Successful information literacy through librarian - lecturer collaboration

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by

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DECLARATION

"I declare that the thesis **Successful information literacy through
librarian - lecturer collaboration** is my own work, that it has not been submitted
before for any other degree or assessment in any other university and that all the
sources I have used or quoted have been indicated and acknowledged by means of
complete references".

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Date   …………………………………………..

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ABSTRACT

This study supports the need for information literacy training for first year or new incoming Community and Health Science (CHS) students at the University of the Western Cape (UWC) and describes the use of a collaborative framework for integrating information literacy into the undergraduate students' curriculum and for assessing the results. The Collaborative Information Literacy Model (CILM) provided the guidelines for a more structured and fuller collaboration between the librarian and the lecturer responsible for the first year Physiotherapy students. The collaborative partnership employed strategies to teach information literacy competencies which were significantly more satisfactory with the students' abilities to successfully complete a research term paper. The process of integration began with developing learning outcomes, an information literacy program, exercises and an assessment instrument for evaluating student performance. Also emphasized is the on-going exchange of expertise between the librarian and the lecturer to enhance library-related components in the design of the program.

The study aimed to answer the following research question:

- How can information literacy be implemented through librarian-lecturer collaboration?

Sub-questions:

- What are the use and understanding of resources by students and their perceptions, as well as the expectations of the faculty regarding information literacy skills?
- What are the preferences of students and faculty regarding information literacy education?
- What does faculty considers to be important services that should be provided by the librarian?
- Did faculty see any improvement in library services as a result of the collaborative partnership?

A survey based on the Association of College & Research Libraries (ACRL) Information Literacy Competency Standards was used to assess information literacy

levels of the first year CHS students. Using a pre-test to assess the exposure to information literacy training at school level, public library skills and computer literacy skills as first year CHS undergraduate students, and a post-test identified the information literacy competencies: search strategy; document types and use of results. To determine the impact of the formal training, the results of the post- and control tests were compared.

Of the 98 first year CHS students, English was their dominant home language (71.4% students). The pre-test results indicated that 61.23% students had their own computer, of the rest 32.65% had other means to computer access and 6.12% had no access to computers. Of the 98 students, 88.77% students had computer skills and 87.76% used the World Wide Web to find information. Although 66.33% students attended schools that had a school library, only 11.22% received information literacy training. Seventy-nine (80.61%) students were members of the public library and visited the public library while 8 (16.33%) students did not have access to public libraries.

In the post-test the pre-group improved significantly indicating that the information literacy training is essential for first year CHS students. With little guidance from the academics and the UWC library information literacy initiatives, the control group remained the same and did not become information literate.

It is widely recognized that information literacy skills play an important role in academic achievement and lifelong learning. The results of the control group identified that a deficiency in information literacy skills has a negative impact on academic achievement, as well as personal and professional development.

The results affirmed that the collaboration of information literacy training and clear faculty-established guidelines and requirements for the use of scholarly resources results in increased quality of students' research.

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LIST OF ACRONYMS

ACRL	Association of College and Research Libraries
ALA	American Library Association
ALC	Academic Literacy Classes
APA	American Professional Association
CHS	Community and Health Sciences
CILM	Collaborative Information Literacy Model
COSALC	Coalition of South African Library Consortia
LIASA	Library and Information Association of South Africa
MLA	Modern Language Association
NCLIS	National Council for Library and Information Services
NQF	National Qualifications Framework
OPAC	Online Public Access Catalogue
SAPA	South African Professional Association
SAQA	South African Qualifications Authority
UWC	University of the Western Cape
WWW	World Wide Web

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CHAPTER ONE

BACKGROUND OF THE STUDY

1.1   Introduction

A great challenge for society in the 21st century is keeping pace with the development of information and technology necessary skills for finding, applying and evaluating information. There are new rules, new players and new technology. Curricular reform has returned and an overload or never-ending supply of information has created a need for efficient filters of raw data at virtually any place and any time. The new literacy for the 21st century and beyond is clearly the ability to utilize appropriate technological tools in an information society (Evans, 1999: 103). In order to foster graduates who have learnt how to learn in the 21st century, academics, librarians and students need to be innovative and collaborative in developing their information literacy competencies.

Living in an information-rich society, information and knowledge is constantly increasing. So what do we mean by "information literacy?" Information literacy is also known as user education, library education, library instruction and bibliographic instruction. Skov and Skoerbak (2003: 326) add that it emphasises student learning and the pedagogical role of the librarian. For the South African context, Sayed and De Jager (1997: 6) provide a more operational definition of information literacy. According to them information literacy refers to the ability of learners to access, use and evaluate information from different sources, to enhance learning, solve problems and generate new knowledge. According to Behrens (1992a: 82) the concept of information literacy includes both information skills (the ability to handle information effectively) and library skills (where and how to look for information, or information gathering skills). Relating to the library skills is computer literacy in the sense of acquiring a set of skills to facilitate locating and usefully organising information on the Internet.

The University of Rhode Island had developed a working definition of information literacy "…the ability to understand the concepts and values of information in the context of data, information and knowledge. Further, it is the ability to understand

where it comes from, where it goes, and what the relationship is between the learner and the information world. It means being able to gather, analyse, and use information in an effective and meaningful manner" (MacDonald, Rathemacher & Burkhardt, 2000: 131). Information literacy is the generic skill pertinent to teaching research in the information age. The most popular American Library Association (1989) definition is "to be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information". Summarising the above, information literacy skills develop an individual as a critical thinker, problem solver and becoming an independent lifelong learner, who will use information legally and ethically.

1.1.1   Role of information literacy in the learning process

Today the issue is no longer how to bring electronic information to the campus or that there is "not enough information". The issue now is "too much information", and how to help the user find, organise, evaluate and apply the content of that information wisely and appropriately to fulfil an information need.

Most people think of information literacy as a set of skills which requires technical ability. True information literacy involves both thinking and doing. With information overload, analysis of an information need, knowledge of resource types, evaluation of access tools, and the interpretation of results are critical to successful information retrieval. Critical to successful information retrieval is we need to "know how", but first "know why".

So what role does information literacy play in the learning process? The emphasis is not only on 'knowing how' to retrieve information, but more specifically on 'knowing why'. Information literacy is a means to express personal ideas, develop arguments, refute the opinions of others, learn new things, or simply identify the truth or factual evidence about a topic. The traditional focus on learning associated with a single vocation is no longer valid. Students must become versatile learners who can adapt to new careers through their own ability of learning 'how to learn'. Those who are not information literate are unable to make informed decisions given an information-related problem and must rely on others rather than thinking for themselves. An information literate person can analyse and interpret information and this ability

enables them to respond critically and creatively to problems. Equally important, information literacy contributes towards personal empowerment and a person's freedom to learn. When one knows how to find and apply information one can teach oneself what you need to learn and essentially you have learned how to learn. This in turn makes the student a life-long learner (Bruce, 1997: 21; Colvin and Keene, 2004; Doyle, 1994: 138 - 148; Lupton, 2004b: 99; Snavely & Cooper, 1997a: 54).

Students must become information literate if they aim to be successful in a constantly changing and competitive workplace and with an increasing awareness that information has become the leading business asset. Kanter (2003: 23 - 24) goes further stressing that the successful companies are those that can turn data (raw material) into information (finished goods) and then into knowledge (meaningful action based on the information). This enacts the "new model of learning" (Breivik, 1998: 127) that is active and based on integrating real world information resources for learning and problem solving.

1.1.2 Librarians' role in teaching information literacy

While information literacy is recognised as a societal need and a strategic issue for universities, higher education institutions have been slow to restructure to produce information literate graduates for the knowledge society. When the higher education institutions have been preoccupied with investment in technology, Ayers (2004: 48) argued that while the academics remained relatively resistant to the possibilities of information technology, librarians have been the real heroes of the digital revolution in higher education. By partnering with the academics, librarians have successfully encouraged initiatives to embed information literacy and library resources into the curriculum.

