?
	Question 8: What are the problems and limitations in the education and training of cataloguers in in-service training?
	Question 9: What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?
Category 4: ***Utilisation of a mix of appropriate media and technologies***	**Question 10**: What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?
	Question 11: How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?

1.5 Research approach

A qualitative approach is used in this study. In this approach the researcher is concerned with process rather than only outcomes and products.

1.5.1 Critical analysis of reported research

The first part of the research is qualitative to establish the status quo of educating and training cataloguers. A critical analysis of reported research forms the foundation of the research. This analysis will make it possible to establish the requirements of employers and outcomes-based education with regard to cataloguers. It will also be possible to establish education and training constraints. The analysis will further be conducted to establish the status quo regarding the training of librarians and especially of cataloguers through computer-assisted training.

1.5.2 Formative evaluation

The empirical component of the research was conducted when a training resource consisting of a mix of media and technologies for educating and training cataloguers was developed and tested, for example by testing certain components from the training programme on distance education students. Evaluation took the form of interviews with students, questionnaires, one-on-one testing and observation of students' verbalised thoughts and actions. Formative evaluation during the early design stages was also conducted. According to Beyer (1995:7), the primary goal of formative evaluation is to "improve the quality of the product being developed so that it will be as likely as possible in everyday use to achieve the objectives it was designed for".

The advantages of formative evaluation are summarised by Cilliers (1997:6):

- It is ongoing.
- It involves assessment.
- It seeks specific information as well as judgements.
- All those involved can learn from it.
- Inadequacies are detected and opportunities are identified for improvement.
- Problems are solved in the learning process.
- Results lead to concrete, immediate and practical implementation strategy and actions.

The research questions were investigated by the following means and data-gathering instruments (Table 1.3):

Table 1.3: Data collection matrix

Research questions	Critical analysis of reported research	Interviews	Focus group discussions	E-mail messages	Evaluation of existing training programmes	Questionnaires	Observations
Question 1: What are the requirements from industry (library and information practice) of newly qualified cataloguers?	✓	✓	✓				
Question 2: What are the requirements set by out-comes-based education and training?	✓						
Question 3: What are the requirements regarding the experiential training component of a cataloguing course?	✓	✓	✓				
Question 4: What are the characteristics of the adult learner, especially the cataloguing student?	✓						
Question 5: How can learning theories be applied in the education and training of cataloguers?	✓						
Question 6: What are the inherent problems of teaching a cataloguing course?	✓	✓	✓				
Question 7: What are the problems and limitations in the education and training of cataloguers in distance education?	✓	✓	✓				
Question 8: What are the problems and limitations in the education and training of cataloguers in in-service training?	✓	✓	✓				
Question 9: What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?	✓	✓	✓	✓	✓	✓	✓
Question 10: What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?		✓	✓	✓	✓	✓	✓
Question 11: How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?		✓	✓	✓	✓	✓	✓

The anticipated results of this study may lead to the following possible applications:

- A self-paced flexible learning course
- A training resource utilising a mix of media and technologies
- Interactive distance learning web utilisation
- A cataloguing laboratory or virtual classroom in the web environment

1.5.3 Subjects of the study

The subjects of the study are all the second-year students in the Library and Information Studies course who have registered for the subject Information Retrieval II. The subject includes the more advanced component of cataloguing training. Therefore all the students have already completed the basic course in cataloguing covered in Information Retrieval I.

1.6 Structure of the thesis

This study contains the following chapters (Table 1.4):

Table 1.4: Structure of the thesis

Chapters	Contents
Chapter 1: Overview and orientation	Introduction and background to the study Motivation and need for the study Defining the field of study Formulating the research problem and subproblems Research approach Structure of the thesis
Chapter 2: Critical analysis of reported research	A review and critical analysis of findings from reported research regarding each of the research questions
Chapter 3: Project description: computer program	Design and development of a computer program Needs analysis Design Development Implementation Formative evaluation of the computer program Results and recommendations
Chapter 4: Project description: training resource programme	Design and development of a training resource programme Needs analysis Design Development Implementation Summative evaluation of the training resource programme Results and recommendations
Chapter 5: Conclusion and recommendations	A critical analysis and interpretation of the results Conclusions of what was learned from this project Recommendations for future developments Guidelines for the design of a training resource programme for the education and training of cataloguers

1.7 Summary

This thesis reports on a study designed to investigate the utilisation of an integrated training resource for the education and training of cataloguing students. This chapter has provided a framework for the study. Chapter 2 reports on a critical analysis of reported research applicable to the research questions.

Chapter 2

Critical analysis of reported research

Contents

2.1 Introduction

A critical analysis of reported research was conducted to investigate the subproblems and research questions that this study addresses. This chapter reports on the findings of the analysis. The purpose of the analysis was to establish what progress, if any, had been made in computer-assisted training of cataloguing. This enabled the researcher to establish the limitations in the education and training of cataloguers and to focus on those specific aspects in the next part of the study.

The research questions as formulated in chapter 1 were addressed. As far as it is appropriate and possible, the questions are investigated within:

- the international context
- national context
- institutional context
- individual context

The focus of the analysis within the above contexts is indicated in Table 2.1.

Table 2.1: Focus of the analysis

Context	Focus
International	Status quo at international library and information studies training institutions, as well as the requirements from industry (cataloguing practice)
National	The outcomes-based education and training system now being implemented in South Africa, as well as the requirements from industry (cataloguing practice)
Institutional	Status quo of cataloguing education and training at South African library and information studies training institutions
Individual	Needs and demands, as well as the characteristics of the individual cataloguing student

2.2 Analysis of reported research per research question

In the following subsections an analysis of the reported research pertaining to each research question is discussed.

2.2.1 Requirements from industry

Research question 1

What are the requirements from industry (library and information practice) of newly qualified cataloguers?

Regardless of the mode of educating or training cataloguers, certain expectations should always be fulfilled at the completion of this training. It is therefore very important to establish the current expectations of graduate, qualified cataloguers.

A number of international articles and books have been published recently on the outcomes expected of newly trained cataloguers. Formulating these expectations became necessary in recent times with the new technological developments in cataloguing, the emphasis moving more towards co-operative cataloguing and the facilities provided by automation and bibliographic networks. The responsibilities of professional cataloguers are expected to expand from traditional tasks, such as creating bibliographic records and authority work to management, co-ordinating tasks, planning and directing cataloguing operations (Rider, 1996:26). This means that paraprofessional staff is increasingly expected to perform the traditional cataloguing tasks such as descriptive cataloguing, assigning classification numbers, assigning subject headings and performing copy cataloguing. Paraprofessionals need to be trained in these skills without this training necessarily forming part of a formal library qualification. This usually means "careful 'hands-on' training" in cataloguing departments (Rider, 1996:29). Rider emphasises the importance of training and continuing education as a priority for paraprofessional staff who have to perform new cataloguing skills. These findings correspond with those of Xu (1996:10-11) on the impact of automation in libraries on the responsibilities of cataloguers.

Khurshid (1998) investigated the preparation of cataloguers by American library schools and library science departments in the Arabian Gulf region. Khurshid (1998:2-3) states that there is still a need for well-prepared cataloguers, but that in addition to knowledge of the cataloguing rules and codes, knowledge of a wide range of computer systems, software and online bibliographic networks is also essential.

The literature criticises the education and training of cataloguers. According to Sellberg (1988:31), cataloguers are inadequately prepared

for the important work of creating, managing and automating catalogue records. Apart from the basic knowledge of cataloguing, subject analysis and classification, managers of cataloguing departments require management-oriented competencies, an understanding of database design, development and maintenance (Howarth, 1997:22). Frost (1991:67) emphasises the broader application of cataloguing skills, namely decision-making, problem-solving, management, communication and instruction.

Clack (1993:34) sums up the skills: "Students must emerge from their programs knowing the full extent of analyses that goes into the making of a catalog."

As reported by Sellberg (1988:33-34), the trend in library and information science schools is to reduce the cataloguing training in the curricula, because networks and shared cataloguing do not require every library to perform their own cataloguing and therefore the cataloguing course is no longer such a professional concern. Practitioners and especially those involved in training newly appointed cataloguers, however, believe that cataloguing should receive more coverage in the curricula. Evans (1993:54) argues strongly that more time should be spent on cataloguing courses. She describes her vision of the perfect cataloguing curriculum as consisting of two courses: one covering basic description, subject analysis and classification, and a second dealing with formats other than books, construction of access points and authority work. It is very important to note that she also believes that a laboratory should be available where students can practise the new skills. Practising cataloguing skills enables a student to acquire more in-depth knowledge and understanding of the course; the more exposure he/she gets to different situations that occur in practical cataloguing, the less on-the-job training will be necessary.

Coetzee (1995:157) states that " ... cataloguing should remain an important part of the core curriculum offered by library schools to all students, regardless of where they are going to work".

According to Brittain (1989:184), more emphasis should be placed on training students in the practical application of cataloguing tools and schemes. The traditional theoretical approach is inadequate for the practical needs determined by practice.

With regard to distance training of librarians, the library community is placing more demands on training institutions to extend continuing education (Haynes & Dillon, 1992:35).

In addition to the basic training in cataloguing procedures, it is also considered very important that cataloguers develop problem-solving skills (Šauperl & Saye, 1999:93), management skills and training skills (Garcha & Buttlar, 1999:69). As Clack (1993:35) states, students must learn to think, because they can use the skill in any job. Cataloguing training provides the ideal opportunity to develop that skill.

The skills required from the entry-level cataloguer are well summarised by Hill (1997:77-82) and Evans (1993:50). The important skills that are required and that still remain valid are summarised in Table 2.2:

Table 2.2: Skills for the newly qualified cataloguer (reported research)

Knowledge of cataloguing tools	Computerised cataloguing	Computer literacy	Managerial skills	Other
Knowledge and application of the latest cataloguing rules (currently the 1988 revision of the Anglo-American Cataloguing Rules) Knowledge and application of classification schemes, especially the Dewey Decimal Classification, Universal Decimal Classification and the Library of Congress Classification systems Knowledge and application of verbal subject cataloguing, for example subject assignment with the Library of Congress Subject Headings	Knowledge and application of computerised cataloguing, including MARC formats and OCLC Knowledge and use of automated library systems Knowledge of various databases	Ability to use office software such as word processors and spreadsheets, including basic troubleshooting Internet skills Knowledge of a wide range of computer systems, software and online bibliographic networks Knowledge of various search engines	Catalogue management and related management issues Ability to use judgement and make decisions Problem-solving skills Ability to anticipate and appreciate catalogue user needs	Communication skills Foreign language proficiency Ability to work in a team Ability to adapt to continuous change Ability to analyse existing cataloguing records for maintenance purposes Ability to analyse items for cataloguing

2.2.2 Requirements set by outcomes-based education and training

Research question 2

What are the requirements set by outcomes-based education and training?

Within the **international context**, exit levels for the different levels of qualifications at various training institutions in different countries are set. Internationally, library and information training institutions generally expect the same outcomes from their successful catalogue students. These outcomes correspond with those indicated by the practitioners (table 2.2).

The Department of Education adopted an outcomes-based approach to education in 1997 (South Africa, 1997). Within the **national context** it is vital to investigate the outcomes expected of trained cataloguers within the National Qualifications Framework (NQF).

Lazenby (1998:25) summarises the **principles** underlying outcomes-based education and training as:

- lifelong learning
- flexible education and training structures
- the integration and transfer of learning
- the need to teach towards critical cross-field and specific outcomes

Outcomes-based education and training focuses on learner-centred education, which is aligned with the constructivist principle that the learner has to construct meaning. Critical cross-field outcomes and specific learning outcomes underlie the outcomes-based education and training approach. Critical cross-field outcomes and specific learning outcomes for **existing** library and information qualifications and exit levels have been

registered (for the interim period) with the South African Qualifications Authority (SAQA).

Critical cross-field outcomes promote communication skills, critical thinking, problem-solving and teamwork skills – all vital skills for the successful cataloguer. The following are critical cross-field outcomes for Library and Information Studies:

- Work effectively with colleagues in a library as a team to provide efficient service to library users.
- Use language skills in communication with the library users.
- Use mathematical skills in certain administrative functions, e.g. compiling library statistics.
- Organise and manage oneself in order to conduct all the different tasks in the library in good time.
- Collect, analyse, organise and critically evaluate information – the activities that form the essence of reference work in a library.
- Identify and solve problems – an integral part of most library work activities in order to have satisfied library users.
- Use science and technology effectively and critically in the application of all the library systems and equipment.

Specific learning outcomes are context-specific and describe the competence which learners should be able to demonstrate in particular areas of learning at certain levels. Learners are measured against pre-stated criteria. The learning outcomes are set for each specific exit level. At technikons in South Africa the exit levels are determined by the different qualifications that a student can obtain, namely National Certificate: Library and Information Studies, National Higher Certificate: Library and Information Studies, National Diploma: Library and Information Studies,

Baccalaureus Technologia (BTech): Library and Information Studies and Magister Technologia (MTech): Library and Information Studies. Specifically at Technikon SA the qualifications, skills and learning outcomes pertaining to cataloguing at the different exit levels are mentioned in Table 2.3 (Auret, 1997:36-38; Technikon SA, 2000:12-16, 32):

Table 2.3: Learning outcomes per exit level

Exit level	Learning outcomes
National Certificate: Library and Information Studies	Catalogue monographs on AACR2R level 1, do limited copy cataloguing, link copies of a bibliographic record to the record.
National Higher Certificate: Library and Information Studies	Catalogue monographs on AACR2R levels 1 and 2, assign DDC 21 classification numbers, assign subject headings, do copy cataloguing, link copies of a bibliographic record to the record.
National Diploma: Library and Information Studies	Catalogue monographs on AACR2R levels 1, 2 and 3, assign DDC 21 classification numbers, assign subject headings, catalogue in computerised format (MARC21) and conduct authority work and control on a bibliographic database.
BTech: Library and Information Studies	Catalogue monographs and non-book materials on AACR2R levels 1, 2 and 3, assign DDC 21 classification numbers, assign subject headings, catalogue in computerised format and conduct authority work and control on a bibliographic database. Conduct indexing, abstracting and thesaurus construction.
MTech: Library and Information Studies	Advanced studies of the foundation of the organisation of knowledge and information, the principles of database construction and maintenance, and the principles of subject analysis, control and retrieval.

The Standards Generating Body (SGB) for Information and Library Studies will generate unit standards and qualifications in accordance with SAQA

requirements.

Within **institutional** context, institutions involved in training cataloguers set certain learning objectives to be achieved as part of the study material. These objectives should correspond with the learning objectives set at the exit levels. Institutional training will have to comply with the standards set within the NQF.

2.2.3 Experiential training of cataloguers

Research question 3

What are the requirements regarding the experiential training component of a cataloguing course?

"Experiential learning is a way of learning which is facilitated by a philosophy of co-operative education traditionally practiced by technikons in South Africa." (Lazenby, 1998:20). Stanford (1997:181) found that there was general agreement that part-time studies in Library and Information Science are enhanced by experiential learning. Experiential learning is considered an effective part of cataloguing training and is usually included in cataloguing instruction (Garrett, 1997:129). The experiential training of cataloguers is addressed mostly through internships and field experiences (Saye, 1993:129).

Internship, as a form of experiential learning, requires a student to gain practical, supervised experience in a cataloguing department under the guidance of a practitioner (Evans, 1993:56-57). Internship is considered a valuable learning experience for the student. It does, however, take up the practitioner's time, who has to carefully plan the internship programme,

select applicable examples for the student to work with and evaluate the student's work.

Some institutions, for example, Technikon SA, use training under the guidance of a mentor (Auret, 1998:2-6). The educational philosophy of Technikon SA is that, through co-operative education, students have to be prepared for their prospective occupations. Co-operative education is a teaching and training method that combines studying at the Technikon with simultaneous experiential training, and therefore presupposes co-operation between the Technikon and the industry or profession concerned. It is thus important to obtain the input of practising library and information professionals to ensure the successful training of students in library and information work.

This form of experiential learning is possible mostly where the students already work in libraries. Practical projects offer students the opportunity to apply their theoretical knowledge to a practical work situation. Students are advised (and encouraged) by duly qualified and experienced practitioners (or mentors). The students select a qualified professional to act as their mentor. The mentor has to be accredited by the training institution.

The establishment where the student is employed consequently serves as the practical class or laboratory where the various practical assignments are carried out and the relevant skills practised and mastered. Because students need guidance, advice and support in carrying out the practical assignments, the system was developed whereby students work under the supervision and guidance of a mentor.

All the practical projects that form part of the course are conducted under the guidance of the mentor and evaluated by the mentor. Final evaluation marks are assigned by the lecturer.

Ideally, for the cataloguing course, the student should appoint a professional from a cataloguing department and spend as much time as possible conducting practical work in that department. However, it is not always possible to find an appropriately qualified and experienced practising cataloguer to act as a mentor. Cataloguing professionals do not have enough time to spend with students.

Although the mentor system assists students in acquiring the practical competencies and skills for many components of the Library and Information Studies course, there are limitations with regard to the cataloguing component. The cataloguing students therefore do not benefit as much from the mentor system as would ideally be required.

2.2.4 Characteristics of the adult learner

Research question 4
What are the characteristics of the adult learner, especially the cataloguing student?

This question focuses on the cataloguing student as an **individual** and is therefore not addressed within the international, national or institutional contexts.

The characteristics of the adult learner are discussed in the literature, but the literature analysis revealed nothing specifically about cataloguing students.

The learning method applied in cataloguing training is very much a problem-solving method. According to Laurillard (1993:55), the main focus of a problem-solving exercise is getting to the answer. The answer in the cataloguing problem is a bibliographic description and assignment of access points to an information source. It is essential to understand the methodology and approaches that are followed to solve the problem. Through understanding students' different approaches to this problem-solving, training can be designed to encourage the activities they need for successive problem-solving (Laurillard, 1993:56).

Bergman and Moore (1990:63) identify characteristics of the adult learner. Many of these characteristics also correspond with those of the so-called generation X category (people born between 1960 and 1980) (Lankard, 1995:1; Brown, 1997:3). Since the majority of cataloguing students are people who have a matriculation qualification (therefore older than 18 years) and are all employed in the field of library and information work (therefore not immediate school leavers), they form part of the generation X category.

The characteristics of the adult learner and generation X as applicable to cataloguing students could be summarised as follows:

- They are psychologically ready to control their activities and learning environment (Bergman & Moore, 1990:63 ; Lee & Mamone, 1995:8) and do not want to be controlled, but appreciate support and feedback (Lankard, 1995).
- They are problem-focused (rather than subject-focused) (Bergman & Moore, 1990:63) and are motivated to learn about things that relate directly to their perceived immediate needs (Milano & Ullius, 1998:25).

- They have experiences to build upon (Bergman & Moore, 1990:63; Milano & Ullius, 1998:25).
- They can diagnose and pace their own progress (Bergman & Moore, 1990:63; Lee & Mamone, 1995:8).
- They are independent problem-solvers (Brown, 1997:3).
- They have little patience to sit through training and have a short attention span (Lee & Mamone, 1995:8). They therefore need an infinitely patient trainer that can wait for them to refocus.
- They are subjected to limited career opportunities and therefore study career-oriented courses such as Library and Information Studies (Kalata, 1996).
- They grew up in a technology-rich environment (for example, with television sets, radios, record players and microwave ovens at home, automatic teller machines and many other computerised facilities). They are therefore not afraid of technology and are used to instant gratification from technology (Brown, 1997:3). As a result of their exposure to the instant gratification of technology, they have a short attention span, can take in audio and visual input (for example, from watching a lot of television) and suffer from information overload (Brown, 1997:3). As a result of their familiarity with technology, they can be trained with technological aids such as computers, the Internet and computer-aided programs.
- They want immediate response (Brown, 1997:3). This is possible with the aid of technology.
- They need stimulation during their training (Brown, 1997:3).
- They are able to work well in groups and especially enjoy learning as a group and social activity with their peers (Lankard, 1995; Brown, 1997:3; Kalata, 1996).
- They can surf and scan information quickly (Brown, 1997:4).

- They should be given assignments that reflect skills needed in the "real world" (Kalata, 1996) and the content of learning has to be relevant to their lives (Milano & Ullius, 1998:26).
- They are diverse in their learning styles with different preferences in terms of the means and media through which they learn (Lyman, 1999:106).
- They have previous learning experiences where they have been subjected to teaching paradigms based on passive learning such as lecturing (Lyman, 1999:107). It takes some time to convince them of other approaches such as interactive and collaborative learning.

2.2.5 Learning theories applied in the education and training of cataloguers

Research question 5

How can learning theories be applied in the education and training of cataloguers?

The taxonomy to categorise types of educational objectives for the **cognitive** domain developed by Bloom (1956) is still a standard used today. The main cognitive levels of learning, namely knowledge, comprehension, application, analysis, synthesis and evaluation, still form the basis for identifying and classifying educational objectives and activities. In the initial cataloguing training the lower level learning objectives (knowledge and comprehension) are addressed. As students progress to more advanced work, the higher order thinking skills (especially application and analysis) play an important role in their training. When students train for managerial levels, for example as the manager of a cataloguing department, synthesis and evaluation come into play, and students are expected to create new products from previous experiences

and make judgements about the value of products and ideas. The application of Bloom's taxonomy in the training of cataloguers could be summarised as follows (Table 2.4):

Table 2.4: Application of Bloom's taxonomy in cataloguing training

Types of learning	General learning objectives	Application in cataloguing training
Knowledge	Remember and recall information (concrete and abstract)	Students learn the theory of cataloguing and cataloguing tools
Comprehension	Understand, translate, interpret and extrapolate information	Students learn to understand and interpret cataloguing rules
Application	Apply concepts or abstractions to problems and situations	Students apply cataloguing rules to catalogue library materials
Analysis	Break down materials into parts and define the relationship between the parts	Students analyse the subject content of materials in order to do the subject cataloguing
Synthesis	Create a new product, combining parts from previous experiences and new material or information	Students perform managerial functions such as re-conversion projects, re-cataloguing of older materials according to the new cataloguing rules and adapting existing cataloguing tools for the library's specific needs
Evaluation	Make judgements about the value of materials, ideas	Students perform managerial functions such as planning cataloguing procedures in the cataloguing department and analysing systems

The broad conceptual approach of Bruner and the hierarchical approach of Gagné provide a solid base in instructional concepts upon which to plan and develop cataloguing instruction. Bruner (cited by Piette, 1995:78) suggests three factors to be considered in a learning situation:

- The nature of the learner
- The nature of the knowledge to be learned

- The nature of the process by which the learner obtained the knowledge needed

Fritze (1994:274) indicates that many factors should be taken into consideration when attempting to understand any learning interaction. For a given learning task these factors include:

- the context of the learner's past experiences
- motivation
- external influences
- perceptions of the purposes of the instruction
- learning strategy skills

The following practical steps listed by Gagné (cited in Piette, 1995:79) are traditionally followed in cataloguing instruction:

- The nature of the performance to be acquired is stated.
- Recall of the component concepts is verbally envoked.
- Cues for the rule as a whole with the concepts to be combined in the right order are given.
- The learner is asked to demonstrate the rule.
- Feedback is provided on the learner's performance.
- Opportunities for practice are provided.

Merrill developed a construct which recognises a sequence of presentation and learning (Merrill, 1983:302-304). Merrill and Gagné recognise that instruction involves intellectual, verbal and procedural skills. Cataloguing instruction involves all these skills. To perform, the learner has to master an integrated number of cataloguing skills.

Kolb notes that learning will take place in different ways, depending on the individual learner (Piette, 1995:82). The different learning styles are labelled assimilators, accommodators, convergers and divergers. The diversity of learning styles has to be taken into consideration in cataloguing instruction. "The problem which all instruction must address is the diversity within the classroom with many different types of students at different levels of maturity" (Piette, 1995:83).

Keller addresses the affective side of instruction in his four-point strategy, which includes attention, relevance, confidence and satisfaction – the ACRS model of instructional design. Satisfaction occurs when a learner can apply and continue to use knowledge. Cataloguing instruction has to address the need for motivation. Questions that could be asked are the following (adapted from Piette, 1995:83):

- Are the learners' needs addressed in the instruction?
- Are the learners overestimated?
- Are meaningful exercises provided that can allow for some measure of success?

In the **constructivist** learning environment students have to apply skills to real-world situations. The constructivist approach is widely accepted by educators in theory, but is not always evident in teaching practices, including web-based instruction (Morphew, 2000:1).

Students actively create their own knowledge from the information and material presented to them and their experiences of the world (Jonassen, 1999:217; Mayer, 1999:143). These tasks should require problem-solving skills (Henze & Nejdl, 1998:64). According to Reeves (1995:222), the learning environment should be as rich and diverse as possible. Both the

lecturer and the student bring prior knowledge to the learning experience and over time and through interaction with others in the learning environment, new meaning is co-constructed to the knowledge-building process (Morphew, 2000:1; Rea et al., 2000:137). Students should have tasks to accomplish and problems to solve that are relevant for them. As far as possible, real-world problems or situations as they would occur in the industry where the student would work should be simulated.

Constructivist learning depends on a learner's cognitive activity rather than behavioural activity. Therefore instructional design should seek to encourage the learner to be cognitively active rather than focus on behavioural activities (Mayer, 1999:147).

Cognitive processes involved in constructive learning include the following (Mayer, 1999:146):

- Paying attention to relevant information in order to select it
- Organising that information into coherent representations
- Integrating these representations with existing knowledge

Mayer (1999:152-156) suggests certain techniques in instructional design to accommodate the cognitive processes:

- The use of headings, italics, boldface, different font sizes, bullets, arrows, icons, underlining, margin text, repetition and white spaces in print-based study material.
- Using adjunct questions and statements of instructional objectives to emphasise relevant information.
- Using summaries.
- Constructing text with an understandable structure.

- Using pointer words such as "because of this" and "as a result".
- Using organised graphic representations.
- Posing elaborative questions to encourage learners to connect new information with their existing knowledge.

These techniques are also applied in the design of outcomes-based study material.

The following approaches in the constructive learning models as discussed by Henze and Nejdl (1998:65) and Brown (1998:28-36) could be adapted for training in cataloguing:

- **Simulation-based learning by doing**: Students have to actively carry out projects in which they apply knowledge and techniques. Projects are designed in the form of simulations. The role of the lecturer or trainer is to assist students when necessary.
- **Incidental learning**: Projects are designed so that students have to apply the knowledge and skills from their conventional course content.
- **Learning by reflection**: Students have to think about and reflect on problems, often in group work with other students and the lecturer or trainer.
- **Case-based/problem-based learning**: Students have to solve problems that are case-oriented and the knowledge that is presented by the lecturer depends on the progress that the students make in solving the problems.
- **Learner-centred training practices**: The teacher or lecturer should not set tasks or assignments, but should organise and facilitate experiences that allow the students to develop their own knowledge and understanding.

- **Authentic assessment**: Knowledge and skills should be demonstrated through performance and by applying them in the same way in which they would be used in the real world. Examples include portfolios, journal-keeping, peer reviews and self-assessment.

2.2.6 Inherent problems of teaching a cataloguing course

Research question 6

What are the inherent problems of teaching a cataloguing course?

"The quality of cataloging education has a direct effect on the quality of cataloging performed by those entering the profession as catalogers" (Romero, 1994:210).

The inherent problems of teaching a cataloguing course are debated at international, national and institutional level.

Problems encountered in training cataloguers through traditional training methods are widely debated in the literature (Henderson, 1987:5-23; Saye, 1987:27-45; Gorman, 1992:694-697; Clack, 1993:27-37; Evans, 1993:49-57; Jeng, 1993:113-114; McAllister-Harper, 1993:99-122; Garrett, 1997:129-136; Weihs, 1997:43-65).

Especially during the 1980s and early 1990s, when computerised cataloguing became prevalent, the cataloguing training and courses were hotly debated.

The concerns of educators and practitioners revolve around the following

issues:

- Should cataloguing be considered the core of librarianship?
- The various cataloguing topics to be taught (descriptive cataloguing, classification, subject headings, computerised cataloguing, to mention but a few).
- The fact that the cataloguing subject is to many students a new and unfamiliar terrain and therefore involves intensive training from introductory to advanced level.
- The increasing number of cataloguing tools with which to familiarise students.
- Should a cataloguing course stress theory or practical application?
- What training methods should be used?
- The effect that computerisation has had on cataloguing practices.
- The role of co-operative cataloguing practices.

Cataloguing requires practice and the practical component forms an important part of the cataloguing course. Time limitations in the courses make it impossible to master anything more than the basic cataloguing rules for description, the basic applications of a classification scheme and subject cataloguing. The shortening of the cataloguing courses in the curricula has made it impossible to fully train cataloguers in all the required skills (Evans, 1993:51).

The education and training of cataloguers does not merely involve training them to use tools and techniques. The challenge is to teach students thinking and decision-making skills.

Curriculum development for Library and Information Science in general is discussed by McGarry (1987:139-156) and Lancaster (1994:201-205), but

little reference is made to syllabi planning for the cataloguing course. Emphasis is placed on the course content and not on the methods of training.

Gorman (1992:694) pays special attention to what the core curriculum of librarianship, and especially cataloguing, should consist of. For him the ideal cataloguing courses should avoid the practice of teaching cataloguers just to be cataloguers or of teaching bibliographic control without context. His outline of the bibliographic control (cataloguing) syllabus is as follows:

- History and evolution of cataloguing and classification
- The ability to think like a librarian
- Theory of nominal and descriptive cataloguing
- Theory of subject cataloguing and classification
- The nature of bibliographic control systems (including catalogues)
- Bibliographic control and reference work
- Bibliographic control and library automation
- Bibliographic control and collection development
- Specific cataloguing codes
- Subject heading systems
- Specific classification systems
- Bibliographic control and database/networks
- Bibliographic control in the online environment
- The economics of bibliographic control

Gorman (1992:697) said that this syllabus should be taught in every way that traditional and innovative pedagogy offers: lectures, hands-on experience, work assignments, interactive video and "other modern educational technologies". At that time the utilisation of the Web in

interactive education and training had only started and is therefore not specified in his article.

It is believed that in the traditional contact university and technikon, teaching does not really take place, but merely information transfer from the lecturer to the student (Boon, 1998). Certain boundaries restrict learning: there are the physical boundaries of a campus and the time restrictions of lessons.

2.2.7 Problems and limitations of distance education

Research question 7

What are the problems and limitations in the education and training of cataloguers in distance education?

In the traditional distance learning environment information transfer also takes place; the lecturer is merely replaced by a comprehensive study guide with printed information.

Universities and technikons are now changing to flexible training. The utilisation of computers, telematic education and the Web makes it possible to study at any place at any time. Internationalisation has also made it necessary for the traditional educational boundaries to fall away (Boon, 1998). Furthermore, there is a move from individual learning to collective learning (Fouché, 1998).

The study of Library and Information Science through distance education has been discussed widely in the library and information studies literature

in the international, national and institutional context. The emphasis is usually on:

- the historical background (Barron, 1990:325-339)
- the specific Library and Information Science courses at training institutions (Van der Merwe, 1988:45-55; Healy, 1991:424-440; Stanford, 1997:180-190;)
- the positive and negative aspects of distance education (Haythornthwaite & White, 1991:305)
- the utilisation of a variety of teaching methods and technologies (Stanford, 1997:180-190; Barron, 1991:41-43; DeCandido & Rogers, 1990:142-143)

According to Van der Merwe (1988:46), Delmas et al. (1991:46), Healy (1991:327), Pillay and Dempster (1995:205) and Stanford (1997:185), the limited face-to-face contact between the lecturer and student is considered the major drawback in distance education. This is especially problematic in more practically oriented courses, such as cataloguing courses, where the students are best taught by letting them perform practical tasks under the supervision of the lecturer or tutor. The lack of face-to-face contact with the lecturer makes this method of teaching impossible. Although occasional face-to-face sessions between lecturers or tutors and students take place, they are not always beneficial to all the students. These sessions are usually intense and such a large amount of new work is covered in a short period that students cannot successfully absorb all the new information and successful learning does not take place (Pillay & Dempster, 1995:205). It is therefore necessary to utilise other methods and media of instruction (Van der Merwe, 1988:47).

Oberg and Henri (1999:29) identify two major changes in distance learning during the past five years, namely in the pedagogical and technological domains. In the pedagogical domain learning has moved from teacher-centred to student-centred and distance education teaching techniques have become asynchronous. In the technological domain the web developments are radically changing the distance education mode.

Galusha (1998) identifies a number of barriers to learning in distance education caused mainly by the unique characteristics of distance education. They could be summarised as follows (Table 2.5):

Table 2.5: Characteristics of distance learning and associated barriers

Characteristics of distance education	Influence on learning	Barriers
More student-centred and teacher is a facilitator of learning	Collaborative effort between student and lecturer is required. Change of teaching styles.	If one party (e.g. student) does not keep contact regularly, effective learning could be hampered. Lack of regular feedback from lecturers. Students find it problematic to perform self-assessment. Often lecturers do not adapt their teaching styles from face-to-face teaching to being distance education facilitators.
Unbound by limits of space, time and single-instructor effort	Learning can take place when it suits students and lecturers.	No human contact. Feeling of alienation and isolation by students. Very limited social interaction amongst students. Leads to insecurity and lack of confidence.
Technology provides various opportunities	Group discussions amongst students and lecturers are possible via audio and video-conferencing and the Internet. Communication through e-mail, telephone calls and faxes.	Not everyone has access to all the technologies. Communication is asynchronous, leaving the students in charge of setting their own study schedule. Cost implications. Lack of training in the use of technologies. Lack of staff training in the development of technologies. Upgrading and maintenance required.
Student demographics	More convenient for many students to study through distance education.	
Student motivation is different for adults who form the majority of students that study through distance education	Participation in distance learning is influenced by students' personal and life circumstances.	Students' circumstances can cause them to perform poorly or drop out. Financial costs of studies, disruption of personal life and lack of support from employers are main barriers.
Prior experience in distance learning	Students with prior experience are more likely to persist with their studies.	
Support services	Academic guidance, tutors and technical and administrative assistance can enhance learning.	Not always readily available for distance education students. Obtaining study materials and borrowing library books are problematic.
Course material	Appropriate course material enhances effective learning.	Course material is often not specially designed for distance education students. Course pacing for distance education students is not taken into consideration. Lack of staff training in course and study material development.
Assessment of learners' performance	Regular assessment of performance is essential for students' motivation and positive reinforcement.	Additional pressures of distance learning lead to poor performance. Not enough opportunities for regular assessment. Not enough interactive assessment. Delay in feedback about performance.

The results from research by Van Wyk and Botha (1999a; 1999b) at Technikon SA clearly indicate that students need additional training and tutoring apart from the printed study texts, print-based assignments and feedback system and occasional personal and telephone contact with lecturers. Students indicated that they wanted more classes.

Minoli (1996:130) identifies four needs of students to be considered in distance education:

- **Interactivity**: Students need involvement and encouragement to ask questions and take part in discussions.
- **Instructional feedback**: Students need answers to questions immediately, often after hours.
- **Elimination of time constraints**: Students need not be restricted by the training institution's office hours, but need communication and interaction opportunities outside office hours.
- **Motivation**: Students need to have fun when they interact with other students and lecturers. The fun element is an important motivational factor.

2.2.8 Problems and limitations of in-service training

Research question 8
What are the problems and limitations in the education and training of cataloguers in in-service training?

This specific aspect has not been researched and addressed widely in the literature.

Time and staff limitations place major restrictions on the in-service training of cataloguers (Evans, 1993:51). Cataloguing is considered to be one of the most time-consuming activities performed in a library (Šauperl & Saye, 1999:78).

It is important to investigate this issue further by means of interviews with cataloguing departments.

2.2.9 Developments in the utilisation of a mix of appropriate media and technologies

Research question 9
What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?

"It has been said that ' ...if your only tool is a hammer, every problem looks like a nail ...'. Multimedia provides us with more tools. It is, however, important to choose the right tool for the task" (Folkers, 1994:311).

According to the well-known and much disputed "no significant difference phenomenon", no matter who or what is being taught, the utilisation of various media will produce the same learning results. Evidence for this argument is based on hundreds of media comparison studies produced since the 1920s (Russell, 1999:xiii). The implication is that when learning results from training by different media are equivalent and adequate to meet the instructional goals, then all media are equally valuable for learning, but would differ in their cost and convenience (Russell, 1999:x). Russell (1998:xiii), however, does believe "that differences in outcomes can be made more positive by adapting the content to the technology". In going through the process of redesigning a course to adapt the content to the technology, it can be improved. He believes that the focus should be more on the process of designing or redesigning the course than on the technologies (Russell, 1999:xiv).

The question with regard to the training of cataloguing students is: Would these students not learn from traditional print-based correspondence courses as well as they would from various other media and technologies? To answer this question, a study similar to the many quoted by Russell (1999) would have had to be conducted, specifically focusing on cataloguing students. The result would probably have been the same: no significant difference. The purpose of this study, however, is not to find a few technologies or media that might achieve improved learning results, but to establish how the available technologies and media should be utilised and combined to meet the instructional and motivational learning needs of all cataloguing students. Since Russell (1999:x) has already concluded that all media are equally valuable for learning but would differ in their cost and convenience, one would now have to establish how to achieve the above-mentioned purpose of this study. Russell's suggestion (1999:xiv) of improving a course by going through the process of

redesigning it to adapt the content to the technology is therefore also an integral part of this study.

In the international literature there are few references to the utilisation of computer-aided instruction in cataloguing training. The utilisation of interactive two-way video and audio technology and teleconferencing as support modes for distance education Library and Information Science students has been investigated and reported on extensively (Stanford, 1997:183). Rowland and Tseng (1991:48) note that since the early 1980s there has been "an increasing emphasis on the use of commercial applications software to support the teaching of principles of information analysis, storage and presentation". They further state that Library and Information Study students are taught about computers and computer software rather than by computer-aided teaching. The main software packages taught can be divided into general office software, library and information software (not teaching software), teaching software (not specific to Library and Information Science training) and teaching software in library and information training (Rowland & Tseng, 1991:50-53). Of the latter group, the most notable packages are MARC Editor and Micro MARC, both assisting students in computerised cataloguing.

The *CatSkill multimedia course on AACR2 and MARC* has been evaluated in the literature (Bowman, 1997:54-56). This course focuses on the cataloguing rules for descriptive cataloguing (AACR) and machine-readable cataloguing (MARC) and does not cover all the cataloguing components, such as classification and assigning subject headings, in which cataloguing students have to be trained.

In her discussion of the new roles of paraprofessional cataloguing staff, Rider (1996:30) mentions among the variety of training methods the

utilisation of CD-ROM software training programs that allow staff to learn at their own pace. No existing programs are specified, however. Haythornthwaite (1990:36) agrees that it would be more cost-effective if staff could be trained through interactive packages at their workplaces rather than attend courses at other venues. She stresses (1990:37) that "interactive methods of instructions should, therefore, be seriously considered, when developing packages for information scientists". At the time of the publication of that article interactive CD-ROM and the application of hypertext were still being developed.

Main (1998:333-340) outlines a model Web-based virtual classroom for Library and Information Science students. She argues that since developments in virtual libraries or "libraries without walls" are taking place, Library and Information Science students should also learn in such an environment. Her model class concentrates mainly on studies in information and society, management and organisation within the library. Cataloguing training is not mentioned.

Kovacs (1991:77-81) reports on a microcomputer-based study module used for additional training in cataloguing to supplement the limited instruction in classes at the University of North Carolina. The program consists of an OCLC tutorial demonstrating the MARC standard and an evaluation of cataloguing software. A laboratory assistant is available to assist students working through the programs. Kovacs found that the advantage of the program was that the students had the opportunity to apply the abstract, theoretical work taught in the classroom in hands-on exercises. The practice helps students to develop stronger foundations in cataloguing. Some of the problems encountered with this training method were that it became essential to have the laboratory assistant available whenever students worked in the laboratory. Independent self-study, as

initially anticipated, was not possible because the manuals were inadequate. Most students also worked full-time and it became difficult to schedule the students' laboratory time with that of the assistant. From this experience it is clear that the utilisation of technology to supplement training can only be successful with guidance in the form of adequate manuals or an assistant.

Niemeyer (1999:90-106) describes the development and testing of a computer-based final examination in a section of a library skills class at the Iowa State University Library. The training was in the searching of an online catalogue to find materials by author, title, subject, call number and keyword. The tutorial and test program was Windows-based, developed in Authorware. It is significant to note that the students who took part in this program were Honours students to whom Niemeyer refers as "academically gifted students" and for whom the program would provide "an appropriate degree of intellectual challenge" (Niemeyer, 1999:94). As part of the study conducted by this researcher, a Windows-based test program developed in Authorware is also utilised. Technikon SA's students, however, are second-year students (undergraduate) and are generally not considered as academically gifted. (A complete discussion on the student profile follows in chapter 3.) It would therefore be important to establish the success of the students' interaction with a computer-based test program. In Niemeyer's (1999:100) study, students responded favourably to the program.

No references to the use of computer-aided training in cataloguing courses could be found in the national literature. The National Library of South Africa presents an online course in MARC 21. This course is aimed at qualified, experienced cataloguers who only need to be trained in MARC

21 – the machine-readable cataloguing format recently implemented for South African libraries.

Fourie (1994) conducted a study on the design of a multimedia study package for distance education of computerised information retrieval. The study contributed to the rethinking of curriculum design and evaluation of course material when a multimedia package is incorporated, especially in the distance education environment. According to Fourie and Van Brakel (1995:145), "the package should function independently with a study guide as a management instrument". For the purposes of this study it is believed that the study guide that consists of printed study text should form an integral part of a training resource. Fourie's study was, however, conducted before the official introduction of outcomes-based education in South Africa. Since 1994 the utlisation of educational technology, especially computer-aided and Web-based training, also started to influence education design and development tremendously. Nowadays outcomes-based education and educational technology play a vital role in the design and development of training and have to be considered in any such studies.

