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.