Academic libraries are directly responsible to their primary users who are students. Librarians can help students conduct their library research and evaluate information in a systematic way. Simply stated, librarians can assist students in becoming information literate persons who have the ability not only to recognise information when it is needed, but locate, evaluate, and effectively use the needed information (American Library Association Presidential Committee on Information Literacy, 1989; Korobili & Tilikidou, 2005: 520). In recent years, many reports from different surveys

all over the world reveal that most members of the teaching faculty recognise the importance of information literacy education and the need to improve students' information literacy skills (Ivey, 1994; Leckie & Fullerton, 1999a; MacDonald, Rathemacher & Burkhardt, 2000; Sinn, 2000). Generally, much of the research and instructional activities in information literacy have focused on basic and general, or universal, skills – skills considered to be fundamental to all aspects of information seeking, evaluation, and use. These skills should be taught in the general undergraduate curriculum**.**

Since the 1970s, many academics and librarians have advocated integrating information literacy into the curriculum, but this is much easier said than done. To comprehensively integrate information literacy instruction into the university courses will take a commitment on the part of librarians, the teaching faculty, and the university administration. In most cases, the librarians and academics have taken the lead (Rader, 2001). Information literacy is particularly critical to students in the health fields. The ability to locate, find, evaluate and use information is critical to such students, not only in helping them to succeed in their courses, but also to succeed in their careers as healthcare practitioners.
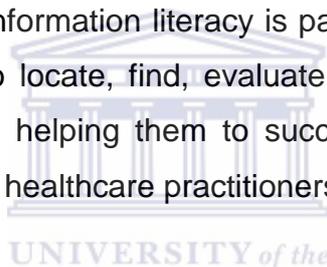
1.1.3 Integrating information literacy into the curriculum

Progress has been made in recent years regarding information literacy and the changing learning environment as new technologies continue, emphasis on preparing for the information society; teaching and learning are in the midst of major revisions. New powerful computers, continually emerging software, the Internet and the World Wide Web have had a substantial impact on the classroom and library environments. Slowly classrooms are becoming electronic (Groesbeck, 1992: 349; Moyo & Robinson 2001: 346 - 347; Stein & Lamb, 1998: 30 - 32). Faculties are beginning to rethink how they will teach in the electronic environment while students are demanding more interactive teaching and computer use. Faculty has to learn how to use the Web and other electronic information sources and how to integrate them into their teaching (Rader, 1999: 221).

By 1995, the UWC Computer Science and Statistics departments saw the need to change to new teaching methods and introduced some innovative teaching methods

such as collaborative learning and teamwork. The objective was to develop each student's talents, to build on their individuality and to give them a way of coping with a world that is overflowing with information. The students enjoyed this new approach of learning, making it worthy of further pursuit. These innovative teaching strategies proved to be successful in paving the way to lifelong learning (Venter & Blignaut, 1998).

During 1995, a pilot project for information literacy was established in South Africa. The project – named the INFOLIT Project was initiated to promote information literacy education on a regional approach in which UWC library partook. Its objectives were to:

- Promote the concept, value and importance of information literacy in the context of globalization and redress to key players in the region
- Launch a series of pilot projects which explore and establish various means of spreading information literacy education in the region
- Investigate information literacy models, programs and initiatives in other countries that could be adapted to local conditions.

The INFOLIT initiative has achieved a number of its objectives (Underwood, 2002).

In 2001, Nassimbeni and De Jager conducted a study determining measurable competencies regarding information literacy of students of the five tertiary institutions in the Western Cape. The results showed a patchy provision of courses or modules in information literacy and a general lack of recognition by educational institutions of its importance in mission statements and strategic plans. It showed that the majority of UWC students lacked information skills (Nassimbeni & De Jager, 2002). UWC curricula did not include any courses (with the exception of the Library Science 121 module in information literacy), aimed at teaching students how to select and evaluate the needed information. At UWC the need to improve student information literacy skills has increased.

Presently, the UWC educational environment offers many opportunities for librarians to achieve partnerships with various faculties and to integrate information literacy into the curriculum. Academic librarians are skilled regarding teaching student competencies for the information age. They are also skilled in helping faculties how

to teach the use of the web and how to integrate electronic information into their teaching and research. They can also be instrumental in helping faculty gain specific information skills. At the same time, this is how information literacy can successfully be integrated into the curriculum (Cardwell & Madgan, 2004: 23 - 24; Rader, 1999: 220 - 221).

Information literacy must also incorporate discipline- or subject-specific skills and resources. As Grafstein (2002: 199) states that teaching information literacy skills to students "involves equipping them with both knowledge about the subject-specific content and research practices of particular disciplines, as well as the broader, process-based principles of research and information retrieval that apply generally across disciplines." The UWC Library and Information Science department introduced a teaching module in information literacy to its Arts and Education undergraduate students.

According to Breivik (1998: 24), curriculum-integrated instruction serves as a valuable model for combining general information literacy skills with subject or discipline-specific information literacy. Orr, Appleton & Wallin, (2001: 457) go further in emphasizing the value of a curriculum-integrated approach. Effectively locating and evaluating information are skills librarians have traditionally taught. Locating information in the electronic age also requires computer literacy, often taken for granted with students. The effective use of information includes such skills as reasoning, writing, adhering to copyright and avoidance of plagiarism. Today librarians are not only integrating information literacy into their teaching, but they are also going beyond the traditional library instruction model by teaching for-credit first-year seminar or information literacy courses, team-teaching courses in the majors, and taking leadership roles on campus to reshape the curriculum. As Farber (1999: 231) states "Course-related instruction is the most effective approach to meeting the objectives of library instruction, thereby making librarian-faculty collaboration all more significant".

By adopting a constructivist approach to teaching, faculty will be able to "shift from being disseminators of substantial amounts of content information to being facilitators for students who are independent learners" (Information literacy

Symposia, 1995: 8). In the learning process, active learning has a common basis in what can be considered a constructivist-cognitive revolution (Hyerle, 1996: 25). This revolution has been spawned by a gap between intention and accomplished within the teaching-learning process, and is being fuelled by a growing understanding of how learning actually takes place. The goal of the constructivist-cognitive movement is to help students how to learn independently, so that they can become life-long learners. Part of the constructivist-cognitive movement is to rethink some basic assumptions about how we learn and when we truly understand. Developing information literacy skills shares a symbiotic relationship with the constructive-cognitive revolution. The emphasis is more on student-centered learning, demanding that students are able to use information to create knowledge rather than simply remember pre-digested knowledge delivered by teachers. This approach facilitates both understanding and application while increasing the likelihood that the knowledge will form the basis of new learning. As Kohl and Wilson (1986: 208) stress this training should be based on cognitive search strategy rather than simply a description of library resources.

Much has been written on information literacy strategies with undergraduates and many examples of information literacy programs can be found on university websites or journals. With the many students becoming the leaders of tomorrow, it is essential that they become information literate in order to "lead in the 21st century information society" (Kanter, 2003: 26). Karl Albrecht (2001a: 11) goes further in stating "that if every business is seen as an information enterprise and recognises the emerging roles of people as knowledge professionals, then we must seek ways to make them more effective and productive".

The development of information literacy skills for lifelong learning has become a major focus of many library instruction efforts and research. In the 1970s information literacy has become so important that it was strongly supported by many accrediting agencies, eg. the American Library Association (ALA) Instruction in the use of libraries Committees; Association of College and Research Libraries (ACRL); (ACRL) Task Force on bibliographic instruction; and others (Association of College & Research Libraries, 2002a). ACRL (2002b) for instance states that information literacy forms the basis for lifelong learning. It is common to all disciplines, to all

learning environments, and to all levels of education. A number of innovative programs and seminal sets of standards and goals have been developed in this area (ACRL, 2000; Arp & Woodard, 2002: 127). Many conferences and workshops were held all over the world, clearinghouses followed, books, articles and publications on case studies and programs appeared.