The following instructional strategies that could be considered for a mix of media and technologies are analysed in the literature:

- **Drills and practice**

  To achieve proficiency and fluency in cataloguing, practice is required. Drill and practice software provides problems or questions for students to solve. Price (1991:26) states that the purpose of drill and practice is to transfer knowledge from the short-term to long-

term memory and enable the student to retrieve knowledge at the appropriate time. This is achieved by **repetition** and examples.

Drills are therefore effective for **providing practice**. A student is prompted for an answer and informed whether the answer was right or wrong. Immediate response is provided with reinforcement. Drill programs do not teach new concepts or ideas, but help students to review, remediate, rehearse and practise (Erickson & Vonk, 1994:67). Drills should therefore always be preceded by some other instructional material or procedure to provide the initial learning (Alessi & Trollip, 1991:92). These could include lectures, study guides, textbooks, group work and demonstrations. Drills provide the opportunity to ensure understanding – which is very important in the teaching of classification. Through repetition students can come to a full understanding of concepts taught.

The methods of generating problems in drill programs, namely random selection, organised queuing, flashcard queuing and variable interval performance queuing (Erickson & Vonk, 1994:68) are all applicable in the teaching of cataloguing. The principle of repetition is very important in cataloguing training, and drill programs lend themselves very well to the application of repetition.

Clearly defined **goals** must be set and clear instructions must be provided in a drill program so that students know exactly how they should respond.

Hannafin and Peck (1988:145) state that drills are most effective when response can be brief and produced rapidly. **Pacing** is not such an important factor in a drill program for cataloguing since the

purpose is to teach the student how to correctly describe a bibliographic item, and time is not as important, especially in initial practice. The student has to consult the necessary cataloguing tools and often other reference tools before producing a final answer.

Drill and practice must provide practice for **defined skills**, and immediate feedback must be provided to a student's response and **remediation** to incorrect responses (Hannafin & Peck, 1988:144). A drill lesson should focus on only one or two well-defined skills (Hannafin & Peck, 1988:147). For example, in one lesson drill exercises in adding from one part of the classification schedules to another should be practised. In a following lesson adding from tables can be practised. As the student's proficiency develops, drills for adding from schedules and tables can be practised.

Feedback is a very important aspect in drill software and should involve more than merely indicating correct and incorrect answers. Feedback can be given on format errors (errors made in the presentation rather than the content), for example if a student must only give a classification number as an answer and he/she describes the answer in words. The computer should compare the student's answer with the correct answer. If the answer is incorrect, the question could be presented again. Hints and explanations can be given to guide the student in determining the correct answer (Price, 1991:27), for example if a student, during the number building process, added from a table that is not allowed, a hint could be: "*Consider adding from table 1 first*" or,
"*Base number correct. Remember to add from table 3B*"

It is helpful to the students and lecturer if the drill program keeps a record of students' progress. This could be motivational to the students and indicates to the lecturer the problem areas that students have.

Competition (especially against the computer) is considered an effective motivating technique (Erickson & Vonk, 1994:69). Motivation can be achieved by providing some form of reward at the end of the drill, although for many classification students, just finally arriving at the correct classification number is motivation enough.

Student control for a cataloguing drill program is best done by the author, otherwise students may not choose enough items for practise or may select an incorrect level of difficulty of items. Students should complete a fixed number of questions and not have the option to choose when they want to quit the exercise. Difficulty should be increased based on students' performance.

The use of **sound, graphics and movement** is limited in a drill and practice program for cataloguing. Text would be the most appropriate mode. A sound or a smiling/frowning face could be used to indicate correct and incorrect answers.

Drill and practice programs are very useful in cataloguing training, because they are based on the learning theory of posing questions, followed by the student's response, followed by feedback and reinforcement (Price, 1991:28) This is probably the most effective method of mastering cataloguing. The saying "practice makes perfect" is most applicable to learning cataloguing.

Drill and practice programs support the constructivist approach to the extent that learning is achieved by constructing new understanding from prior knowledge about classification. Behaviourism is supported in that learning is enhanced by reinforcement. Specific learning outcomes are addressed and performance evaluation takes place.

- **Simulations**

Simulation helps to bring **real-world situations** into a safe and controlled environment (Erickson & Vonk, 1994:54). Simulations form an important part of action learning where students have to work on real issues or problems and carry real responsibility in real conditions (Zuber-Skerritt, 1993:45). They are designed to approximate real-world experiences. A simulation can simplify reality by changing or omitting details (Alessi & Trollip, 1991:119). In cataloguing training simulation, it is therefore possible to choose the examples of library materials for cataloguing to cover only certain aspects. Simulations can be used in any of the four activities of learning: presenting information, guidance, practice, assessment or a combination of all four (Alessi & Trollip, 1991:119).

A **believable scenario** with circumstances, reasonable response options and logical consequences for responses must be a feature of a successful simulation (Hannafin & Peck, 1988:150).

There are various types of simulations:

- **Procedural simulations** are designed to teach the procedure for accomplishing a specific goal.

- **Situational simulations** deal with attitudes, behaviours and beliefs, and the goal is to examine social or behavioural issues.

- **Physical simulations** are associated with scientific experimentation.

- **Process-oriented simulations** are related to physical simulations, but differ in that they teach major concepts associated with an experiment, rather than only providing an experimental tool (Erickson & Vonk, 1994:77). They are common in the social sciences.

Simulations allow students to practise and **apply** their learning in an artificially constructed yet realistic context for learning (Romero, 1995:9). In such a simulation a student should be presented with real presentations of library materials to catalogue. Such a representation of a book, for example, will have to include a title page, table of contents, chapter headings and preface. The student should also have access to other reference tools. In a simulation the student must apply theory to concrete situations and interpret the concrete experience in the light of theory. In a simulation the student can experience as much of the real world of cataloguing as possible. Each library material presented to classify should present a typical cataloguing dilemma.

A **situational simulation**, i.e. dealing with attitudes and behaviours of people in different situations and teaching different approaches to a situation (Alessi & Trollip, 1991:127), is the type of simulation that could best be applied to advanced cataloguing training. In a typical

cataloguing department of a library the cataloguer often has to catalogue problematic library materials. In this situation he/she has a number of options to choose and must take a decision: catalogue it strictly according to the cataloguing rules, consult the databases or catalogues of other libraries to see how the majority of other institutions have catalogued the material, or consult with colleagues. A situation like this could be presented to the student through a situational simulation program. The student can become an integral part of the simulation (Alessi & Trollip, 1991:127) by being, for example, the cataloguer, challenged with the cataloguing problem, while other students can also play a role by being the colleagues.

A simulation is **available at any time** (Alessi & Trollip, 1991:132). This means that when the lecturer believes the students are ready to learn how to handle certain cataloguing problems, they can be presented with those problems in a simulated format.

It is also an advantage that simulations are **repeatable** (Alessi & Trollip, 1991:132). Therefore, if the simulated cataloguing problem was not dealt with satisfactorily, the students can repeat it.

Simulation enhances **motivation** in that the student can become an active participant in the learning situation (Alessi & Trollip, 1991:133). It is more interesting to solve a real cataloguing problem than to read about it in a textbook.

A simulation can begin like a tutorial, i.e. present the student with some instructional information, for example showing the cataloguing tool and how to follow the rules and instructions in it to catalogue bibliographic items. Then the program can allow students to

catalogue library material, and provide guidance by correcting. Exercises like these can be repeated so that the simulation takes on the characteristic of a drill (Alessi & Trollip, 1991:135). This can be followed by a situational simulation in a cataloguing department.

Fidelity is also important in a simulated cataloguing training program. Fidelity indicates how faithfully the simulation represents the part of the world being simulated (Levin & Waugh, 1988:72). The closer the simulation imitates the reality of cataloguing problems in libraries, the better the students will be prepared to deal with these problems when actually working in a library. Manipulative fidelity (Levin & Waugh, 1988:72) indicates the extent to which the student's actions correspond to the actions to be taken in the simulated world, in this case the student's actions regarding classification problems in a cataloguing department. **Transfer of learning** (the extent to which a student can apply what was learned to new situations) is also an important factor in simulations (Alessi & Trollip, 1991:135). High fidelity may inhibit initial learning when the student is not yet very familiar with a cataloguing tool, but may enhance transfer of learning so that the student will know how to approach new cataloguing dilemmas. Low fidelity will facilitate the initial learning, but it will be difficult to transfer that learning when the student is faced with a new classification problem.

Dynamic support is a feature of simulations indicating the sequence of systematically decreasing the amount of assistance provided to the students as they progress and become more experienced (Levin & Waugh, 1988:73).

Simulations are very supportive of constructivism. Real-world situations are created. Students are encouraged to engage in dialogue with each other when working in a simulated cataloguing department. They interact with the simulated library world. Strategies are not forced on students, but as cataloguing problems are presented, students have to apply creative thinking in consultation with each other.

2.2.10 Advantages and disadvantages of training by means of a mix of media and technologies

Research question 10

What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?

Forsyth (1996:50) identifies the following strengths of computer-based education and training that can also be brought to an Internet delivery:

- Students can work on the course at times that suit them.
- Testing and retesting is possible with a computer.
- Simulations are possible.
- The variety of computer-based training stimulates students and promotes positive attitudes to learning.
- A degree of individualised instruction is possible.
- It is possible for the student to navigate the content.
- Almost instant feedback is possible.

Forsyth (1996:29-30) and Daniel (2001:B24) mention the following disadvantages and limitations:

- Access to all the media and technologies is not always available.
- Hardware and communication infrastructure is expensive.
- Training in the use of technologies and media is necessary; which is time-consuming and expensive.
- It is difficult to get students interested in new media and technologies; students prefer print media.

Table 2.6 indicates the advantages and limitations of types of media and technologies currently used for training.

Table 2.6: Advantages and limitations of types of media and technologies

(adapted from Forsyth, 1996:29-30)

Types of media	Technologies	Uses and advantages	Limitations
Print-based	Handouts Study text Prescribed and recommended books Written/printed assignments	Easy to read Enables self-paced reading and study Can be re-read	No interaction Time delay in feedback
Visual-based	Diagrams Charts Pictures Transparencies Slides Photographs	Another method to enhance explanation	Can distract and confuse Memory-intensive Can be used for decorative and not functional reasons
Audio-based	Audio-tape cassettes Compact discs (CDs)	Another method to enhance explanation	No interaction Not possible to demonstrate practical application
Audio-visual-based	Slide-tape Video Film	Shows motion Captures attention Adds emphasis and emotion	Expensive Hardware-intensive Training in use necessary
Telecommunications-based	Telephone Fax Audio/videoconferencing E-mail Internet	Interaction Immediate feedback	Hardware-intensive Communication infrastructure intensive Training in use necessary
Computer-based	Computer-managed instruction Computer-based testing Computer-based instruction Electronic performance support systems	Another method to enhance explanation Interaction possible to some extent	Hardware intensive Communication infrastructure intensive Training in use necessary
Human-based	Lecturer Tutor Mentor Contact classes	Interaction Immediate feedback	Not always available when needed

The following matrix (Table 2.7) indicates how the media and technologies chosen for the training programme could be utilised for the different attributes required by the instruction.

Table 2.7: Matrix for media and technologies for the different attributes required by instruction

(Adapted from Leshin, Pollock & Reigeluth, 1992:105)

	Print	Human	Computer	Telecommunication	Visual
	Handouts Study text Prescribed and recommended books Written/printed assignments	Lecturer Tutor Mentor Contact classes	Computer-managed instruction Computer-based testing Computer-based instruction Electronic performance support systems	Telephone Fax Audio/videoconferencing E-mail Internet	Diagrams Charts Pictures Transparencies Slides Photographs
Attributes required by instruction					
Situation for use: Large group	Handouts Study text Cataloguing tools Books	Lecturer Tutor Contact class		Internet	Transparencies
Small group	Handouts Study text Cataloguing tools Books	Lecturer Tutor Mentor Contact class		Internet	Transparencies
Self-paced learning	Handouts Study text Cataloguing tools Books	Tutor Mentor	Computer-managed instruction Computer-based testing	Telephone Fax E-mail Internet	Diagrams Charts Pictures

	Print	Human	Computer	Telecommunication	Visual
			Computer-based instruction Electronic performance support systems		
Treatment required of subject					
Real symbolic verbal abstractions		Lecturer Tutor Mentor			
Performance required					
Real simulation			Simulation Game		
Training constraints					
Money Time Resources	Study text Prescribed and recommended books	Lecturer Tutor Mentor Contact classes	Computer-managed instruction Computer-based testing Computer-based instruction Electronic performance support systems	Audio/videoconferencing E-mail Internet	Diagrams Charts Pictures Transparencies Slides Photographs
Development constraints					
Money Time Human resources Material resources	Study text Prescribed and recommended books	Lecturer Tutor Mentor Contact classes	Computer-managed instruction Computer-based testing Computer-based instruction Electronic performance support systems	Audio/videoconferencing E-mail Internet	Diagrams Charts Pictures Transparencies Slides Photographs
Organisation's preferences	Study text Prescribed and	Tutor Mentor	Computer-managed	Telephone Fax	Diagrams Charts

	Print	Human	Computer	Telecommunication	Visual
	recommended books	Contact classes	instruction Computer-based testing Computer-based instruction Electronic performance support systems	Audio/videoconferencing E-mail Internet	Pictures Transparencies Slides Photographs
Lecturer's preferences	Study text Prescribed and recommended books	Tutor Mentor Contact classes	Computer-managed instruction Computer-based testing Computer-based instruction Electronic performance support systems	Telephone Fax E-mail Internet	Diagrams Charts Pictures Transparencies Slides Photographs
Learner's preferences	Study text Prescribed and recommended books	Lecturer Tutor Mentor Contact classes		Telephone Fax Audio/videoconferencing E-mail Internet	Diagrams Charts Pictures Transparencies Slides Photographs

Factors to be considered during the instructional analysis include the following (adapted from Lee & Mamone, 1995:65):

- Experience in computer-aided training
- Learning preferences (team or individual)
- Language ability or preference
- Previous training
- Job (specifically cataloguing) experience

2.2.11 Design of training by means of a mix of media and technologies

Research question 11

How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?

In the introduction to his paper on online teaching, Spender (1996:1) made a very valid and important point, namely that computers and the Internet provide a new medium for teaching, but that this new medium will not be the only medium and should form "part of the repertoire of educational mediums". This viewpoint should always be kept in mind when designing a Web-based training programme for cataloguers - a field in which the utilisation of a repertoire of educational mediums is possible.

Abernathy (1999:24) quotes Rossett, who states that the enhancement of online experiences is needed "to simulate authentic situations, capture examples, provide alternative perspectives, urge action, and allow the user to compare her approaches with others." These are actions that are also applicable to the cataloguing student.

"The ability to interact is a key feature of face-to-face teaching. It is therefore important to decide what actual or equivalent levels of interaction are possible in other forms of delivery and access" (Forsyth, 1996:27).

Examples of computer-assisted education and training in various fields can be found in the literature, but very little has been done in the training of cataloguing. The literature does not indicate that research has been conducted in this field yet.

2.3 Summary

The analysis of reported research was conducted for each of the research questions. An analysis of the reported research has indicated that the needs regarding the training of cataloguing students have not been satisfactorily addressed by the utilisation of media and technologies.

The next two chapters will present a project description where a resource training programme consisting of a mix of media and technologies is used to facilitate the training of cataloguing students.

Chapter 3

Project Description: computer program

Contents

3.1 Introduction

This chapter describes the design, development, implementation and evaluation of one of the components of the training programme for cataloguing students. This component comprises a specific training medium, namely a variety of exercises on a computer program (CD-ROM). It is the first time that this format has been used for training cataloguing students and, indeed, as part of a mix of media and technologies in a Technikon SA training programme. The other components of a mix of media and technologies had already been designed and developed as part of Technikon SA's training programmes and were merely adapted for the specific training of cataloguing students. The evaluation of these components as part of an integrated resource training programme is dealt with in chapter 4. Since the design, development and evaluation of the computer program was a major new development, it is dealt with exclusively in this chapter.

The goal of the chapter is to report on the investigation of the instructional and motivational effectiveness of a computer program as a means of providing additional practice for cataloguing students.

The case study is a response to the urgent need to conduct research on the provision of additional practice opportunities to students. Previously, students were only provided with printed course material. This material included all the course notes as well as exercises, activities and assignments. Students have to complete these exercises, activities and assignments on paper and submit them for evaluation and feedback. Since this is done mostly via the postal system, it means that students only receive the feedback after a period of about six weeks. By that time they have lost touch with the particular exercise or assignment. The nature of cataloguing demands as much practice as possible. The number of

existing exercises and assignments does not give students sufficient opportunity to practise cataloguing. The result of this is that students fail the practical examination paper in cataloguing badly.

The performance also had an effect on the through-put rate (the number of students who actually successfully completed the course). When students perform poorly in one particular subject they often cancel the entire course since they feel discouraged and cannot proceed with the next levels of the course.

Personal interviews were conducted with the students involved in this study. During contact classes, group discussions about problems students had with the subject were also held. A discussion thread on the issue is also still in progress on TSA COOL (virtual campus site of Technikon SA). About 30% of the students took part in these discussions. Written notes were taken during the personal interviews and group discussions.

The personal interviews and group discussions about the problems students have with the subject resulted in the following conclusions:

- Students find the subject content new and unfamiliar.
- They find the cataloguing and classification tools difficult to follow and apply.
- They need immediate feedback when they practise skills. The time it takes before they receive a written or printed assignment back can be anything from six weeks to two months.
- They need more opportunities to practise the skills.
- They need different methods to practise the skills.
- A great need for more personal contact with a lecturer or tutor was expressed. This concurs with Morgan, Ponticell and Gordon's (1998:20) finding that tutoring is a very powerful technique for

enhancing student learning across different types of students and learning areas. Tutors are available for students. The number of students studying Library and Information Studies are generally low, especially in remote areas, and students are distributed all over Southern Africa. It is therefore only possible to appoint tutors in the larger regions (Johannesburg and Durban) where the majority of students reside. The availability of the tutors is also limited since they perform these duties on a part-time basis.

The benefits of a computer program could be threefold:

- It provides interactivity (i.e. students give an answer and receive immediate feedback).
- It provides additional exercises in a different format.
- It provides alternative training methods to accommodate different learning preferences.

The challenge of such a development is, as White(1996:69) states, to create a rich learning environment, which is situated in real-life, or which closely resembles real-life within which the students can construct meaning. This means that a computer program should not merely repeat exercises that could also be made available in print format, but should closely resemble real-life cataloguing situations and add the dimension of interactivity.

The purpose is not to measure learning gain through pre-tests and post-tests alike, because Clark's (1994) contention that media do not influence learning and Russel's (1999) conclusion that there are no significant differences in performance between individual delivery media are accepted.

Students' response to such a program is evaluated. The advantages and disadvantages of the program as experienced by the students are addressed.

If the feedback generated by such an evaluation is positive, it would be worthwhile to introduce the computer program as a component of a training resource for cataloguing students.

The report in this chapter commences by listing the relevant research questions, the aspects of the questions as addressed by the computer program and the means of investigation of each question. This is followed by the research methods used to conduct the research, the needs analysis, design, development, implementation, evaluation and the results pertaining to the program. Finally, a summary is given, and conclusions and recommendations specific to the program are proposed.

The design of the program was started in 1999. The development, implementation and evaluation of the program took place in 2000.

3.2 Research questions

The development of a computer program forms part of a mix of media and technologies. Research questions 9, 10 and 11 (as set out in Table 1.2 of chapter 1) are addressed by the development of the computer program (as part of a resource training programme): The aspect addressed by each research question and the means of investigation are summarised in Table 3.1.

Table 3.1: Research questions and aspects addressed by the computer program

NO.	QUESTION	ASPECT	MEANS OF INVESTIGATION
9	What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?	New development	Questionnaires, observations, interviews, focus group discussions
10	What are the advantages and disadvantages of training cataloguers by means of a mix media and technologies?	Advantages and disadvantages as experienced by students	Questionnaires, observations, interviews, focus group discussions
11	How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?		Questionnaires, observations, interviews, focus group discussions

3.3 Research methods

The computer program was developed as a pilot test and addressed the classification part of the cataloguing course. This part was selected since the results of previous assignments and examinations, as well as interviews conducted with students who repeated the course, indicated that this is the part with which they experience the most difficulty.

The research is primarily a qualitative study. Questionnaires, interviews, observations and focus group discussions were used to evaluate students' experience of the program. Questionnaires were sent to all the students registered for the first registration period of 2000. Students completed the questionnaire after spending some time using the program. Observations were made and interviews and focus group discussions were held with

students (individually and groups of five to ten students) who could attend contact sessions at Technikon SA's main campus in Florida (Roodepoort, South Africa).

Observation entailed the researcher being present with the students while they worked with the program, to record noteworthy incidents and comments.

The interviews and focus group discussions were held to examine students' response to the program.

3.4 Development process

The merits of constructivist paradigms of learning are increasingly emphasised in research on education, and have to be considered during the design and development of courseware (Nicholson, 1994:36; Willis, 2000).

The computer program for the classification component was designed by the Integrated Technology Centre (ITC), a division of Technikon SA. They were responsible for the multimedia programming and graphical design. The contents were supplied by the lecturer.

The following phases were addressed during the process:

- Needs analysis phase:
  - Goal analysis
  - Target population analysis
  - Task analysis
  - Content analysis
  - Instructional strategies analysis

- Media analysis

- Design phase
- Development phase
- Implementation phase
- Formative evaluation phase

The development process is illustrated in the Table 3.2:

Table 3.2: The development process

COMPONENTS	NEEDS ANALYSIS →	GOAL ANALYSIS →	DESIGN →	DEVELOPMENT →	IMPLEMENTATION →	EVALUATION →	REVISION →
SPECIFICS	Syllabus needs Students' needs Lecturers' needs Needs from practice	Target population Learner characteristics Task analysis Content analysis Objectives Learning outcomes Evaluation criteria	Teaching strategy Design of study material Media selection User interface Instructional activities	Authoring Layout Preparation of students	Making program available Monitor Trouble shooting	Students' progress Performance assessment	
METHODS	Critical analysis of reported research (chap. 2)	Student profile Subject matter specialists Syllabus documents Critical analysis of reported research (chap. 2 & 3)	Research methodology (chap. 1) Design Criteria (chap. 3)	Chap. 3	Chap. 3	Observation Assessment of exercises Questionnaires Interviews Specific case studies (chap.3)	
PRODUCTS	Needs assessment report	Student profile Content outline Instructional objectives	Flow charts Instructional archetypes Scripts	Program documentation CD-ROMs	Program documentation	Program documentation Formative evaluation report (chap. 3)	Summative evaluation report (chap. 4)
FORMATIVE EVALUATION							

3.5 Needs analysis phase

During the needs analysis phase attention was paid to the following:

3.5.1 Goal analysis

The goal statement articulates the relationship between the training that is being designed and the desired performance (Milano & Ullius, 1998:98). During the goal analysis the purpose of the design was established. At first the goal could only broadly be formulated as: *"to educate students about a specific subject area, namely cataloguing and to train them in the necessary skills to practise cataloguing."*

It was necessary to formulate a clear statement that answered the question: *"Why do we want to use a training programme consisting of a mix of media and technologies for training cataloguing students?"* From the literature reviewed (chapter 2) and studies regarding students' needs (Van Wyk & Botha, 1999a; 1999b), it was possible to arrive at a more specific goal statement.

More specifically, the following questions were asked in order to formulate the goal:

- Why is the additional training programme needed?
- Who needs the instruction?
- What must the students do with the programme?
- When must they use the programme?
- Where will the programme be used?

By answering these questions the goal could be formulated as follows:

"To enhance training in the knowledge and skills of cataloguing for Library and Information Studies students by means of a training programme of mixed media and technologies that students can use at their own time where it is convenient for them."

A more specific goal for the computer program could then be formulated:

"*The computer program should be used in conjunction with, firstly, the printed course material to complement it and to form an integral part of a mix of training media and technologies.*"

The printed course is of a tutorial nature and supports a behaviourist paradigm. Students are expected to master a concept and complete the applicable activities and exercises before a new concept is introduced. The computer program had to provide the necessary practical exercises. These exercises could either be done on an individual basis or by small groups of students in contact class situations. Therefore the program had to partially support a constructivist paradigm.

3.5.2 Target population analysis

Since students' personal background and circumstances, educational background, professional background, expectations and experience of distance education, study methods and access to media and technology influence their studies, it was considered necessary to establish these factors by means of a questionnaire (annexure A). The profile of the cataloguing students had never been established before as very limited and often incomplete details are provided during registration. An extensive questionnaire was compiled to obtain as much information as possible about the student profile. The questionnaire was adapted specifically for

cataloguing students at Technikon SA from the questionnaire designed by Beneke (1998). The South African Advertising Research Foundation's Living Standards Measure (LSM) (1993) also provided useful information regarding the demographics, financial circumstances, lifestyle and media access that could be further explored in the questionnaire. It was assumed that the majority of students fell into the category LSM5 (the young aspirers). This was further supported by the results from the questionnaire.

Only a selection of the results relevant to this study are summarised in the following tables. The relevant personal and demographic information and its significance to this study is summarised in Table 3.3.

Table 3.3: Personal and demographic details of student profile

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Gender	Male	15	The majority of librarians are female.
	Female	85	
Language group	Afrikaans	8.57	Only about 14% of the students belong to the English language group. This an important consideration for the language level at which the training media are developed. English is the chosen medium of instruction since all the cataloguing tools and manuals are in English. It is too expensive to translate course material into any of the other official languages.
	English	14.29	
	Northern Sotho	20	
	Southern Sotho	14.29	
	Swati	2.86	
	Tsonga	0	
	Tswana	22.86	
	Venda	5.71	
	Xhosa	0	
	Zulu	11.43	
	Other	0	
Age	Under 25	22.86	The majority of students are young adults (under 40). The characteristics (discussed in chapter 2) of that age group have to be taken into account when designing training materials.
	25-29	28.57	
	30-34	14.29	
	35-40	28.57	
	Over 40	5.71	
Province of residence	Gauteng	44.44	The majority of students live in the northern part of the country (corresponds with majority of Tswana and Northern Sotho speakers) and KwaZulu-Natal. This means that many of the students have easier access to contact classes (presented in Johannesburg and Durban).
	Mpumalanga	2.78	
	North-West	13.89	
	Northern Province	5.55	
	Free State	5.55	
	Eastern Cape	0	
	Northern Cape	2.78	
	Western Cape	2.78	
	KwaZulu-Natal	22.22	

The educational background relevant to the study and its significance is summarised in Table 3.4.

Table 3.4: Educational background of students

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Final school qualification	Matriculation with exemption certificate	22.22	The majority of students have passed the Senior Certificate examination, but would not have been accepted at university for studying Library and Information Science.
	Senior Certificate (without matriculation exemption)	75	
	Grade 10 (standard 8)	0	
	Other	2.7	
Average percentage in final school examination	70-100	0	The majority of students had an average pass mark at school and are not the top performers.
	60-69	19.35	
	50-59	35.48	
	40-49	32.25	
	33⅓ - 39	16.12	

The professional background relevant to the study and its significance is summarised in Table 3.5.

Table 3.5: Professional background of students

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Number of years working in a library/ information centre/ department	First year	14.71	The majority of students are still inexperienced librarians/ information workers.
	1-5 years	44.12	
	6-10 years	23.53	
	11-15 years	11.76	
	More than 15 years	5.88	
Most recently completed library qualification	National Certificate	18.18	The majority of students are unqualified library and information workers and have therefore not received any higher education training.
	Lower Diploma	6.06	
	Unqualified	75.76	
	Other	0	
Demographic area of library/ information centre/ department where students work	City (e.g. Johannesburg, Cape Town, Durban)	52.94	The majority of students work in larger urban areas where access to facilities such as electricity and telecommunications infrastructure is available.
	Large town (e.g. Rustenburg, Pinetown, Kroonstad)	26.47	
	Small country town (e.g. Hammanskraal, Brandfort, Colenso)	17.65	
	Rural area without a town in the immediate vicinity	2.94	
Type of library where students work	Large public/ community library (main library)	40	The majority of students work in the public and community library sector. Examples selected for cataloguing in the training media should resemble items that would typically have to be catalogued in these types of libraries.
	Branch library of a large library	20	
	School library/ Media centre	0	
	Academic library (e.g. university, technikon, college)	14.29	
	Provincial library	2.86	

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
	Special library or information centre (e.g. engineering, law libraries)	14.29	
	Information department that forms part of a larger organisation	8.57	
Section/ department of library/ information centre/ department where students work	Reference desk	14.29	None of the students work in a cataloguing section (accept those in one-person libraries who sometimes have to perform cataloguing tasks). This means that students have not been exposed to the work and procedures in such a department. Training materials should be designed to introduce students to cataloguing.
	Lending desk	25.71	
	Interlibrary loans	2.86	
	Acquisitions	8.57	
	Cataloguing	0	
	Serials	2.86	
	Children's section	2.86	
	Physical processing (e.g. inking, covering, binding of materials)	8.57	
	All sections (such as a one-person library)	25.71	
	Other	5.71	
Number of staff members that work with students	20 or more	8.57	At present many libraries are understaffed. The majority of students have less than 5 staff members to assist them at their work. This usually means working extra hours and having less time for studies.
	Between 10 and 20	17.14	
	Between 5 and 10	17.14	
	Between 2 and 5	34.29	
	1	22.86	
Current post designation	Librarian	8.57	The majority of students are library assistants, which is the typical designation of an unqualified library worker (especially in the community and public library sector) who performs various administrative duties.
	Assistant librarian	5.71	
	Library assistant	62.86	
	Library clerk	0	
	Administrative assistant	5.71	
	Casual worker	5.71	
	Other (information officers)	11.43	

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Students' abilities to carry out their tasks at work	I consider myself an expert in the tasks that I have to perform.	41.18	The majority of students have worked 1-5 years in libraries performing administrative tasks in which they have received training. However, they would have no training or expertise in professional duties.
	I perform tasks that I was trained in.	32.35	
	I perform tasks that I have experience in, but was not trained in.	14.71	
	I perform tasks in which I have no training or experience, but I am coping.	11.76	
	I am not coping with my work.	0	

The study methods and circumstances relevant to the study and their significance are summarised in Table 3.6.

Table 3.6: Study methods and circumstances

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Study space	The dining room/ kitchen table	37.14	The availability of study space gives an indication of whether students have space to accommodate additional training media and equipment. The majority of students do not have appropriate study space.
	My bedroom	37.14	
	I study at work	5.71	
	I study at a friend's/ relative's house	0	
	A study room at home	11.43	
	A library (other than my workplace, e.g. public library, Technikon library)	8.57	
During the academic year students only complete the assignments and leave most of the studying for the examinations	Yes	48.57	Students focus mainly on the examinations and during the academic year only do what is essential to obtain a valid yearmark. Additional training material should contribute to students' final marks, otherwise they will not readily participate in it.
	No	33.33	
	Sometimes	19.44	
Average number of hours per week devoted to studies	5 hours or less	57.14	Students do not have much time to devote to their studies since they all work full time. Study time also has to be divided among all the subjects.
	Between 5 and 10 hours	34.29	
	Between 10 and 15 hours	5.71	
	More than 15 hours	2.86	
Students' evaluation of personal level of competence in studying in English	Excellent	31.43	All the study material is compiled in English, but the level of language has to meet the students' language abilities. For the majority of students English is not their first language.
	Good	42.86	
	Satisfactory	22.86	
	Unsatisfactory	2.86	
	Very poor	0	
Students' expectation of contact with lecturers during the academic year	Weekly	11.76	Students expect regular contact with their lecturer and this will have to be incorporated in the training media.
	Monthly	50	
	Quarterly	38.24	

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Type of contact with lecturers that students prefer	Personal counselling by appointment	38.88	Students could select more than one type. The majority of students prefer personal, face-to-face contact during a personal meeting or contact classes. Only a small number prefer electronic communication.
	Contact classes	63.88	
	Telephonic communication and counselling	27.77	
	Written communication and counselling	11.11	
	Counselling via e-mail messages	19.44	

The media and technology facilities relevant to the study and its significance is summarised in Table 3.7.

Table 3.7: Media and technology facilities for study

CHARACTERISTICS		PERCENTAGE	SIGNIFICANCE
Availability of radio	Yes	83.33	Although radios are readily available, this broadcast medium is not considered ideal for the nature of cataloguing subjects where demonstration and practical application are very important.
	No	16.67	
Availability of television sets	Yes	77.77	Television could be utilised either for live broadcasts and videoconferencing or for viewing recorded lectures. The former is expensive at this stage and logistically difficult to organise. All participants should be available at the same time. For the latter, students must also have video recorder/playback equipment.
	No	22.23	
Availability of audio tape recorder	Yes	69.44	As is the case with radios, taped sound recordings are not considered an ideal broadcast medium for the nature of cataloguing subjects.
	No	30.56	
Availability of VCRs	Yes	69.44	The availability of VCRs and television sets makes video recorded lectures a possibility.
	No	30.56	
Access to computers	Yes	72.22	The high number of students who have access to computers makes the utilisation of computer programs a possibility.
	No	27.78	
Access to the Internet	Yes	41.66	Access to the Internet is still problematic for some students. During interviews it became clear that the Internet is available at the workplace, but students are often not allowed to use it for personal studies. Internet cafés are not always in a close proximity of students' residence. More Internet access could be made available at TSA regional offices and study centres.
	No	58.34	

3.5.3 Task analysis

The task analysis is conducted to determine the content needs to be included in the instruction for the students to achieve the learning objectives for that specific instruction (Smith & Ragan, 1999:63). The task analysis can be conducted by traditional processes such as:

- investigating what has been taught on the subject in the past
- trial-and-error (teaching and observing where there are problems)
- following the structure of the subject content

For the purpose of this course the outcomes-based method was used in combination with the above traditional approaches. The learning goals or tasks were formulated according to outcomes that have to be achieved by the students.

The cataloguing process consists of a number of activities. The diagram in Figure 3.1 summarises the most important activities performed in most libraries.

It is not possible to immediately include all the content of the cataloguing course as indicated in the figure, since the content is complex and involves different aspects. The contents include descriptive cataloguing, assignment of access points, classification, assignment of subject headings, indexing, abstracting, copy cataloguing and authority work.

As a pilot project, the first component of the cataloguing process for which a training programme was designed was the **classification module**. The motivation for this decision was that students' results, personal interviews and group discussions revealed that students found the classification module the most problematic part of their studies. Comments such as "*classification is the most difficult part of the entire Library and Information Studies course*" were often made.

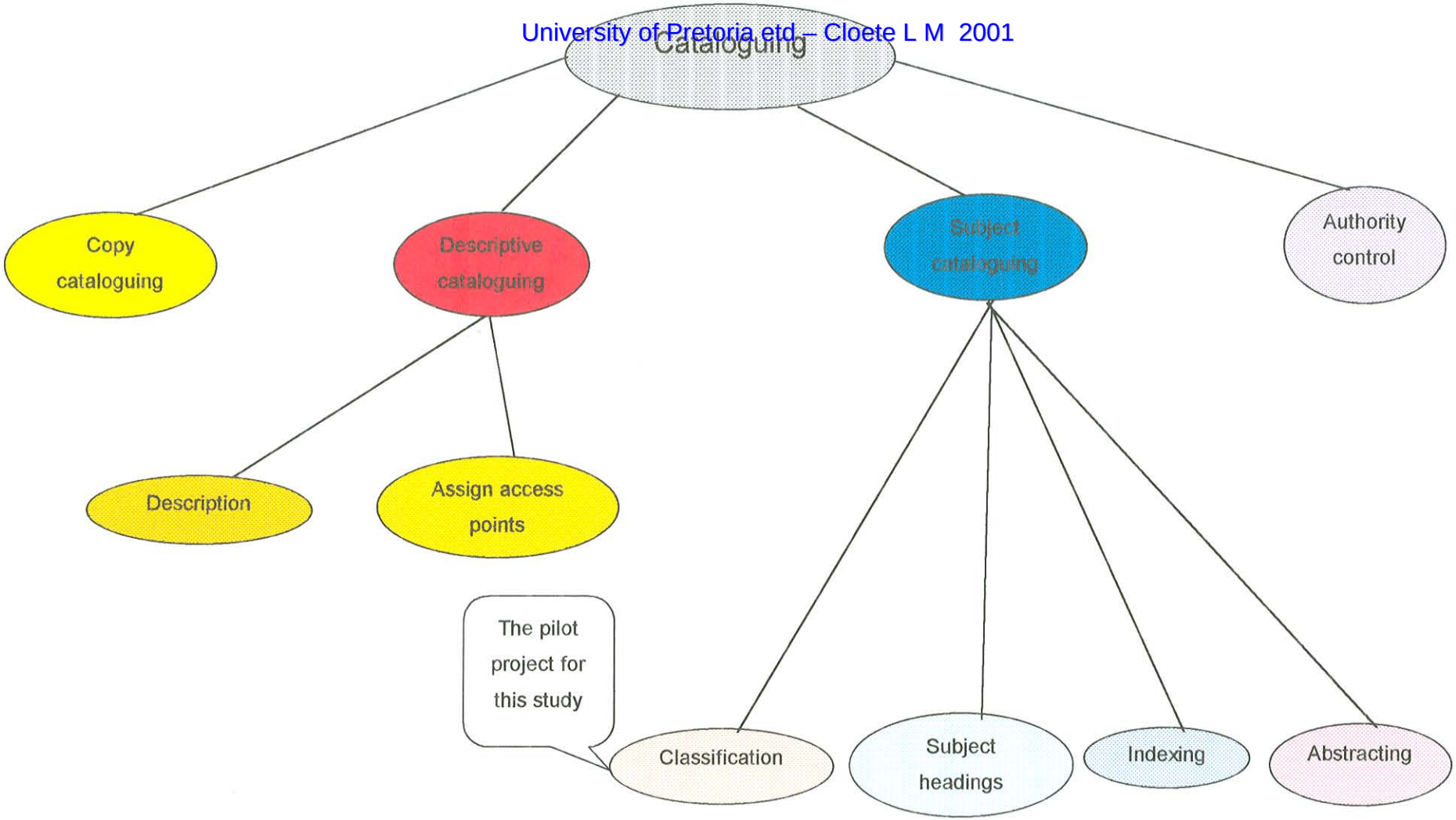


Figure 3.1: Cataloguing process

The **broad outcome** for the classification module was formulated as follows:

"*To do subject description of information sources according to DDC21*"

Laurillard (1994:288) emphasises the importance of learning objectives for providing guidance in the design process and for enabling the students to know what to expect and what is expected of them.

Although objectives are considered fundamental to behaviouristic approaches to education, they are not exclusive to behaviourism (Laurillard, 1994:288).

Beattie (1994:249) suggests that learning objectives in the following three domains of Bloom's taxonomy should be formulated:

- The cognitive (thinking and knowing) domain which involves the skills of recall, recognition, comprehension, application, analysis, synthesis and evaluation
- The psychomotor (practical) domain
- The affective (attitudes and values) domain

The **learning objectives** were formulated as follows:

Students should be able to:

- determine the subject of an entity
- determine the discipline in which an entity should be classified
- recognise and use the main classes of the DDC21

- find a subject entry in the relative index with its corresponding classification number
- look up a classification number in the schedules
- assign classification numbers to entities by using the index and the schedules of the DDC21
- describe tables 1, 2, 3, 4, 5, 6 and 7 and their functions
- use the tables for building classification numbers
- build classification numbers by combining notations in the schedules

3.5.4 Content analysis

The content analysis was performed to find out what the program ought to contain. It was conducted by analysing existing study material. The content had to comply with the syllabus (described in chapter 2).

The development of a computer program coincided with the revision and design of the printed course material. That process is briefly discussed in chapter 4.

3.5.5 Instructional strategies analysis

The different potential instructional strategies had to be investigated to determine the most appropriate strategy for the training programme. It would also ensure that the computer program would be as effective as it would be understandable.

Tutorials are applied in the printed course material. The following strategies were analysed to be utilised in the computer program:

Drills and practice

The lecturer determines how many problems a student has to complete in order to master a specific concept. With cataloguing in particular, it is important that students get as much practice as possible. Reinforcement of cataloguing skills is the key to successful training. Problems presented must not be too difficult or too easy. The selection of problems must also not be too limited.

Simulations

A simulation is ideal for teaching actual, real-world cataloguing problems as encountered when cataloguing materials for a library. One of the most important advantages of simulations for training classification is the fact that the **complexity** of the learning can be controlled. Students can be presented with various real-world cataloguing problems, but the level of complexity can be changed to teach a certain aspect.

3.5.6 Media analysis

The only media considered for this part of the project was the computer program (CD-ROM) used in conjunction with the printed course material. A complete media analysis was conducted to determine the media that should be included in the final training resource programme. The analysis is discussed in chapter 4.

3.6 Design phase

The printed study text for first- and second-year level was designed and developed first. The text was written in OBET and took into account the techniques for instructional design suggested by Mayer (1999:152-156) (discussed in chapter 2 under research question 5). Upon completion of

this process, the computer program was designed. A team approach was followed, involving the subject expert (lecturer) who had to provide the content and the Integrated Technology Centre (ITC) of Technikon SA, which performed the programming.

The computer program was designed as pre-programmed computer-based learning (Bates, 1995:188). The following features of computer learning programs motivated the design of such a program for the training of classification model (Bates, 1995:189, 191-192):

- The student interacts solely with the computer; there is no direct contact through the computer with a tutor, instructor or other students.
- The student has to work though pre-designed material, interacting by answering questions and choosing options.
- The program reacts to students' responses and controls routes through the material.
- The program provides feedback to the students' responses.
- With the use of questions and responses from students followed by feedback from the program, dialogue with the student is simulated.
- The program can assess the student and keep record of the progress.
- The program can identify areas where further study is necessary and prevent students from moving to new material until previous material has been mastered.
- The program can allow students to select materials, levels of difficulty or pathways through the subject matter.
- Video, audio and animated graphics can be integrated within the program.

