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.