1.1.4 Development of information literacy standards for lifelong learning

At its 1998 Spring Conference, the American Association for Higher Education sponsored a special session on information literacy for colleges and universities, where it listed development of information literacy competencies among its standards. Disciplinary accrediting bodies are also mandating information literacy. There are now Information Literacy Competency Standards for Higher Education. Standards of information literacy competencies are developed worldwide. The current focus upon information literacy competencies reflects awareness of the rapidly changing information environment in which we live. As part of the Standards it recognises that information literacy depends on collaboration between the librarian and the disciplinary faculty in ensuring that all students have these necessary skills. In order to effectively implement a program all parties must be involved (American Library Association, 2000; Gresham, n.d.). ACRL (2003) sees collaboration between librarians and faculty as fundamental to information literacy: collaboration is based on shared goals, a shared vision, and a climate of trust and respect. Each partner brings different strengths and perspectives to the relationship; the teacher brings an understanding of the strengths, weaknesses, attitudes and interests of the students, and of the content to be taught; and the librarian adds a thorough knowledge of information skills and methods to integrate them into the course, pedagogical knowledge for teaching these skills and an understanding of students' frustration with the research process. Successful collaboration requires carefully defined roles, comprehensive planning and shared leadership. Librarians are geared toward improving student learning. As librarians' roles are continually changing, their expertise can help modernize classroom practice to make it more fitting to the new learner.

Middle States Commission on Higher Education (2002: 32 - 34) stresses that 'information literacy is vital to all disciplines and to effective teaching and learning in

any institution.' Their 11th standard states "collaboration between professional library staff and faculty in teaching and fostering information literacy skills is a fundamental element of education offerings." Information literacy competency standards are a useful guide to curriculum development. Information literacy as a concept brings together a wide range of skills.

Many institutions are in the process of revising the undergraduate curricula so they set measurable competencies for students. The pressure is on higher education and faculty to evaluate how they educate individuals for high performance and achievement in the 21st century's information environment (MacMullen, Vaughan & Moore, 2004: 323).

The higher education and academic librarians are now at the crossroads. Teaching and learning are undergoing major revisions and opportunities abound for librarians to collaborate with faculty in bringing about changes in the university curriculum. To be successful, librarians need to be alert, creative and informed about what is happening on their university campuses. Many examples of librarian-faculty partnerships are already in existence and new ones are created every day (Carlson & Miller, 1984; Farber, 1999; Ivey, 1994; Lederer, 2000; Meldrem, Johnson & Spradling, 2001; Rader, 2002). Librarians who started a few years ago to offer Internet workshops and technology instruction for faculty are now finding themselves in situations where faculty are seeking their advice and help in rethinking teaching. For librarians to become partners with faculty in curriculum reform and achieving resource-based learning for students, they will have to break away from their traditional ways and become innovative in their interaction with the faculty. As Bodi (1989: 151; 1992: 71) has demonstrated, the rise in professional interest in information literacy issues among librarians is closely related to more general concerns among the educational community, especially the desire to foster critical thinking skills among the students.

In recent years, librarians have leveraged technology issues to further their information literacy programmes (Raspa & Ward, 2000: 2). Innovative faculty has collaborated with librarians in the creation of instructional websites suited to their courses (Graziadei & McCombs, 1996: 93 - 94). Librarians have witnessed change

in faculty attitudes towards librarians as a result of the information explosion caused by the Internet, which creates demand for instruction for both faculty and their students. Technology can lead to opportunities for libraries and librarians, eg. librarians can provide training for teaching faculties in order to increase faculty understanding of the importance of integrating information literacy into their courses. As Woodard (1996: 138) adds by librarians leveraging their computer expertise, they can establish themselves as technology leaders on campus in both faculty development and students' information literacy. As referred to earlier, INFOLIT remedied this need for computer expertise.

The importance of information literacy must be emphasised, especially with the many technological changes taking place (Correia & Teixeira, 2003: 314). Grafstein (2002: 202) argues that the responsibility for teaching information literacy should be shared throughout an academic institution, and not be the responsibility of the academic library only. Information skills teaching should be contextualised within the structures and modes of thought of particular disciplines. Collaboration between librarians and the faculty to create an embedded information literacy skills program structured around upcoming assessment tasks has more relevance to students than generic "library" information literacy skill classes. The development of efficient information literacy education initially requires in depth understanding of the present situation and of future expectations.

On entering university a student needs to be information literate. It is a universal phenomenon that many students entering university are not equipped with the information skills required for study at tertiary level (Colvin & Keene, 2004; Lupton, 2004a: 26; Snavely & Cooper, 1997b: 10 - 11). South Africa is no different as many school leavers have none or a low level of information skills and are under-prepared for tertiary studies. The majority of new undergraduate students at the University of Western Cape do not have the necessary information skills required to complete tertiary education (Malan, 1997: 49 - 54). Many have no library or information skills given their disadvantaged background, inadequate schooling, and limited exposure to libraries and its resources. However at university they are expected to cope with methods of teaching and learning previously unknown to them. In such situations the university library as an educational support agency should play its part to the full.

The librarians at the UWC library have been involved in library instruction for many years. Although during the orientation week students are introduced to the library and its resources, they do not realise the importance of the library. Coming from a background where the majority of incoming students have had none or limited exposure to the library, it is not seen or deemed as necessary or important. The UWC library has for years marketed its services and scheduled library sessions on how to access the library resources. This was poorly attended. This is a worrying factor, because the impact of such a knowledge gap would definitely influence the student's academic success. Normally on the UWC campus the academics provided students with course readers consisting of notes, parts of books and journal articles accompanied with the prescribed textbooks from the short loan section of the library.

Many changes are occurring in the higher education due to the knowledge-based technology and multiple advances in technology. The teaching and learning environments are also revised as the funding agents for higher productivity in education are pressuring universities to evaluate and rethink themselves in terms of structure, teaching methods, curriculum and outcomes. As many institutions are in the process of revising their mission statements as well as their undergraduate curricula so that they set measurable competencies for students, UWC addressed information literacy education in their new revised mission statement and strategic plans. The UWC's new strategic plans gave birth to a Teaching and Learning unit to implement the integration of information literacy into the undergraduate curricula. This also led to the Charter of graduate attributes which was approved in 2009.

In brief, one universal message comes across: that information literacy skills must be taught in the context of an academic curriculum through the collaboration of lecturers and librarians (Breivik, 1998; Colvin & Keene, 2004; Eisenberg & Berkowitz, 1988; Kiondo & Msuya, 2005; Lupton, 2004a; Thaxton, Facciolim & Mosby, 2004; Wright & McGurk, 2000).

This study, therefore aimed to provide further knowledge with regard to the most appropriate information literacy education that will help students become lifelong

learners in their discipline. To ensure information literate students, it was done on the foundation of the librarian-lecturer collaborative partnership.

1.2   Research question

In an endeavour to present successful information literacy through librarian-lecturer collaboration, this study poses the following research question:

- How can information literacy be implemented through librarian-lecturer collaboration?

1.2.1. Sub-questions

The following sub-questions are based on this main research question.

Research sub-questions:

- What are the use and understanding of resources by students and their perceptions, as well as the expectations of the faculty regarding information literacy skills?
- What are the preferences of students and faculty regarding information literacy education?
- What does faculty considers to be important services that should be provided by the librarian?
- Did faculty see any improvement in library services as a result of the collaborative partnership?

1.3   Literature review

1.3.1 Information literacy and librarian-faculty collaboration

Librarians have come a long way in the past thirty year period of bibliographic instructions. Hannelore Rader (2002: 242 - 261) has provided a record of bibliographic instructions through her annual literature reviews published in *Library Trends*; over 5000 publications related to user instruction and information literacy have been published and reviewed during this thirty year period. In *Library Literature* more than thirty citations regarding librarian-faculty collaboration are retrieved. In a pioneering copy on this topic, *The collaborative Imperative: librarians and faculty working together in the information Universe,* the co-authors stated that "…collaboration between librarians and instructing faculty will be commonplace. Our

work will include more partnerships and teams, each of us with a specialty, and each blending individual work with that of others" (Raspa & Ward, 2000: 2).