- Pre-programmed computer-based learning can be combined with other forms of instruction such as printed materials, video tapes, audio tapes and broadcasts.
- Students are allowed to work at their own pace.

The design of the program has to make provision for interactivity, individual work and group work. For this, content, user interface and the infrastructure has to be considered (Harris, 1999:153). The researcher included navigational aspects and input methods under infrastructure and also added guidance, feedback, support and progress evaluation. All these aspects should support the content and learning objectives.

3.6.1 User interface design

The user interface is critical to the success of a computer-based training programme. There is nothing else to keep the student interested in learning except the computer (Lee & Mamone, 1995:107). The interface should firstly attract students and secondly keep them interested. The following factors were considered:

- The level of simplicity or complexity expected from the students (based on their previous experience).
- Screen sizes: The content should be designed to accommodate the smallest or most common screen size that students will use
- Screen layout: This involves consistent placement of information, colour combinations and object size.
- The loading time of graphics and sound: This should not be so slow that it will discourage the students from using the program

- Interactivity to keep the student involved in the learning process: The student should input information, get a response and spend some time thinking about the answer.

The population analysis established the characteristics of students who have to use the program. It is essential during the design process to be specifically aware of how much computer experience the students have. According to the analysis, students have very little computer experience.

The interface should be transparent to the students, allowing them to move easily through the course without having the interface interfere with their learning. It should contain signs and signals that direct the student appropriately. The design of buttons, menus, labels and other commonly used interface elements had to be carefully considered (Lohr, 2000:45). The interface had to be as clear and simple as possible.

3.6.2 Content

The actual content of the program consists of different types of classification exercises. These include:

- true and false questions
- multiple-choice questions
- completing diagrams and flow charts
- placing books in their correct positions on shelves

The content for each type of exercise or unit is randomly arranged by the program. This means that the order in which questions appear is different each time the student attempts the exercises. This eliminates guessing answers after a previous attempt.

The content had to be supported by the appropriate **graphics** and **audio**. During prototyping it was important to experiment with background and text colours to find a suitable combination. It was decided to keep colours simple and use only a few consistently throughout the program.

Audio had to consist of a human voice that introduced the program and gave responses to answers, as well as computer sounds that indicated responses. It was decided to experiment with the human voice and computer sounds and determine during the formative evaluation process how students experienced the audio and what they preferred. A voice with a British accent was used because it was the only voice available at that time.

People with computer experience as well as students with very little experience were asked during the design process to evaluate the graphics and sound. The experienced people (lecturers and programmers) were satisfied with the graphics and preferred the human voice to computer sounds. They believed a voice with a South African accent would be more appropriate. The students were satisfied with the graphics and voice and indicated that they enjoyed the sounds. In the questionnaire for the formative evaluation of the program, which had to be completed by all the students, a section was included on screen layout, colours and the audio to determine how students experienced these aspects. The results are discussed in section 3.10.

3.6.3 Navigation

Since students' computer experience was limited, it was decided to make the interaction as simple as possible. It was decided that students would have to follow a predetermined route through the program that coincided with their printed course material. The learning events are also short and confined to one screen. Therefore students' input has to be short, for example, selecting a letter to correspond with an answer, selecting true or false, or entering a number. Only after completion of these exercises are students expected to proceed with more advanced interaction, such as moving an object from one position to another. To keep students meaningfully involved, feedback is provided after each response.

Unnecessary levels of menus and decisions about paths to take interfere with learning (Lee & Mamone, 1995:108). The screens were therefore kept as consistent as possible.

3.6.4 Input methods

Although there are various input methods, the keyboard and mouse are the methods with which students are most familiar and it was decided to use these methods. Since the students have very few typing skills, it would take them far too long to answer a long question and reduce the effectiveness of their learning. They therefore merely have to type in letters or click on an option. The more advanced input involves clicking and dragging objects with the mouse.

3.6.5 Guidance

Students should know what to do at every step throughout the program. The guidance comes in the form of navigational help files that should be consulted before starting the exercises. Interactive feedback and explanations are provided after each response from the student. Whenever reading on-screen is required, the text remains on the screen until the students respond with an input or answer.

3.6.6 Feedback

"Action without feedback is completely unproductive for a learner" (Laurillard, 1993:61). It is also important that feedback is used. An action should be adjusted according to the feedback to enable learning. Laurillard (1993:61-62) distinguishes between two types of feedback, namely intrinsic and extrinsic feedback. Intrinsic feedback is given as a natural consequence of action. In the program the student gets an indication after his/her input, of whether the answer is correct or incorrect. Extrinsic feedback is usually in the form of an external comment, approval or disapproval. Extrinsic feedback is more helpful if it includes suggestions on how to improve on an action. If the answer is incorrect, a brief explanation of the correct answer is given.

3.6.7 Support

Provision should be made to give students support throughout their use of the program. Support should be available not only for content-related problems, but very importantly, for problems that students may encounter with the running of the program.

After completion of each section, students have the option to review the section. The questions with correct answers are then displayed. After completion of the flow charts and book classification sections, students also have the opportunity to make print-outs of those screens. The print-outs can be added to their printed study text or own notes for future reference.

The student should have the opportunity to describe the problem he/she has encountered. Depending on the type of problem, it should either be investigated and solved by the lecturer (if it is more content-related) or it should be referred to a bugmaster (a system specialist). Feedback should then be provided to the student who reported the problem. A help function is available to assist students with navigation through the program.

3.6.8 Progress evaluation

Progress evaluation plays an important motivational role. As students progress through the program, an evaluation bar indicates to them how they are performing. After completion of a unit, they receive a report comparing their score with their previous score. The incentive is therefore to attempt to improve the score each time they do a particular section.

3.7 Development phase

The development phase involved the final authoring of the program and integration of all the components. The researcher provided all the content for the exercises. The programmer from ITC had the major responsibility of integrating the graphics, audio and text during the development phase.

3.7.1 Authoring

At this stage the text, audio, graphics and sound files were integrated. The program was developed in Authorware. Authorware was selected as it is powerful and flexible and can be adapted to perform many functions, including creating different types of exercises (Vaughan, 1998:164). As far as possible, the program was developed to meet the standards of personal computers mostly in use by private individuals and libraries, since those are mostly the computers on which the program would run. The following minimum requirements are necessary to run the program:

- Pentium II
- 64 MB memory
- 16-speed CD-ROM drive
- Sound card
- Windows 95/98/2000 or NT

The program was developed to start running and loading automatically so that the minimum input is required from the users when they use it for the first time.

3.7.2 Layout of the program

The program consists of:

- an introduction
- the option to look at the help files
- the exercises, namely:
  - a true or false section
  - multiple-choice section

- a section where missing text should be filled in
- a book classification section
- a flow chart

The following screen captures illustrate the layout of the program:

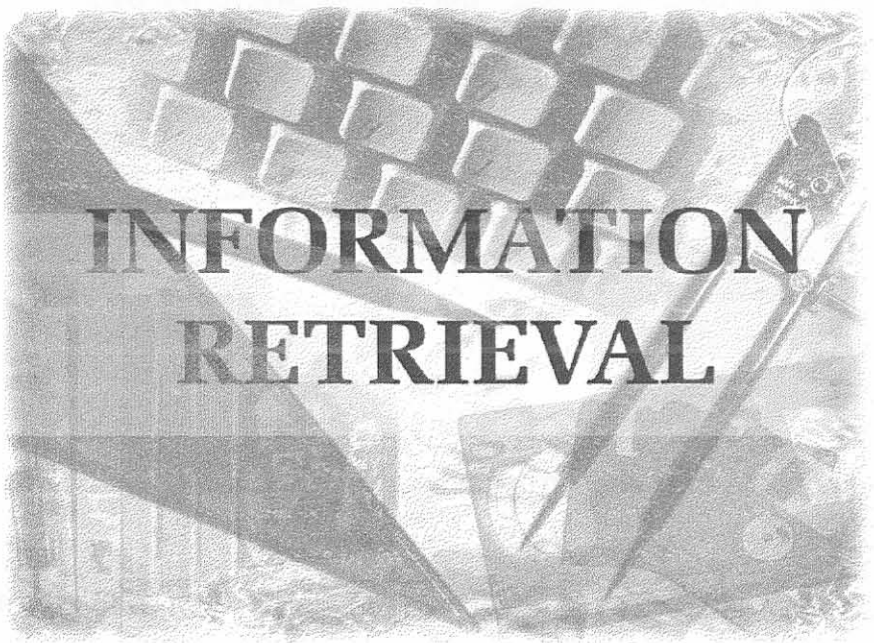


Figure 3.2: Introduction to the program

Two colours are used and different types of media are displayed as background. The selection of media was twofold: information resources are available in different formats and media, and this program forms part of a training resource consisting of different media and technologies. The inclusion of mathematical instruments was the programmer's idea. It was accepted by the researcher since it symbolises the precision involved in this subject matter. Many students over the years have also compared the subject with mathematics.

Figure 3.3: Welcome and introduction screen

The above screen is displayed (with the wording changing as seen in Figure 3.4) while a brief audio introduction is given. The introduction gives a brief description of the course in general. It then indicates where the classification module fits into the course as a whole. Reference is also made to the relevant chapters from the study guide.

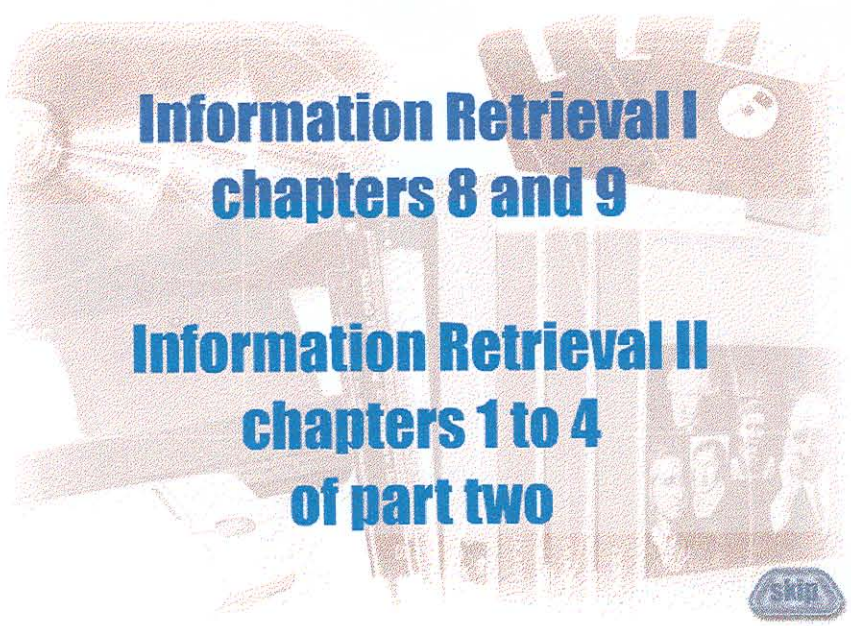


Figure 3.4: Screen with wording to emphasise aspects of the introduction

Users have the option to skip the introduction and proceed with the exercises. When students use the program for the first time, they have to listen to and read the introduction. This is indicated to them in an accompanying letter (annexure D).

Users may first access the **navigational help files** that explain the navigation of the program. Alternatively, they may proceed with the exercises. When students use the program for the first time, they have to work through the help files before starting the exercises. This is indicated to them in the accompanying letter. The following screen captures illustrate the help screens:

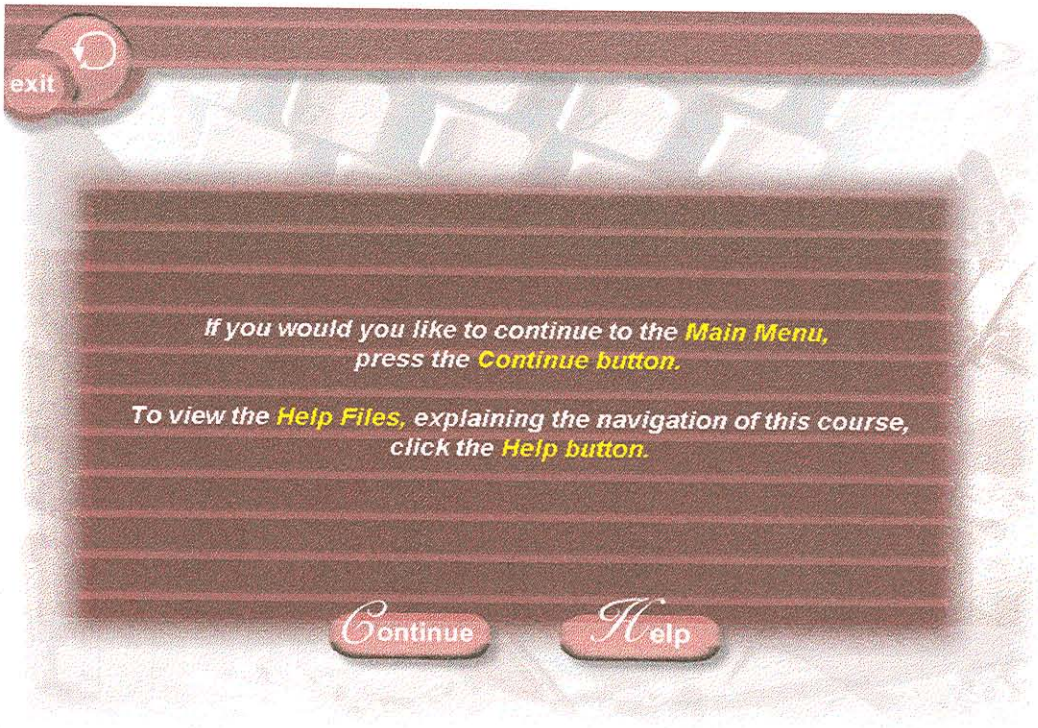


Figure 3.5: Providing the option to view the help function

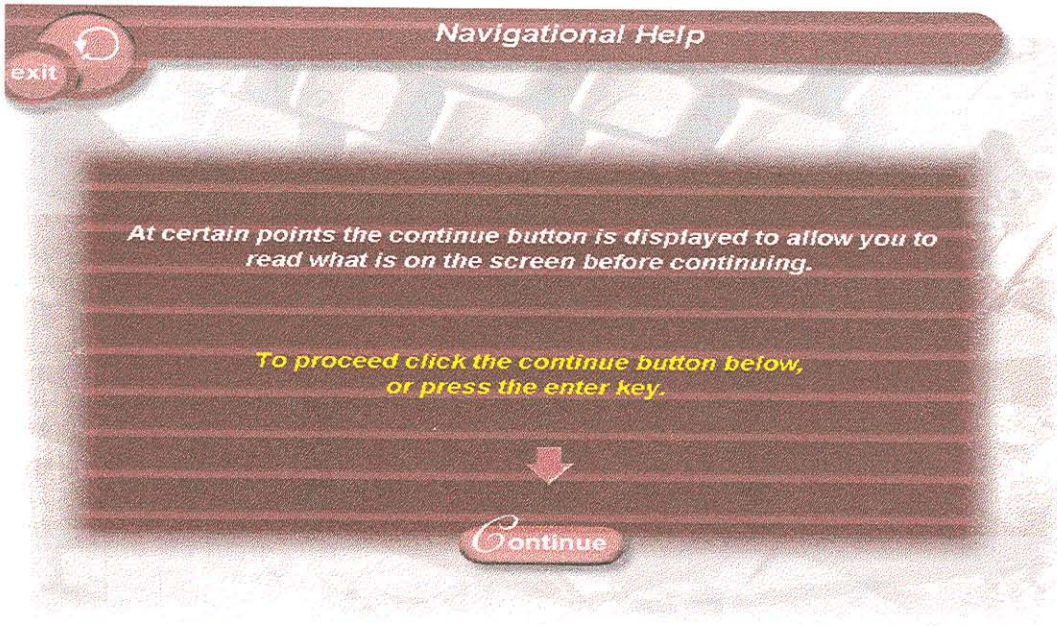


Figure 3.6: Use of the continue button

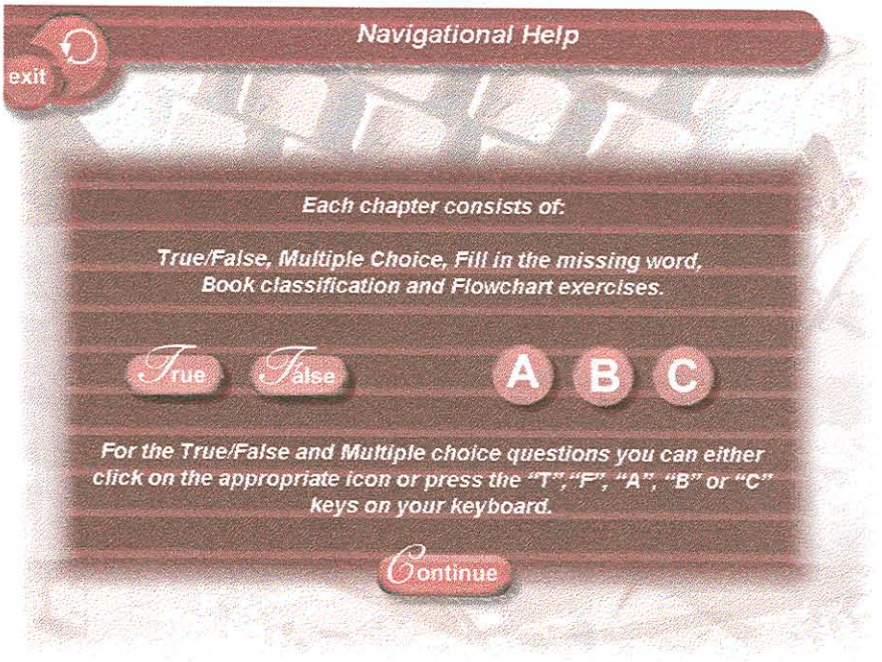


Figure 3.7: Different types of exercises explained

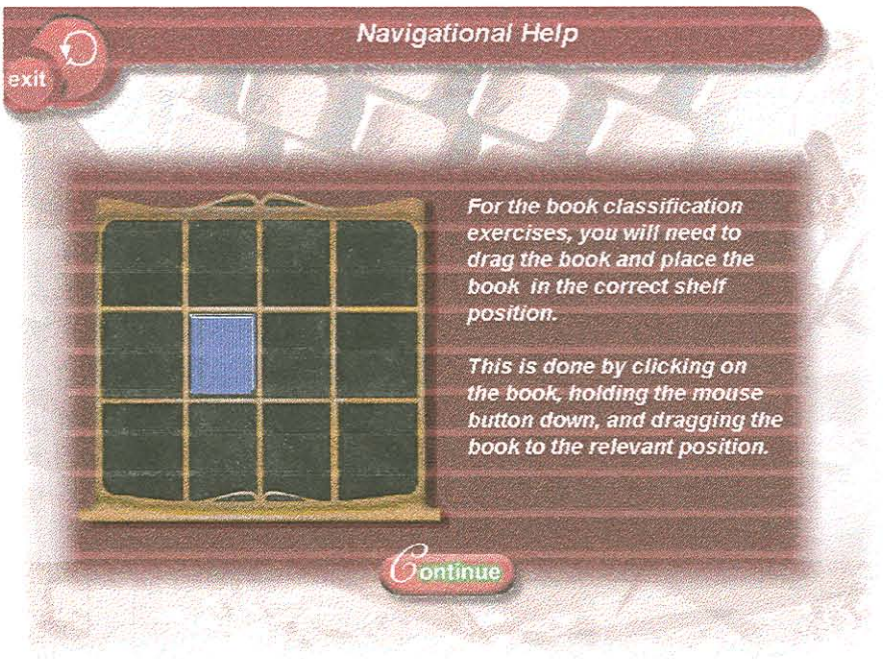


Figure 3.8: Book classification explained

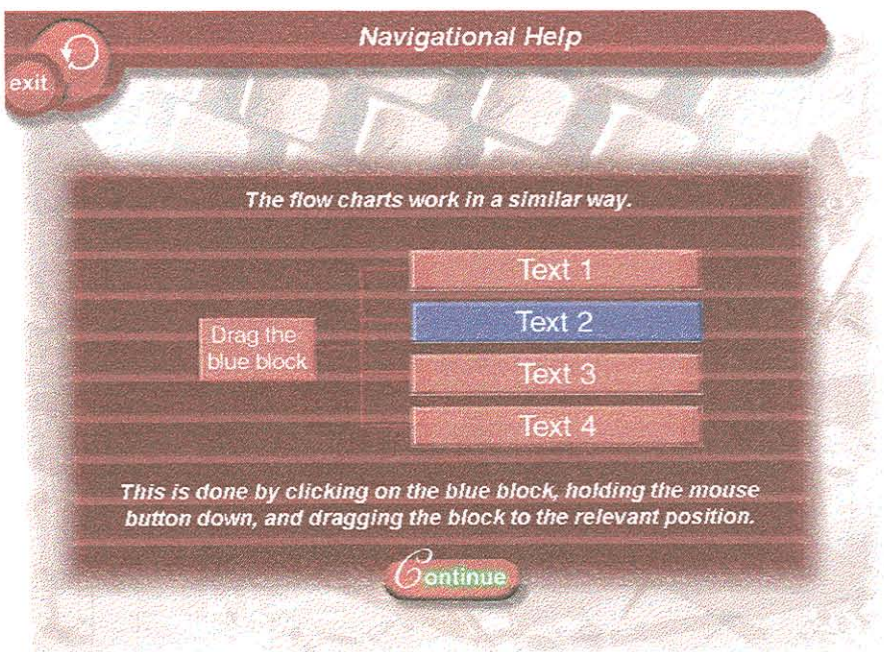


Figure 3.9: Flow charts explained

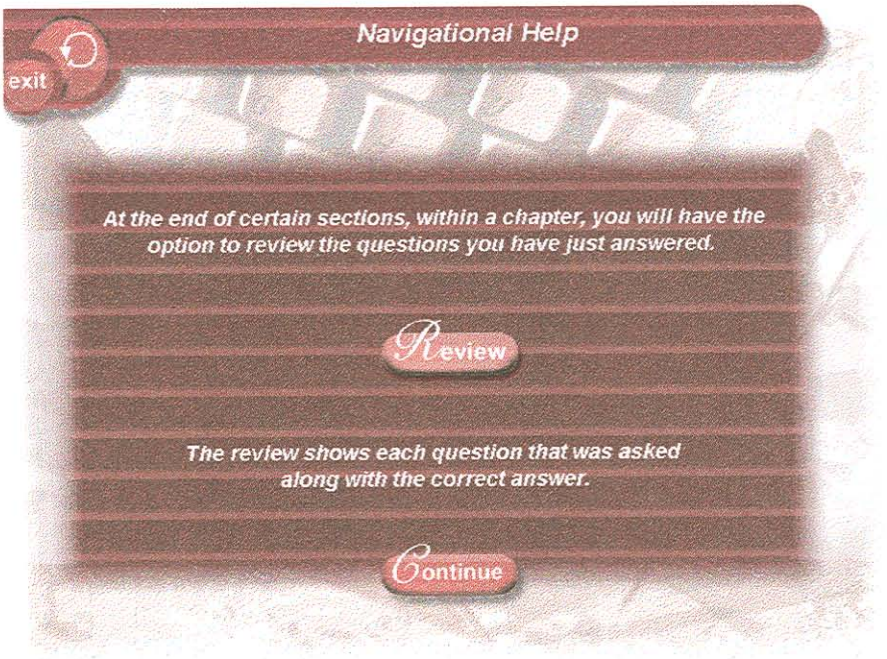


Figure 3.10: Option to review explained

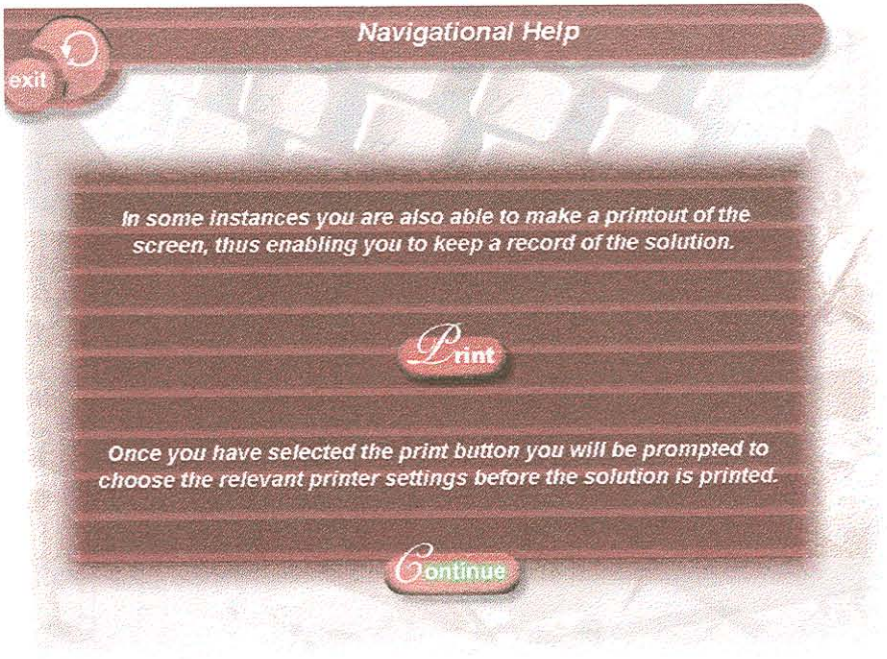


Figure 3.11: Option to print explained

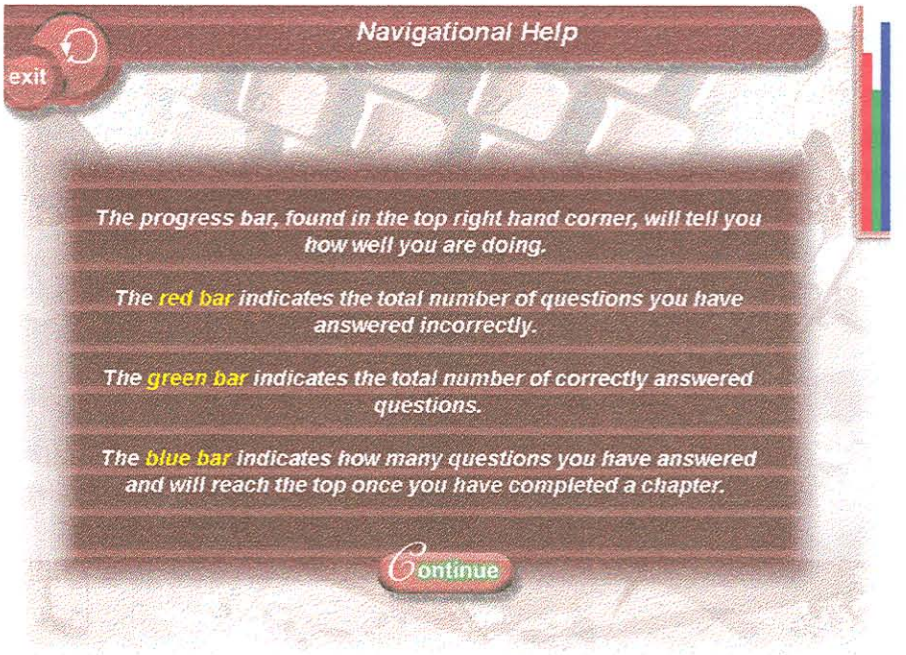


Figure 3.12: Progress bar explained

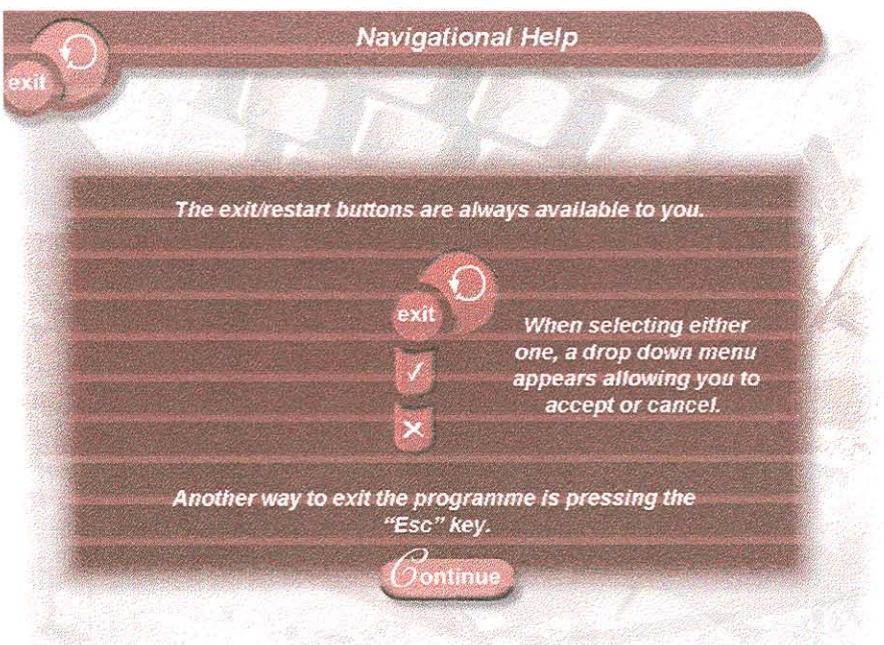


Figure 3.13: Exit/restart buttons explained

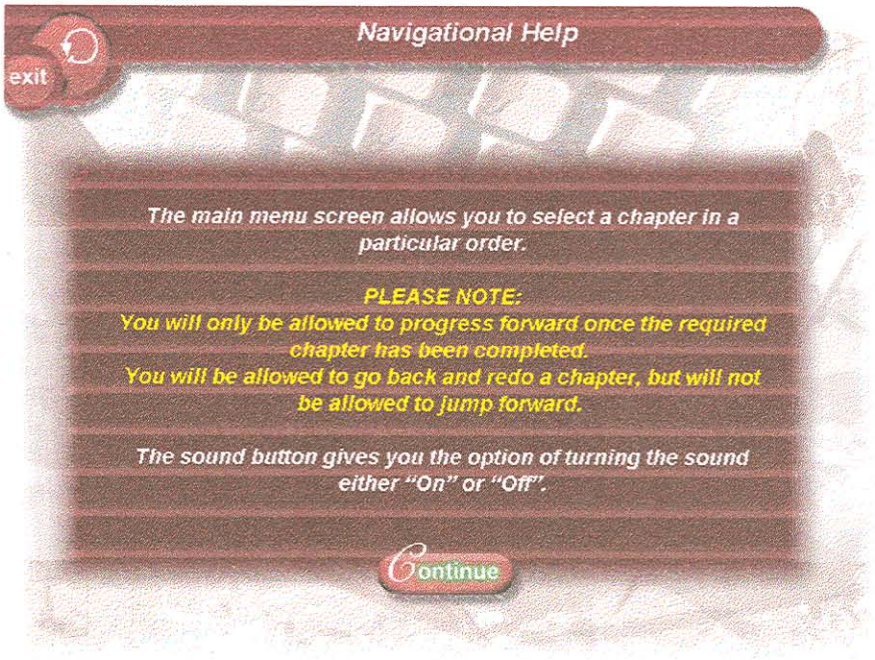


Figure 3.14: Main menu explained

The **main menu** is organised according to the relevant chapters from the study guides for the first and second years of the subject. Students have to start with chapters 8 and 9 from the first year. At this point the other chapters are not accessible. After completion of these chapters, the students are allowed to continue with chapter 1 from the second year. They then progress to chapters 2, 3 and 4. The reason for this sequence is to allow students to revise first-year work before they attempt the second-year work. From there on they have to follow the sequence. A summary becomes accessible after completion of all the chapters. The summary contains new questions from all the chapters and serves as a revision exercise. It allows the students to integrate the work from all the chapters.

Figure 3.15: Main menu

The first section in each chapter is a set of true and false questions. Immediately after selection of an answer, the correct answer with a brief explanation is given.

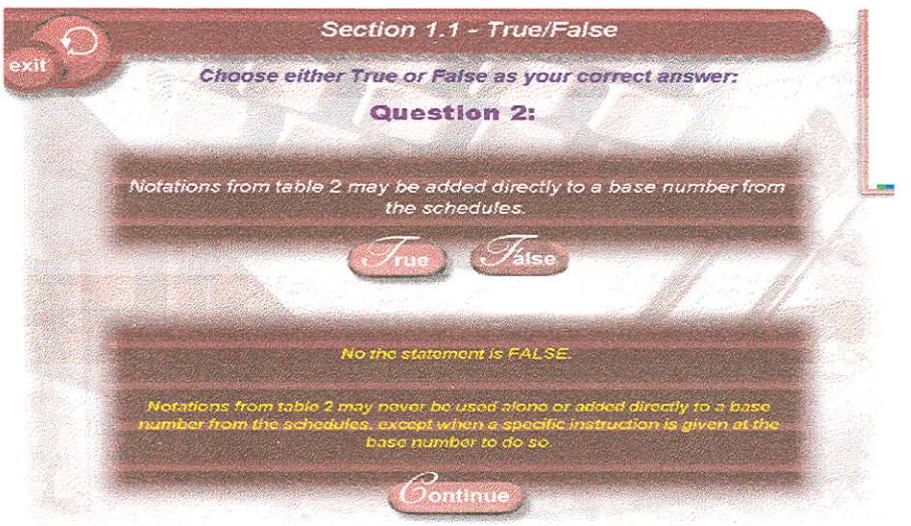


Figure 3.16: True and false section

The next section is a multiple-choice section. After the student's response, the correct option is given.

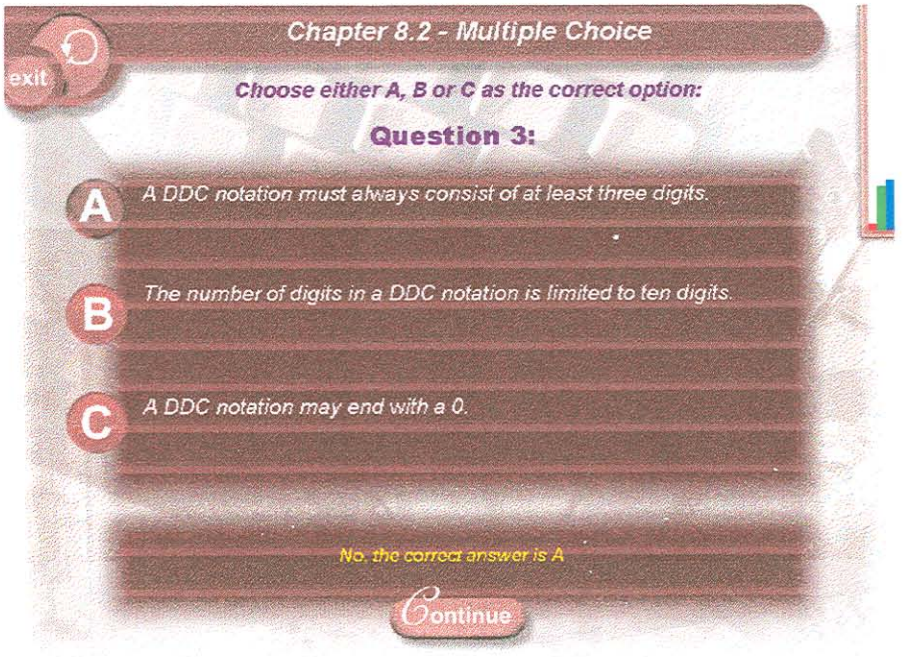


Figure 3.17: Multiple-choice section

In the book classification section, book classification according to the Dewey Decimal Classification (DDC) system is simulated. This exercise can be done individually or jointly by small groups. The exercise is performed by placing books in the correct positions on shelves. The shelves have the classification numbers. The student has to select the correct number for each book. This can only be done if the student can correctly classify the book according to DDC. There are more numbers on the shelves than there are books, so students cannot guess the numbers of the last books. The student has two opportunities to place the books. Thereafter it is done by the program. After completion of this exercise the student has the option to make a print-out of the screen.

In terms of constructivist assessment the multiple-choice exercises and the simulations provide individualised guidance and immediate feedback.

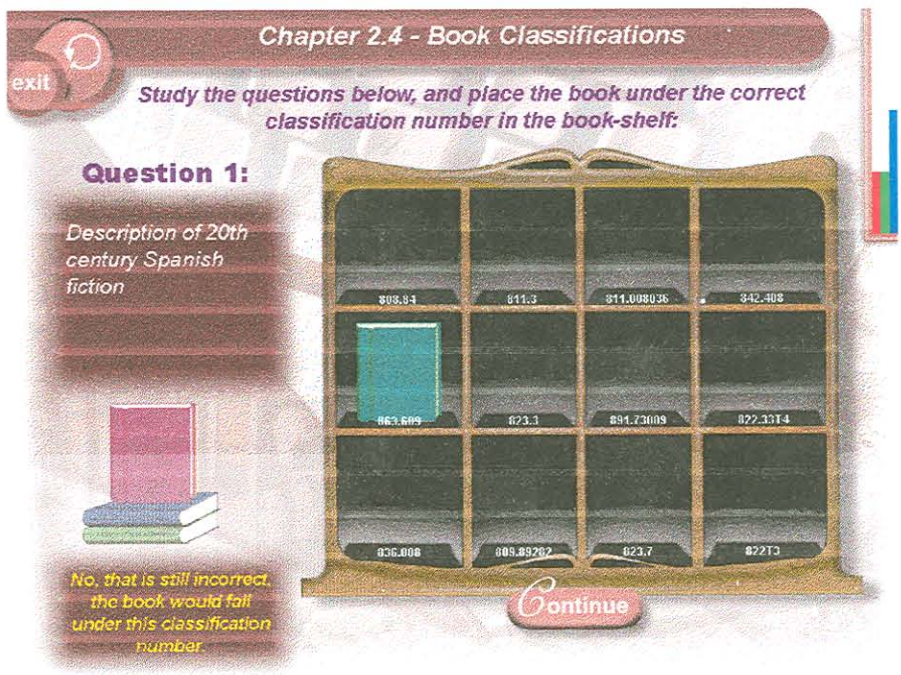


Figure 3.18: Book classification section

The last section is the flow chart section where students have to click and move blocks to their correct positions in a flow chart. This section was developed since following steps in the correct sequence is very important for successful classification. It gives students the opportunity to actually follow the flow charts presented in the DDC and the study guide.

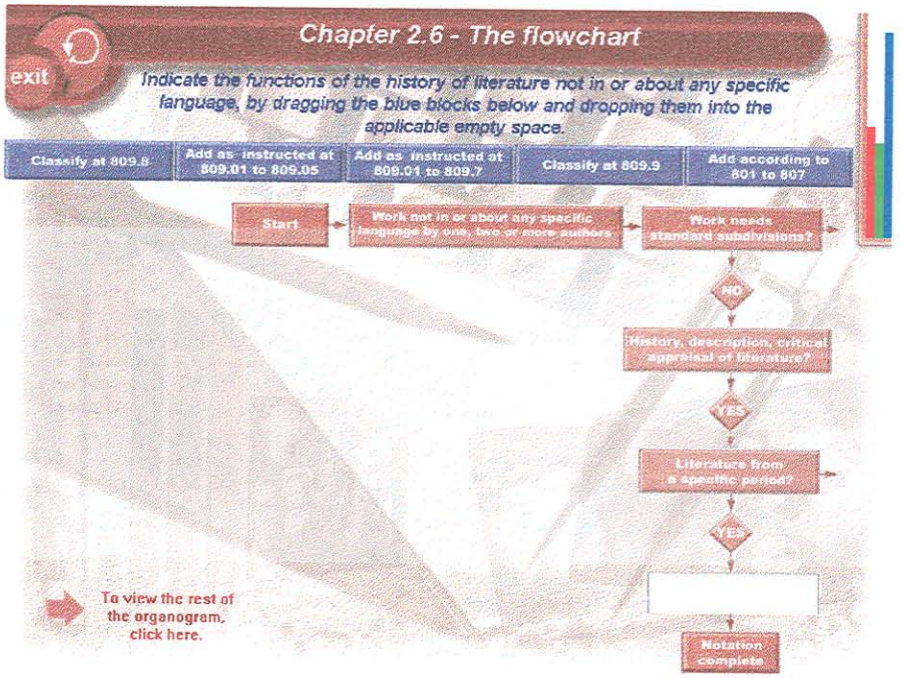


Figure 3.19: Flow chart section

After completion of a chapter, students can see how they have performed and compare this with their previous performance in the chapter.

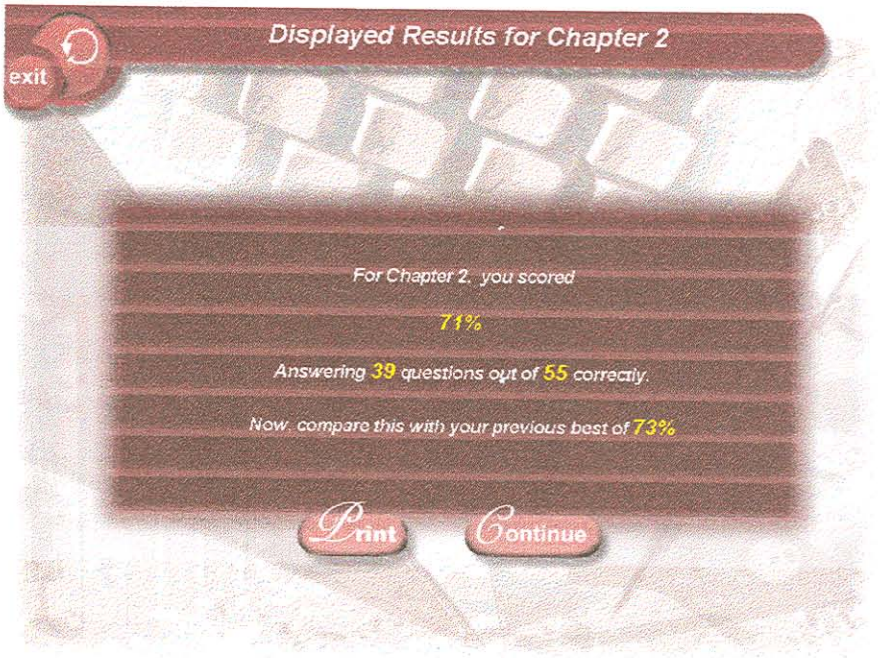


Figure 3.20: Display of results

3.7.3 Evaluation and testing

Testing involved review for content errors and evaluation for instructional effectiveness. Subject matter experts were used to review the content for accuracy, clarity and understandability. During the prototype development the program was tested for technical errors such as links that did not work, incorrect flow through the parts and inconsistent navigation. A pilot test with two students was also conducted.