There is a rich body of literature about information literacy through librarian-faculty collaboration. Many reported of challenges that librarians are facing with regard to powerful and evolving technologies, new software, accreditation standards and user studies. Librarians could learn about important efforts in *College & Research Libraries; Research Strategies; Reference Librarian; Reference Services Review; The Journal of Academic Librarianship; and Issues in Sciences & Technology Librarianship,* to mention just a few prevalent journal titles. Refer to chapter three for more detail.

The Library Science literature provides information on library instruction practices in the sciences, information literacy and goals (ACRL 2000; 2002a). The literature also addresses librarian-faculty collaboration which is extremely important in instruction planning and implementation (Bowden & DiBenedetto, 2002; Haynes, 1996; Kotter, 1999; Smith, 2003).

A health review of the health and library literature revealed that there are various examples of health care educators and librarians integrating library and information searching and evaluation skills into the curriculum. There is some evidence that a majority of health care curricula do integrate library instruction in some fashion. In a survey of 123 medical schools libraries, Earl (1996) investigated the level of library instruction offered in the medical school curricula. Results from the 55 respondents indicated 75 percent of the schools offered formal library instruction, and 49 percent of these respondents made these courses compulsory.

As the need for information literacy education has been identified by many authors (Behrens, 1992b; Black, Crest & Volland, 2001; Bundy, 2002; Cooney & Hiris, 2003; Cunningham & Lanning, 2002: Grafstein, 2002; Harley, 2001: Iannuzzi, 1999; Lupton, 2004a; Rader, 2002; 2001; Sayed & De Jager, 1997; Varga-Atkins & Ashcroft, 2004), most studies in the relevant literature indicate that faculty members consider information literacy skills to be a prerequisite for academic success. Faculty commitment to and involvement in the information literacy program is critical to the

success of such programs (Carlson & Miller, 1984; Farber, 1999; Gwinn, 1978; Ivey, 1994; Lederer, 2000; Meldrem, Johnson & Spradling, 2001; Nesbitt, 1997). "Librarians must work extensively with and have the cooperation of the faculty who teach these classes" (Carlson & Miller, 1984: 484). Dynamic librarian-faculty interaction is most important in order to build strong collaborative instruction programs. However, most faculties do not feel responsible for developing the information literacy skills of their students (Canon, 1994: 525; Maynard, 1990: 69 - 71; Thomas, 1994: 211 - 214). More specifically, some studies show that most faculties believe that librarians should have the responsibility to teach people how to use the library resources (Julien, 1998: 311; Thomas, 1994: 211 - 212), while others show that both faculty and librarians should be responsible for information literacy education (Canon, 1994; Hollister, 2004; Maynard, 1990; Sinn, 1998, 2000). Although many collaborative opportunities exist, there are barriers that may hamper such collaboration. Leckie and Fullerton (1999b) describe tensions that exist between librarians and their faculty. They found that arguments exist on the part of faculty that there is no time for information literacy to be integrated in already overcrowded disciplines; another seems to be faculty's lack of willingness to give up any intellectual space to library instruction. Leckie and Fullerton (1999b) suggest a number of possible roles for librarians in partnering with their faculty as personal liaisons with departments, as collaborators, leaders, mentors and supporters. In some instances, faculty tends not to recognise that librarians play a legitimate role in the education of students and research which usually results in a lack of much needed cooperation and support (Ivey, 1994: 69).

In a representative review of the literature, Jayne and Vander Meer (1997: 125) identified three common approaches that librarians have taken to the problem of teaching students how to apply critical thinking skills to the use of web-based information resources: (1) the development of generic evaluative criteria that may be applied to web-based information resources; (2) the inclusion of web-based information resources as one more material type to be evaluated during the course of research; and (3) working with faculty to integrate critical thinking skills into an academic assignment that asks students to use or evaluate web-based information resources relevant to their coursework. Smalley (2000: 34) reviewed the librarian - faculty partnerships in information literacy instruction, in the best-case scenario "the

student gains mastery in using some portion of Internet resources, as well as exposure to resources intrinsically important to disciplinary pursuits. In doing the web-based exercises, students saw information seeking and evaluation as essential parts of problem solving within the field of study".

In Australia, higher education is transforming the teaching and learning and postulated a different construct of teaching. Academics are to re-evaluate traditional curricula offerings and modes of delivery. Some of the Australian universities are required to work more collaboratively. Sharing the responsibilities of the curricula affords the librarians many opportunities to assume a more active educative role and demonstrate their actual and potential contribution to the re-engineering of the teaching and learning environment (Doskatsch, 2003: 112). Bundy (2002) predicts, in the near future, Australian universities will be based on a collaborative approach inclusive of all those who (librarians inclusive) contribute to effective teaching and learning.

According to Tennant and Miyamoto (2002: 185 - 190), students learn to evaluate and synthesize the information that they retrieved, coupled with information provided in classroom lectures, thus resulting in well-researched papers. Their survey indicated that students found the library sessions and the librarians' instructions to be very useful. Responses also indicated that the instructions increased the understanding of concepts, appreciation for the scientific research process and relevance to the real world. According to them the library benefited from this partnership on a variety of fronts. The course and associated information instruction and assigned projects can be considered models for course-integrated instruction and the role of librarians in undergraduate education. As Farber (1999: 232) states "the most sensible, most practical relationship is a cooperative one, in which teaching faculty work with librarians".

The results of different studies have also indicated differences in faculty perceptions, pedagogical practices and sources or topics introduced to students in various departments. Sinn's (1998: 113 - 114, 2000: 31 - 33) findings showed that there was a focus on topics such as how to use some specific databases, how to use the World Wide Web and journals. There are also differences among departments as to

the instructional methods faculty prefers, and as to how valuable the information literacy skills would be for their first and second year students (Canon, 1994: 530 - 534; Leckie & Fullerton, 1999b). Herrington (1998: 383 - 384) has suggested that for instruction to be effective it must be presented at the time students realise the need. Canon's (1994: 539) study indicated that information literacy could be successful, only if it is course related. Students need to learn to solve problems that reflect an authentic context (Farmer, 2003: 307; Nicaise & Barnes, 1996: 205; Reigeluth, 1996: 14; Reigeluth & Squire, 1998: 42). Savery and Duffy (1995: 37 - 38) concluded that students could learn better how to use the information sources of the library if they are given work that relates to their area of specialisation. On the other hand, there are not many studies concerning students' perceptions regarding their needs. The majority of the European and American Universities have moved from bibliographic instruction into information literacy education (Maughan, 2001: 71; Steward, 1999: 167; Williams, 2000: 325).

Judd and Tims (1996: 21 - 30) described course-integrated methods using a team-teaching approach with students, and collaborative teaching efforts that strive to impart not only bibliographic knowledge, but also critical thinking and literacy skills.
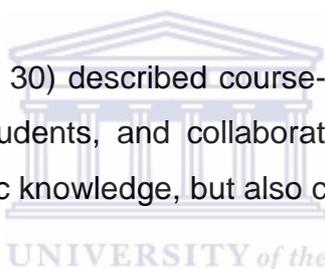
1.3.2 Information Literacy Competency Standards

In 2000, the Association of College & Research Libraries adopted the *Information Literacy Competency Standards for Higher Education.* Libraries could now assess their information literacy efforts based on established performance indicators in conjunction with generally accepted standards.

The ACRL standards for information literacy for higher education are:

Standard 1

The information literate student determines the nature and extent of the information needed.

Indicator: The information literate student defines and articulates the needed information.

Outcome: The student explores general information sources to increase familiarity with the topic.

Standard 2

The information literate student assesses information effectively and efficiently.

Indicator: The student selects the most appropriate information retrieval systems for assessing the needed information.

Outcome: The student investigates benefits and applicability of various retrieval methods.

Standard 3

The information literate student evaluates information and its sources critically and incorporates selected information into her / his knowledge base and value system.

Indicator: The student summarizes the main ideas to be extracted from the information gathered.