3.8 Implementation phase

The program was issued in CD-ROM format to all the students of a specific registration period (1st registration 2000) for evaluation. The CD-ROM was accompanied by a letter (annexure D) explaining the purpose of the program and a questionnaire to be completed for the formative

evaluation (annexure B). The students had one month in which to use the program and return the questionnaire. During this period students also had the opportunity to discuss the program with the lecturer (researcher) and fellow students via telephone, fax, e-mail and the discussion group facility on TSA COOL. All the comments and questions were noted. There was also a contact session at the main campus where the program was illustrated and students could use it in small groups. During this session personal interviews and focus group discussions were held with the students. Observations were made while they worked and their comments and other noteworthy incidents were recorded. The information was gathered and then organised to be used in conjunction with the questionnaires for the formative evaluation phase.

3.9 Formative evaluation phase

Laurillard (1994:287) defines formative evaluation as " ... the collection and analysis of data on the pedagogic value of a teaching program, defined in terms of the learning processes it promotes and the learning outcomes it achieves".

According to Lee and Mamone (1995:267), formative evaluation occurs from the time that the need for a training programme is established until the final product is delivered to "ensure the instructional soundness, quality, and suitability of a training program".

Formative evaluation forces the developers to think from the start in terms of what students are supposed to get out of the training (Laurillard, 1994:287). It is an essential part of the development process. It provides the means for the research to be carried out and for the practitioners to become more reflective of their work (Laurillard, 1994:293).

Formative evaluation is limited to a focus on a specific context. The purpose is to improve a specific programme or product (Patton, 1990:156). For formative evaluation, questions are included to identify any parts of the programme that may be ineffective.

During the formative evaluation the following is addressed (Alexander & Hedberg, 1994:242; Beattie, 1994:246; Hale & French, 1999:166):

- Effectiveness of user interaction
- Process feedback
- Any technical problems
- Content problems
- Navigation problems
- Learning experiences
- Merit of the programme (how did it assist students?)

The following methods were used to conduct the formative evaluation:

3.9.1 Observations

According to Laurillard (1994:289), observation is more efficient if it is focused. Therefore a template for recording observations should enable focused observation to be recorded easily. For example, the amount of time it takes students to perform certain actions or exercises in the program or which options they select most frequently could be recorded. Open-endedness plays an important role in observations. Through observations unintended outcomes of the program can be evaluated. Laurillard (1994:290) considers observations an extremely rich and useful data collection method that can be carried out very quickly. The

unconstrained data collection process complements the closed evaluation techniques such as questionnaires and structured interviews.

The value of observations can be summarised as follows (Patton, 1990:203):

- The researcher can understand the program activities and impacts through the detailed descriptive information about what occurred in the program and how the participants reacted to what has occurred.
- He/she can better understand the context within which the program operates.
- He/she can be open, discovery-oriented and inductive in approach.
- He/she can observe things that may routinely escape conscious awareness among participants.
- He/she can learn about things that participants may be unwilling to discuss during interviews.

In this evaluation exercise one or more students used the program and discussed it as they used it. Students worked in pairs or small groups. This "conversation" was observed (without interference). This method can reveal a great deal about students' experience of the program, particularly about the screen design or interface, pointing out things that might interfere with learning and might otherwise have gone unnoticed (Beattie, 1994:254). This helps designers to understand not only where the program fails, but why, and what needs to be done about it. (Laurillard, 1994:290). One must, however, keep in mind that what students say they "like" or "prefer" may not necessarily be the best for learning.

3.9.2 Interviews and informal discussions

Interviews can be in-depth with individuals or in small groups. Alternatively, casual conversation may be recorded. Interviewing is considered a labour-intensive evaluation technique and is therefore used with small numbers of students (Laurillard, 1994:290). The open-ended nature of interviews can help to establish what aspects should be further investigated with the closed form of the questionnaire (Laurillard, 1994:290). On the other hand, certain information obtained from questionnaires can be further investigated in more depth by interviewing respondents to the questionnaires. Interviews and informal discussions were held with the students who used the program in groups and with individual students who attended a contact session. These interviews were conducted after the questionnaires had been completed. The interviews and discussions provided the researcher with the opportunity to clarify certain comments made by the students and aspects indicated in the questionnaire.

3.9.3 Focus groups

Focus groups are useful in the planning and design phases if there is a formative question to ask that will guide the design of the programme. (Beattie, 1994:255). A focus group consists of a small group of students convened separately or jointly to determine their experience of the training programme. The purpose of the focus groups was the same as that of the interviews and discussions. Focus group discussions were held during the contact session.

3.9.4 Student questionnaires

Questionnaires are used to test the experience of the wider population of students. The questionnaire was administrated to all the students registered for Information Retrieval II for the first registration period of 2000. (annexure B).

The guidelines compiled by Steenekamp (1984) for the CSIR and those for setting up questionnaires compiled by the University of Pretoria, Department of Information Technology, Research Support (1981) were followed in the design of the questionnaires.

The purpose of the questions was to obtain simple reflections from the students' recent experience with the program. Only closed questions were asked so that students had to indicate a rating of their experience. They had to select one of the following ratings:

SA	=	Strongly agree
A	=	Agree
N	=	Neither agree nor disagree (cannot decide)
D	=	Disagree
SD	=	Strongly disagree

Students' experiences of the following aspects were determined:

- How the program assisted them in classification
- Computerised format of the exercises
- Screen displays
- Text layout
- Language level
- Graphics
- Sound

- Content
- Navigation and interaction
- Assessment of performance
- Group work with the program
- Enjoyment of the program

3.10 Results

Only three students had difficulty in using and accessing the CD-ROM. The low figure was surprising since the majority of students had never used CD-ROM in their studies before. Difficulties were mainly due to incorrect personal computer settings. These difficulties were quickly resolved when the students contacted their lecturer, tutor or the network administrator.

In the summary of the results presented here, the SA and A ratings were combined, as well as the D and SD ratings. This was done to provide a more compact presentation. Detailed findings are provided in annexure E.

3.10.1 How did the program assist students in the study of classification?

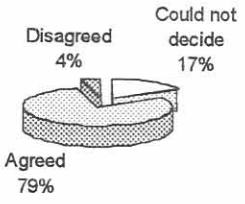
Students' impressions of how the program assisted them in the study of classification were established. The purpose was therefore not to determine whether students' performance in the module improved or not with the use of the program. In other words, students were not tested before and after working through the program. The results of pre- and post-testing of performance are also influenced by other factors that do not form part of the scope of the study.

Students had to indicate to what extent they agreed that the program:

- helped them with their classification
- helped them to understand the contents on classification in the study guide better
- helped them to answer questions for self-evaluation and assignment questions

The finding to all the above statements is summarised and indicated in Table 3.8.

Table 3.8: Assistance in classification

Aspect	Finding
The program assisted students in their study of classification.	

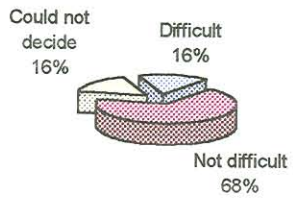
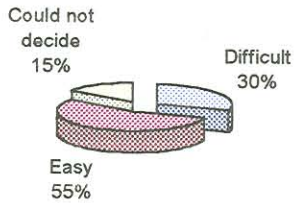
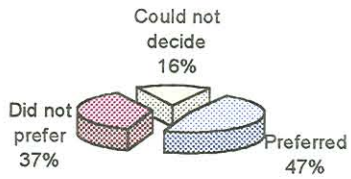
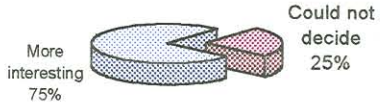
During the observations it was also clear that students reacted positively to the different training medium. Comments from the students indicated that they appreciated the fact that they were given exercises in a different format that was more closely related to "real-life" classification situations.

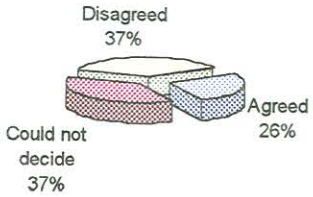
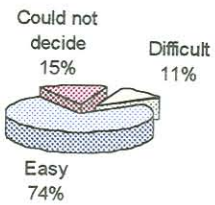
3.10.2 How did students experience the computerised format of the exercises?

Most of the students had never used computers in their training before. Some had limited experience of word processing tasks and routine computerised tasks, such as issuing library materials, at the libraries where they work. It was therefore surprising to find, especially during the observations, that the students quickly worked out for themselves how the program worked. Some students had to read the help file first, but others managed simply by following the instructions. The following aspects were evaluated:

- Difficulty because of the computerised format
- Preference for pen-and-paper format
- Whether the computerised format made the exercises more interesting
- The use of the mouse (clicking and dragging was a new activity for students)

Table 3.9: Computerised format of the exercises

Aspect	Finding
Did students find it difficult to do the exercises because of the computerised format?	
Did students who usually have difficulty working on computers find the exercises easy to do?	
Would students have preferred to do the exercises in a pen-and-paper format?	
Did the computerised format make the exercises more interesting than an equivalent pen-and-paper format?	

Aspect	Finding
Where students had the option to use either the mouse or the keyboard they preferred the keyboard instead of the mouse.	
Did students find the use of the mouse and clicking and dragging objects difficult?	

There is some contradiction in the preference for pen-and-paper format versus computerised format. Nearly half of the respondents still indicated a preference for the pen-and-paper format, but admitted that the computerised format made the exercises more interesting. Respondents indicated no preference for using the mouse or keyboard where they had a choice. They found it easy to use the mouse. The following comment regarding the computerised format was made by a student:

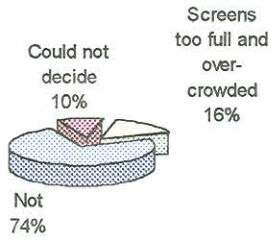
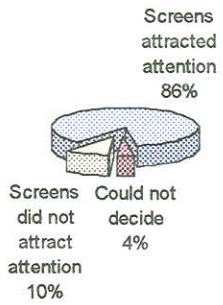
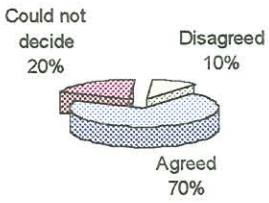
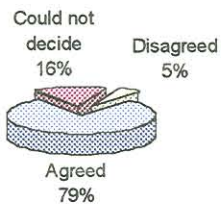
"*They say you learn by doing and this is how the CD works for me. I remember the details better if I do it on the computer.*" (Meyer, 2001)

3.10.3 How did students experience screen displays?

Since the screen displays form an integral part of the interface, the evaluation of students' experience of them is considered important. It should be noted that owing to students' limited experience of computerised training, they could not compare the layout with any other layouts. The following aspects were evaluated:

- Fullness of screens
- Attracting attention
- Similarity of each screen
- The understanding of the meaning of each picture, button and symbol

Table 3.10: Screen displays

Aspect	Finding
Did students find the screens too full and overcrowded?	
Did the screens attract students' attention?	
The fact that each category of questions has the same screen layout in every chapter helps students to understand how to answer the questions.	
Students knew what each picture, button and symbol on the screens meant.	

Since students reacted positively to the screen display, the display will be maintained during further developments of the CD-ROM.

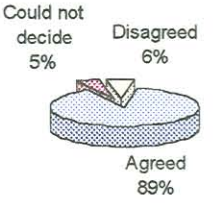
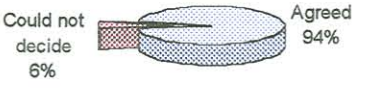
3.10.4 How did students experience the text layout?

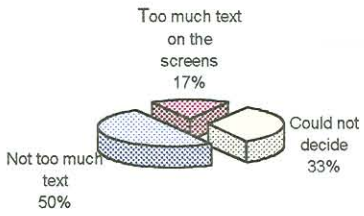
The text-layout is also an important aspect influencing students' interaction with the program. The following aspects were evaluated:

- Ease of reading the font
- Attractiveness of the font
- Font size
- Colour
- Amount of text on the screen

All the respondents (100%) indicated that the text layout was easy to read (refer to annexure E).

Table 3.11: Text layout

Aspect	Finding
The font used for the text was easy to read.	
The font was attractive.	
The font size was readable and acceptable.	
Students liked the colours used for the text.	

Aspect	Finding
Was there too much text on the screens?	

The students reacted positively to the text layout. It will be maintained for further developments.

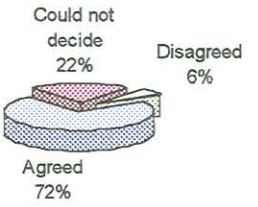
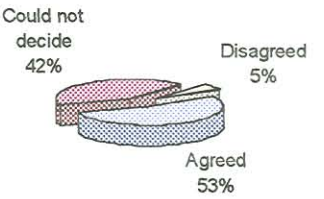
3.10.5 How did students experience the language level?

The student profile indicated that English was not the home language of the majority of students. It was therefore important to determine if the language level used in the program was satisfactory. The following aspects were evaluated:

- Whether the language contributed to understanding the program
- The length of sentences
- Vocabulary
- Possibility of looking up unfamiliar terms

All the respondents (100%) indicated that the vocabulary made the program easy to understand (refer to annexure E).

Table 3.12: Language level

Aspect	Finding
The language used made it easy to understand the program.	
The length of the sentences made the program easy to understand.	
Students could look up any unfamiliar terms or phrases in the study guide.	

The students indicated that the language level and length of the sentences assisted them in understanding the program.

From the observations of and comments from students it became clear that students did not consult the study guide often to look up any unfamiliar terms. In fact, they do not consult the study guide often, even when preparing for assignments. This is a concern to be addressed at a later stage.

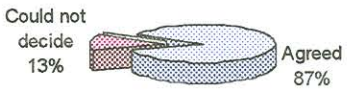
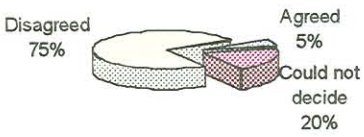
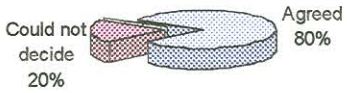
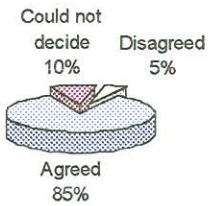
The language level will be maintained for further developments.

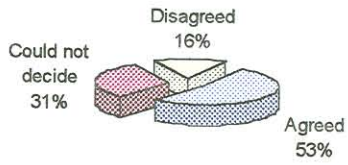
3.10.6 How did students experience the pictures and colour?

Pictures and choice of colour also contribute to the effectiveness of the interface. The following aspects were evaluated:

- Creating the feeling of classifying real books
- Whether pictures distracted students' attention
- Experience of colours
- Preference for more pictures

Table 3.13: Pictures and colour

Aspect	Finding
The use of pictures of books and a bookshelf in the book classification exercises made it feel as if students were classifying real books.	
The pictures of books and a bookshelf distracted students so that they could not concentrate on the exercises.	
The colours used for pictures were pleasant to look at.	
The colours used for the backgrounds of screens were pleasant to look at.	

Aspect	Finding
Students would have liked more pictures in the program.	

The majority of students experienced the pictures and colours positively. The colour scheme will be maintained for future developments. More graphics could be used. The following comment was made by a student about experiencing the book classification exercise as if real books were being classified:

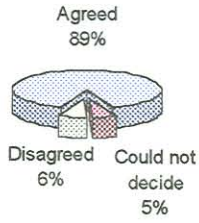
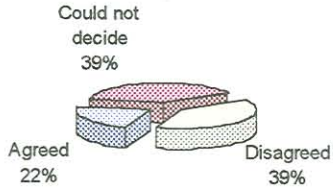
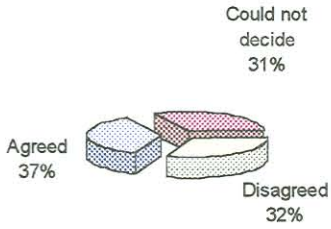
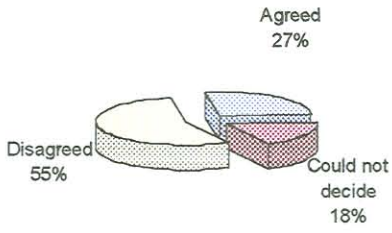
"*You can imagine shelving the books from your screen.*" (Ngubane, 2001)

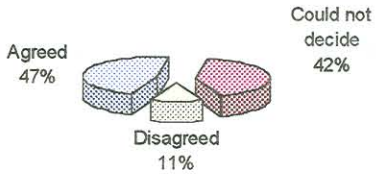
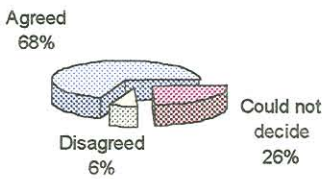
3.10.7 How did students experience the sound?

The sound involved two components: a human voice and computer sounds. The following aspects were evaluated:

- Satisfaction with the voice used for the introduction
- Accent of the voice
- Preference to have the sound option on or off
- Preference for the human voice
- Preference for the computer sounds

Table 3.14: Sound

Aspect	Finding
Students were satisfied with the voice used for the introduction to the program.	
The accent of the voice was too British.	
Students would have preferred a voice with a South African accent.	
Students preferred to have the sound option off.	

Aspect	Finding
Students preferred the human voice that told them when an answer was correct and incorrect.	
Students preferred the computer sounds that indicated to them when an answer was correct or incorrect.	

Although it was initially decided to use a voice with a South African accent, a British accent voice was available during the recording of the computer program. Students' reaction to this was tested. The majority of students were satisfied with the voice used for the introduction to the program and it can therefore be maintained for future developments.

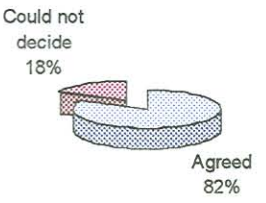
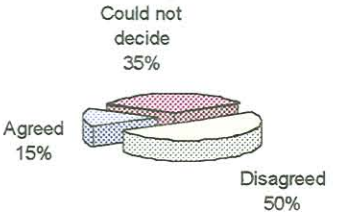
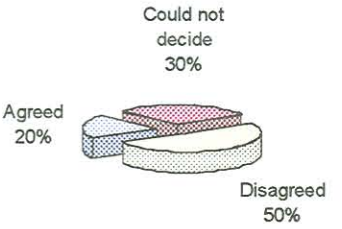
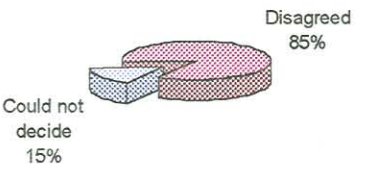
It was clear, especially during the observations, that students liked the sounds and human voices that responded to their answers. Students indicated that it did not really matter to them whether computer sounds or human voices were used. The current selection of sounds and human voices will therefore be maintained for further developments.

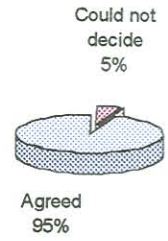
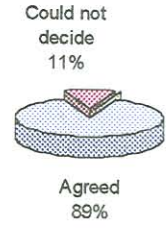
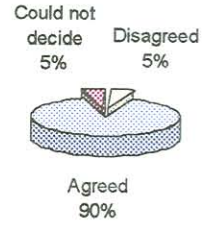
3.10.8 How did students experience the content of the program?

The following aspects were evaluated:

- Whether students who enjoy classification were also satisfied with the program
- Whether students found the content too difficult
- Whether students who do not enjoy classification were satisfied with the content
- Whether students who do not enjoy classification were not satisfied with the content either
- Whether the content helped students to understand the printed study material better
- Whether students found the review section after each chapter useful
- Whether students found the summary at the end of the program useful

Table 3.15: Content

Aspect	Finding
Students who enjoy classification were also satisfied with the program.	
Students who enjoy classification found the content too difficult.	
Students who do not enjoy classification were satisfied with the content.	
Students who do not enjoy classification were not satisfied with the content of the program either.	

Aspect	Finding
The content helped students to understand their printed study material better.	
Students found the review section after each chapter useful.	
Students found the summary at the end of the program useful.	

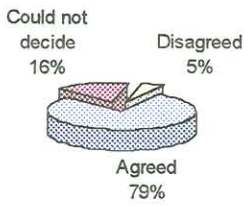
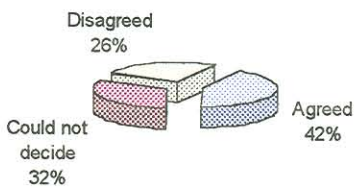
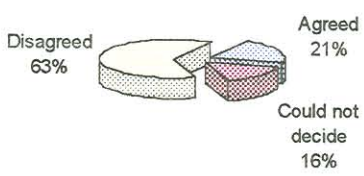
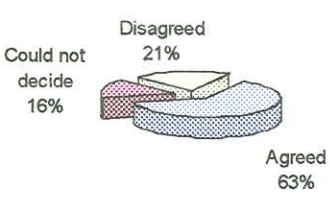
In the past, when only printed material was used in the training of the classification module, students indicated that they found the module very difficult and therefore not a very pleasant experience. It was therefore anticipated that they would also find the content of the computer program difficult and would indicate that they did not enjoy classification. As indicated by the results, the opposite was experienced. The majority of students enjoyed the program and were satisfied with its content.

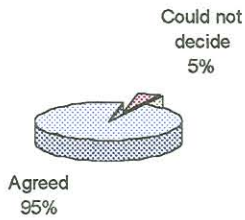
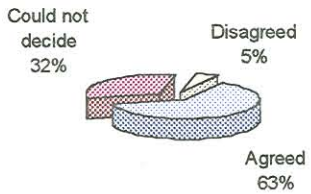
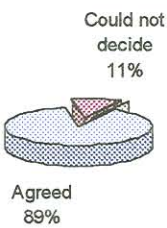
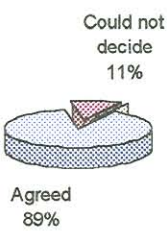
3.10.9 How did students experience the navigation and interaction within the program?

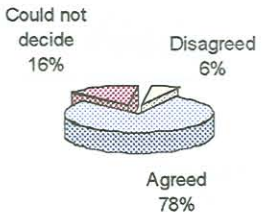
The ability of students to find their way around the program is very important. It can determine whether students continue practising with the program or "give up" because the program is too difficult. The following aspects were evaluated:

- Whether students felt as if the program addressed them personally
- Whether there were times when the students were uncertain about what to do
- Whether students got lost in the content
- Whether students always knew where they were in the program
- Whether the introductory statements in the program explained the purpose of the program clearly
- Whether it was easy to get help from the help files
- Whether directions were clear and easy to follow
- Whether students knew what each icon meant and when to click on it
- Whether students found the option to make a print-out of a screen useful

Table 3.16: Navigation and interaction

Aspect	Finding
Students felt that the program addressed them personally.	
There were times when students were uncertain about what to do.	
Students got lost in the content.	
Students always knew where they were in the program.	

Aspect	Finding
The introductory statements to the program explained the purpose of the program clearly.	
It was easy to get help from the help files.	
The directions were clear and easy to follow.	
Students knew what each icon meant and when to click on it.	

Aspect	Finding
Students found the option to make a print-out of the screen useful.	

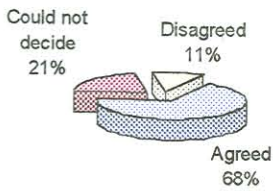
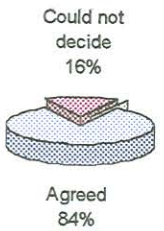
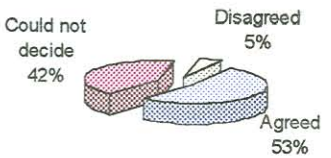
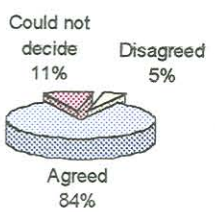
From the results it seems that the navigation is satisfactory. During the observation of students it was clear that there were times when the students were not sure what to do next. This happened mostly when students did not read the help files before attempting the exercises. Within the exercises the help files are not available. Clear instructions are, however, given at each exercise and question. During further developments the navigational help files should be made available at all times.

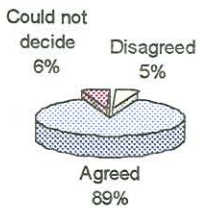
3.10.10 How did students experience the assessment of performance?

Students' performance in the program could be a motivational factor to continue using the program in order to improve performance. The following aspects were evaluated:

- Usefulness of the progress bar
- Clarity of answers and explanations
- Preference for more attempts to do book classification
- Usefulness of percentage marks for performance
- Usefulness of comparison with previous performances

Table 3.17: Assessment of performance

Aspect	Finding
Students found the progress bar useful.	
The answers and explanations were clear.	
Students would have preferred more than two attempts at the book classification section.	
Students found the percentage marks awarded for performance useful.	

Aspect	Finding
Students found the comparison of their percentage marks with the previous performance useful.	

All the respondents felt it was helpful to receive the correct answer immediately and, where applicable, explanations of incorrect answers (refer to annexure E).

The immediate feedback provided by the program, which includes correct answers as well as explanations, was highly appreciated. The following comment was made by a student in this regard:

"*... the good thing is when you are wrong, it provides instant feedback.*" (Opperman, 2001)

Students also appreciated the fact that their performance was measured and that they could compare it with previous performances. This is similar to points ratings in many computer games.

The following comment was made by a student about the fact that questions are randomised, which therefore provides the opportunity to repeat practise:

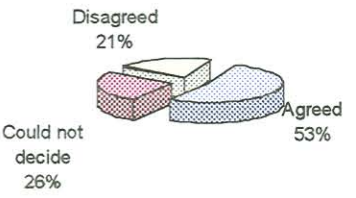
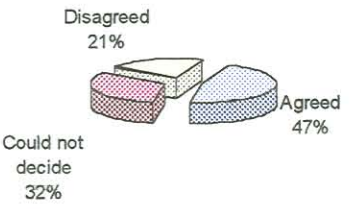
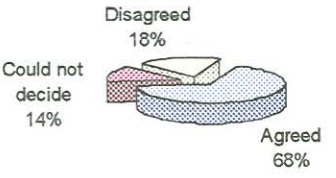
"*The most wonderful part is that when you work on the CD the second and third time, it changes to other questions whereby you can work it a lot of times.*" (Makhubela, 2001)

3.10.11 How did students experience group work with the program?

The program lends itself to individual as well as group work. Students often express the desire to get together and practise cataloguing. It was therefore decided to determine how students experience group work with the program. The following aspects were evaluated:

- Whether students usually like working in a group
- Whether students would have liked to do the program in a group
- Whether students would have preferred to do the exercises on their own

Table 3.18: Group experience

Aspect	Finding
Students usually like working in a group.	
Students would have liked to do the program in a group with others.	
Students preferred to do the exercises in the program on their own.	

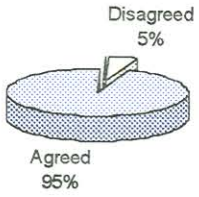
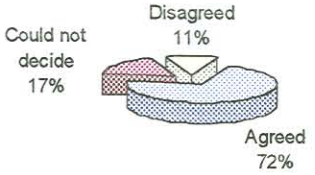
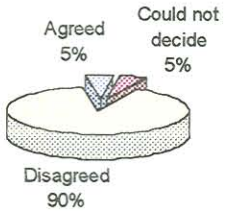
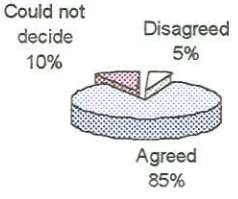
From the results there is no definite preference for doing the program in a group or individually. Students who worked on it during observations preferred to work in groups. The program is suitable for group work or individual work.

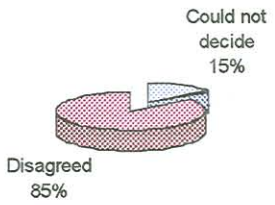
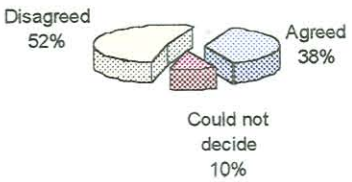
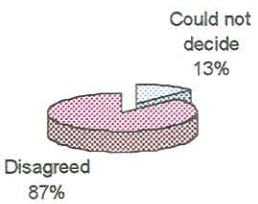
3.10.12 How did students enjoy the program?

Enjoyment of the program is also considered a strong motivational factor. The following aspects were evaluated:

- Challenging aspect of the program
- Stimulating aspect of the program
- Boredom with the program
- Whether students who enjoy classification also enjoyed practising with the program
- Whether students who enjoy classification did not enjoy practising with the program
- Whether students who do not enjoy classification enjoyed practising with the program
- Whether students who do not enjoy classification did not enjoy practising with the program either

Table 3.19: Enjoyment of the program

Aspect	Finding
Students found the program challenging.	
Students found the program stimulating.	
Students were bored with the program.	
Students who enjoy classification also enjoy practising with the program.	

Aspect	Finding
Students who enjoy classification do not enjoy practising with the program.	
Students who do not enjoy classification, enjoy practising with the program.	
Students who do not enjoy classification do not enjoy practising with the program either.	

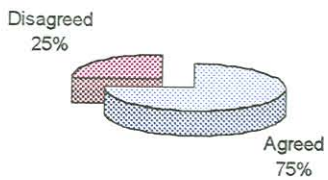
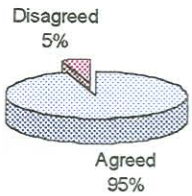
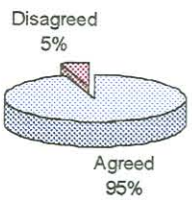
Results on the measurement of enjoyment of the program were very positive. Follow-up discussions with students confirmed that the different medium contributed significantly to the enjoyment.

3.10.13 How did students experience the program in general?

The following aspects were evaluated:

- Whether there was enough time to complete the program
- Whether students would use the program again
- Whether students would recommend the program to others

Table 3.20: Experience of program in general

Aspect	Finding
There was enough time to complete the program.	
Students would use the program again.	
Students would recommend the program to others.	

The students who had difficulty in completing the program attributed it to the fact they had too many other subjects and work commitments.

The fact that an overwhelming majority of students would use the program again and recommend it to others is an indication that further multimedia developments of the course are necessary.

3.11 Summary

This chapter described the design, development, implementation and evaluation of one of the components of the training programme for cataloguing students, namely a variety of exercises on a computer program. The goal of the chapter was to investigate the instructional and motivational effectiveness of a computer program as a means of providing additional practice for cataloguing students.

Students adapted quickly to the new format and did not experience difficulty in understanding the program and working through it.

The lack of immediate feedback was identified as one of the main problems of learning cataloguing through distance training (as identified under research question 7). With this program students could immediately follow up incorrect answers.

Students expressed positive responses to the program and its value in their learning of classification. The results clearly indicate that they appreciated the fact that they were given exercises in a different format that were more closely related to "real-life" classification situations.

Students also found the program enjoyable, which is a strong motivational factor.

The program was found to be suitable for individual as well as group work.

It has been determined that the computer program is effective both instructionally and motivationally.

3.12 Recommendations

This investigation has demonstrated that the overall effect or outcome of the evaluation was positive. It is recommended that the screen layout, text layout, language level, graphics and sound selection be maintained. The content should be expanded to include the other components of the cataloguing course as well. The navigational help files should be accessible at all times in the program. A useful addition would be references to further explanations in the printed study material. This would also encourage students to refer more to their study material.

With reference to the specific research questions under investigation in this chapter the recommendations are summarised as follows (Table 3.21):

Table 3.21: Summary of recommendations

NO.	QUESTION	ASPECT	RECOMMENDATION
9	What developments have taken place in the utilisation of a mix of appropriate media and technology in training cataloguers?	New development	Maintain the computer program and expand it to include other components of cataloguing
10	What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?	Advantages and disadvantages as experienced by students	**Advantages** ➢ Motivation ➢ More practice opportunities ➢ Interactivity ➢ Enjoyment **Disadvantages** ➢ Students have to get used to the new medium before they can focus on the content ➢ A lot of help and guidance need to be included in the development ➢ Students regard the different media as separate entities and do not use them in conjunction with other training materials and media
11	How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?		Simplicity should be maintained Computer programs should be included

Chapter 4 will present the project description of the training resource consisting of a mix of media and technologies.

Chapter 4

Project description: training resource programme

Contents

4.1 Introduction

This chapter describes the design, development, implementation and evaluation of the training resource programme for cataloguing students. All the components of a mix of media and technologies, except the computer program described in chapter 3, had already been designed and developed as part of Technikon SA's training programmes and were utilised for the specific training of cataloguing students. Special attention will therefore be paid to the utilisation of the components to form an integrated training resource. The focus is on the utilisation of the virtual campus, TSA Co-operative Online Learning (TSA COOL) (previously known as TSA Online).

The goal of this chapter is to report on the investigation of the instructional and motivational effectiveness of a mix of media and technologies for training cataloguing students.

The utilisation of a mix of media and technologies could:

- train cataloguers that better meet the requirements from industry than is currently the case
- meet the requirements set by outcomes-based education
- complement the experiential training component of a cataloguing course
- incorporate the characteristics of the adult learner (specifically the cataloguing student)
- apply the learning theories in the education and training of cataloguers
- address the existing problems and limitations of training cataloguers, especially in distance education

- provide alternative training methods to accommodate different learning preferences
- provide media and technologies to complement the existing printed course material
- provide more opportunities to communicate with the lecturer and fellow students
- provide additional exercises in different formats

The report in this chapter commences by listing the relevant research questions, the aspects of the questions as addressed by the training resource and the means of investigation of each question. This is followed by the research methods used to conduct the research, the needs analysis, design, development, implementation, evaluation and the results pertaining to the resource. Finally, a summary is given, and conclusions and recommendations are proposed.

4.2 Research questions

Research questions 9, 10 and 11 (as set out in Table 1.2 of chapter 1) are addressed by the development of the resource training programme. The aspect addressed by each research question and the means of investigation are summarised in Table 4.1.

Table 4.1: Research questions and aspects addressed by the computer-aided program

NO.	QUESTION	ASPECT	MEANS OF INVESTIGATION
9	What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?	Adaptation of media and technologies for cataloguing course	Questionnaires, observations, interviews, focus group discussions
10	What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?	Advantages and disadvantages as experienced by students	Questionnaires, observations, interviews, focus group discussions
11	How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?		Questionnaires, observations, interviews, focus group discussions

4.3 Research methods

The training resource was developed as a combination of various media and technologies to present the cataloguing course. The research is primarily a qualitative study. Questionnaires, interviews, observations and focus group discussions were used to evaluate students' experience of the resource. Questionnaires were sent to all the students registered for the first registration period of 2000. Students completed the questionnaire after spending some time using the resource. Observations were made and interviews,and focus group discussions were held with students (individually and groups of five to ten students) who could attend contact sessions at Technikon SA's main campus in Florida (Roodepoort, South Africa).

Observation entailed the researcher being present with the students while they worked with the components of the training resource, to record noteworthy incidents and comments.

The interviews and focus group discussions were held to examine the students' response to the training resource.

4.4 Development process

The following phases were addressed during the process:

- Needs analysis phase:
  - Goal analysis
  - Target population analysis
  - Task analysis
  - Content analysis
  - Instructional strategies analysis
  - Media analysis
- Design phase
- Development phase
- Implementation phase
- Summative evaluation phase

The development process is illustrated in the Table 4.2.

Table 4.2: Development process

COMPONENTS	NEEDS ANALYSIS →	GOAL ANALYSIS →	DESIGN →	DEVELOPMENT →	IMPLEMENTATION →	EVALUATION →	REVISION →
SPECIFICS	Syllabus needs Students' needs Lecturers' needs Needs from practice	Target population Learner characteristics Task analysis Content analysis Objectives Learning outcomes Evaluation criteria	Teaching strategy Design of study material Media selection User interface Instructional activities	Integration of media components Preparation of students	Making programme available Monitor Trouble shooting	Students' progress Performance assessment Summative evaluation	
METHODS	Critical analysis of reported research (chap. 2)	Student profile Subject matter specialists Syllabus documents Critical analysis of reported research (chap. 2 & 3);	Research methodology (chap. 1) Design Criteria (chap. 3 & 4)	Chap. 3 & 4	Chap. 3 & 4	Observation Assessment of exercises Questionnaires Interviews Specific case studies (chap.3 & 4)	
PRODUCTS	Needs assessment report	Student profile Content outline Instructional objectives	Flowcharts Instructional archetypes Scripts	Programme documentation Components of training programme	Programme documentation	Programme documentation Formative evaluation report (chap. 3)	Summative evaluation report Recommendations (chap. 4 & 5)
SUMMATIVE EVALUATION							

4.5 Needs analysis phase

During the needs analysis phase attention was paid to the following:

4.5.1 Goal analysis

The goal analysis was discussed in chapter 3 in order to derive a specific goal for the computer program. The goal for the training resource was formulated as follows:

"To enhance training in the knowledge and skills of cataloguing for Library and Information Studies students by means of a training programme of mixed media and technologies that students can use at their own time where it is convenient for them."

4.5.2 Target population analysis

The target population analysis was applicable to the computer program as well as the complete training resource. It was discussed in chapter 3.

4.5.3 Task analysis

The task analysis for the training analysis focused on the cataloguing course as presented at second year level. As indicated in Figure 4.1, the course includes training in description and assigning access points according to the Anglo American Cataloguing Rules (2nd edition, 1988 revision), classification according to the Dewey Decimal Classification system (21st edition) and the assignment of subject headings according to the Sears List of Subject Headings (16th edition).

The broad outcome of the course is formulated as follows:

"To conduct cataloguing, classification and subject heading assignment of printed materials."

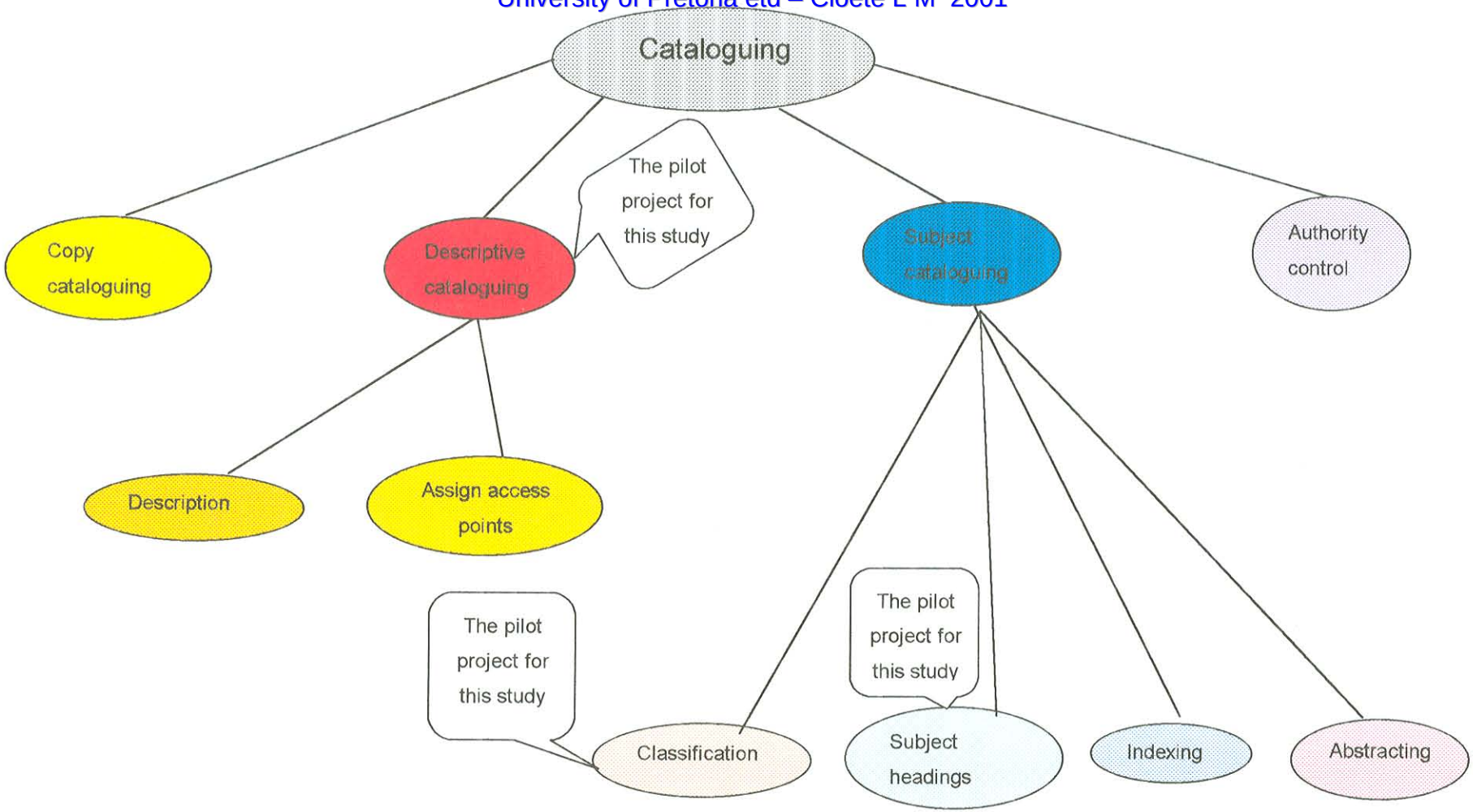


Figure 4.1: The cataloguing process

4.5.4 Content analysis

The content analysis was conducted to determine what the training resource should contain. The study guides contain the tutorial material for the course as well as activities and projects that students have to perform at their workplace under the guidance of a mentor. From the target population analysis and interviews with students it became evident that there was a need for more communication with the lecturer and fellow students. There was also a need for more practice opportunities.

The computer program could be included to provide more practice opportunity. The availability of a virtual campus, namely TSA COOL, could be utilised to facilitate more communication opportunities and provide more practice opportunities.

There are already components of a training resource programme in place. These components are the conventional communication channels (telephone, fax and e-mail), the contact classes and mentor system. Although these components had been implemented, their efficiency had never been evaluated. It was decided to conduct such an evaluation together with the evaluation of the newly introduced components.

The training resource consists of:

- print material (study guides, tutorial letters and prescribed books)
- practical exercises (drill exercises in print format)
- contact classes (presented monthly in Johannesburg and Durban)
- communication channels
- mentor system
- TSA COOL (virtual campus)

- computer program

4.5.5 Instructional strategies analysis

The instructional strategies analysis was conducted for the training resource as a whole and was discussed in chapter 3.

4.5.6 Media analysis

The following media types and technologies (from Table 2.6) were selected (Table 4.3):

Table 4.3: Media types and technologies

MEDIA TYPE	TECHNOLOGIES	USES AND ADVANTAGES	LIMITATIONS
Print-based	Handouts Study text Prescribed and recommended books Written/printed assignments	Easy to read Enables self-paced reading and study Can be re-read	No interaction Time delay in feedback
Visual-based	Diagrams Charts Pictures	Another method to enhance explanation	Can distract and confuse Memory-intensive Can be used for decorative and not functional reasons
Telecommunications-based	Telephone Fax E-mail Internet	Interaction Immediate feedback	Hardware-intensive Communication infrastructure intensive Training in use necessary
Computer-based	Computer-managed instruction Computer-based testing Computer-based instruction Electronic performance support systems	Another method to enhance explanation Interaction possible to some extent	Hardware intensive Communication infrastructure intensive Training in use necessary
Human-based	Lecturer Tutor Mentor Contact classes	Interaction Immediate feedback	Not always available when needed

4.6 Design phase

The design of individual components as well as the training resource as an integrated whole was done.

Contact classes and communication channels had never been designed as such, but are an integrated part of the training process. Their efficiency needed to be evaluated to determine necessary improvements.

The mentor system was already in place and apparently functioning well. It had, however, never been evaluated. The results from the evaluation would indicate whether a revision of the design was necessary.

The computer program was discussed in chapter 3.

TSA COOL had already been designed and implemented for all TSA students. The researcher had to utilise and adapt, as far as possible, the facilities for the cataloguing course.

4.6.1 Design of printed course material

The printed course material was designed in collaboration with the Centre for Courseware Design and Development (CCDD), a division of Technikon SA. The CCDD was established in 1994 to ensure the provision of courseware that takes into account learner profiles. Since the establishment of outcomes-based education and training, the principles underlying OBET have also been incorporated in courseware design. Team members include a project leader, subject expert (lecturer), instructional designer, language practitioner and electronic originator. The courseware includes activities set according to specific

learning objectives, self-assessment exercises, functional graphics and mental models such as concept maps and taxonomies.

4.6.2 Design of the virtual campus (TSA COOL)

A virtual classroom is defined as a "class that exists on the Internet without traditional class meetings. Students retrieve information via a telephone, modem, and computer from anywhere in the world" (French, Ransom & Bett, 1999:134). According to Lazenby (1998:46), a virtual campus "could be described simply as an electronic platform which provides existing institutional services, as well as additional products enabled through particular technology attributes". It is therefore unlimited by geographical location, time or space.

Sites used for distance education typically provide extensive online course content with links to WWW material (Malaga, 2000:293). They usually also provide feedback mechanisms and a wide range of communication technologies such as discussion groups, chat rooms, notice boards and e-mail.

Learning involves the development of new knowledge and understanding through individual assimilation as well as group and peer interaction (Rea et al., 2000:135). Communication is therefore an important component in the learning process. An obvious means to increase convenience of communication among students is the use of in-place technologies. In-place technologies for communication with the lecturer that were already widely used were the telephone and fax facilities.

TSA COOL is combined with the traditional print-based distance education media and could therefore be referred to as a hybrid campus. TSA COOL partially supports a constructivist paradigm in that it encourages collaborative learning. This takes the form of group

activities, a discussion group facility, links to sites with related topics, an e-mail facility to the authors of the site and contact with live subject matter experts. TSA COOL promotes discovery learning in that it has links to other organisations' web sites.

The development of TSA COOL and the extent to which a virtual learning environment facilitates constructivist learning is described by Lazenby (1998).

The design and development of TSA COOL started in 1997. Since 1998 it has been refined and most of the courses offered at TSA can be facilitated with TSA COOL. However, there is generally still reluctance amongst academics to embrace these facilities at their disposal, for the following reasons:

- They believe their students do not have access to the Internet and therefore cannot benefit from TSA COOL.
- It is considered extra work added to an already heavy workload.

The researcher believes that the facilities available on TSA COOL can greatly contribute to a training resource programme for cataloguing students. They are therefore included in the programme.

The Integrated Technology Centre (ITC) of TSA is responsible for the design, development, implementation and maintenance of TSA COOL. A number of essential issues that have to be addressed during the design and update of TSA COOL are the following:

- During the design the different interfaces and infrastructures that the students may have, must be taken into account.
- Different browsers are used, for example Internet Explorer and Netscape Navigator. Of those, different versions with variant capabilities are used.

- Different e-mail programs are used. It is therefore important not to give instructions that are program-specific.
- Different computers, namely the IBM PC-compatibles and the Apple Macintosh computers, could be used. Instructions for each type of computer should be given where it is anticipated that both types are being used by students.
- Screen sizes vary. The content should be designed to accommodate the smallest or most common screen size that students will use.
- Different operating systems must be taken into account. The content must be generic so that the instructions could be followed on any operating system. Instructions must not be specific to the operating system.
- Different Internet connections are used with variable speeds, for example a 28.8k Baud modem that a student may use at home is much slower than a direct connection at larger institutions. The loading time of graphics, sound and video clips will be so slow that it will discourage the learners from using the Internet.
- Different Internet service providers (ISPs) provide a variety of services, availability, response time and costs. For example, some students may have to pay by the minute and therefore content should be designed so that large parts can be downloaded at a time and worked in offline mode. Students then only have to go online if they are ready with a response or to continue with the next section of work.
- Students should be provided with support in the form of instructions and guidelines on how to use and benefit from the online learning, for example, guidelines on e-mail etiquette and the use of the discussion group facility.

4.7 Development phase

The development phase focuses on the development of TSA COOL, since the other components for the training resource had already been developed.

TSA COOL was designed and developed to accommodate all the students and courses offered by the Technikon. It is therefore not possible to design a virtual campus for specific courses. Lecturers are encouraged to utilise and adapt the facilities on TSA COOL to best meet the needs of their students. The development phase of this component of the resource training programme therefore focuses on the utilisation of TSA COOL for training cataloguing students.

The following screen captures illustrate the utilisation of the facilities of TSA COOL for cataloguing students.

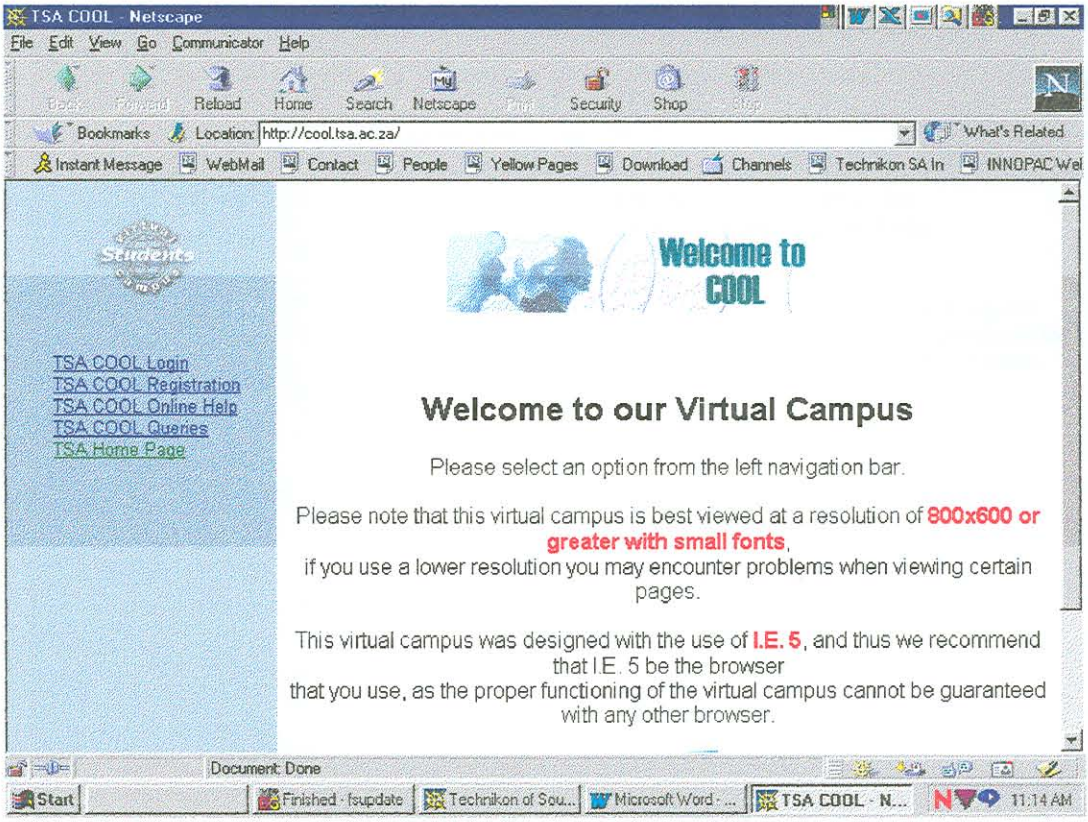


Figure 4.2: TSA COOL welcome screen

When students wish to use TSA COOL for the first time, they select TSA COOL Registration. They fill in a short form providing their student number (which becomes their login name) and choose their own password. After registration, they can log in.

The welcome screen advises users of the appropriate resolution settings and browser selection.

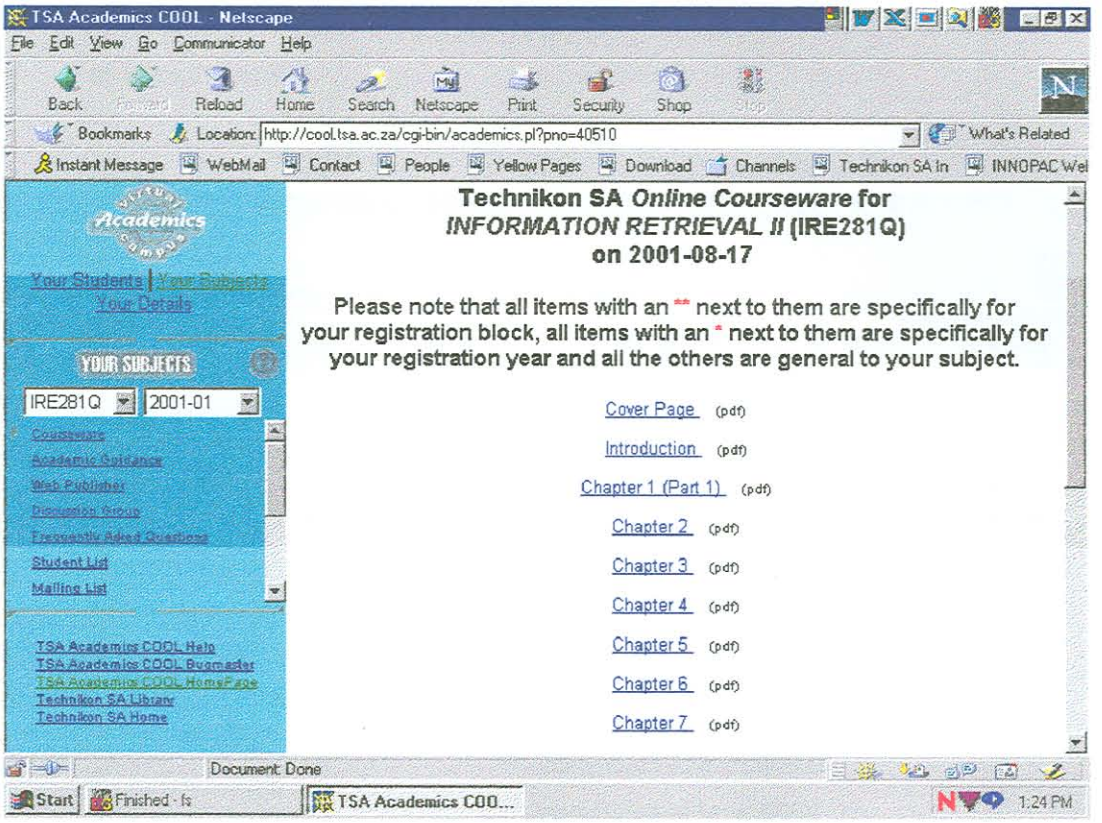


Figure 4.3: Electronic course material

In this area students find a page that will link them to electronic versions of the study guides they receive in the post. The electronic courseware is available in two formats, either HTML or PDF. The latter requires the Acrobat Reader to view the material. At present the course material can either be downloaded on the student's computer or printed. This delivery mode is passive since it is a replacement of printed course material (Nguyen & Kira, 2000:24). No form of interactivity within the course material is therefore possible. The major advantage of the availability of electronic course material is that students are able to access it easily without having to rely on the postal system. In the past an alarming large number of students never received their course material through the postal system. This resulted

in material being re-mailed at high costs and delays in the submission of assignments.

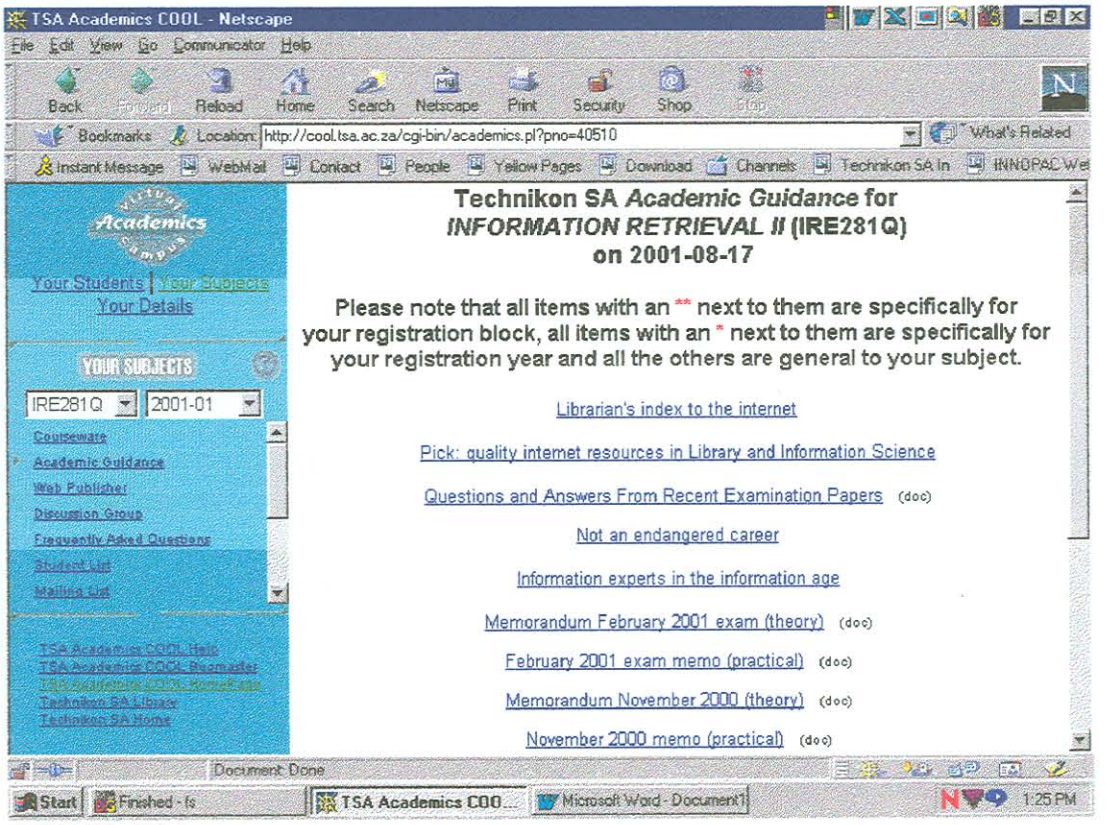


Figure 4.4: Academic guidance

By using the academic guidance facility, class announcements, tutorial letters, solutions to assignments, previous examination papers with memoranda and links to articles, etc., are made available. The material is simply converted into HTML or PDF format or a link is given to a MSWord document. Links to other related Internet resources are posted in a similar way on the academic guidance web page. Posting and uploading is done by using the Web Publisher facility.

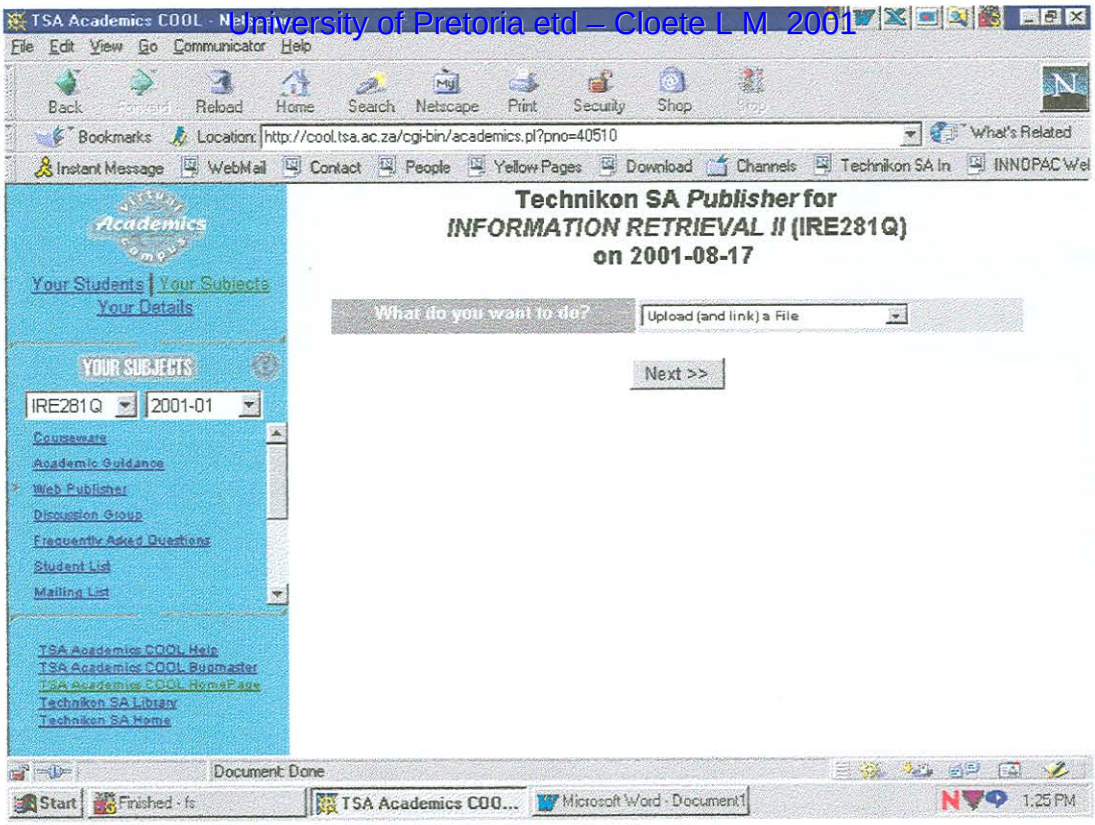


Figure 4.5: Web Publisher facility

The information can be viewed with an Internet browser or reader, downloaded and printed by students.

Web-based teaching can be made interactive in an attempt to encourage active learning since the Web's greatest intrinsic power is that it encourages branched, non-linear instruction (Brooks, 1997:28). Students can move around between materials created by the lecturer as well as materials created by others.

The content on these pages is supplied solely by the lecturer and it is up to the lecturer to encourage students to use this facility. Students need little encouragement to look at previous examination papers. They are encouraged to visit links to other related Internet resources. They are requested to post their comments on the information found at these links to the discussion group. Students receive bonus marks for their practical projects when they participate in these discussions.

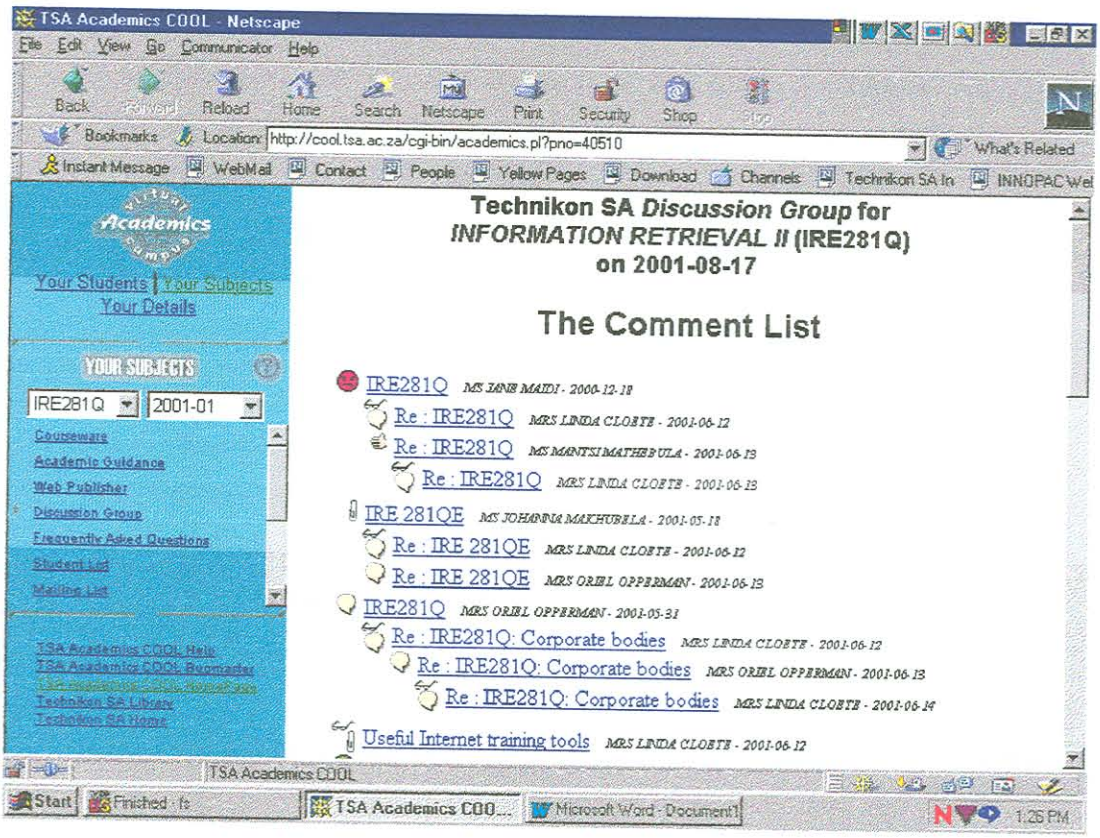


Figure 4.6: Discussion group facility

The discussion groups are there to enable interaction between the students, fellow students and their lecturers. They are in many ways the life and soul of this virtual campus.

Asynchronous communication technologies such as discussion groups enhance a class by providing a discussion medium for students who find it difficult to have contact with each other in a group.

Students should use discussion groups whenever they have a question to ask or a suggestion to make. The lecturers also have access to these discussion groups and also participate.

On entry into the discussion group, there is a list of various messages which have been posted. Each of these messages has a title, who posted it, the date the person posted it and an icon representing the type of message.

There is a list of the various icons and their meanings at the bottom of the discussion group page. Each message that has been posted by a lecturer will have a pair of glasses next to the normal icon.

The discussion group facility currently only allows for text-based interaction. The discussion group has to be checked periodically by the lecturer and students to see if there are new postings. The group focuses on presenting a topic or problem and generating a discussion around it.

Students are encouraged to use this facility, especially to communicate with one another. They should realise that they are no longer in isolation from one another, but instead can learn from (and support) one another by sharing information, ideas and techniques.

When students were first made aware of the discussion group facility, there was very little response. Students had to be reminded and encouraged via e-mail and tutorial letters to use it. Once one student started posting messages, other students began to respond and pose new issues.

At the time of writing this report, students were asking questions about and discussing the interpretation of certain AACR2R rules. The lecturer corrected any misinterpretation of the rules. Students were also organising additional group discussion classes among themselves. The lecturer got involved by offering to organise the venue for additional classes, but left it up to the students to decide on dates and times. The

students also used the discussion group to encourage each other before the examinations.

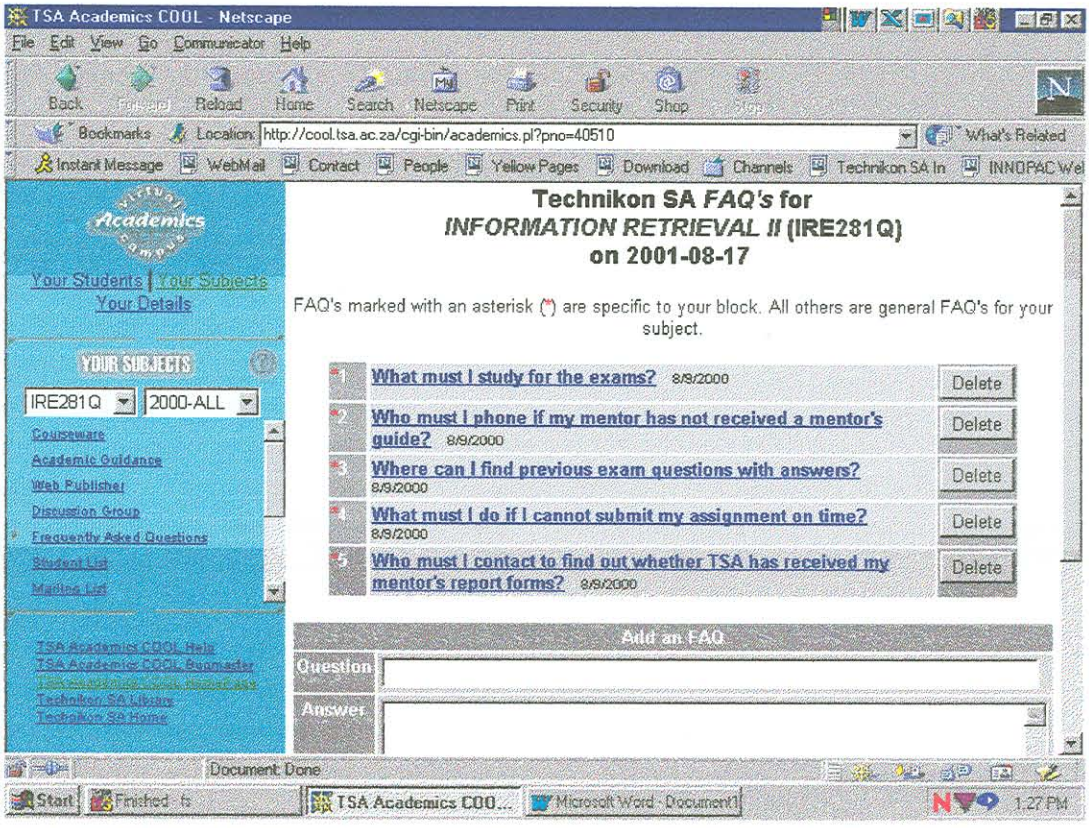


Figure 4.7: Frequently asked questions

The lecturer posts any frequently asked questions (FAQs) in this space. The FAQs act as a timesaver. Instead of having to respond to the same questions several times over, the lecturer types the answers, which are immediately available to the students. By the same token, students do not have to be at the mercy of telephone messages and the like to find answers to their questions. The FAQs for the cataloguing course were compiled from records kept by the lecturer of all the telephone and e-mailed questions received from students.

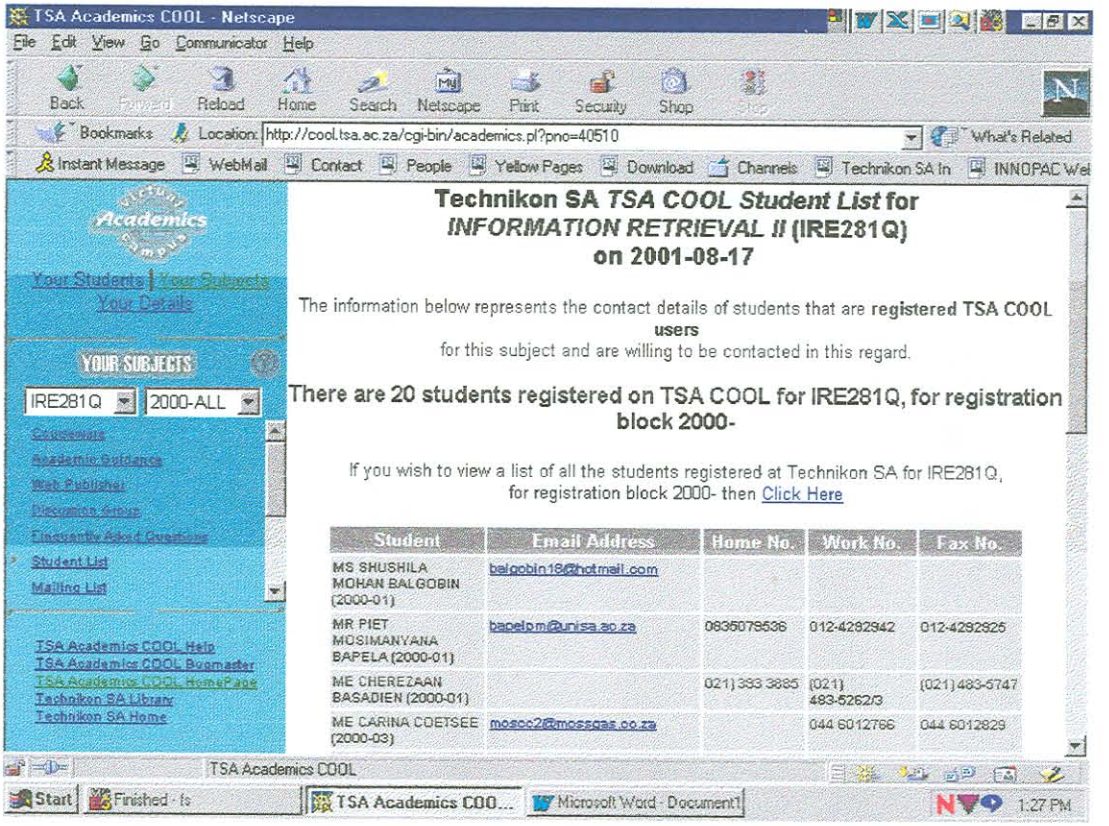


Figure 4.8: Student list

The student list facility provides a list of names with contact numbers and e-mail addresses of all the students registered on TSA COOL for a subject.

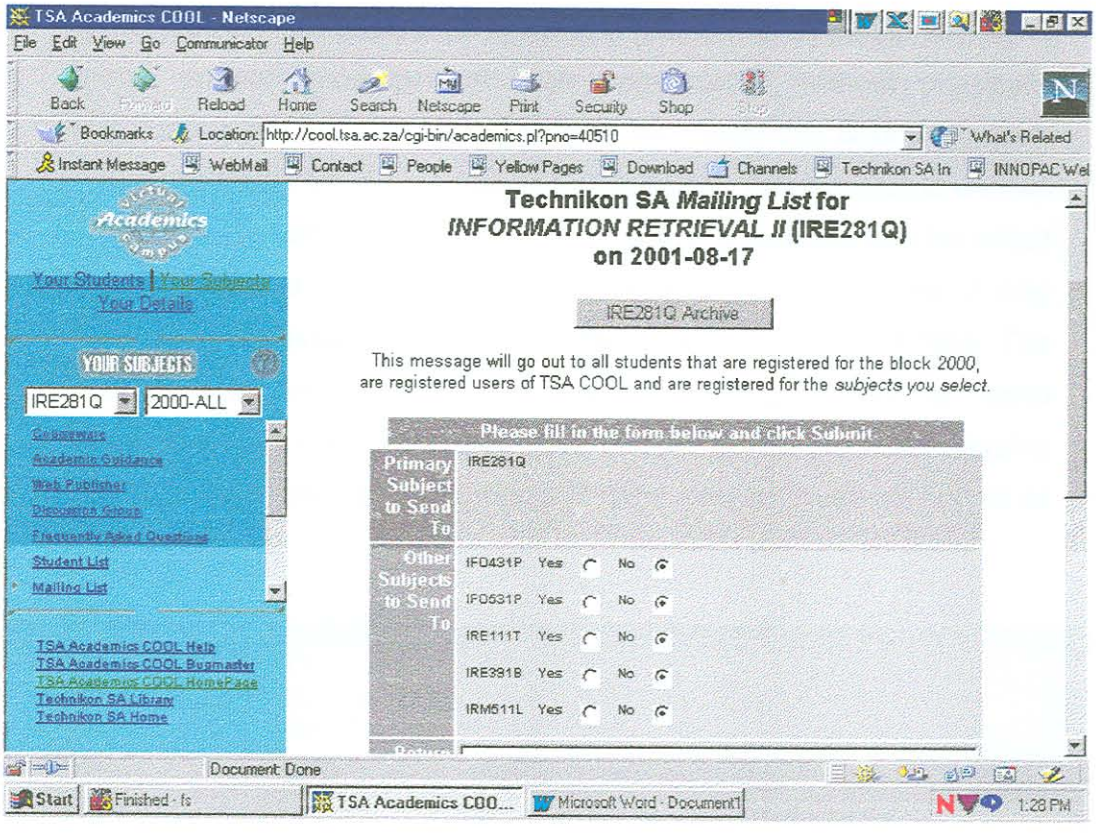


Figure 4.9: Mailing list

The mailing list enables the lecturer to send messages to all the students who have provided e-mail addresses. This serves as a listserv. It is possible to send a message (of a general nature) to the students of all the subjects for which the lecturer is responsible. Interactivity is also supported by a listserv where everyone on the list receives all the messages. Responses to a message can lead to a discussion on a topic among the participants.

Interaction through e-mail is possible by sending and receiving messages. E-mail is becoming the principal tool for maintaining interactions between students and lecturers in the distance education environment. There is often a delay in e-mail and this should be taken into account during the design. E-mail can be sent between the lecturer and some or all of the students, as well as among the students

themselves. The advantage of using e-mail is that all parties can send and answer messages at their convenience without physically disturbing one another, as is the case with telephone calls (Nguyen & Kira, 2000:23). Electronic files can be attached. Attachments to e-mails may include text, graphics, sound and video. Messages can be edited and forwarded. If one or more parties delay their response, it may result in necessary feedback not being received in good time. The cataloguing students are increasingly using e-mail to send assignments. The assignments are marked in the electronic version and e-mailed back to the students with the relevant follow-up tutorial as an attachment.

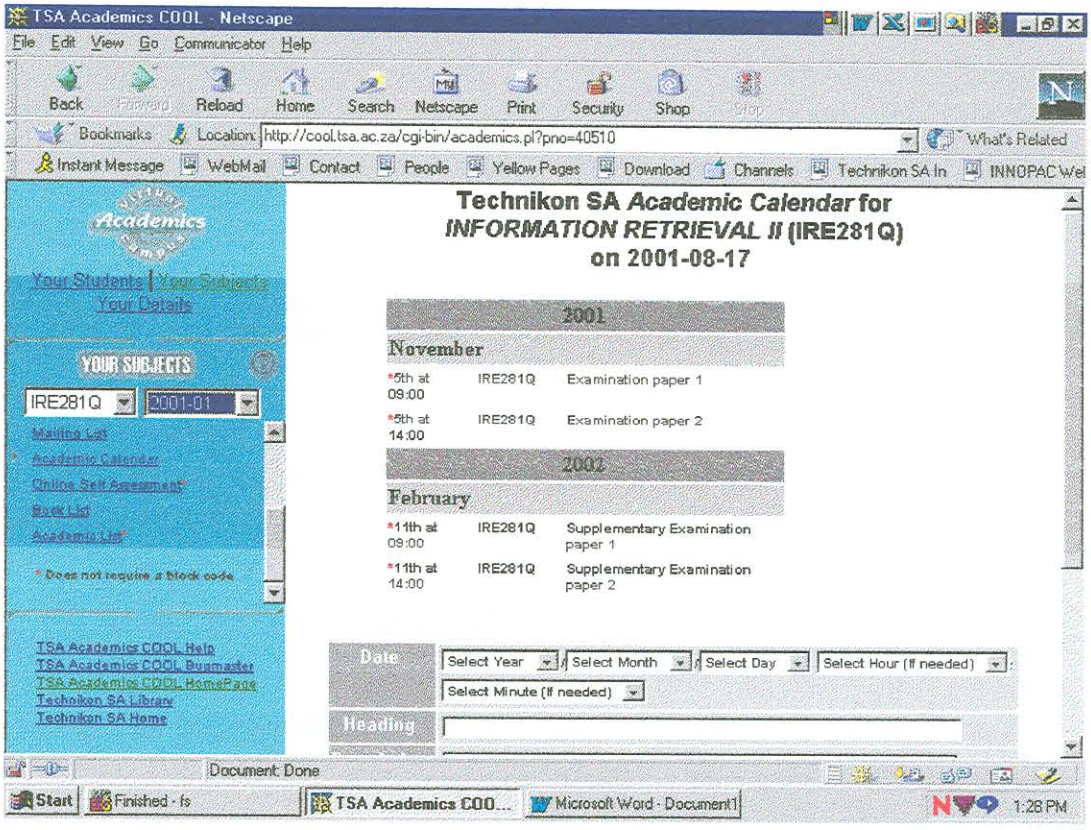


Figure 4.10: Academic calendar

The academic calendar provides all the important dates relevant to the course. Dates include examination dates loaded by the examination

department, as well as any other due dates or dates of group discussion classes added by the lecturer.

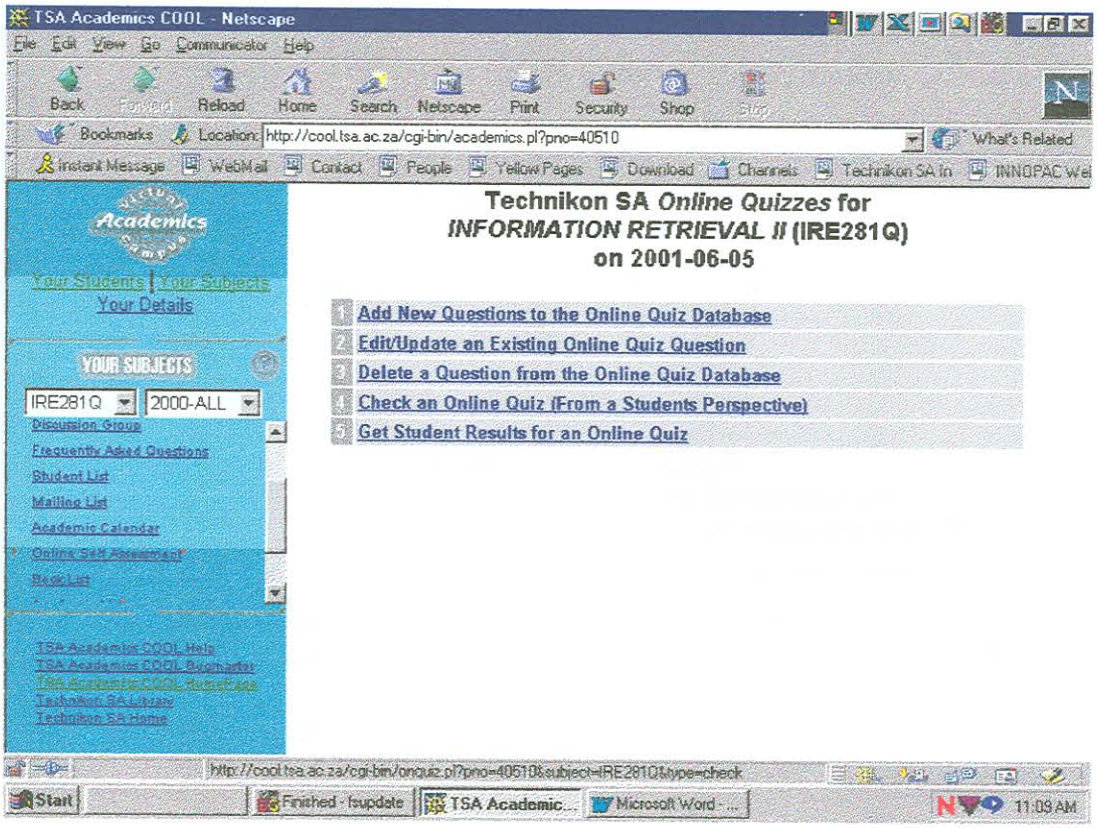


Figure 4.11: Online self-assessment

This facility provides students with online quizzes. The questions are related to specific chapters of their printed course material.

They first have to select which chapter they wish to test themselves on, then answer the multiple-choice questions that appear. Their attempt will then be marked and a report is generated. The result is also logged to the database for the lecturer's use. Although the result is logged, students can attempt these online quizzes as many times as they want, as the quizzes are randomised.