Outcome: The student reads the text and selects main ideas.

Standard 4

The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

Indicator: The student applies new and prior information to the planning and creation of a particular product or performance.

Outcome: The student organises the content in a manner that supports the purposes and the format of the product or performance

Standard 5

The information literate student understands many of the economic, legal and social issues surrounding the use of information and accesses and uses information ethically and legally.

Indicator: The student acknowledges the use of information sources in communicating the product or performance.

Outcome: The student posts permission granted notices, as needed for copyrighted material. The information literate student evaluates information and its sources critically and incorporates selected information into his/ her knowledge base and value system.

Thus, competency standards state that an information literate person will be able to:

- determine the extent of information needed
- access the needed information effectively and efficiently
- evaluate the information and its sources critically
- incorporate selected information into one's knowledge base
- use information effectively to accomplish a specific purpose

- understand the economic, legal and social issues surrounding the use of information, and access and use information ethically and legally.

According to Iannuzzi (1999: 304 - 305) this is how librarians can assess student progress.

1.3.3   Information literacy in higher education

According to Bundy (2004b) information literacy is recognised as a societal need and a strategic issue for universities, yet education institutions are slow to restructure to produce information literate graduates for the knowledge society. For Bundy (2002) university libraries should place emphasis on their distinctive educational role rather than their informational role. Everyone in authority is now aware of information literacy, and knows of the expectations of the knowledge society or society. Learning now has to be continuous and almost a way of being (Vaill, 1996: 89). Universities could allow their constitutions to integrate information literacy into everything they do in order to be successful in the constantly changing work environment in organizational work and in society. Universities also need to look at the business world where strategic advantages are now more based on learning and teaching organisations to take advantage of evolving technology, the Internet, global markets and the new economy (Harris, 1996: 25 - 27). It is now part of all higher education institutions throughout the world to define their concept of competencies and identify generic skills or attributes that support lifelong learning. Governments have implemented quality assurance controls that are shaping teaching and learning practices in higher education institutions. This offers librarians the opportunity to collaboration within the faculty.

1.3.4 Information literacy in South Africa

The inauguration of a new Government of Unity of 1994 resulted in the immediate implementation of new structures and dismantling of the oppressive structures of the previous apartheid state, but it had little immediate effect on libraries and information services. In 2001 the National Council for Library and Information Services (NCLIS) was established and its operations commenced in 2004. This statutory body coordinated and developed its library services. One of its objectives being to provide optimal access to relevant information to every person in an economic and cost-

effective manner and to inform and advise the Minister of Education on the effectiveness of education and training for library and information services (De Jager, Nassimbeni, Underwood & Zinn, 2007). The education system of the post-1994 South African government consisted of a mixture of state and private provision, overlain by separation on racial lines. The consequences of this system of uneven allocation of resources led to the detriment of the non-white schools and schools in the rural areas. The consequences also manifested in the inadequate provision and training of staff at many schools and the lack of basic school facilities in many rural areas. The school drop-out rates were high and the quality and preparedness of entrants to further and higher education was extremely uneven, which further discouraged participation. The new education system introduced an affordable compulsory system of primary and secondary education with adequate safeguards to ensure quality and community consultation and embracing lifelong learning essential for social healing and economic development (De Jager, Nassimbeni, Underwood & Zinn, 2007).

One of the major impetuses behind the recognition of the importance of information literacy in South Africa has been the report – the Western Cape Library Cooperative Project, also known as the Senn Breivik Report (Breivik, Pitkin & Tyson, 1992 cited in De Jager, Nassimbeni, Underwood & Zinn, 2007). It addressed the need for the facilitation of cooperative academic planning within the five tertiary education institutions of the Western Cape of South Africa in order to achieve transformation with limited economic resources. Weaknesses in the access to information and the management of information resources were identified as problems for which a cooperative solution would be viable. It also reported that information literacy is inherent in the service role played by higher education to the regional community including the granting of access to its resources by the community (De Jager, Nassimbeni, Underwood & Zinn, 2007).

The Senn Breivik Report recommended the establishment of a pilot project in information literacy with staff and faculty development activities. The specific point was emphasised that only access to a rich base of information resources in many formats can allow a move away from the traditional lecture / textbook / short loan /reserve teaching approach that characterised the majority of course delivery styles.

A rich base of information resources is necessary to design assessments that develop students' information accessing and evaluative skills (Breivik, Pitkin& Tyson, 1992 cited in De Jager, Nassimbeni, Underwood & Zinn, 2007).

In 1995 the INFOLIT Project was established with the following primary objectives:
- Promoting the concept, value and importance of information literacy in the context of globalisation and redress to key players in the region,
- Launching a series of pilot projects which explore and establish various means of spreading information literacy education in the region,
- Investigating information literacy models, programmes and initiatives in other countries that could be adapted to local conditions.

These objectives were guiding the framework for activities for the INFOLIT Project. Of the objectives that were achieved was the creation of awareness of the potential of information literacy amongst librarians and faculty. Workshops were held where librarians and faculty discussed educational transformation, the redress and the impact of information and communication technologies on the learning space. Capacity development amongst faculty and librarians was the principal method of working, guided by the belief that development of the curriculum is best undertaken with the specific needs of each discipline in mind. The librarians shared their experiences with librarians in other regions to ensure the Project's influence was more widely-spread (Underwood, 2002).

1.3.5 Information literacy in South African higher education

One of the most important contributions on information literacy education in a South African context was 'The segregated information highway' by Yusuf Sayed (1998). Sayed surveyed the teaching of information literacy education at the five tertiary level education institutions in the Western Cape Province in South Africa. It also looked at how the Apartheid influences still loom over the education sphere, from primary school through to tertiary education. It is still evident when many black South Africans arrive at university unprepared for the rigors of tertiary level education and many students are not equipped with the information literacy skills required for study at tertiary level.

With the arrival of the new technology, universities made huge investments in IT. However, it did not do much for the underprepared students. Many saw it as an obstacle rather than an enabling tool which facilitates academic work. Much needed to be done in the classroom to bring students up to speed with new technology. The reality of the classroom situation was that many of the students came from homes where computers are not a priority; do not have access to Internet connectivity or coming from impoverished rural areas (Frier, 2009).

The state of information literacy education from 1997 -2002 has been extensively reviewed in a paper by De Jager and Nassimbeni (2002). The survey showed that there were many information literacy interventions taking place. It found that librarians were aware of the pedagogical desirability of the integrated approach, but were finding it difficult to make inroads into the academic curriculum. Many institutions offer library orientation courses in addition to ad hoc interventions when requested by students or academics.

The Library and Information Association of South Africa (LIASA) is the leading body promoting and providing continuing professional development of library and information workers in South Africa. One of its five policy statements incorporates the goals of information literacy for all in conjunction with lifelong learning. LIASA has since 2002 facilitated a number of workshop and training courses to equip librarians with the understanding of the role of information literacy in student learning and to provide them with guidance on curriculum design, teaching and assessment methods. Librarians are encouraged to attend professional development courses such as developments in web technology, new electronic products and communication tools to enhance their own information literacy skills. Of the library schools, UWC'S Department of Library and Information Science offers a compulsory module on information literacy to its first year students.

In South Africa the higher education system is influenced by global movements such as the nature of skills required for the knowledge economy, employability of graduates and the demand for bigger accountability. All this led to higher education policies requiring changes in approach to teaching and learning (De Jager & Nassimbeni, 2005: 33). The South African Council on Higher Education through its

Higher Education Quality Committee has been assigned the responsibility for quality assurance in higher education that is associated with quality improvement and enhancement. All this is to ensure that institutions effectively and efficiently deliver education, training, research and community services which are of high quality and which produce socially useful and enriching knowledge, skills, competencies necessary for social and economic progress (De Jager & Nassimbeni, 2005: 33). As UWC is one of the educational institutions that must deliver an effective and efficient education, the library will become part of the process (Morta, 2006). This makes librarian-faculty collaboration crucial and could be seen as one quality assurance activity.