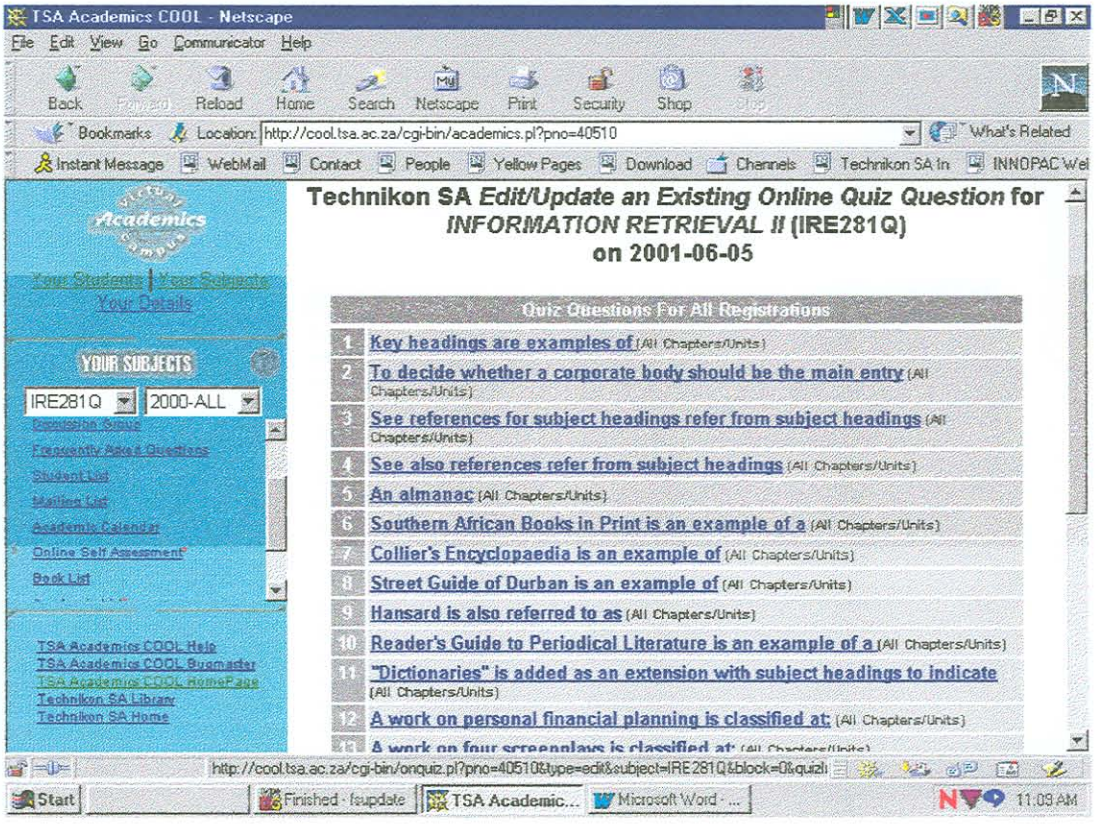


Figure 4.12: Example of self-assessment questions

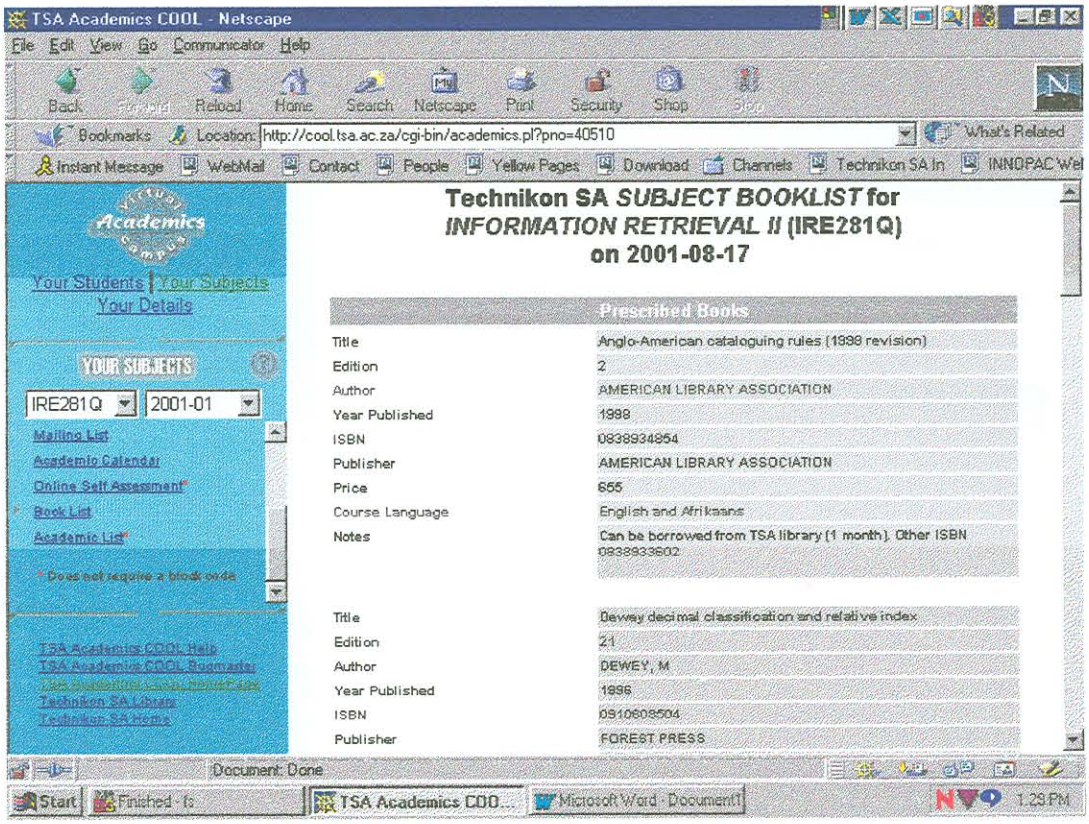


Figure 4.13: Book list

The book list provides all the details of prescribed and recommended books for the course, as well as where they can be obtained.

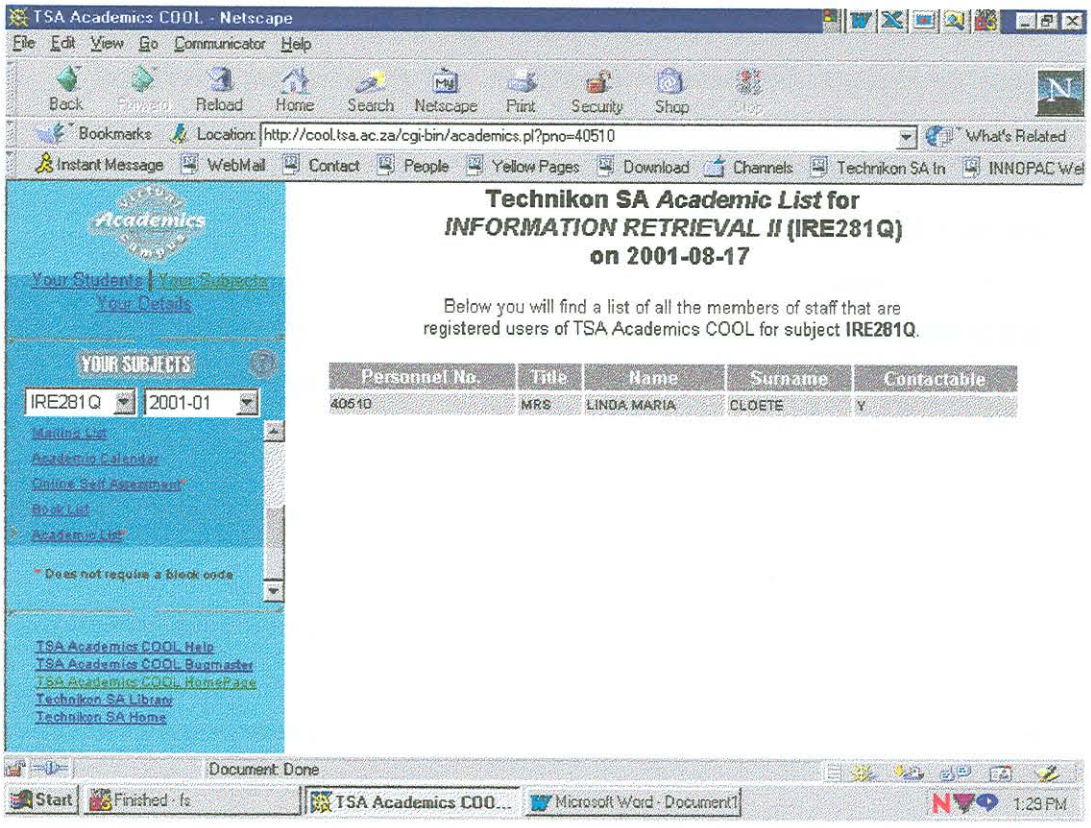


Figure 4.14: Academic information

The academic information provides the details of the lecturer.

The development of TSA COOL provided the technologies and additional communication channels for communication among students, namely e-mail and online discussion groups. E-mail and discussion groups also provided another means of communication with the lecturer. Students can now attach work, ask questions and provide comments. The major disadvantage of this asynchronous communication is that the student does not receive immediate feedback. During a synchronous communication session such as an office visit or telephone conversation, a question can be answered within five minutes. A number of hours or even days can pass before such a question is addressed via e-mail. The reason for this is that the lecturer often does not have time, owing to other obligations, to read

and address all the e-mail received on one day. There is thus additional pressure on the lecturer and even the student to reply immediately to e-mail (Rea et al., 2000:141).

Other forms of interaction such as interactive web pages and chat are currently not available on the virtual campus. These are more advanced forms of interaction. Depending on students' response to the existing facilities, the other facilities will be designed at a later stage.

4.8 Implementation phase

The training resource was implemented as follows:

- Printed study material was posted to the students registered for the first registration period.
- In the printed material students were informed about the mentor system, communication facilities (e-mail, fax and telephone numbers) and TSA COOL. They were encouraged to use these facilities regularly.
- They received the computer program (CD-ROM) when they started on the classification module of the course.

During this period students also had the opportunity to discuss the training resource with the lecturer (researcher) and fellow students via telephone, fax, e-mail and the discussion group facility on TSA COOL. All the comments and questions were noted. During a contact session at the main campus personal interviews and focus group discussions were held with the students. The information gathered was then organised to be used in conjunction with the questionnaires for the summative evaluation phase.

4.9 Summative evaluation phase

Summative evaluation is defined as "testing the effectiveness of the training program along predetermined criteria" (Lee & Mamone, 1995:272).

The focus of summative evaluation is to break new ground (Laurillard, 1994:291), differentiate between new training approaches, methods, techniques and technologies from other methods and define what unique contributions can be made.

Evaluation should ask whether whatever is being evaluated, is an appropriate use of technology (Folkers, 1994:310).

The purpose of summative evaluation is not to prove that students learn cataloguing better by doing it with different media and technologies. As Beattie (1994:56) points out, research has shown that the method of delivery does not affect learning. The same content could be delivered by any equivalent teaching methods. She, however, rightly states that research has also indicated that factors such as student control and self-pacing of learning benefit by computer-based instruction. The purpose of summative evaluation is to define what alternative media can offer in training rather than to demonstrate whether alternative media and technologies are better for training than traditional methods (Laurillard, 1994:291).

The needs analysis carried out actually performed a summative evaluation function. The training problem and needs were established. It was then determined how to correct the problem and the methodology for delivering the solution was developed.

The summative evaluation is therefore carried out when the programme is used in learning (Folkers, 1994:310).

The purpose of summative evaluation is to judge the effectiveness of the training.

The difference between formative evaluation and summative evaluation lies primarily in the scopes of the two techniques (Laurillard, 1994:292). Formative evaluation is used during the design and development of the programme in order to improve the design. Once the design is satisfactory, summative evaluation can be used to decide whether the programme contributes something new or unique. Through summative evaluation the researcher wishes to demonstrate what the best training course could be and what its potential uses are once it has been proven effective.

A questionnaire was designed to serve as a summative evaluation of a mix of media and technology training in cataloguing. (annexure C). Students' experiences of the following were determined:

- The cataloguing course in general
- The utilisation of printed study material
- Print-based practical exercises
- Electronic practical exercises
- Contact classes
- The mentor system
- E-mail communication
- TSA COOL
- A combination of the media and technologies

The same methods used for the formative evaluation of the computer program (discussed in chapter 3) were used to conduct the summative evaluation:

- Observations
- Interviews and formal discussions

- Focus groups
- Student questionnaires

4.10 Results

Only a few students had difficulty in using and accessing TSA COOL facilities. This low figure was surprising since the majority of students had never used online facilities or multimedia in their studies before. Difficulties were mainly due to incorrect personal computer settings and the network, which was "down" from time to time. These difficulties were quickly resolved when the students contacted their lecturer, tutor or the network administrator.

Detailed findings are provided in annexure F.

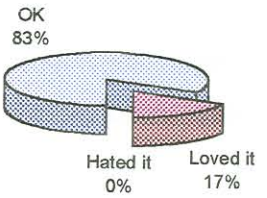
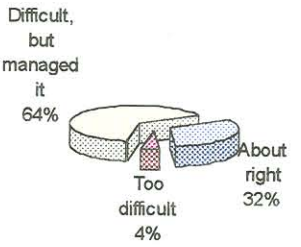
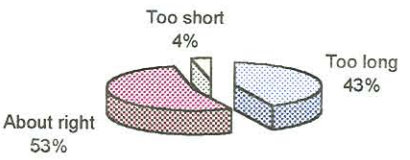
4.10.1 How did students find the cataloguing course in general?

Informal discussions with students and comments from students have created the impression that students consider the cataloguing course as the most difficult and time-consuming component of their training in Library and Information Studies. The researcher wanted to determine more formally how students experienced the course.

The following aspects were evaluated:

- How students liked the course
- How students experienced the difficulty of the course
- How students experienced the length of the course

Table 4.4: Experience of the cataloguing course in general

Aspect	Finding
How did students like cataloguing?	
How did students experience the difficulty of the cataloguing course?	
How did students experience the length of the cataloguing course?	

It is encouraging that the majority of students reacted positively to the course and managed it. A significant number of respondents found the course too long. However, owing to the nature of the course it is not possible to shorten it. The complete course has been spread over three years from introductory level (first year) to advanced level (third year).

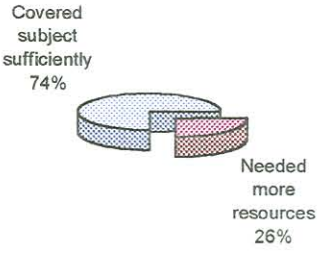
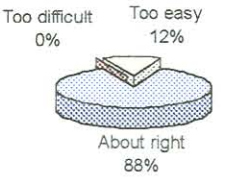
4.10.2 How did students experience the printed material?

Students are familiar with the printed course material, but have never had the opportunity to indicate how they experience it. Since printed course material forms an important part of the training resource programme, students' evaluation of it is considered important.

The following aspects were evaluated:

- Whether students believed that the printed material covered the course sufficiently or whether they felt that they needed more resources
- How students experienced the difficulty of the printed material

Table 4.5: Experience of printed material

Aspect	Finding
Did students believe that the printed material covered the course sufficiently or did they feel that they needed more resources?	
How did students experience the difficulty of the printed material?	

The respondents reacted positively to the printed material. A concern is, however, the fact that during interviews and informal discussions the majority of students admitted that they did not work through the printed study material. Possible solutions should be investigated further.

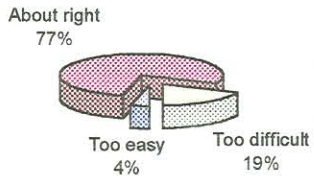
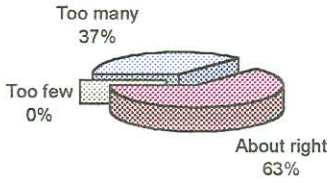
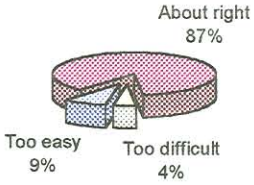
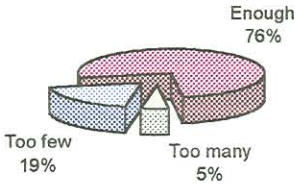
4.10.3 How did students experience the practical exercises related to the course?

Practical application is an essential aspect of the cataloguing course. Practical exercises, projects and learning activities are provided in the printed course material and computer program. Students' evaluation of them was regarded as essential in order to determine how the practical component could be improved in the future.

The following aspects were evaluated:

- How students experienced the difficulty of the practical exercises in the study guide and written assignments
- How students experienced the number of exercises in the study guide and written assignments
- How students experienced the difficulty of the practical exercises in the computer program
- How students experienced the number of exercises n the computer program

Table 4.6: Experience of practical exercises related to the course

Aspect	Finding
How did students experience the difficulty of the practical exercises in the study guide and written assignments?	
How did students experience the number of exercises in the study guide and written assignments?	
How did students experience the difficulty of the practical exercises on the CD-ROM?	
How did students experience the number of exercises on the CD-ROM?	

Generally the response to the practical exercises in both media (printed material and the CD-ROM) was positive.

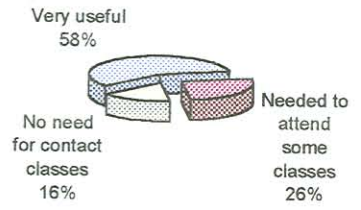
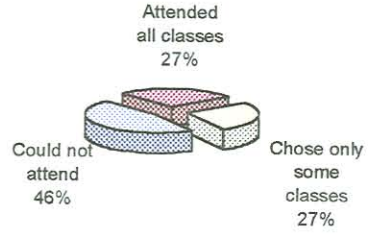
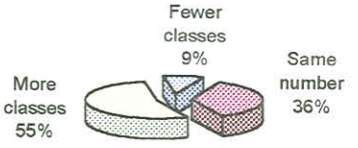
4.10.4 How did students experience the contact classes?

Contact or group discussion classes are held in Johannesburg and Durban (since the majority of students are in those areas). Students' requests have resulted in more classes being presented each year. The presentation of these classes has costs implications. It was therefore necessary to evaluate the classes as part of the training resource programme.

The following aspects were evaluated:

- How students experienced the availability of contact classes
- How many contact classes students attended
- How students felt about the number of contact classes that should be presented in the future

Table 4.7: Experience of contact classes

Aspect	Finding
How did students experience the availability of contact classes?	
How many contact classes did students attend?	
How did students feel about the number of contact classes that should be presented in the future?	

All the students who had been interviewed indicated that they needed contact classes. They do experience problems with transport and they cannot always attend classes since they also have to work over weekends. The poor attendance of classes is a concern. Some students admitted that they did not diarise classes or simply forgot about them.

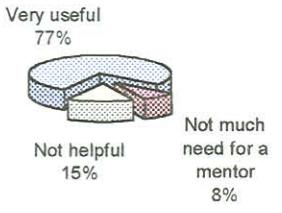
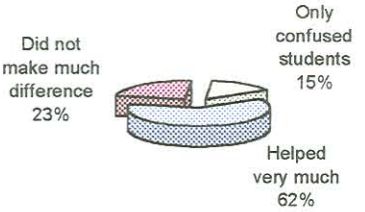
4.10.5 How did students experience the mentor system?

The mentor system has always been an important component of the experiential learning in Library and Information Studies. It has never been evaluated before and the researcher believes that is important to determine how the mentor system, as part of the training resource programme, contributes to the cataloguing course.

The following aspects were evaluated:

- How useful students found the mentor system
- How the direct interaction with a mentor helped students with their understanding of the course

Table 4.8: Experience of mentor system

Aspect	Finding
How useful did students find the mentor system?	
How did the direct interaction with a mentor help students with their understanding of the course?	

The mentor system is greatly appreciated by the students. However, it is not always possible to find a mentor who is a practising cataloguer. Some students felt that the mentors only confused them since they had a different opinion on some aspects of the subject. Mentors complained that students demanded a lot of their time and sometimes expected them to do their assignments for them. The administration of the mentor system is also very demanding.

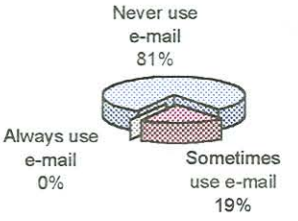
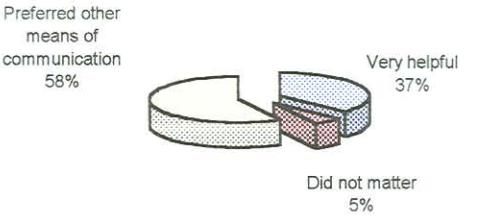
4.10.6 How did students experience e-mail communication?

Although facilities on the Internet, including e-mail as a communication channel, have been available to the students for about four years, it is the researcher's experience that only a small number of students use them. It was therefore necessary to determine how students experienced the facility as part of a training resource programme.

The following aspects were evaluated:

- How students used e-mail to communicate subject issues with the lecturer and fellow students
- How useful students found e-mail communication

Table 4.9: Experience of e-mail communication

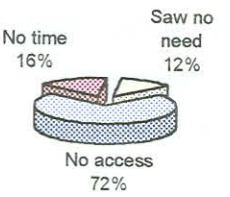
Aspect	Finding
How did students use e-mail to communicate subject issues with the lecturer and fellow students?	
How useful did students find e-mail communication?	

Only a few students communicate via e-mail. The majority prefer to use telephone calls, faxes and letters through the mail. Reasons for this given by the students were that they did not have e-mail facilities or that they were not allowed to use the e-mail at their places of work for private or study-related issues. They were, however, allowed to use the telephone and fax facilities for these issues (more costly). Those students who did use e-mail were pleasantly surprised at the quick responses and the fact that their documents did not get lost as is often the case with mailed material. It is necessary to educate students as well as their employers in the use and advantages of e-mail.

4.10.7 How did students experience the facilities on TSA COOL?

The question was phrased from a negative perspective ("why not" and not: "why do they use ...") since it was already clear from informal discussions with students that many did not make use of TSA COOL for different reasons. It was therefore necessary to determine what those reasons were in order to eliminate them in future.

Table 4.10: Experience of TSA COOL

Aspect	Finding
Why did students not use TSA COOL facilities?	

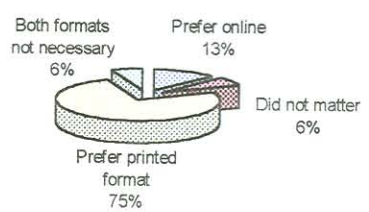
The availability of the virtual campus was widely promoted at the main campus as well as regional offices, but has not been used much by students. The reasons for not accessing the virtual campus were very much the same as for the non-use of e-mail. Although students were informed about the possibilities from where the Internet could be accessed, only a few used them. The general belief among the students was that if they do not have access at home or work, they do not have access at all. Students also indicated that they did not know how to access it and rather asked friends to do so on their behalf. Print-outs of relevant material would then be made. When it became clear that students were reluctant to access the virtual campus, questions and answers from previous examination papers were made available

on this site to attract students. The result was that many more students then wanted to access the virtual campus and did so. The same happened when their examination results became available on the virtual campus. When students accessed the facility for this information, they became aware of all the other facilities that had been made available and indicated that they were pleasantly surprised by it all. It therefore seems that initially it will be necessary to provide some attraction for students in order to persuade them to make use of all the online training facilities.

4.10.8 How did students experience online course material?

All the printed course material is also made available on the virtual campus and can be downloaded in PDF format. Since every student receives a set of printed study material after registration, there is no real need to download the material from the virtual campus.

Table 4.11: Experience of online course material

Aspect	Finding
Did students prefer to have their study guides and tutorial letters available online?	

The online availability of printed course material is only useful in cases where students lose their printed material (often the case with tutorial letters). Instead of requesting new material, paying for it and waiting

some time before eventually receiving it, students can download it immediately.

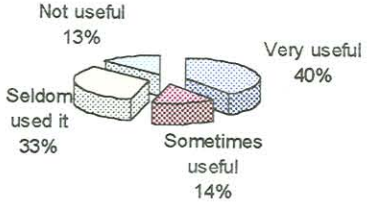
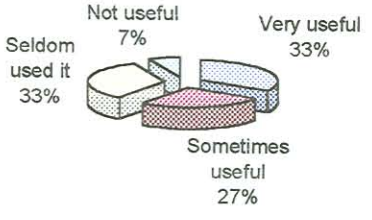
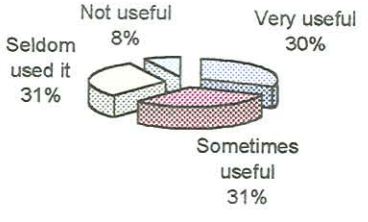
The other facilities on TSA COOL provide new, additional training opportunities for cataloguing students and it is important to determine students' response to those facilities as presented in the following sections.

4.10.9 How did students experience the academic guidance?

The following aspects were evaluated:

- How useful students found the academic guidance
- How useful students found the interactive exercises
- How useful students found the links to web sites of interest

Table 4.12: Experience of academic guidance

Aspect	Finding
How useful did students find the academic guidance (which includes interactive exercises, links to web sites, etc.)?	
How useful did students find the interactive exercises?	
How useful did students find the links to web sites of interest?	

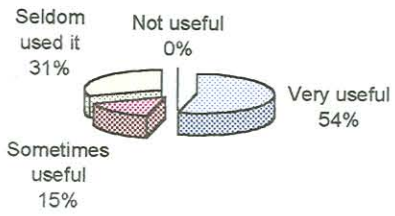
Since about a third of the respondents seldom used the academic guidance, there is a need to bring this particular facility to their attention. It provides them with additional training material as well as

more drill and practice exercises (already identified under research question 7 as a need).

4.10.10 How did students experience the online self-assessment?

The randomised online quizzes provide another opportunity for students to test their knowledge of the course and practise cataloguing. Students' experience of the facility had to be determined to decide whether it should be expanded.

Table 4.13: Experience of online self-assessment

Aspect	Finding
How useful did students find the online self-assessment?	

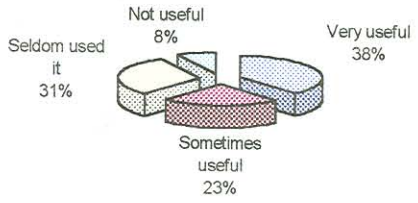
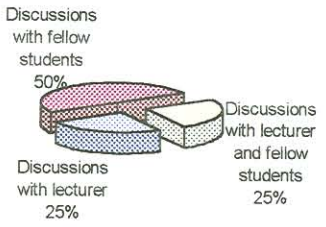
Since about a third of the respondents seldom used the online self-assessment, there is a need to bring this particular facility to their attention. It provides them with additional training material as well as more drill and practice exercises (already identified under research question 7 as a need).

4.10.11 How did students experience the online discussion groups?

The following aspects were evaluated:

- How useful students found the online discussion groups
- Main reasons why students used the online discussion groups

Table 4.14: Experience of online discussion group

Aspect	Finding
How useful did students find the online discussion groups?	
What were the main reasons why students used the online discussion groups?	

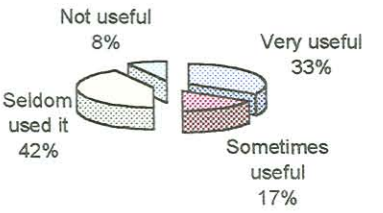
About a third of the respondents seldom used the facility. Again, it is necessary to promote this facility to the students. It provides an opportunity for them to communicate with each other as well as the lecturer about subject-related issues. From the requests that are

received from students to provide them with contact details of fellow students, it is clear that there is need for this communication forum.

4.10.12 How did students experience the frequently asked questions (FAQs)?

Since the FAQs provide answers to the questions students often ask, it was important to determine whether students used the facility and found it useful.

Table 4.15: Experience of FAQs

Aspect	Finding
How useful did students find the FAQs?	

This facility addresses many of the questions that students often phone about. Again, more than a third of the respondents indicated that they did not use this facility and it should therefore be promoted more.

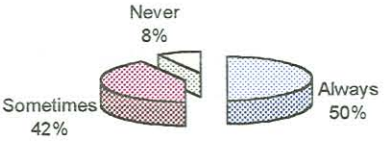
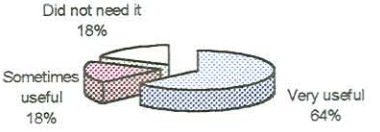
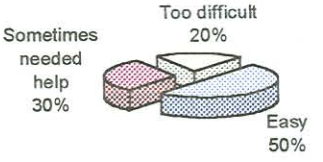
4.10.13 What were students' general reactions to TSA COOL facilities?

The following aspects were evaluated:

- Whether students would use TSA COOL facilities again in the future

- How useful students found the availability of online facilities as additional instructional methods for the cataloguing course
- How difficult students found the online facilities to use

Table 4.16: Students' general reactions to TSA COOL

Aspect	Finding
Would students use TSA COOL facilities again in the future?	
How useful did students find the availability of online facilities as additional instructional methods for the cataloguing course?	
How difficult did students find the online facilities to use?	

At first students only wanted to access the virtual campus for help in preparing for examinations and getting examination results. Once they

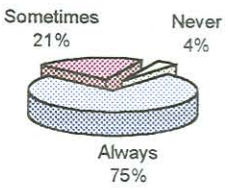
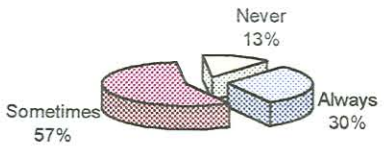
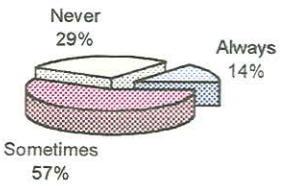
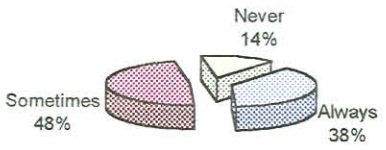
had become aware of the other facilities, they reacted positively to TSA COOL and indicated that they found it very useful and would use it again.

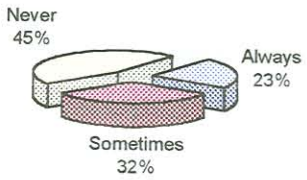
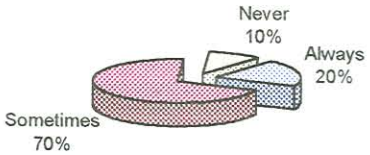
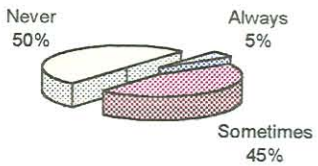
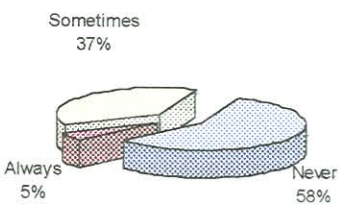
4.10.14 How did students experience a combination of a mix of media and technologies?

The following aspects were evaluated:

- Whether students preferred to use only the printed study guide, tutorial letters and prescribed books
- Whether students also used other reference sources in printed and electronic form
- Whether students also used e-mail, telephone and fax communication with their lecturer and other students
- Whether students also relied a lot on their mentor for help
- Whether students also attended the contact classes
- Whether students also used the computer program for classification training
- Whether students also used the computer program, e-mail and TSA COOL
- Whether students also used the computer program, e-mail, TSA COOL and attended contact classes

Table 4.17: Experience of a combination of media and technologies

Aspect	Finding
Did students prefer to only use the printed study guide, tutorial letters and prescribed books?	
Did students also use other reference sources in printed and electronic form?	
Did students also use e-mail, telephone and fax communication with their lecturer and other students?	
Did students also rely a lot on their mentor for help?	

Aspect	Finding
Did students also attend the contact classes?	
Did students also use the computer program for classification training?	
Did students also use the computer program, e-mail and TSA COOL?	
Did students also use the computer program, e-mail, TSA COOL and attended contact classes?	

It was clear that students showed a high preference for printed materials, the mentor system, contact classes and direct

communication with the lecturer. They enjoyed experimenting with the new media.

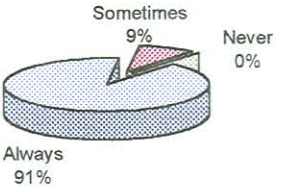
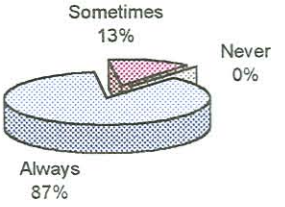
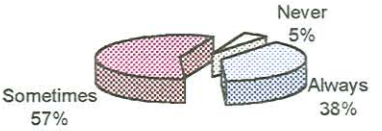
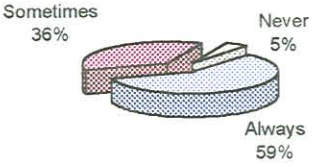
4.10.15 Which of the following media and technologies would students use in future again?

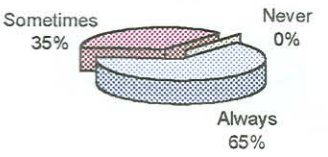
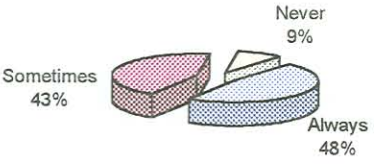
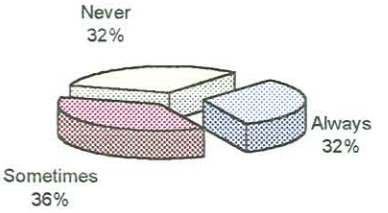
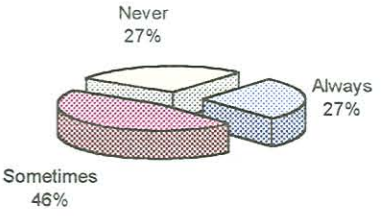
The researcher had to determine which of the media and technologies students preferred in order to expand those technologies. The media and technologies not preferred should be revisited to determine why students do not want to use them in the future and how improvements could be made.

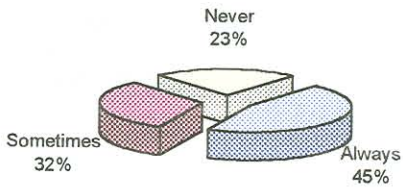
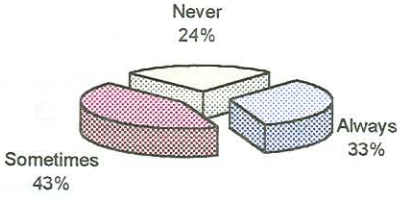
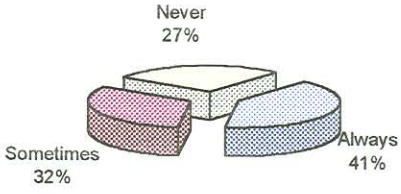
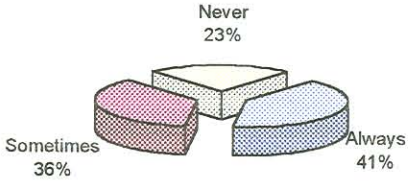
The following aspects were evaluated:

- Whether students would use printed material again
- Whether students would use printed practical exercises again
- Whether students would use practical exercises in the computer program again
- Whether students would make use of contact classes again
- Whether students would use the mentor system again
- Whether students would use telephone and fax facilities again
- Whether students would use e-mail again
- Whether students would use online discussion groups again
- Whether students would use online study guides and tutorial letters again
- Whether students would use online academic guidance again
- Whether students would use online self-assessment again
- Whether students would use FAQs again

Table 4.18: Future use of media and technologies

Aspect	Finding
Would students use printed material again?	
Would students use printed practical exercises again?	
Would students use practical exercises in the computer program again?	
Would students make use of contact classes again?	

Aspect	Finding
Would students use the mentor system again?	
Would students use telephone and fax facilities again?	
Would students use e-mail again?	
Would students use online discussion groups again?	

Aspect	Finding
Would students use online study guides and tutorial letters again?	
Would students use online academic guidance again?	
Would students use online self-assessment again?	
Would students use FAQs again?	

Students would like to use all the training facilities again. The well established media and technologies with which they are more familiar,

such as printed course material, the mentor system, faxes, telephones and direct personal communication and contact classes, are the most preferred components. The other media and technologies such as the computer program and virtual campus are not as popular yet.

During the interviews and discussions students indicated the following as reasons why they would not always make use of all the facilities:

- Time constraints: The nature of the cataloguing course meant that the course itself took up a lot of their time. There was not always enough time to use all the training facilities.
- Access: Not all the students had access to all the facilities.

These issues need to be investigated further to determine how students could benefit more from all the media and technologies in the resource training programme.

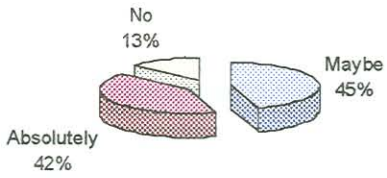
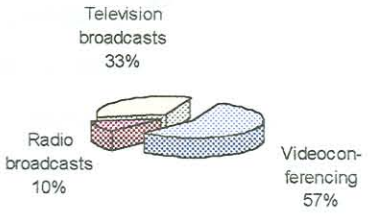
4.10.16 Would students like to receive instruction by means of a mix media and technologies?

Since there are also other media and technologies available, students' feelings towards using these facilities were also determined.

The following aspects were evaluated:

- Whether students would like to receive instruction in the form of a mix of media and technologies
- Whether students would like videoconferencing, television broadcasts and radio broadcasts for instruction

Table 4.19: Receive instruction by means of media and technologies

Aspect	Finding
Would students like to receive instruction in the form of a mix of media and technologies?	
Would students like videoconferencing, television broadcasts and radio broadcasts for instruction?	

Videoconferencing could be used to reach students during contact classes in regions other than Johannesburg and Durban. Television broadcasts are not used yet, but are considered a future possibility. Further research will have to be conducted to determine exactly how a cataloguing course could be presented with these media.

4.11 Summary

This chapter described the design, development, implementation and evaluation of the training resource programme for cataloguing students.

The goal of this chapter was to report on the investigation into the instructional and motivational effectiveness of a mix of media and technologies for the training of cataloguing students.

Students expressed positive responses to the programme and its value in their learning of cataloguing. The results clearly indicate that they appreciated the opportunity to utilise a combination of media and technologies. However, they still indicated a preference for printed material and direct contact with the lecturer and fellow students.

It has been determined that the training resource consisting of a mix of media and technologies is effective, both instructionally and motivationally.

4.12 Recommendations

This investigation has demonstrated that the overall effect or outcome of the evaluation was positive.

With reference to the specific research questions under investigation in this chapter, the recommendations are summarised as follows:

Table 4.20: Summary of recommendations

NO.	QUESTION	ASPECT	RECOMMENDATION
9	What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?	New development	Maintain and refine existing media and technologies
10	What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?	Advantages and disadvantages as experienced by students	**Advantages** ➢ Motivation ➢ More practice opportunities ➢ Interactivity ➢ Enjoyment **Disadvantages** ➢ Students have to get used to the new media before they can focus on the content ➢ Things can go inexplicably wrong with technology ➢ Not all students have access to all the facilities ➢ A lot of help and guidance need to be included in the development ➢ Students regard the different media as separate entities and do not use them in conjunction with other training

NO.	QUESTION	ASPECT	RECOMMENDATION
			materials and media
11	How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?		Simplicity should be maintained. Media and technologies should be included but should be utilised as an integrated whole

In chapter 5 the results from the analysis of the reported research and evaluations of the training resource programme will be integrated to answer the research questions.

Chapter 5

Conclusion and recommendations

Contents

5.1 Introduction

In chapter 1, section 1.3, the motivation for this study was set out as being based on the lack of previous research, the necessity of cataloguing courses and the shortage of qualified cataloguers. Based on this motivation, the research problem was formulated in section 1.4 as the concern with the problems and limitations in the education and training of cataloguers and with establishing possible solutions. Special reference was made to the implications of utilising a training resource in which a mix of media and technologies is applied as a training mode. The research problem could be divided into eleven specific research questions. The aim of the study was to address each question by means of an analysis of reported research and some of the questions by means of two pilot projects. By finding answers to these questions, it would be possible to determine how the education and training of cataloguers could be improved by utilising a training resource programme consisting of a mix of media and technologies.

In chapter 2 the critical analysis of reported research pertaining to each research question was presented. Chapters 3 and 4 answered research questions 9, 10 and 11 by specifically reporting on the case studies made of the training research programme. The goal of chapter 5 is to integrate all the results from the analysis of the reported research and case studies in order to answer the research questions. Finally, a conclusion to the study is formulated and recommendations for further research and developments are suggested.

5.2 Findings and results per research question

The findings and results as integrated from chapters 2, 3 and 4 are discussed and analysed. The researcher set out to answer each question by means of analysing the reported research, interviews, focus group discussions, e-mail messages from participants, evaluation of a newly designed training resource, questionnaires and observations.

5.2.1 Requirements from industry

Research question 1
What are the requirements from industry (library and information practice) of newly qualified cataloguers?

The researcher needed to determine what industry requires of newly qualified cataloguers in order to develop training that best meets these requirements.

This question was addressed by means of the following:

- A critical analysis of reported research.
- Interviews and focus group discussions with heads of cataloguing departments and staff in supervisory positions (involved in training newly appointed cataloguers). The comments from mentors and supervisors involved in the practical training of students were also taken into consideration. These were obtained from the report forms that mentors have to complete after each practical project, as well as from telephone and personal discussions.

The requirements indicated by heads of cataloguing departments and staff in supervisory positions correspond mostly with the findings from the

critical analysis of reported research (Table 2.2). From the results it is clear that emphasis is placed on the knowledge and application of the cataloguing tools and cataloguing in the computerised environment. These aspects therefore need to be addressed in training cataloguers. Many of the cataloguing students currently work as library assistants in libraries or branches of public and community libraries that are not fully computerised. This creates some problems in teaching the computerised aspects.

The findings as presented in Table 2.2 and obtained from the interviews and focus group discussions can be integrated and summarised as follows (Table 5.1):

Table 5.1: Skills required of the newly qualified cataloguer

Knowledge of cataloguing tools	Computerised cataloguing	Computer literacy	Cataloguing duties that students should be able to perform	Managerial skills	Other
Knowledge and application of the latest cataloguing rules (currently the 1988 revision of the Anglo-American Cataloguing Rules) Knowledge and application of classification schemes, especially the Dewey Decimal Classification, Universal Classification and the Library of Congress Classification systems Knowledge and application of verbal subject cataloguing, for example subject assignment with the Library of Congress Subject Headings	Knowledge and application of computerised cataloguing, including MARC formats and OCLC Knowledge and use of automated library systems Knowledge of various databases	Ability to use office software such as word processors and spreadsheets, including basic troubleshooting Internet skills Knowledge of a wide range of computer systems, software and online bibliographic networks Knowledge of various search engines	Search for cataloguing copies Catalogue straightforward material with available cataloguing copies Edit existing bibliographic records on local systems Perform original cataloguing Assign classification numbers Assign subject headings	Catalogue management and related management issues Ability to use judgement and make decisions Problem-solving skills Ability to anticipate and appreciate catalogue user needs	Communication skills Foreign language proficiency Ability to work in a team Ability to adapt to continuous change Ability to analyse existing cataloguing records for maintenance purposes Ability to analyse items for cataloguing

Table 5.2 summarises how the skills required of the newly qualified cataloguers are met by the training resource programme consisting of a mix of media and technologies:

Table 5.2: Skills of newly qualified cataloguer met by training resource programme

SKILLS	MET BY TRAINING RESOURCE PROGRAMME
Knowledge of cataloguing tools	Covered by all the components of the training resource programme
Computerised cataloguing	Not covered by the computer program
Computer literacy	Computer program and TSA COOL promote computer literacy
Cataloguing duties that students should be able to perform	Covered by all the components of the training resource programme
Managerial skills	Problem-solving skills covered by all the components of the training resource programme
Other	Teamwork and communication skills promoted by all components of the training resource programme

5.2.2 Requirements set by outcomes-based education and training

Research question 2

What are the requirements set by outcomes-based education and training?

The researcher needed to determine what outcomes-based education requires of newly qualified cataloguers in order to develop training that best meets these requirements.

The question was addressed by a critical analysis of reported research. The focus was specifically on the outcomes-based approach to education. Critical cross-field outcomes for Library and Information Studies and

specific learning outcomes pertaining to cataloguing were identified (presented in Table 2.3).

Table 5.3 indicates whether the resource training programme consisting of various media and technologies meets the critical outcomes:

Table 5.3: Critical cross-field outcomes met by training resource programme

CRITICAL CROSS-FIELD OUTCOME	MET BY TRAINING RESOURCE PROGRAMME
Work effectively with colleagues as a team	Components of the programme such as the computer program, TSA COOL and the contact classes can be used by students in groups, thus promoting teamwork in training.
Use language skills in communication	Language skills are not directly promoted by the programme, but are necessary to successfully understand and use the programme. Students do two different language courses as part of their overall training in Library and Information Studies.
Use mathematical skills	Not directly promoted by the training programme.
Organise and manage oneself in order to conduct various tasks	To work through the volume of the course successfully and master the different media, self-management is essential.
Collect, analyse, organise and critically evaluate information	These aspects form the essence of cataloguing work and are thus incorporated in the training programme.
Identify and solve problems	This forms an integral part of cataloguing work and is thus incorporated in the training programme.
Use science and technology effectively and critically	The utilisation of a mix of media and technologies promotes this outcome.

The specific learning outcomes pertaining to cataloguing are all covered by the printed course material, the mentor system, TSA COOL, the contact classes and the available communication channels. The classification with DDC21 is also covered by the computer program.

5.2.3 Experiential training of cataloguers

Research question 3
What are the requirements regarding the experiential training component of a cataloguing course?

The researcher needed to determine the requirements of the experiential training component in order to develop training that best meets these requirements.

This question was addressed by means of the following:

- A critical analysis of the reported research.
- Interviews and focus group discussions with heads of cataloguing departments and staff in supervisory positions (involved in training newly appointed cataloguers). The comments from mentors and supervisors involved in the practical training of students were also taken into consideration.

Respondents agreed that experiential training is an important part of cataloguing training. Two forms of experiential training are currently practised in South African libraries:

- Fieldwork: A student (usually studying full time) visits the cataloguing department of a library for a number of weeks and has to perform

certain cataloguing duties under the guidance of a supervisor or experienced staff member.

- Mentorship: A student (usually studying part-time and already working in a library) is assigned certain practical cataloguing projects. These have to be performed under the guidance of a mentor (qualified cataloguer). Specific guidelines regarding the project are given to the mentor. The establishment where the student is employed serves as the practical class.

Certain problems encountered with experiential learning were indicated as follows:

- It is not always possible to find an appropriately qualified cataloguer who is willing to act as a mentor or supervise fieldwork.
- It is an extra duty for cataloguers to supervise students – a duty for which they receive no remuneration.
- Cataloguers have to cope with heavy workloads and do not have enough time to spend with students.
- Projects assigned by lecturers do not always correspond with the cataloguing duties performed in the cataloguing departments where the students have to work. This sometimes leads to conflict and confusion for the students.
- There are not enough cataloguing tools and computers or terminals available in cataloguing departments to accommodate students.
- Due dates for projects cannot always be met since the supervisor or mentor is not always available when the students need him/her.
- Students abuse the assistance of the mentors and supervisors and expect them to also assist them with other assignments.

From the results it is clear that experiential training is an important part of the training of cataloguers, but certain problems need to be addressed to

streamline the process. Cataloguing students do not always benefit as much as would be ideally required from the mentor system. The experimental training aspect is partially addressed in the computer-assisted programme where simulations are used when students have to classify library books. This aspect could be extended by further developments with the program (to be discussed later in this chapter).

5.2.4 Characteristics of the adult learner

Research question 4

What are the characteristics of the adult learner, especially the cataloguing student?

The researcher needed to determine the characteristics of the adult learner, especially the cataloguing student, in order to develop training that best develops these characteristics. The characteristics were determined from the analysis of reported research, as well as the student profile (discussed in chapter 3). Table 5.4 summarises how the training resource programme addresses the characteristics of adult cataloguing students.

Table 5.4: Characteristics of the adult student met by training resource programme

CHARACTERISTICS	MET BY TRAINING RESOURCE PROGRAMME
Psychologically ready to control their activities and learning environment	Training programme provides the opportunity to plan and control their cataloguing studies
Do not want to be controlled, but appreciate support and feedback	Support and feedback provided by all the components of the training programme; some components provide more immediate feedback
Problem-focused	Training programme focuses on the cataloguing training problems
Independent problem-solvers	Training programme provides opportunities for solving cataloguing problems independently
Motivated to learn about things that relate directly to their perceived immediate needs	Perceived immediate needs are to solve problems in being trained in cataloguing; addressed by the programme
Diagnose and pace their own progress	The computer program, in particular, and TSA COOL provide the opportunity to pace own progress
Short attention span	The computer program and TSA COOL can be used for as long as students want to concentrate
Need an infinitely patient trainer that can wait for the students to refocus	Computer technology is infinitely patient
Want an immediate response	Computer program and questions for self-assessment on TSA COOL provide immediate response and feedback
Need stimulation and motivation during their training	The use of a variety of media and technologies provide stimulation and motivation
Study career-oriented courses such as Library and Information Studies	Cataloguing component addressed by the training programme forms part of the career-oriented training
Need assignments that reflect skills required in the real world	Addressed by all the components of the training programme

CHARACTERISTICS	MET BY TRAINING RESOURCE PROGRAMME
Not afraid of technology	This made it possible to experiment with a variety of media and technologies
Can take in audio and visual input	Audio and visual aspects used in the computer program and TSA COOL
Can surf and scan information quickly	Students can scan information quickly if it is conveniently packaged and made accessible; this was attempted with printed (revised) study material, as well as TSA COOL and the computer program
Suffer from information overload	Students indicated that they feel overwhelmed by the volume of information relating to the course and incorporated in the training programme
Can be trained with technological aids such as computers, the Internet and computer-aided programs	All these components included in the training programme
Able to work well in groups and especially enjoy learning as a group and social activity with their peers	Provision was made for individual and group work with the computer-assisted program, TSA COOL and the contact classes
Diverse in their learning styles with different preferences in terms of the means and media through which they learn	A variety of media and technologies is incorporated to meet the diverse needs
Previous learning experiences where they have been subjected to teaching paradigms based on passive learning such as lecturing	Previous paradigms cannot be eliminated altogether (since students cannot adapt immediately to new paradigms such as constructivist learning) and are thus maintained to a large extent in the printed study material; constructivist approach is progressively adapted in other training components
It takes some time to convince them of other approaches such as interactive and collaborative learning	Other approaches are progressively introduced in the training programme

5.2.5 Learning theories applied in the education and training of cataloguers

Research question 5

How can learning theories be applied in the education and training of cataloguers?

The researcher needed to determine how learning theories are applied in the education and training of cataloguers in order to develop training that best meets these applications.

The main cognitive levels of learning, namely knowledge, comprehension, application, analysis, synthesis and evaluation, still form the basis of identifying and classifying educational objectives and activities. The application of Bloom's taxonomy in the training of cataloguers could be summarised and is presented in Table 2.4.

In the constructivist learning environment students have to apply skills in real-world situations. They actively create their own knowledge from the information and material presented to them and their experiences of the world. These tasks should require problem-solving skills. The learning environment should be as rich and diverse as possible. Students should have tasks to accomplish and problems to solve that are relevant for them. As far as possible, real-world problems or situations as they would occur in the industry where the student would work should be simulated.
The following approaches in the constructive learning models could be adapted for training in cataloguing:

- Simulation-based learning by doing
- Incidental learning
- Learning by reflection
- Case-based/problem-based learning

- Learner-centred training practices
- Authentic assessment

Table 5.5 indicates how the training resource programme addresses the cognitive and constructivist approaches.

Table 5.5: How training resource programme addresses the cognitive and constructivist approaches

APPROACH	MET BY TRAINING RESOURCE PROGRAMME
Cognitive approach	
Knowledge	Addressed by printed study material and TSA COOL
Comprehension	Addressed by printed material, practical exercises, computer program, TSA COOL (self-assessment questions)
Application	Addressed by printed material, practical exercises, computer program, TSA COOL and practical projects conducted under supervision of mentor
Synthesis	Addressed at third- and fourth-year level by printed study material and TSA COOL; to be extended by computer program
Evaluation	Addressed at third- and fourth-year level by printed study material and TSA COOL; to be extended by computer program
Constructivist approach	
Simulation-based learning by doing	Addressed by the mentor system and computer program
Incidental learning	Addressed by the computer program, mentor system and TSA COOL
Learning by reflection	Addressed by contact classes and discussions on TSA COOL
Case-based/problem-based learning	Addressed by the computer program, mentor system and TSA COOL
Learner-centred training practices	Addressed by the computer program, mentor system and TSA COOL
Authentic assessment	Addressed by the computer program, mentor system and TSA COOL

5.2.6 Inherent problems of teaching a cataloguing course

Research question 6

What are the inherent problems of teaching a cataloguing course?

The researcher needed to determine the inherent problems of teaching a cataloguing course in order to develop training that best overcomes these problems.

This question was addressed by means of the following:

- A critical analysis of reported research.
- Interviews and focus group discussions with academic staff involved in training cataloguing students as well as heads of cataloguing departments and staff in supervisory positions (involved in training newly appointed cataloguers). The comments from mentors and supervisors involved in the practical training of students were also taken into consideration.

The problems can be summarised as follows:

- There is a variety of cataloguing tools, applications, skills and computer literacy aspects in which students have to be trained over a limited period (refer to research question 2).
- It is very important to practise cataloguing skills and applying cataloguing tools (through drills and practice exercises). Again, time does not allow for sufficient practice.
- Results, i.e. pass rates and throughput rates, are very important in academic institutions. Therefore the emphasis during the course is very much on obtaining valid yearmarks and preparation for

examinations. Certain important skills and aspects of the course are then neglected.

- There is not enough time to train students in analytical and problem-solving thinking skills – essential for a cataloguer.
- The challenge is to teach students thinking and decision-making skills.
- In general students have to be trained in more library skills and practices. These have to be made to fit into the curriculum, which sometimes leads to a reduction of the cataloguing syllabi.
- The cataloguing subject is to many students a new and unfamiliar terrain and therefore involves intensive training from introductory to advanced level.
- The question is whether a cataloguing course should stress theory or practical application.
- The right training methods should be selected.
- Computerisation has had an effect on cataloguing practices.
- The role of co-operative cataloguing practices needs to be considered.

The following inherent problems pertaining to the teaching of a cataloguing course are addressed by the training resource programme as follows (indicated in Table 5.6):

Table 5.6: Inherent problems pertaining to the teaching of a cataloguing course addressed by the training resource programme

PROBLEM	ADDRESSED BY TRAINING RESOURCE PROGRAMME
Time constraints regarding mastering tools and practising with them by means of drills and practice	Addressed by computer program and TSA COOL; students practise in their own time as often as they can
Co-operative learning	Mentor system
Various training methods to be used	Implemented with the mix of media and technologies
Need for intensive training	Possible by utilising the complete resource training programme
Need to be taught thinking and decision-making skills	Incorporated in training programme

5.2.7 Problems and limitations of distance education

Research question 7

What are the problems and limitations in the education and training of cataloguers in distance education?

The researcher needed to determine the problems and limitations of the education and training of cataloguers in distance education in order to develop training that best overcomes these problems.

This question was addressed by means of the following:

- A critical analysis of reported research.
- Interviews and focus group discussions with academic staff involved in training cataloguing students. The comments from

mentors and supervisors involved in the practical training of students were also taken into consideration.

The problems and limitations can be summarised as follows:

- Limited face-to-face contact between the lecturer and student is considered the major drawback in distance education. Lack of face-to-face contact makes it difficult to teach practically oriented courses such as cataloguing.
- Students expressed a need for human contact. They want a person to tell and show them how to do cataloguing.
- In the pedagogical domain, learning has moved from being teacher-centred to student-centred.
- Distance education teaching techniques have become asynchronous.
- Students still rely very much on paper-based study material which makes immediate feedback impossible.
- They find it difficult to assess themselves.
- They have too many other commitments, especially since most distance learning students usually work full time.
- Administrative problems make it difficult to provide regular assessment and feedback.
- Students find it problematic to do time planning.
- They do not work systematically through the study material.
- They need additional training and tutoring apart from the printed study texts, print-based assignments and feedback system, and occasional personal and telephone contact with lecturers.

A number of barriers to learning in distance education caused mainly by the unique characteristics of distance education have been identified. They are summarised in Table 2.5.

From the results it became clear that owing to the nature of the course, the lack of direct face-to-face contact and immediate feedback is problematic for the distance learning students. This is applicable to many other courses presented through distance learning. Distance learning institutions attempt to overcome these problems by appointing tutors and presenting contact classes. This is, however, only possible in regions where there are large numbers of students. Since only a limited number of students do the cataloguing course, only those in the larger areas have access to tutors and contact classes. The appointment of mentors at the students' places of work (also discussed under research question 3) overcomes some of the problems.

The following problems pertaining to the limitations in the education and training of cataloguers in distance education are addressed by the training resource programme as follows (indicated in Table 5.7):

Table 5.7: Problems and limitations in the education and training of cataloguers in distance education addressed by the training resource programme

PROBLEM	ADDRESSED BY TRAINING RESOURCE PROGRAMME
Limited face-to-face contact between the lecturer and student	Addressed specifically by contact classes
Training has become student-centred	Students have the opportunity to create their own learning by utilising the programme
Immediate feedback is impossible through print-based course material	Immediate feedback provided in computer program and questions for self-assessment in TSA COOL
Students find it difficult to assess themselves	Assessment provided in computer program and questions for self-assessment in TSA COOL
Students need additional training and tutoring	Addressed by training programme as a whole

Although the training resource programme does not provide solutions to all the problems and limitations, it is the researcher's opinion that the crucial issues, as stipulated in Table 5.7, are addressed. Future research and developments may be focused on the remaining problems and limitations.

5.2.8 Problems and limitations of in-service training

Research question 8

What are the problems and limitations in the education and training of cataloguers in in-service training?

The researcher needed to determine the problems and limitations of the education and training of cataloguers in in-service training in order to develop training that best overcomes these problems.

This question was addressed by means of the following:

- A critical analysis of reported research.
- Interviews and focus group discussions with heads of cataloguing departments and staff in supervisory positions (involved in training newly appointed cataloguers). The comments from mentors and supervisors involved in the practical training of students were also taken into consideration.

The following problems were identified:

- Staff limitations and existing workloads make it difficult for experienced staff members to train newly appointed staff members.
- In-service training should only be limited to training in the specific routines of the particular library and cataloguing departments. Therefore newly appointed staff members should meet the requirements identified under research question 1.

The implication of these results is that the training institutions are expected to deliver fully trained cataloguers to libraries. The training resource programme addresses many of the problems pertaining to the training of cataloguing students. The programme therefore contributes to delivering fully trained cataloguers.

5.2.9 Developments in the utilisation of a mix of appropriate media and technologies

Research question 9

What developments have taken place in the utilisation of a mix of appropriate media and technologies in training cataloguers?

The researcher needed to investigate whether developments have taken place in the utilisation of a mix of appropriate media and technologies in the training of cataloguers, and if so, what these developments are, in order to adapt existing developments or develop new training resources. The question was investigated by means of an analysis of reported research and by evaluating a resource training programme consisting of a mix of media and technologies. The training resource consists of:

- print material (study guides, tutorial letters and prescribed books)
- practical exercises (drill exercises in print format)
- contact classes (presented monthly in Johannesburg and Durban)
- communication channels
- mentor system
- TSA COOL (virtual campus)
- computer program

The findings from the reported research and evaluation of the training resource programme to answer this question are summarised as follows:

- The utilisation of various media will produce the same learning results.
- Library and Information Study students are taught about computers and computer software rather than by computer-aided teaching.
- In the international literature few references are made to the utilisation of computer-aided instruction in cataloguing training.

- No references in the national literature could be found to the use of computer-aided training in cataloguing courses.
- Drills, practice and simulations are the instructional strategies that could be considered for a mix of media and technologies.
- Students were generally satisfied with the training resource programme.

The following comparison between suggestions from the reported research regarding online training in general and findings by the researcher about a training resource programme for cataloguers resulted in the following (Table 5.8):

Table 5.8: Comparison between suggestions in literature and findings from evaluation

Literature suggests	Findings from evaluation
Students expect lecturers to respond to their e-mail messages almost immediately and can be more demanding online than in person (Rea et al., 2000:137)	Students send a follow-up e-mail within a couple of hours to a day if a response to an original e-mail was not sent. Even if they did not ask a question, but only e-mailed work, they want a response. The same, however, also applies to telephone messages and faxes.
Lecturers must spend time and energy on the virtual campus site to ensure that the site is working properly and all information is up to date. This means extra work, but this tends to decrease over time (Rea et al., 2000:145).	Initially it took time to set up all the information, links, FAQs, discussion groups and academic guidance for the subject on TSA COOL. Once the site has been set up, it has to be monitored regularly for students' inputs. Outdated information is removed once a month and new information is added as it becomes available.
Students expect information such as the syllabi, previous examination papers and notices on the virtual campus site (Rea et al., 2000:146).	Once students became aware that previous examination papers were available on TSA COOL, they expected them shortly after each examination period and made enquiries if the papers were not immediately available.
The utilisation of drills and practice helps students to review, remediate, rehearse and practise (Erickson & Vonk, 1994:67).	Students found the drill-type exercises in the computer program and questions for self-assessment on TSA COOL very helpful for practice.
Immediate feedback and remediation to students' responses is very important (Hannafin & Peck, 1988:144).	Students expressed their appreciation for the immediate feedback and explanations in the computer program and TSA COOL's questions for self-assessment.
Competition is considered an effective motivating technique (Erickson & Vonk, 1994:69).	Students found it challenging to have their performance assessed in the computer program and TSA COOL's questions for self-assessment and to have the opportunity to improve on their scores.

From the above comparison it is evident that findings from the evaluation correspond mostly with suggestions from the reported research.

5.2.10 Advantages and disadvantages of training by means of a mix of media and technologies

Research question 10

What are the advantages and disadvantages of training cataloguers by means of a mix of media and technologies?

The researcher needed to determine the advantages and disadvantages in order to develop training that best suits the training needs of cataloguing students.

The findings from the reported research and evaluation of the training resource programme to answer this question are summarised as follows:

Advantages

- Students find it more interesting to work with different media and technologies.
- The limitations of one medium such as print can be overcome by the variety of other media and technology.
- Students can work on the course whenever it suits them.
- Neither the distance that geographically separates students nor the time of day when it suits them to study place limitations on their progress.
- A degree of individualised instruction is possible.
- A variety of information and additional exercises can be provided by the different media and technologies.

- The electronic media make it possible to train students in specific skills of the cataloguing course which are not possible through the print media.
- The electronic media make it possible to create simulations of cataloguing situations.
- Immediate feedback is possible through the facilities on the virtual campus and the computer program.
- Testing and retesting is possible with a computer.
- The variety of computer-based training stimulates students and promotes positive attitudes to learning.
- It is possible for the student to navigate the content.
- Connectivity makes belonging to discussion groups possible so that students have the opportunity to give and share their opinions.
- The computer program and TSA COOL encourage group work and collaborative learning. This helps students to get to know each other better, and reduces the social isolation associated with distance learning.
- Students can reflect and learn from other students when they participate in the discussion group facility on TSA COOL.

Disadvantages

- The electronic media are still very new to the students and they are therefore reluctant to use them.
- Students have difficulty in getting access to the Internet.
- Students do not all have adequate hardware or appropriate software to access the multimedia and interactive capabilities of the virtual campus.
- It takes time and technical support to become a competent user of the virtual campus.
- Students consider the use of the electronic media and technology as extra work in an already demanding course.

- Lack of computer skills creates problems for certain students to adjust to the electronic media.

5.2.11 Design of training by means of a mix of media and technologies

Research question 11
How should training by means of a mix of media and technologies be designed to serve as an appropriate training mode?

The researcher needed to determine how training by means of a mix of media and technologies should be designed in order to develop an appropriate training resource. To achieve this, it is necessary firstly to summarise what the researcher has learned from this study. Secondly, guidelines for the design and development of a resource training programme will be formulated. Thirdly, possible future developments will be investigated. These issues will be discussed in the following sections.

5.3 What the researcher has learned from the study

- Students use media and technologies to meet their needs and not necessarily in ways expected by the lecturer.
- Students with little understanding of or familiarity with computers will find the use of media and technology difficult at first, and will have to spend more time on the media and technology than on the contents of the course.
- Frequent communication with students is essential.
- No assumptions should be made about students' abilities, experience, etc. A student profile should be compiled first.

- Students should be told exactly what they can and should do with each component of the training resource programme, for example what each function of TSA COOL is for and how to use it.
- Merely placing course material on the virtual campus, i.e. using it as just another delivery mode, should be avoided.
- Students do not use all their study material, but only what they consider essential for passing the course.
- The utilisation of a mix of media and technologies allows interaction between students, lecturers and sources of information.
- Many frustrations can be related to technical problems, e.g. Internet connections and download time. Technical problems diminish as students progress with the course.
- Students tend to forget that a variety of communication channels to the lecturer and fellow students are available. They often complain that geographical distance makes it impossible to benefit from the training. They need to be reminded of all the possible channels such as e-mail, fax and discussion groups.
- There is no definite preference for using the computer program in a group or individually. Students who worked on it during observations preferred to work in groups.
- The immediate feedback provided by the program, which includes correct answers as well as explanations, was highly appreciated.
- Students start to use one component of the programme, such as the group discussion facility on TSA COOL, to organise another component, namely additional contact classes amongst themselves.

5.4 Guidelines for designing and developing a training resource programme

From the analysis of the reported research and the evaluation of the training resource programme, it is now possible to derive the following guidelines for the design and development of a training resource programme consisting of a mix of media and technologies.

- A user-friendly design is essential to make the program accessible to all students.
- Frustrations and problems related to the technical aspect should be counteracted, as such problems affect how students perceive and experience the program. Support should be available for all students. Networks must be stable to avoid problems with access and passwords, problems accessing information, slow response times and unreliable features.
- The program should be suitable for group work or individual work.
- Immediate feedback in certain components of the programme is essential. Students need to know the correct answers immediately and, where applicable, explanations of incorrect answers should be given.
- Performance measurement is helpful to the students. This could be done similarly to the score ratings given in many computer games.
- Navigation must be satisfactory. Students should be encouraged to read the guidelines and instructions before attempting the program. Navigational help files should be made available at all times.
- There should be frequent, active involvement from the learner and lecturer, who, in fact should act more as a facilitator than a lecturer.
- Hypertext linkages should be used. These could be electronic links between related information chunks to expand ideas, learn related concepts, view document sources and stimulate additional learning.

Immediate access to the most recent information could be provided by hypertext linkages.

- Multimedia (sound, graphics, colour and moving images) should be used functionally to enhance learning.
- Visual appeal: There should be a polished look to the program with the colour, graphics, animation, etc.
- Communication channels such as e-mail and discussion groups should provide options for frequent interaction.
- Records of students' participation should be kept.
- It should be easy to update all information.
- Alternative instructional strategies should be created, each with appropriate multimedia materials, and students should be directed toward that strategy found to be most effective for their style.
- Individual students should be encouraged to participate in the discussion group facility. As in the contact classroom situation, students often do not respond to a question or statement if it is posed to them in general, but have to respond when they are addressed directly. In the discussion group students could be encouraged by awarding them for responding, for example 5 marks could be added to an assignment.
- Students working alone as well as those working in groups must benefit from the media and technologies.
- Regardless of the technical support provided, the lecturer must have a good knowledge of the media and technologies and be prepared to answer questions on equipment as well as content. A key feature should be that a variety of methods of interaction is available.
- A smaller pilot project that focuses on specific learners should be implemented. A course should be run parallel to the paper-based system.
- It is essential that the lecturer give students the necessary guidance and motivation they need for participating in the training programme.

- A great deal of interaction with students is necessary for them to comprehend the course material and new media and technologies effectively.
- The training resource programme should function as a coherent whole.
- A training resource programme that suits the training institution's budget should be considered.

The possibilities of a training resource programme consisting of a mix of media and technologies for cataloguing students and their implications for instructional design and promotion of learning could be summarised as follows (Table 5.9):

Table 5.9: Possibilities and implications of a training resource programme consisting of a mix of media and technologies

	Printed course material	Contact classes	Communication channels	Mentor system	Computer program	TSA COOL
Uses	Provides the contents of the course material and tutorial material. Includes exercises and activities to be answered in print-format.	Opportunity for face-to face contact with the lecturer and fellow students. Students can discuss content problems and clarify issues.	E-mail, fax, telephone and discussion group facilities can be used to communicate with the lecturer and fellow students to clarify course content problems or just exchange ideas and comments.	Part of the experiential training component. Students conduct work-related projects (cataloguing) under the supervision of a mentor.	Incorporation of multimedia to provide an element of reality. Graphics, sound and text attract attention. Incorporation of problem-solving situations.	Incorporation of multimedia to provide an element of reality. Graphics, sound and text attract attention. Incorporation of problem-solving situations. Provides links to useful web sites and documents.
Implications	Must be designed very carefully with clear learning objectives to be met by the contents and evaluation methods applied in the training resource.	Classes should revolve around students' needs and not become merely formal lectures.	Students must be reminded of these opportunities and the responsible use of them should be explained to them.	Clear guidelines should be provided to the students and mentors of what is expected from them.	Students must become involved in the learning process. They must be engaged in solving problems related to cataloguing issues. Contents must be in audio-visual format with a high level of interactivity. Easy to use.	Students must become involved in the learning process. They must be engaged in solving problems related to cataloguing issues. Site should incorporate interactivity. Site must be engaging and stimulating. Useful. Organised and easy to use.

5.5 Possible utilisation of more media and technologies

The media and technologies to which most cataloguing students have access and which are the most economical to develop or expand have been considered for the purpose of this study. There are, however, existing and emerging media and technologies to consider for future developments. Existing technologies includes radio for broadcasts. This is not useful for cataloguing since the visual aspect is absent. Television broadcasts and videoconferencing are possible, but very expensive. The number of students does not justify the use of these technologies at this stage.

The incorporation of chat rooms in the virtual campus is a more realistic possibility for the near future. This would be an extension of the discussion group facility.

Another possibility for the near future is the opportunity for students to create their own web sites with course content related material. These sites could develop into online portfolios. Students are currently trained in basic HTML and the use of web editor programs (in the subject Library and Information Technology). Students at third-year level could be expected to post certain cataloguing work and practical projects to their web sites or portfolios for evaluation.

Other technologies that have emerged recently include the following (Sangrà, 2001:11):

- Cell phones, especially those incorporating WAP technology, enable one to send immediate messages to students. This could develop into another communication channel.

- Satellite Internet is useful in remote parts where it is difficult to install a telephone cable. Access to online training will be improved.

- Interactive television: Students could communicate with the presenter. This is not, however, commonly available yet.

5.6 Developments towards a virtual cataloguing training classroom

The ultimate goal of the training resource programme is to develop an online, fully interactive course: an online virtual cataloguing classroom. This means that technology is incorporated as a substitute for the classroom and traditional distance training methods. The students may never meet the lecturer in person. The virtual cataloguing classroom incorporates all the technologies already used and discussed. The course is then only offered over the Internet. Weaknesses of this approach lie in the fact that students may become disassociated with the course since they do not feel involved. Lack of personal interaction will also contribute to this.

Since students are familiar with the traditional classroom setup, the classroom metaphor could be kept. The classroom serves as the interface in which students present their own work and view their fellow students' work. Students can thus enter into the spirit of a physical classroom. Training of librarians in the virtual environment is further motivated by the move towards the virtual library or "library without walls". Soon more and more librarians will work in such an environment and therefore similar training is considered appropriate.

5.7 Concluding remarks

The fact that an overwhelming majority of students would use the program again and recommend it to others is an indication that further multimedia developments of the course are necessary. Further developments include expanding the computer program to include all the aspects pertaining to the cataloguing course, namely bibliographic description, subject heading assignment, indexing and abstracting.

The development of a distance learning programme for cataloguing students using a mix of media and technologies is still in the experimental phase.

As further developments take place, both the lecturer and learners must deal with constant change.

Many of the requirements of trained cataloguers cannot be met in the traditional contact class or through the traditional distance training methods. The opportunities provided by the training resource programme researched here will contribute to improved knowledge and interaction. It offers the student many more possibilities of interacting and being active in mastering the cataloguing course.

Multimedia capabilities of the virtual campus and computer program mean that learners can access a variety of means of representing information. They can also be afforded opportunities to engage in active learning, working both alone and in group situations with others.

Students will not focus on the lecturer but rather on their own learning process. The tools provided by a training resource programme assist the

students to rely on their own learning rather than being directed all the time. Lecturers are becoming learning facilitators.

Apart from specific subject knowledge, the goal of the initial training of cataloguers must necessarily include basic training in the use and exploitation of media and technologies. The media and technologies play a threefold role:

- They are an end in themselves: a computer and communication technology.
- They are a tool used in computerised cataloguing.
- They are a training resource, incorporating the most appropriate media designed to best meet the learning needs.

It is the researcher's opinion that the use of media and technologies in a training research programme for cataloguing training could to a great extent also be applied to other library and information courses, as well as other fields of study.

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Annexure A
Questionnaire to establish our student profile

For office use

Respondent number ☐☐ V1 : 1-2

Please circle an appropriate number in the shaded area, or where necessary, write your answer in the shaded area.

1. Personal details

1.1 What is your gender?

a	Male	1	☐ V2 : 3
b	Female	2	

1.2 To which language group do you belong?

a	Afrikaans	1	☐☐ V3 : 4-5
b	English	2	
c	Northern Sotho	3	
d	Southern Sotho	4	
e	Swati	5	
f	Tsonga	6	
g	Tswana	7	
h	Venda	8	
I	Xhosa	9	
j	Zulu	10	
k	Other (specify)		

1.3 What is your marital status?

a	Unmarried	1	☐ V4 : 6
b	Married	2	

1.4 What was your age in years on your last birthday?

a	Under 25	1	☐ V5 : 7
b	25-29	2	
c	30-34	3	
d	35-40	4	
e	Over 40	5	

1.5 How many children do you have?

a	None	1	V6 : 8
b	One	2	
c	Two	3	
d	Three	4	
e	More than three (specify)		

1.6 How many adults (18 years and older) are living with you in your home?

a	None	1	V7 : 9
b	One	2	
c	Two	3	
d	Three	4	
e	More than three (specify)		

1.7 How many children (under 18 years of age) are living with you in your home?

a	None	1	V8 : 10
b	One	2	
c	Two	3	
d	Three	4	
e	More than three (specify)		

1.8 In which province do you live at present?

a	Gauteng	1	V9 : 11-12
b	Mpumalanga	2	
c	North-West	3	
d	Northern Province	4	
e	Free State	5	
f	Eastern Cape	6	
g	Northern Cape	7	
h	Western Cape	8	
I	KwaZulu Natal	9	
j	Namibia	10	
k	Other (specify)		

1.9 What is your gross income per month (fully monthly salary before anything is deducted)?

a	R2 500 and less	1	V10 : 13
b	R2 501 to R4 500	2	
c	R4 501 to R6 500	3	
d	R6 501 to R8 500	4	
e	R8 501 and more	5	

1.10 How do you fund your studies?

a	I pay for my studies myself	1	V11 : 14
b	My husband/wife pays	2	
c	A relative pays	3	
d	I obtained a bursary/loan	4	
e	Other (specify)		

1.11 How would you prefer to pay for your studies?

a	In full when I register	1	V12 : 15
b	In advance before I register	2	
c	In six installments	3	
d	In monthly installments	4	

1.12 For which certificate/diploma/degree in Library and Information Studies are you registered?

a	National Certificate	1	V13 : 16
b	National Higher Certificate	2	
c	National Diploma	3	
d	BTech	4	

2. Personal circumstances

2.1 In what type of accommodation do you live?

a	Own house / flat	1	V14 : 17
b	Rented house / flat	2	
c	Room (with relatives or friends)	3	
d	Hostel	4	
e	Temporary structure	5	
f	Other (specify)		

2.2 What source of light is available at your place of accommodation?

a	Permanent electricity supply	1	
b	Electric generator (220 volt)	2	
c	Battery power	3	
d	Cylinder gas	4	
e	Candles	5	
f	Other (specify)		

V15 : 18

2.3 What type of water supply is available at your place of accommodation?

a	Running water in the home	1	
b	Water obtained from a communal tap outside	2	
c	Water obtained from a stream, fountain or well	3	
d	Containers of purchased water	4	
e	Other (specify)		

V16 : 19

2.4 What type of postal delivery service do you use for your studies?

a	At your home	1	
b	At your own Post Office box	2	
c	At your work place	3	
d	At a collection point (e.g. station, farm store)	4	
e	At a communal Post Office box	5	
f	Other (specify)		

V17 : 20

2.5 How often do you collect your mail?

a	Daily	1	
b	Weekly	2	
c	Fortnightly	3	
d	Monthly	4	
e	Other (specify)		

V18 : 21

2.6 How would you rate the quality of Technikon SA postal service?

a	Very good	1	
b	Satisfactory	2	
c	Not satisfactory	3	

V19 : 22

2.7 What is the amount of time you spend travelling to and from work each day?

a	Less than fifteen minutes	1
b	Between fifteen and thirty minutes	2
c	Between thirty minutes and an hour	3
d	Between an hour and two hours	4
e	More than two hours	5

☐ V20 : 23

2.8 What mode of transport do you use daily?

a	I go on foot	1
b	Bicycle	2
c	Bus	3
d	Taxi	4
e	Own car	5
f	Train	6
g	Other (specify)	

☐ V21 : 24

3. Educational background

3.1 What was your final school qualification?

a	Matriculation with exemption certificate	1
b	Senior Certificate (without matriculation exemption)	2
c	Grade 10 (standard 8)	3
d	Other (specify)	

☐ V22 : 25

3.2 In which year did you obtain your final school qualification?

1	9		

☐☐ V23: 26-27

3.3 At what type of institution did you finish your secondary education?

a	Government school	1
b	Private school	2
c	Correspondence school	3
d	Adult education centre	4
e	Other (specify)	

☐ V24 : 28

3.4 What was the average percentage you obtained in final school examinations?

a	70-100 % (average = 75) [A + B aggregate]	1	V25 : 29
b	60 – 69 % (average = 65) [C aggregate]	2	
c	50 – 59 % (average = 55) [D aggregate]	3	
d	40 – 49 % (average = 45) [E aggregate]	4	
e	33⅓ - 39 % (average = 36) [F aggregate]	5	

3.5 In your opinion, what influence will your final school examinations have on your present studies?

a	Great influence	1	V26 : 30
b	Little or same influence	2	
c	No influence	3	

4. Professional background

4.1 How many years have you worked in a library / information centre / information department?

a	This is my first year	1	V27 : 31
b	1-5 years	2	
c	6-10 years	3	
d	11-15 years	4	
e	More than 15 years	5	

4.2 What is your most recently completed library qualification?

a	National Certificate	1	V28 : 32
b	Lower Diploma	2	
c	Unqualified	3	
d	Other (specify)		

4.3 How long ago did you obtain the above qualification?

a	1999	1	V29 : 33
b	2-3 years ago	2	
c	4-6 years ago	3	
d	7-9 years ago	4	
e	10 or more years	5	

4.4 In which demographic area is the library / information centre/ information department where you work?

a	City (e.g. Johannesburg, Cape Town, Durban)	1	V30 : 34
b	Large town (e.g. Rustenburg, Pinetown, Kroonstad)	2	
c	Small country town (e.g. Hammanskraal, Brandfort, Colenso)	3	
d	Rural area without a town in the immediate vicinity	4	

4.5 In what type of library do you work?

a	Large public / community library (main library)	1	V31 : 35
b	Branch library of a large library	2	
c	School library / Media centre	3	
d	Academic library (e.g. university, technikon, college)	4	
e	Provincial library	5	
f	Special library or information centre (e.g. engineering, law libraries)	6	
g	Information department that forms part of a larger organisation	7	

4.6 In which section or department of the library / information centre / information department do you work?

a	Reference desk	1	V32 : 36-37
b	Lending desk	2	
c	Interlibrary loans	3	
d	Acquisitions	4	
e	Cataloguing	5	
f	Serials	6	
g	Children's section	7	
h	Physical processing (e.g. inking, covering, binding of materials)	8	
l	All sections(such as a one person library)	9	
j	Other (specify)	10	

4.7 How many staff members work in your section or department?

a	Twenty or more	1	V33 : 38
b	Between ten and twenty	2	
c	Between five and ten	3	
d	Between two and five	4	
e	One	5	

4.8 What is your present post designation?

a	Librarian	1
b	Assistant librarian	2
c	Library assistant	3
d	Library clerk	4
e	Administrative assistant	5
f	Casual worker	6
g	Other (specify)	

V34 : 39

4.9 Which statement best describe your ability to carry out the tasks that you have to do at your work?

a	I consider myself an expert in the tasks that I have to perform.	1
b	I perform tasks that I was trained in.	2
c	I perform tasks that I have experience in, but was not trained in.	3
d	I perform tasks in which I have no training or experience, but I am coping.	4
e	I am not coping with my work.	5

V35 : 40

5. Expectations and impressions

5.1 Before registering at Technikon SA, what was the quality of information you had received about the Technikon?

a	All relevant information	1
b	Insufficient information	2
c	No information at all	3

V36 : 41

5.2 From whom did you obtain the most useful information about Technikon SA? You may indicate more than one source.

a	Colleagues at work	1
b	The Technikon administration	2
c	Friends / relatives	3
d	A Technikon student councillor / advisor	4
e	Posters, brochures and advertisements in the media	5

V37 : 42
V38 : 43
V39 : 44
V40 : 45
V41 : 46

5.3 What was the <u>one</u> most important reason why you enrolled for further studies and training?

a	To improve my qualifications and skills in library and information work	1
b	For promotion opportunities and a possible increase	2
c	For personal fulfilment	3
d	For social reasons (e.g. some of my friends were studying; because of status I would receive)	4

V42 : 47

5.4 What was the one most important reason why you enrolled at Technikon SA?

V43 : 48

a	I can study while I work full-time	1
b	I can study at my own pace	2
c	I improve my qualifications and at the same time gain more experience in my work	3
d	I was impressed by the information I had received about the Technikon	4

5.5 If you could choose again, where would you enrol for further studies and training? Only indicate one institution.

V44 : 49

a	Technikon SA	1
b	A residential technikon	2
c	A residential university	3
d	A distance education university	4
e	An institution outside South Africa	5
f	I would rather undergo in-service training at my work place	6

5.6 How was your registration at Technikon SA handled?

V45 : 50

a	Very well	1
b	Satisfactorily	2
c	Poorly	3

5.7 When did you receive your study materials?

V46 : 51

a	A week after registration	1
b	Two weeks after registration	2
c	Three or more weeks after registration	3
d	Too late to complete the first assignment on time	4

5.8 Which registration period do you prefer?

V47 : 52

a	First registration period (January to March)	1
b	Second registration period (May to July)	2
c	Third registration period (September to October)	3

5.9 What was your impression of your contact with Technikon SA in general?

V48 : 53

a	Excellent	1
b	Better than expected	2
c	As expected	3
d	Not as good as expected	4
e	Very unsatisfactory	5

5.10 What was your impression of your studies in Library and Information Studies so far?

a	Excellent	1
b	Better than expected	2
c	As expected	3
d	Not as good as expected	4
e	Very unsatisfactory	5

☐ V49 : 54

5.11 Considering your duties at work, domestic circumstances and other responsibilities, when would you prefer to write your examinations? Only indicate one option.

a	In October/November	1
b	In January (after the holidays)	2
c	In the middle of the year (June/July)	3
d	A combination of A, B & C	4

☐ V50 : 55

5.12 What is your opinion of the length of the academic year (from your registration date to your examination)

a	Too long	1
b	Long enough	2
c	Too short	3

☐ V51 : 56

5.13 Indicate the subjects for you are enrolled at present.

a	Information Retrieval I	1
b	Information Retrieval II	2
c	Library and Information Practice I	3
d	Library and Information Practice II	4
e	Library and Information Practice III	5
f	Library and Information Technology I	6
g	Library and Information Technology II	7
h	Human Studies	8
i	End-user computing (theory)	9
j	End-user computing (practical)	10
k	Communication in a language (X)	11
l	Communication in a language (Y)	12
m	Library Promotion	13
n	Psychology in Organisations	14

☐ V52 : 57
☐ V53 : 58
☐ V54 : 59
☐ V55 : 60
☐ V56 : 61
☐ V57 : 62
☐ V58 : 63
☐ V59 : 64
☐ V60 : 65
☐☐ V61: 66-67
☐☐ V62: 68-69
☐☐ V63:70-71
☐☐ V64:72-73
☐☐ V65:74-75

6. Study methods and circumstances

6.1 Do you experience any negative influences that could affect your studies?

a	None	1
b	Hardly any	2
c	Some, but I can cope with them	3
d	Yes, definitely	4

V66 : 76

6.2 What are your domestic study circumstances?

a	Practically impossible	1
b	Fairly difficult	2
c	Convenient	3
d	Good	4
e	Excellent	5

V67 : 77

6.3 What study space do you have available?

a	The dining room / kitchen table	1
b	My bedroom	2
c	I study at work	3
d	I study at a friend's / relative's house	4
e	A study room at home	5
f	A library (other than my work place, e.g. public library, Technikon library)	6

V68 : 78

6.4 Do you expect study methods to cause you any problems this year?

a	No	1
b	I may have some problems	2
c	Yes, study methods are one of my major problems	3

V69 : 79

6.5 Generally, how important is it for you to do better than merely obtain a PASS in the subjects you study?

a	Very important	1
b	Of some importance	2
c	Not important – I am happy if I pass	3

V70 : 80

In the following items, choose the option that best describes the study skills you use at present.