1.3.6 South African literature on information literacy

Of the first publications to appear was that of Rosemary Bell (1990) looking at library literacy in the academic library. During the early 1990s information literacy needed to be promoted (Breivik, Pitkin & Tyson, 1992; Fidzani, 1995; Marais, 1992; September, 1993) and Behrens (1992; 1993; 1994; 1995; 1999) actively looked at librarians and information literacy; information literacy at tertiary level; lifelong learning in the education and training environment; mastering information skills and looking at information literacy as a current topic. Yusuf Sayed's (1998; 2000) studies on information literacy in a South African context surveyed the then five tertiary education institutions in the Western Cape; information literacy and South African students (Sayed & De Jager,1997) which was later followed up by Karen De Jager and Mary Nassimbeni (1998; 2002; 2003; 2005) and Peter Underwood (2002). Post-apartheid developments at tertiary institutions brought about planning and policy for information literacy (Breivik, Pitkin & Tyson, 1992; Coalition of South African Library Consortia, 1999; Lockhart, 2011; National Commission on Higher Education, 1996).

The literature that looked at the need for information literacy education was identified by many authors (Bitso, 2000: 29-32; Jacobs, 2000: 22-28; Kiondo & Msuya, 2005; Leach, 1999: 58-60; Prozesky, 1999: 56-57; Rawlins, 1999: 54-55; Reagon & Tise, 2005; Sayed & De Jager, 1997: 5-12; Thompson, 1998: 125-129; Underwood, 2000: 15-21). Library and faculty involvement and commitment in the information literacy programs are critical for integration into the curriculum of the undergraduate student (Machet, 2005: 180-195; Makhubela, L. 2000a: 1-7; 2000b: 133-153; Somi-Thomas

& De Jager, 2005: 259-267). The collaborative partnerships developed frameworks and new models on how to implement information literacy successfully (De Jager & Nassimbeni, 2003: 108-114; Fourie & van Niekerk, 1999: 333-352; Haberle, 2002: 21-30; Ten Krooden, 1999: 82-92; Thompson, 2001; Thompson & Cronje, 2001: 3-14; Van Vuuren & Henning, 2001: 79-85; Zondi, 1992: 204-208). A number of published manuals and workbooks have been produced by the Goldfields Library and information Centre of Technikon SA, which provided the framework for students' information literacy portfolios (Erasmus, 2001: 18-19).

A few theses and dissertations were completed on information literacy and the undergraduate students. Lindi Zondi's (1991) research was the first study to be conducted in library user skills and information seeking patterns of first year students in South Africa. Shirley Behrens (1992) studied the undergraduate library and information skills in a learning environment. In the South African context, many studies have shown the role played by the academic libraries in the enhancement of information literacy and integrating it into the curriculum of the undergraduate students (Davis, 2004; Haberle, 2001; King, 2007; Lockhart, 2011; Makotoko, 2000; Mariti, 2006; Ntsala, 1994; Sieberhagen, 2005; Somi, 2004; Webster, 2000).

1.4 The Librarian-faculty collaborative partnership

1.4.1 Introduction

As higher education prepares for the 21st century changes are occurring due to new technological developments and the need on the part of the faculty and students to acquire computer and information skills. Learning now has to be continuous and almost a way of being. Universities must teach their constituents to integrate learning opportunities into everything they do to be successful in the constantly changing work environment, in organisational work and society. Higher education needs to look closely at the business world where strategic advantages are now more based on learning and teaching organisations to take advantage of evolving technology, the Internet and the new economy (Rader, 1998).

Since the 1970s, many librarians and educators have advocated integrating information literacy into the curriculum, but this is not so easy. Comprehensively integrating information literacy instruction into university courses takes a

commitment on the part of library professionals, the teaching faculty and the university administration. If the university administration has not taken the lead, a department would. It would be the academics who would recognise that their students were not fully utilising the vast amounts of information available to help them make critical decisions in their practices (Dorner, Taylor & Hodson-Carlton, 2001: 132). At the same time librarians also realised the problem of students not utilising the information resources to its fullest. At UWC the Computer Science and Statistics departments were the first; to follow was the Library and Information Science department; the CHS and Economic and Management Science faculties. They saw that information literacy is particularly critical to students in those fields. This ability is critical to such students not only in helping them to succeed in their courses, but also in their careers.

Due to the overwhelming amount of information available, students do not fully utilize the vast amount of information available, due to ignorance and fear. Ignorance, as students are not aware of all of the resources available to them nor are they able to judge which are the most useful. Fear, because they are intimidated by the unfamiliarity of the resources and tools (Dorner, Taylor & Hodson-Carlton, 2001: 132). Getting past that ignorance and fear is part of the collective effort by the librarian and lecturer to incorporate information literacy into the curriculum.

Based on the study's research question and sub-questions, the rationale for embedding information literacy into course design, delivery and assessment is firmly grounded in a growing body of knowledge emphasising collaborative librarian-faculty partnership. As the Association of College and Research Libraries (ACRL) (2003) states collaboration between librarians and faculty is fundamental to information literacy. That collaboration is not only based on shared goals and vision, but on trust and respect as well. Each partner brings different strengths and perspectives to the relationship. ACRL goes further stating that successful collaboration requires carefully defined roles, comprehensive planning and shared leadership. The teacher brings an understanding of the strengths, weaknesses, attitudes and interests of the students and of the content to be taught, whilst the librarian adds a thorough knowledge of information skills and methods to integrate them into the course and teach these skills. Middle States Commission on Higher Education (2002: 32 - 34)

states in their 11th standard that library-faculty collaboration is a fundamental element of education offerings. Information literacy competency standards are a useful guide to curriculum development. Information literacy as a concept brings together a wide range of skills.

In South Africa, De Jager and Nassimbeni (2005: 35) used a series of surveys to track progress in institutionalising and inculcating information literacy in higher education, asking whether respondents' institutions had shown any strategic awareness of the importance of information literacy (De Jager & Nassimbeni, 2002: 176). They initially found little evidence of institutional commitment and only a few examples of information literacy featuring in library mission or plans, but later identified some progress, with twenty-one institutions reporting references in their library mission statements (De Jager & Nassimbeni, 2005: 36).

Bundy (1999: 248) stated that any university library which maintains into the 21st century a mission confined to excellence in the provision of information resources will lack credibility in the changing teaching and learning context of higher education, and it will sell itself, its institution and most critically its user, short. This echoes Bruce's (1994) view that the incorporation of educational philosophies related to information literacy should be reflected in the library's mission statements and goals. Booth and Fabian (2002: 128) stress the fundamental importance and pervasive nature of information literacy as the central and underlying priority of all library activities, calling for articulation of information literacy goals as they relate to distinct library activities as well as inclusion in mission / vision statements. McGuinness (2003: 158) also argues that strategic plans and missions' offer a useful means of establishing the library's commitment to information literacy, or information skills programmes. Wilson (2001: 5) suggests this applies at institutional level and in relation to academic goals, that information literacy is prominent in mission and vision statements, strategic plans and program descriptions. Information literacy is an institution-wide and not viewed as one department's purview. The faculty recognises that information literacy matches the educational goals of the institution, that it adds value to learning and that it is complementary to discipline-based goals. Bruce (2002) confirms the need for institutional policies to support information education and the responsibility must be shared within strategic partnerships,

operating at various levels, including curriculum design, policy development, staff development, research and classroom teaching; and be supported by educational leaders such as the deans.

Booth and Fabian (2002: 139) assert that librarians must develop, exploit and foster strategic and diverse teaching and learning alliances. A strategic, forward-looking, entrepreneurial approach for integrating the library agenda into institutional documents and for making information literacy a centrepiece of university success measures should be advocated for. A broad view of library partnerships, including campus administrators, academic leaders and teaching faculty must be encouraged.