6.6 I memorise the content of the study guides and textbooks.

a	Yes	1
b	No	2
c	Sometimes	3

V71 : 81

6.7 I try to understand and apply the content of the study guides and textbooks.

a	Yes	1
b	No	2
c	Sometimes	3

V72 : 82

6.8 I both memorise and try to understand and apply the content of the study guides and textbooks.

a	Yes	1
b	No	2
c	Sometimes	3

V73 : 83

6.9 I rely totally on studying previous assignments and examination papers.

a	Yes	1
b	No	2
c	Sometimes	3

V74 : 84

6.10 During the academic year I only complete the assignments and leave most of the study for the examinations.

a	Yes	1
b	No	2
c	Sometimes	3

V75 : 85

6.11 How many hours, on average, do you expect to devote to the study of all your subjects each week?

a	Five hours or less	1
b	Between five and ten hours	2
c	Between ten and fifteen hours	3
d	More than fifteen hours	4

V76 : 86

6.12 What personal expectations do you have of your studies in Library and Information Studies at Technikon SA?

a	I expect them to be very interesting and exciting.	1	V77 : 87
b	I expect them to be partially interesting.	2	
c	I expect them to be uninteresting, but essential.	3	

6.13 What is your <u>one</u> main fear as regards to your studies?

a	How to study effectively on my own	1	V78 : 88
b	How to keep to a study timetable	2	
c	How best to plan my time	3	
d	How to cope with examinations	4	
e	How to do assignments well	5	

Expectations about Technikon SA support

6.14 Lecturers should take into consideration that I need to be assisted in my studies.

a	Yes, completely	1	V79 : 89
b	Only sometimes	2	
c	Unsure	3	
d	No, I will cope on my own	4	

6.15 I hope that Technikon SA will provide counselling for their students by means of ... You may indicate more than one option.

a	A student counsellor	1	V80 : 90
b	Tutors	2	V81 : 91
c	Lecturers	3	V82 : 92
d	Student administration staff	4	V83 : 93
e	I do not require counselling	5	V84 : 94

6.16 I find the Technikon administrative staff ...

a	Co-operative	1	V85 : 95
b	Unco-operative	2	

6.17 Indicate the ways in which you would make contact with the Technikon when you need counselling. You may indicate more than one option.

a	Visit the Technikon at the main campus in Florida	1		V86 : 96
b	Write a letter	2		V87 : 97
c	Visit my nearest regional office	3		V88 : 98
d	Make a phone call	4		V89 : 99
e	Contact a tutor	5		V90 : 100
f	Contact my lecturer	6		V91 : 101
g	Consult somebody else	7		V92 : 102

6.18 Evaluate your personal level of competence in studying in English.

a	Excellent	1		V93 : 103
b	Good	2		
c	Satisfactory	3		
d	Unsatisfactory	4		
e	Very poor	5		

6.19 How often do you expect to have contact with lecturers and tutors during the academic year?

a	Weekly	1		V94 : 104
b	Monthly	2		
c	Quarterly	3		

6.20 What type of contact with the lecturers or tutors do you prefer? You may indicate more than one option.

a	Personal counselling by appointment	1		V95 : 105
b	Contact classes	2		V96 : 106
c	Telephonic communication and counselling	3		V97: 107
d	Written communication and counselling	4		V98 : 108
e	Counselling via e-mail messages	5		V99 : 109

6.21 How often do you plan to attend contact classes?

a	I hope to attend all the classes	1		V100 : 110
b	I hope to attend some of the classes	2		
c	I plan to attend one class only	3		
d	I will not be able to attend any classes	4		

7. Media and technological facilities for study

7.1 Do you have a radio (either at home or work) that can be used for lecture broadcasts?

a	Yes	1		V101 : 111
b	No	2		V102 : 112

7.2 Do you have a television set (either at home or work) that can be used for lecture broadcasts?

a	Yes	1		V103 : 113
b	No	2		V104 : 114

7.3 Do you have a sound tape recorder (either at home or work) that you can use to listen to taped lectures?

a	Yes	1		V105 : 115
b	No	2		V106 : 116

7.4 Do you have a videocassette recorder (VCR) (either at home or work) that you can use to watch recorded lectures?

a	Yes	1		V107 : 117
b	No	2		V108 : 118

7.5 Do you have access to a computer (PC) (either at home or work) that you are allowed to use for your studies?

a	Yes	1		V109 : 119
b	No	2		V110 : 120

7.6 Do you have access to the Internet either at home, where you work , a study centre, or an Internet café for study purposes?

a	Yes	1		V111 : 121
b	No	2		V112 : 122

7.7 Do you have none of the above at home?

a	Yes	1		V113 : 123
b	No	2		V114 : 124

7.8 Do you have none of the above where you work?

a	Yes	1		V115 : 125
b	No	2		V116 : 126

7.9 Do you wish to mention anything not included in these questionnaire?

a	Yes– Include a separate letter / note with comments	1		V117 : 127
b	No	2		V118 : 128

Thank you for your participation and co-operation!

Annexure B

Formative evaluation of a computer-aided training program on classification using Dewey Decimal Classification

For office use

Respondent number ☐☐ V1 : 1-2

Please complete this questionnaire to help us to improve the program and assist us with similar future developments.

Please circle an appropriate number in the shaded area, or where necessary, write your answer in the shaded area. The answers you have to consider per question would be **ONE** of the following:

SA = Strongly agree
A = Agree
N = Neither agree nor disagree (cannot decide)
D = Disagree
SD = Strongly disagree

---

1. Indicate how the program helped you in your studies of the classification module of Information Retrieval

		SA	A	N	D	SD	
a	It helped me with my studies of classification	1	2	3	4	5	☐ V2 : 3
b	It helped me to understand the contents on classification in my study guide better	1	2	3	4	5	☐ V3 : 4
c	The different ways in which questions were asked helped me to understand classification better	1	2	3	4	5	☐ V4 : 5
d	After completing it I felt that I could answer the questions for self-evaluation in the study guide better	1	2	3	4	5	☐ V5 : 6
e	After completing it I felt that I could answer my assignment questions better	1	2	3	4	5	☐ V6 : 7

2. How did you experience the computerised format of the exercises?

		SA	A	N	D	SD		
a	I found it difficult to do the exercises because of the computerised format	1	2	3	4	5		V7 : 8
b	I usually have difficulty working on a computer, but I found the exercises in this program easy to do	1	2	3	4	5		V8 : 9
c	I would have preferred to do the exercises of this program in a pen-and-paper format	1	2	3	4	5		V9 : 10
d	The computerised format made these exercises more interesting than an equivalent pen-and-paper format	1	2	3	4	5		V10 : 11
e	Where I had the option to use either the mouse or the keyboard in my responses, I preferred to use the keyboard instead of the mouse	1	2	3	4	5		V11 : 12
f	I found it difficult to click on an object and drag it to another position in the exercises where this action was expected of me	1	2	3	4	5		V12 : 13

3. How did you experience the screen displays?

		SA	A	N	D	SD		
a	The screens are too full and overcrowded	1	2	3	4	5		V13 : 14
b	The screen displays attracted my attention	1	2	3	4	5		V14 : 15
c	Each category of questions has the same screen layout in every chapter and that helped me to understand how to answer the questions	1	2	3	4	5		V15 : 16
d	I knew what each picture, button and symbol on the screens meant	1	2	3	4	5		V16 : 17

4. How did you experience the text layout?

		SA	A	N	D	SD		
a	The layout made it easy to read	1	2	3	4	5		V17 : 18
b	The font used for the text is easy to read	1	2	3	4	5		V18 : 19
c	The font is attractive	1	2	3	4	5		V19 : 20
d	The font size used is readable and acceptable	1	2	3	4	5		V20 : 21
e	I liked the colours used for the text	1	2	3	4	5		V21 : 22
f	There is too much text on the screen	1	2	3	4	5		V22 : 23

5. How did you experience the language level?

		SA	A	N	D	SD		
a	The level of the language used made it easy to understand the program	1	2	3	4	5		V23 : 24
b	The vocabulary made the program easy to understand	1	2	3	4	5		V24 : 25
c	The length of the sentences made the program easy to understand	1	2	3	4	5		V25 : 26
d	I could look up any unfamiliar terms or phrases in my study guide	1	2	3	4	5		V26 : 27

6. How did you experience the pictures and colour?

		SA	A	N	D	SD		
a	The use of pictures of books and a bookshelf in the book classification exercises made it feel as if I was classifying real books	1	2	3	4	5		V27 : 28
b	The use of pictures of books and a bookshelf in the book classification exercises distracted me and I could not concentrate on the exercises	1	2	3	4	5		V28 : 29
c	The colours used for the pictures were pleasant to look at	1	2	3	4	5		V29 : 30
d	The colours used for the backgrounds of the screens were pleasant to look at	1	2	3	4	5		V30 : 31
e	I would have liked more pictures in the program	1	2	3	4	5		V31 : 32

7. How did you experience the sound ?

		SA	A	N	D	SD		
a	I was satisfied with the voice used for the introduction to the program	1	2	3	4	5		V32 : 33
b	The accent of the voice used for the introduction to the program was too British	1	2	3	4	5		V33: 34
c	I would have preferred a voice with a South African accent for the introduction to the program	1	2	3	4	5		V34 : 35
d	When I did the exercises, I preferred to turn the sound option off	1	2	3	4	5		V35 : 36
e	I preferred the human voice that told me when an answer was correct or incorrect	1	2	3	4	5		V36 : 37
f	I preferred the computer sounds that indicated to me when an answer was correct or incorrect	1	2	3	4	5		V37 : 38

8. How did you experience the content of the program?

		SA	A	N	D	SD		
a	I enjoy classification and was also satisfied with the content	1	2	3	4	5		V38 : 39
b	I enjoy classification, but I found the content too difficult	1	2	3	4	5		V39 : 40
c	I do not enjoy classification, but I was satisfied with the content	1	2	3	4	5		V40 : 41
d	I do not enjoy classification and was not satisfied with the content either	1	2	3	4	5		V41 : 42
e	The content helped me to understand my printed study material better	1	2	3	4	5		V42 : 43
f	I found the review section after each chapter useful	1	2	3	4	5		V43 : 44
g	I found the summary at the end of the program useful	1	2	3	4	5		V44 : 45

9. How did you experience the navigation and interaction within the program?

		SA	A	N	D	SD		
a	I felt as if the program addressed me personally	1	2	3	4	5		V45:46
b	There were times when I was uncertain about what to do	1	2	3	4	5		V46:47
c	I got lost in the content	1	2	3	4	5		V47:48
d	I always knew where I was in the program	1	2	3	4	5		V48:49
e	The introductory statements to the program explained the purpose of the program clearly to me	1	2	3	4	5		V49:50
f	It was easy to get help from the help files	1	2	3	4	5		V50:51
g	Directions were clear and easy to follow	1	2	3	4	5		V51:52
h	I knew what each icon meant and when to click on it	1	2	3	4	5		V52:53
i	I found the option to make a printout of a screen useful	1	2	3	4	5		V53:54

10. How did you experience the assessment of your performance in the program?

		SA	A	N	D	SD		
a	I found the progress bar (which indicated how many questions I had completed, how many I had correct and how many incorrect) useful	1	2	3	4	5		V54:55
b	It was helpful to receive the correct answer immediately and, where applicable, an explanation when I had answered a question incorrectly	1	2	3	4	5		V55:56
c	The answers and explanations were clear to me	1	2	3	4	5		V56:57
d	I would have preferred more than two attempts at the book classification section	1	2	3	4	5		V57:58
e	I found the percentage marks given for my performance at the end of a chapter useful	1	2	3	4	5		V58:59
f	I found the comparison of my percentage marks with my previous performance useful.	1	2	3	4	5		V59:60

11. How did you experience group work with the program?

		SA	A	N	D	SD		
a	I usually like working in a group	1	2	3	4	5		V60 : 61
b	I would have liked to do the program with others in a group	1	2	3	4	5		V61 : 62
c	I preferred to do the exercises in this program on my own	1	2	3	4	5		V62 : 63

12. How did you enjoy the program?

		SA	A	N	D	SD		
a	The program was challenging	1	2	3	4	5		V63 : 64
b	The program was stimulating	1	2	3	4	5		V64 : 65
c	I was bored with the program	1	2	3	4	5		V65 : 66
d	I enjoy classification and also enjoyed practicing with this program	1	2	3	4	5		V66 : 67
e	I enjoy classification, but did not enjoy practicing with this program	1	2	3	4	5		V67 : 68
f	I do not enjoy classification, but I enjoyed practicing with this program	1	2	3	4	5		V68 : 69
g	I do not enjoy classification and did not enjoy practicing with this program either	1	2	3	4	5		V69 : 70

13. General questions

a	There was enough time to complete the program	1	2	3	4	5		V70: 71
b	I would use the program again	1	2	3	4	5		V71 : 72
c	I would recommend the program to others	1	2	3	4	5		V72 : 73

Thank you for your participation and co-operation!

Annexure C

Summative evaluation of a mix of media and technology training for the cataloguing module (including descriptive cataloguing, classification and subject headings) in the subject Information Retrieval

For office use

Respondent number ☐☐ V1 : 1-2

Please complete this questionnaire to indicate to us how you experienced the cataloguing (including AACR2R, Dewey and SEARS) module of the Information Retrieval course. Please note that the questions only refer to the cataloguing module and not the reference work module or any of your other subjects.

Please circle an appropriate number in the shaded area, or where necessary, write your answer in the shaded area.

1. The cataloguing course in general

1.1 How do you like cataloguing? ☐ V2 : 3

a	Hate it	1
b	It's OK	2
c	Love it	3

1.2 How did you experience the course? It was … ☐ V3 : 4

a	too easy	1
b	about right	2
c	difficult, but I managed it	3
d	too difficult	4

1.3 How did you experience the length of the course? ☐ V4 : 5

a	Too long	1
b	About right	2
c	Too short	3

2. Printed material (study guide, tutorial letters and prescribed text books)

2.1 How did you find the printed material?

a	It covered the course sufficiently	1
b	I needed more resources	2

☐ V5 : 6

2.2 The printed material was:

a	Too easy	1
b	About right	2
c	Too difficult	3

☐ V6 : 7

3. Practical exercises related to the course

3.1 How were the practical exercises in the study guide and written assignments?

a	Too easy	1
b	About right	2
c	Too difficult	3

☐ V7 : 8

3.2 How were the practical exercises in the study guide and written assignments?

a	Too few	1
b	About right	2
c	Too many	3

☐ V8 : 9

3.3 How were the practical exercises in the computer program?

a	Too easy	1
b	About right	2
c	Too difficult	3

☐ V9 : 10

3.4 How were the practical exercises in the computer program?

a	Too few	1
b	About right	2
c	Too many	3

☐ V10 : 11

4. Contact classes (presented in Johannesburg and Durban)

4.1 I found the availability of contact classes:

a	Very useful	1
b	I needed to attend only some of the classes	2
c	I had no need for classes	3

V11 : 12

4.2 How did you attend contact classes?

a	I could not attend	1
b	I chose to attend only some classes	2
c	I attended all the classes	3

V12 : 13

4.3 There should be:

a	Fewer contact classes	1
b	The same number of contact classes	2
c	More contact classes	3

V13 : 14

5. Mentor system

5.1 How did you experience the mentor system?

a	Very helpful	1
b	I had not much need for a mentor	2
c	Not at all helpful	3

V14 : 15

5.2 The direct interaction with a mentor at my workplace:

a	Helped me very much with the understanding of the course	1
b	Did not make much difference in my study of the course	2
c	Only confused me since the mentor had a different opinion on some aspects of the subject	3

V15 : 16

6. E-mail communication

6.1 Did you use e-mail to communicate subject content issues with your lecturer and fellow students?

a	Never	1
b	Sometimes	2
c	Always	3

☐ V16 : 17

6.2 How was your experience of e-mail communication about subject content issues?

a	I found the quick responses very helpful	1
b	It did not make much difference whether I used e-mail or other forms of communication	2
c	I preferred to communicate via telephone and faxes	3

☐ V17 : 18

7. Facilities on TSA COOL

These questions only refer to the facilities that are specifically related to the subject content of your course. The general administrative facilities pertaining your studies are not covered here.

7.1 I did not use TSA COOL facilities because:

a	I did not have access to the Internet	1
b	I did not have time	2
c	I saw no need for using it	3
d	It was not compulsory to use	4

☐ V18 : 19

If you did use the TSA COOL facilities for the cataloguing module of Information Retrieval, please answer the following questions:

8. Online study guides and tutorial letters

8.1 Would you prefer to have your study guides and tutorial letters available online?

a	Yes	1
b	It does not matter	2
c	I prefer the printed format	3
d	It is unnecessary to have them in both formats	4

☐ V19 : 20

9. Academic guidance

9.1 Did you find the academic guidance (which includes interactive exercises, links to web sites of interest etc.) useful?

a	Very useful	1
b	Some times useful	2
c	I seldom used it	3
d	Not useful	4

☐ V20 : 21

9.2 I found the interactive exercises:

a	Very useful	1
b	Some times useful	2
c	I seldom used it	3
d	Not useful	4

☐ V21 : 22

9.3 I found the links to web sites of interest:

a	Very useful	1
b	Some times useful	2
c	I seldom used it	3
d	Not useful	4

☐ V22 : 23

10. Online self-assessment

10.1 Did you find the online self-assessment useful?

a	Very useful	1
b	Some times useful	2
c	I seldom used it	3
d	Not useful	4

☐ V23 : 24

11. Online discussion groups

11.1 Did you find the online discussion groups useful?

a	Very useful	1
b	Some times useful	2
c	I seldom used it	3
d	Not useful	4

☐ V24 : 25

11.2 I used the online discussion groups mostly for discussions with:

a	My lecturer	1
b	Fellow students	2
c	My lecturer and fellow students	3

☐ V25 : 26

12. Frequently asked questions (FAQ's)

12.1 Did you find the frequently asked questions (FAQ's) useful?

a	Very useful	1
b	Some times useful	2
c	I seldom used it	3
d	Not useful	4

☐ V26 : 27

13. General questions about TSA COOL

13.1 In future I will use the TSA COOL facilities again.

a	Always	1
b	Sometimes	2
c	Never again	3

☐ V28 : 29

13.2 How did you like the availability of online facilities as additional instructional methods for the cataloguing course?

a	Very useful	1
b	Sometimes useful	2
c	I did not need it	3

☐ V29 : 30

13.3 How did you experience the online facilities?

a	It was easy to use	1
b	I sometimes had to get help in the use of it	2
c	It was too difficult for me	3

☐ V30 : 31

14. Combination of a mix of media and technologies

Please circle an appropriate number in the shaded area that best matches your opinion.

14.1 When I studied the cataloguing module:

		Always	Sometimes	Never		
a	I preferred to only use my study guide, tutorial letters and prescribed books.	1	2	3		V31 : 32
b	I also used other reference sources in printed form (e.g. library books and articles) and electronic form (e.g. sources from the Internet)	1	2	3		V32 : 33
c	I also used e-mail, telephone and fax communication with my lecturer and other students.	1	2	3		V33 : 34
d	I also relied a lot on my mentor for help.	1	2	3		V34 : 35
e	I also attended contact classes.	1	2	3		V35 : 36
f	I also used the CD-ROM for classification training.	1	2	3		V36 : 37
g	I also used the CD-ROM, e-mail and TSA COOL.	1	2	3		V37 : 38
h	I also used the CD-ROM, e-mail, TSA COOL and attended contact classes.	1	2	3		V38 : 39

14.2 Which of the following media and technologies would you use in future again?

		Always	Sometimes	Never	
a	Printed material	1	2	3	V39 : 40
b	Printed practical exercises	1	2	3	V40 : 41
c	Practical exercises on CD-ROM	1	2	3	V41 : 42
d	Contact classes	1	2	3	V42 : 43
e	Mentor system	1	2	3	V43 : 44
f	Telephone and fax	1	2	3	V44 : 45
g	E-mail	1	2	3	V45 : 46
h	Online discussion groups	1	2	3	V46 : 47
i	Online study guides and tutorial letters	1	2	3	V47 : 48
j	Online academic guidance	1	2	3	V48 : 49
k	Online self-assessment	1	2	3	V49 : 50
l	Frequently asked questions (FAQ's)	1	2	3	V50 : 51

14.3 Would you like to receive instruction in the form of a mix of media and technologies again?

a	No	1
b	Maybe	2
c	Absolutely	3

☐ V51 : 52

14.4 Which of the following forms of media and technology would you like to have available for instruction?

a	Videoconferencing	1
b	Television broadcasts	2
c	Radio broadcasts	3

☐ V52 : 53

Thank you for your participation and co-operation!

Annexure D

Letter to students

Dear student

In Information Retrieval I (IRE111T) you were introduced to classification with DDC21. In Information Retrieval II (IRE281Q) part 2 of your study guide, training in classification is continued. To assist you with the practical component, we have designed a computer program on CD-ROM with additional exercises in the application of DDC21.

The purpose of the CD is to provide you with an additional training option in classification. Please note that the CD does not replace any of your existing study material. You should use it with your study guide, prescribed books, tutorial letters and communications via the e-mail and discussion groups.

To load the program onto your computer, simply insert it in your computer's CD-ROM drive. It will start loading automatically. Just follow the instructions on the screen. Once it is loaded onto your computer's hard drive, you may run it from the hard drive and do not have to use the CD again.

Before you start the exercises it is very important that you read all the instructions under the help files of the CD first so that you know exactly what to do.

For revision purposes you should firstly attempt the exercises for chapters 8 and 9 of Information Retrieval I. Then you should study the first chapter of part 2 of the Information Retrieval II study guide. Once you have completed the chapter attempt the exercises for that chapter on the CD. Continue with chapters 2, 3, and 4 until you have completed all the exercises.

After completion of the CD you must please complete the attached **three (3) questionnaires** and send them to your lecturer at:

Mrs LM Cloete
Technikon SA
Programme Group Applied Communication
Private Bag X6
FLORIDA
1710

(An envelope is enclosed for this purpose)

Fax: (011) 471-3119

E-mail: lcloete@tsa.ac.za

For those students who have registered on TSA Online and whose e-mail addresses we have, the questionnaire will also be e-mailed to them and they are welcome to e-mail the completed questionnaire back to the lecturer.

The purpose of the questionnaires is threefold:

1. To help us identify any problems that students experience with the CD
2. To get your general opinion about your studies in Library and information Studies at TSA.
3. To establish a learner profile.

This will enable us to improve the training method for future developments.

It is essential that you complete all the questionnaires and return them by the end of September 2000. Please note that your last assignment with the follow-up tutorial letter will not be sent back to you before we have not received all the completed questionnaires!

Your co-operation in this regard is highly appreciated!

Please do not hesitate to contact your lecturer at any time if you experience any problems with the CD.

LM Cloete

(011) 471-2858
0828227027
(011) 471-3119 (f)
lcloete@tsa.ac.za

Annexure E

Detailed findings of formative evaluation of the computer program

Rate the following on a scale where SA = strongly agree, A = agree, N = neither agree nor disagree (cannot decide), D = disagree and SD = strongly disagree.

1. Indicate how the program helped you in your studies of the classification module of Information Retrieval:

a) It helped me with my studies of classification:

SA	A	N	D	SD
33.33%	52.38%	14.29%	-	-

b) It helped me to understand the contents on classification in my study guide better:

SA	A	N	D	SD
30%	55%	10%	5%	-

c) The different ways in which questions were asked helped me to understand classification better:

SA	A	N	D	SD
36.36%	50%	9.09%	4.55%	-

d) After completing it I felt that I could answer the questions for self-evaluation in the study guide better:

SA	A	N	D	SD
10%	60%	25%	5%	-

e) After completing it I felt that I could answer my assignment questions better:

SA	A	N	D	SD
10%	60%	25%	5%	-

2. How did you experience the computerised format of the exercises?

a) I found it difficult to do the exercises because of the computerised format:

SA	A	N	D	SD
10.53%	5.26%	15.79%	47.37%	21.05%

b) I usually have difficulty working on a computer, but I found the exercises in this program easy to do:

SA	A	N	D	SD
20%	35%	15%	25%	5%

c) I would have preferred to do the exercises of this program in a pen-and-paper format:

SA	A	N	D	SD
36.84%	10.53%	15.79%	26.32%	10.53%

d) The computerised format made these exercises more interesting than an equivalent pen-and-paper format:

SA	A	N	D	SD
35%	40%	25%	-	-

e) Where I had the option to use either the mouse or the keyboard in my responses, I preferred to use the keyboard instead of the mouse:

SA	A	N	D	SD
10.53%	15.79%	36.84%	31.58%	5.26%

f) I found it difficult to click on an object and drag it to another position in the exercises where this action was expected of me:

SA	A	N	D	SD
5.26%	5.26%	15.79%	42.11%	31.58%

3. How did you experience the screen displays?

a) The screens are too full and overcrowded:

SA	A	N	D	SD
5.26%	10.53%	10.53%	52.63%	21.05%

b) The screen displays attracted my attention:

SA	A	N	D	SD
38.10%	47.62%	4.76%	4.76%	4.76%

c) Each category of questions has the same screen layout in every chapter and that helped me to understand how to answer the questions:

SA	A	N	D	SD
25%	45%	20%	10%	-

d) I knew what each picture, button and symbol on the screens meant:

SA	A	N	D	SD
21.05%	57.89%	15.79%	5.26%	-

4. How did you experience the text layout?

a) The layout made it easy to read:

SA	A	N	D	SD
33.33%	66.67%	-	-	-

b) The font used for the text is easy to read:

SA	A	N	D	SD
33.33%	61.11%	-	5.56%	-

c) The font is attractive

SA	A	N	D	SD
33.33%	55.56%	5.56%	5.56%	-

d) The font size used is readable and acceptable:

SA	A	N	D	SD
40%	50%	-	10%	-

e) I liked the colours used for the text:

SA	A	N	D	SD
27.78%	66.67%	5.56%	-	-

f) There is too much text on the screen:

SA	A	N	D	SD
5.56%	11.11%	33.33%	44.44%	5.56%

5. How did you experience the language level:

a) The level of the language used made it easy to understand the program:

SA	A	N	D	SD
61.90%	33.33%	4.76%	-	-

b) The vocabulary made the program easy to understand:

SA	A	N	D	SD
38.89%	61.11%	-	-	-

c) The length of the sentences made the program easy to understand:

SA	A	N	D	SD
33.33%	38.89%	22.22%	5.56%	-

d) I could look up any unfamiliar terms or phrases in my study guide:

SA	A	N	D	SD
10.53%	42.11%	42.11%	5.26%	-

6. How did you experience the pictures and colour?

a) The use of pictures of books and a bookshelf in the book classification exercises made it feel as if I was classifying real books:

SA	A	N	D	SD
39.13%	47.83%	13.04%	-	-

b) The use of pictures of books and a bookshelf in the book classification exercises distracted me and I could not concentrate on the exercises:

SA	A	N	D	SD
-	5%	20%	50%	25%

c) The colours used for the pictures were pleasant to look at:

SA	A	N	D	SD
15%	65%	20%	-	-

d) The colours used for the backgrounds of the screens were pleasant to look at:

SA	A	N	D	SD
15%	70%	10%	5%	-

e) I would have liked more pictures in the program:

SA	A	N	D	SD
15.79%	36.84%	31.58%	10.53%	5.26%

7. How did you experience the sound?

a) I was satisfied with the voice used for the introduction to the program:

SA	A	N	D	SD
31.58%	57.89%	5.26%	5.26%	-

b) The accent of the voice used for the introduction to the program was too British:

SA	A	N	D	SD
5.56%	16.67%	38.89%	33.33%	5.56%

c) I would have preferred a voice with a South African accent for the introduction to the program:

SA	A	N	D	SD
15.79%	21.05%	31.58%	31.58%	-

d) When I did the exercises, I preferred to turn the sound option off:

SA	A	N	D	SD
9.09%	18.18%	18.18%	54.55%	-

e) I preferred the human voice that told me when an answer was correct or incorrect:

SA	A	N	D	SD
5.26%	42.11%	42.11%	10.53%	-

f) I preferred the computer sounds that indicated to me when an answer was correct or incorrect:

SA	A	N	D	SD
21.05%	47.37%	26.32%	5.26%	-

8. How did you experience the content of the program?

a) I enjoy classification and was also satisfied of the content:

SA	A	N	D	SD
22.73%	59.09%	18.18%	-	-

b) I enjoy classification, but I found the content too difficult:

SA	A	N	D	SD
5%	10%	35%	50%	-

c) I do not enjoy classification, but I was satisfied with the content:

SA	A	N	D	SD
-	20%	30%	45%	5%

d) I do not enjoy classification and was also not satisfied with the content:

SA	A	N	D	SD
-	-	15%	70%	15%

e) The content helped me to understand my printed study material better:

SA	A	N	D	SD
20%	75%	5%	-	-

f) I found the review section after each chapter useful:

SA	A	N	D	SD
21.05%	68.42%	10.53%	-	-

g) I found the summary at the end of the program useful:

SA	A	N	D	SD
28.57%	61.90%	4.76%	4.76%	-

9. How did you experience the navigation and interaction within the program?

a) It felt as if the program addressed me personally:

SA	A	N	D	SD
15.79%	63.16%	15.79%	5.26%	-

b) There were times when I was uncertain about what to do:

SA	A	N	D	SD
5.26%	36.84%	31.58%	26.32%	-

c) I got lost in the content:

SA	A	N	D	SD
-	21.05%	15.79%	57.89%	5.26%

d) I always knew where I was in the program:

SA	A	N	D	SD
10.53%	52.63%	15.79%	21.05%	-

e) The introductory statements to the program explained the purpose of the program clearly to me:

SA	A	N	D	SD
20%	75%	5%	-	-

f) It was easy to get help from the help files:

SA	A	N	D	SD
10.53%	52.63%	31.58%	-	5.26%

g) Directions were clear and easy to follow:

SA	A	N	D	SD
22.22%	66.67%	11.11%	-	-

h) I knew what each icon meant and when to click on it:

SA	A	N	D	SD
21.05%	68.42%	10.53%	-	-

i) I found the option to make a printout of a screen useful:

SA	A	N	D	SD
16.67%	61.11%	16.67%	-	5.56%

10. How did you experience the assessment of your performance in the program?

a) I found the progress bar (which indicated how many questions I had completed, how many I had correct and how many incorrect) useful:

SA	A	N	D	SD
21.05%	47.37%	21.05%	10.53%	-

b) It was helpful to receive the correct answer immediately and, where applicable, an explanation when I had answered a question incorrectly:

SA	A	N	D	SD
40.91%	59.09%	-	-	-

c) The answers and explanations were clear to me:

SA	A	N	D	SD
26.32%	57.89%	15.79%	-	-

d) I would have preferred more than two attempts at the book classification section:

SA	A	N	D	SD
5.26%	47.37%	42.11%	5.26%	-

e) I found the percentage marks given for my performance at the end of a chapter useful:

SA	A	N	D	SD
15.79%	68.42%	10.53%	5.26%	-

f) I found the comparison of my percentage marks with my previous performance useful:

SA	A	N	D	SD
21.05%	68.42%	5.26%	5.26%	-

11. How did you experience group work with the program?

a) I usually like working in a group:

SA	A	N	D	SD
21.05%	31.58%	26.32%	15.79%	5.26%

b) I would have liked to do the program with others in a group:

SA	A	N	D	SD
15.79%	31.58%	31.58%	15.79%	5.26%

c) I preferred to do the exercises in this program on my own:

SA	A	N	D	SD
45.45%	22.73%	13.64%	9.09%	9.09%

12. How did you enjoy the program?

a) The program was challenging:

SA	A	N	D	SD
42.86%	52.38%	-	-	4.76%

b) The program was stimulating:

SA	A	N	D	SD
16.67%	55.56%	16.67%	5.56%	5.56%

c) I was bored with the program:

SA	A	N	D	SD
-	5%	5%	65%	25%

d) I enjoy classification and also enjoyed practising with this program:

SA	A	N	D	SD
20%	65%	10%	-	5%

e) I enjoy classification, but did not enjoy practising with this program:

SA	A	N	D	SD
-	-	15%	80%	5%

f) I do not enjoy classification, but I enjoyed practising with this program:

SA	A	N	D	SD
-	38.10%	9.52%	42.86%	9.52%

g) I do not enjoy classification and did not enjoy practising with this program:

SA	A	N	D	SD
-	-	13.33%	66.67%	20%

13. General

a) There was not enough time to complete the program:

SA	A	N	D	SD
20%	55%	-	15%	10%

b) I would use the program again:

SA	A	N	D	SD
28.57%	66.67%	-	-	4.76%

c) I would recommend the program to others:

SA	A	N	D	SD
33.33%	61.90%	-	-	4.76%

Annexure F

Detailed findings of summative evaluation of the training resource programme

Please circle an appropriate number in the shaded area, or where necessary, write your answer in the shaded area.

1. The cataloguing course in general:

1.1 How do you like cataloguing?

Hate it	It's OK	Love it
-	82.19%	17.81%

1.2 How did you experience the course? It was ...

Too easy	About right	Difficult, but I managed it	Too difficult
-	32.14%	64.29%	3.57%

1.3 How did you experience the length of the course?

Too long	About right	Too short
42.86%	53.57%	3.57%

2. Printed material (study guide, tutorial letters and prescribed text books)

2.1 How did you find the printed material?

It covered the course sufficiently	I needed more resources
74%	26%

2.2 The printed material was:

Too easy	About right	Too difficult
11.54%	88.46%	-

3. Practical exercises related to the course:

3.1 How were the practical exercises in the study guide and written assignments?

Too easy	About right	Too difficult
3.70%	77.77%	18.53%

3.2 How were the practical exercises in the study guide and written assignments?

Too few	About right	Too many
-	62.96%	37.04%

3.3 How were the practical exercises on the computer program?

Too easy	About right	Too difficult
8.70%	86.96%	4.35%

3.4 How were the practical exercises on the computer program?

Too few	About right	Too many
19.05%	76.19%	4.76%

4. Contact classes (presented in Johannesburg and Durban)

4.1 I found the availability of contact classes:

Very useful	I needed to attend only some classes	I had no need for classes
57.89%	26.32%	15.79%

4.2 How did you attend contact classes?

I could not attend	I chose to attend only some classes	I attended all the classes
46.15%	26.93%	26.92%

4.3 There should be:

Fewer contact classes	The same number of contact classes	More contact classes
9.09%	36.36%	54.55%

5. Mentor system:

5.1 How did you experience the mentor system?

Very helpful	I had not much need for a mentor	Not at all helpful
76.92%	7.69%	15.39%

5.2 The direct interaction with a mentor at my workplace:

Helped me very much with the understanding of the course	Did not make much difference in my study of the course	Only confused me since the mentor had a different opinion on some aspects of the subject
61.54%	23.08%	15.38%

6. E-mail communication

6.1 Did you use e-mail to communicate subject content issues with your lecturer and fellow students?

Never	Sometimes	Always
80.77%	19.23%	-

6.2 How was your experience of e-mail communication about subject content issues?

I found the quick responses very helpful	It did not make much difference whether I used e-mail or other forms of communication	I preferred to communicate via telephone and faxes
36.84%	5.26%	57.9%

7. Facilities on TSA COOL (Virtual campus)

7.1 I did not use TSA COOL facilities because:

I did not have access to the Internet	I did not have time	I saw no need for using it	It was not compulsory to use
72%	16%	12%	-

8. Online study guides and tutorial letters

8.1 Would you prefer to have your study guides and tutorial letters available online?

Yes	It does not matter	I prefer the printed format	It is unnecessary to have them in both formats
12.50%	6.25%	75%	6.25%

9. Academic guidance:

9.1 Did you find the academic guidance (which includes interactive exercises, links to web sites of interest etc.) useful?

Very useful	Sometimes useful	I seldom used it	Not useful
40%	13.33%	33.33%	13.33%

9.2 I found the interactive exercises:

Very useful	Sometimes useful	I seldom used it	Not useful
33.33%	26.67%	33.33%	6.67%

9.3 I found the links to web sites of interest:

Very useful	Sometimes useful	I seldom used it	Not useful
30.77%	30.77%	30.77%	7.69%

10. Online self-assessment:

10.1 Did you find the online self-assessment useful?

Very useful	Sometimes useful	I seldom used it	Not useful
53.85%	15.38%	30.77%	-

11. Online discussion groups:

11.1 Did you find the online discussion groups useful?

Very useful	Sometimes useful	I seldom used it	Not useful
38.46%	23.08%	30.77%	7.69%

11.2 I used the online discussion groups mostly for discussions with:

My lecturer	Fellow students	My lecturer and fellow students
25%	50%	25%

12. Frequently asked questions (FAQs)

12.1 Did you find the frequently asked questions (FAQs) useful?

Very useful	Sometimes useful	I seldom used it	Not useful
33.33%	16.67%	41.67%	8.33%

13. General questions about TSA COOL:

13.1 In future I will use the TSA COOL facilities again:

Always	Sometimes	Never again
50%	41.67%	8.33%

13.2 How did you like the availability of online facilities as additional instructional methods for the cataloguing course?

Very useful	Sometimes useful	I did not need it
63.64%	18.18%	18.18%

13.3 How did you experience the online facilities?

It was easy to use	I sometimes had to get help in the use of it	It was too difficult for me
50%	30%	20%

14. Combination of a mix of media and technologies

14.1 When I study the cataloguing module:

a) I preferred to only use my study guide, tutorial letters and prescribed books:

Always	Sometimes	Never
75%	20.83%	4.17%

b) I also used other reference sources in printed form (e.g. library books and articles) and electronic form (e.g. sources from the Internet)

Always	Sometimes	Never
30.43%	56.52%	13.05%

c) I also used e-mail, telephone and fax communication with my lecturer and other students:

Always	Sometimes	Never
14.29%	57.14%	28.57%

d) I also relied a lot on my mentor for help:

Always	Sometimes	Never
38.10%	47.62%	14.29%

e) I also attended the contact classes:

Always	Sometimes	Never
22.73%	31.82%	45.45%

f) I also used the computer program for classification training:

Always	Sometimes	Never
20%	70%	10%

g) I also used the computer program, e-mail and TSA COOL:

Always	Sometimes	Never
5%	45%	50%

h) I also used the computer program, e-mail, TSA COOL and attended contact classes:

Always	Sometimes	Never
5.26%	36.84%	57.89%

14.2 Which of the following media and technologies would you use in future again?

a) Printed material:

Always	Sometimes	Never
90.91%	9.09%	-

b) Printed practical exercises:

Always	Sometimes	Never
86.96%	13.04%	-

c) Practical exercises on the computer program:

Always	Sometimes	Never
38.10%	57.14%	4.76%

d) Contact classes:

Always	Sometimes	Never
59.09%	36.36%	4.55%

e) Mentor system:

Always	Sometimes	Never
65.22%	34.78%	-

f) Telephone and fax:

Always	Sometimes	Never
47.83%	43.48%	8.70%

g) E-mail:

Always	Sometimes	Never
31.82%	36.36%	31.82%

h) Online discussion groups:

Always	Sometimes	Never
27.27%	45.45%	27.27%

i) Online study guides and tutorial letters:

Always	Sometimes	Never
45.45%	31.82%	22.73%

j) Online academic guidance:

Always	Sometimes	Never
33.33%	42.86%	23.81%

k) Online self-assessment:

Always	Sometimes	Never
40.91%	31.82%	27.27%

l) Frequently asked questions (FAQs):

Always	Sometimes	Never
40.91%	36.36%	22.73%

14.3 Would you like to receive instruction in the form of a mix of media and technologies again?

No	Maybe	Absolutely
12.50%	45.83%	41.67%

14.4 Which of the following forms of media and technology would you like to have available for instruction?

Videoconferencing	Television broadcasts	Radio broadcasts
57.14%	33.33%	9.52%