The academic library's mission is to move from a content view (books, subject knowledge) to a competency view (what students will be able to do). Like the general education program, the library has a direct and an indirect interest in the learning outcomes for all the students at the university. The direct and indirect interest of the librarian can be satisfied or achieved by collaboration between academic librarians and members of the faculties. The common theme for both the integration and assessment of information literacy learning is identified by many authors that there needs to be close collaboration between all educators (Bruce, 1995; Candy, Crebert & O'Leary, 1994; Colvin & Keene, 2004; Iannuzzi, 1999: 304-305; Lupton, 2004b; Smith, 2003; Thaxton, Facciolim & Mosby, 2004: 185-189; Wright & McGurk, 2000: 83-97). Many authors also agree that collaborating with the faculty to integrate information literacy into the academic courses in higher education is a well-documented goal of academic librarians (Cohen, 1995; Cunningham & Lanning, 2002; Nimon, 2001; Walter, 2000; Winner, 1998; Paglia & Donahue, 2003). Many studies in the library literature reflect the importance of librarian-faculty collaboration around library skills, and in particular around the development of information competencies in various disciplines (Baxter, 1986; Carter, 2002; Daugherty & Carter, 1997; Fiegen, Cherry & Watson 2002; Merriman, LaBaugh & Butterfield, 1992; Thaxton, 2002; Walter, 2000).

Dewald's (1999: 29) best practice on librarian-faculty collaboration is based on three characteristics: the first one is of paramount importance for effective skills teaching and is subject related; the second characteristic of good library instruction is that the

course fosters active learning; and the third is collaborative learning. Fitzwater, Geesaman, Gray, Kickels, Olberding, Payne, Sandiford, Sutton & Webb (2003) added more characteristics in that it must be linked to the goals and educational philosophy of the College; receive support; and that it should rely on a set of information literacy standards to establish curriculum and assess learning. According to Gillbert (2001: 76), librarian-faculty collaboration must be a symbiotic mutually beneficial relationship before it can be called a partnership. A partnership must consist of librarian involvement in curricular discussions and an active instructor involvement in discussing library service provisions. Factors that affect this relationship include the number of academic librarians, the strength and weakness of the collection, the size of the institution, the faculty and the student body (Gilbert, 2001: 76; Ivey, 1994: 70; Meldrem, Johnson & Spradling, 2001: 30 - 32). Black, Crest and Volland, (2001) affirm that information literacy must foster the creation of strong interpersonal relationships between librarians and faculty and through both informal and formal faculty development sessions which is essential for success of meeting specific information literacy goals.

The process of collaborating with faculty to incorporate information literacy skills into discipline curriculum is a rewarding process that benefits students, librarians and the faculty. Grafstein (2002: 197) maintains that the success of a discipline-based approach to information literacy is dependent on the sharing of information literacy instruction responsibilities. Librarians and faculty must agree on complementary responsibilities as information literacy skills are introduced to students to cement the importance of the subject content and increase the opportunities for transfer of learning. Grafstein (2002: 199) argues further that information literacy training outside of a discipline will not interest the students, or if it is not connected to an assignment or progression in learning a discipline's required research skill. The challenge is to see that both librarian and faculty should see that the information literacy skills must be transferred to students to equip them with both knowledge about the subject-specific content and research practices of particular disciplines and the broader process-based principles of research and information retrieval that apply generally across disciplines. These enable students to decide upon the *modus operandi* of their own learning, engage with real world information and gain life-long learning skills and information literacy competencies. As Breivik (1998: 128) stated

that this enacts the new model of learning that is active and based on integrating real world information resources for learning and problem solving.

The librarian-faculty collaborative partnership could serve as a template for future collaborative efforts between the library and the classroom faculty in terms of integrating information technology and information literacy into the academic curriculum (Bodi, 1992: 71 - 73). There are numerous studies on librarian-faculty collaboration in higher education the world over. They vary tremendously in complexity and scope, but demonstrate that such collaboration is possible and can be effective for everyone who is a part of it. Such partnerships do require a certain amount of entrepreneurship and creativity on the part of librarians who need to reach out to the faculty to initiate cooperative ventures (Bodi, 1992; Carlson & Miller, 1984; Cooney & Hiris, 2003; Dilmore, 1996; Farber, 1999; Farmer, 2003; Gwinn, 1978; Iannuzzi, 1999; Ivey, 1994; Nesbitt, 1997; Sinn, 1998; Tennant & Miyamoto, 2002).

The primary objective of the librarian-faculty-student collaboration remains the accomplishment of a short-term goal in response to an immediate research/teaching request. The librarian's contribution is bibliographic expertise, providing instruction about how to locate and retrieve relevant materials, and the faculty teaching content knowledge. Several recent trends have helped to make possible more innovative approaches to collaboration (Farber, 1999: 233). Among the most important are the rapid pace of technological change, especially the Internet, a focus on information literacy, and the growing popularity of the liaison model of librarianship. The Internet makes possible the documentation of a sustainable collaborative relationship between the library and the rest of the academic community. Information literacy stresses the importance of understanding the structure and "life-cycle" of information and the evaluation of information resources, an addition to the facility with searching techniques. The liaison model centres on building closer ties between librarians and teaching faculty and students, in the implementation of collection development, bibliographic instruction, and individualized reference consultations.

Many projects over the world which were developed by universities combine many of these dynamic elements (Raspa & Ward, 2000: 3 - 5). The project will centre on the innovative use of technology, takes advantage of the librarian-faculty-students

collaboration in the creation of intellectual content. Its most distinctive feature lies in its futurity (work in progress), deriving its success from the continuing participation of librarians, faculty members and students. According to Raspa and Ward (2000: 6), a fully collaborative enterprise is, "a more pervasive, long-term relationship in which participants recognise common goals and objectives, share more tasks, and participate in extensive planning and implementation." As Farber (1999: 231) describes "a successful if not ideal cooperative librarian-faculty relationship is one which both the lecturer's objectives and the librarian's are not only achieved but mutually reinforcing – the lecturer's objectives being those that help students attain a better understanding of the course's subject matter, and the librarian's objectives being those that enhance the student's ability to find and evaluate information. Course-related instruction is the most effective approach to meeting the objectives of library instruction, thereby making librarian-faculty collaboration all the more significant."

It is important to examine the information literacy activities to find out if students are adopting lifelong learning skills. Assessing student learning is also a key element in addressing an emerging array of institutional realities. In order to measure student learning in information literacy programs, assessment tools have become commonplace among librarians who work with instruction, reference liaison or consulting duties (Iannuzzi, 1999: 301-303). Various evaluation methods have been used, for example, formative and summative (Merz & Mark, 2002: 33), multi-part assessment tools (Knight, 2002: 17; Rabine & Cardwell, 2000: 323-325), pre- and post-test methodology (Barclay, 1993: 195-199; Faust, Ginno, Laherty, Manuel & Ramsdell, 2001; Thaxton, 2002: 4-5) and essay (Daughtery & Carter, 1997: 32-33). According to Iannuzzi (1999: 304) assessment is difficult because librarians cannot do it alone. They need the perspective that comes with the collaborative energy of working with the faculty.

The following discussion of the collaborative framework was based on the many collaborations or partnerships of librarians and faculties that developed information literacy programs for their undergraduate students. It was adapted to suit the needs of a lecturer teaching the Physiotherapy first year students in the Community and Health Sciences Faculty at UWC. They formed part of the initial case study. This

was based on the formalization and enhancement of a long-standing librarian-lecturer relationship, with the emphasis on the elements of the librarian-lecturer collaborative framework for integrating information literacy and its assessment into the undergraduate Physiotherapy course.

1.4.2 Elements of the librarian-faculty collaborative framework

The librarian-lecturer collaborative framework provided a system for integrating information literacy and its assessment into the course, and served as the contract of understanding between the librarian and the lecturer. The framework consisted of several inter-related steps, namely: librarian-lecturer teamwork; establishing goals and objectives; including an information literacy requirement in the course syllabus; designing and compiling assessment instruments; providing enhanced class instruction; incorporating an information literacy component into the term project; and assessing the learning outcomes. All of these elements will facilitate an enhanced level of collaboration between librarian and lecturer, and are essential for integrating information literacy and its assessment into the course. This collaborative effort engaged the students right from the start (in the course syllabus) in the information literacy process (ACRL, 2003; Bodi, 1992: 70 - 71; Carlson & Miller, 1984; Cooney & Hiris, 2003: 216 - 221; Doskatsch, 2003: 113 - 118; Nesbitt, 1997: 5 - 6; Smalley, 2000: 34; Woodard, 1996: 133 - 134). Refer to chapter four for more detail.

1.4.2.1   Goals and objectives of the collaborative framework

The goals and objectives of this study was developed in support of ACRL Information Literacy Competency Standards, Middle State Commission on Higher Education, and customised to suit the librarian-faculty collaborative framework. This provided the means to measurably evaluate the learning outcomes.

Goal 1: The student knew the major information sources in the research and studies in the disciplines.

Objective: The student was able to identify, locate and use appropriate important information.

Support ACRL Standards #1 & 2: The information literate student accessed needed information effectively.

Goal 2: The student evaluated the reliability and significance of information found relevant to research.

Objective: The student was able to identify, locate and use the reliable and authoritative information.

Support ACRL Standards #3 & 4: The information literate student evaluated information and its sources critically.

Goal 3: The student used appropriate attributes and citation formats for print and electronic resources.

Objective: The student was able to identify and use appropriate attribution and citation formats and methods.

Support ACRL Standard # 5: The information literate student understood many of the economic, legal and ethical issues.

Goal 4: The Librarian-faculty collaborative partnership.

Objective: The relationship in which librarian and faculty recognised common goals and objectives, shared tasks, and participated in planning and implementation to respond to a research/teaching request.

Support MSCL Standard # 11: Collaboration between librarians and faculty was fundamental to information literacy. Refer to chapters four for more details.
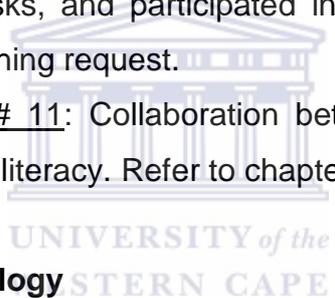
1.5   Research methodology

1.5.1 Introduction

The study will combine quantitative and qualitative approaches. This combination research approach is suited to research amongst people from any educational level, language and culture. The use of both approaches also ensured that data collected were valid and reliable. The methodology utilized qualitative and quantitative measures of student perceptions of the information literacy program and the classroom sessions, as a pedagogical tool and focuses on documenting approaches and information literacy practices. The following qualitative data was analysed by the librarian and lecturer: 1) transcripts of the classroom sessions; 2) emails of the researcher, the lecturer and the students; and 3) field notes of the researcher. The following quantitative data was analysed: a survey instrument that compares the two delivery options: 1) the questionnaire; and 2) the research term paper (the transfer of knowledge about information literacy) and the list of the information tools used. This

study, through the use of the research question and sub-questions, assessed the effectiveness of the classroom sessions and the research term paper.

Black, Crest and Volland (2001), advocate that no one avenue is best, but rather a combination of common-sense methods. It was important to continually examine numerous communication channels to discover which ones worked best in the UWC setting. Considering that the content of the information literacy education should be related to a specific discipline, it was decided to examine a specific department – Physiotherapy 1 as the pre-group. Health research is essential in the health discipline; students are expected to locate information on a wide variety of topics from seemingly diverse areas of the health sciences and health studies in order to design and implement efficient and effective strategies (Kotler & Armstrong, 1991: 31 - 33). Therefore, this population was considered to be appropriate for an investigation of information needs. This diversity contributes to gain insight in other areas of the health sciences. It was thought that an information literacy program addressed to the (n = 49) students of the Physiotherapy department could be used as a model for preparing instructional materials for other departments as well.

As part of the investigation another department in the CHS Faculty, Occupational Therapy 1 students (n = 49) also partook in the study as the control group. The lecturer responsible for the Occupational Therapy 1 students could not participate due to lack of time and her huge workload. The control group were only taught the information instructions without the involvement of their lecturer. There was also no research paper or assignment given, even when asked by the librarian. The students only wrote tests. This meant that the lecturer could not complete the questionnaire.

The collaborative effort began with planning. A letter was drafted (Appendix A) and sent to the heads of the Physiotherapy and Occupational departments for permission to collect data within their department.

Decisions needed to be made by the researcher and the lecturer coordinating and responsible for the first year Physiotherapy students, about what would be covered by the instruction, and where it would be integrated. The librarian and lecturer agreed it would be necessary to inform the students of the importance of information

literacy in the syllabus. This was done in collaboration with the lecturer and the librarian who provided the instruction in information literacy. Students were told that they would complete a research term paper which also included a score for information literacy competency.

Each one in the collaboration brought a variety of complementary skills and perspectives to the program. The librarian brought the expertise in information literacy and took responsibility for designing the instructional module. The lecturer (co-ordinator and responsible for the first year Physiotherapy students) contributed her knowledge of the course content and the significant understanding of the students' experience levels and competencies. The lecturer provided the assignments and the researcher tied in with the information literacy concepts. The research term paper requirements were forwarded to the librarian at the beginning of the semester for preparations. Throughout the collaboration, communication between the librarian and the lecturer took place for discussions.

Two surveys were conducted: The instrument of the survey [see p.93 4.4.4 Pilot study] was a structured questionnaire that was pre-tested by five first year undergraduate students and five faculty members. Members of the faculty were used at this point in an effort to gain face validity of the questionnaire (Tull & Hawkins, 1993: 317) [see also 4.4.4 on p.93]. The revised questionnaire was distributed to the first year Physiotherapy students during their first class session and one to the first year Physiotherapy lecturer co-ordinating the first year Physiotherapy students. The instrument was a specially designed structured questionnaire. The design and the content of the questionnaires were adapted from the works of many authors. The other instrument was the students' research term paper and their List of Information Tools used.

With regards to the students, it was important to examine these information literacy activities to find out if students were adopting lifelong learning skills. Assessment was difficult and therefore librarians cannot do it alone. If both the faculty and the librarian worked together then the outcome can be measured (Iannuzzi, 1999: 304).

1.5.2 Class instruction

For this research, in these fourteen class sessions, in addition to presenting traditional resource materials, the focus was on instructing students in information literacy and helping them to develop these important skills. The class time was one period per week. The students were orientated to the UWC library, and were given a comprehensive overview and hands-on demonstration of the relevant print and online resources for their project. The key concepts of information literacy, i.e. having the ability to locate, evaluate, and use effectively the needed information and in accompanying handouts and exercises related to the sessions and their project. Students were instructed how to evaluate resources: authority, accuracy, timeliness, coverage, objectivity and support for a web site. Since it was essential to instruct students in citation methods, regarding the legal and ethical issues, the students were shown print and online sources of the two popular style manuals (American Professional Association (APA) and Modern Language Association (MLA)). The first year Physiotherapy co-ordinator was an active participant who made comments that enhanced the students' understanding of the value of the sources presented by the librarian in fulfilling the research term paper.

Students completed a major research term paper. Specific guidelines were given. This paper was research based and also required students to do intensive data collection and analysis. It was essential for students to know how to collect accurate and comparable data in order for them to apply it.

Specific guidelines were developed for the paper requirements which were designed not only to allow students to apply the theory and knowledge gained from the sessions and readings, but to guide the students in the preparation of a well organised and originally researched paper presented in proper form. These requirements assisted the lecturer in grading the respective components of the paper. The research term paper was designed to assist the librarian in directing students to authoritative sources of information and data. All the above was to ensure that the collaboration was implementing the research sub-questions.

At the end of the sessions, students were reminded that their research term paper and List of Information Tools used would receive a literacy competency score which would weigh 20% of the final mark. Refer to chapter four for more detail.

1.5.3 Data collection procedures

The results of this study were derived chiefly from the two assessment tools used, namely, the information literacy questionnaires and their completed research term paper along with the List of Information Tools used and the results of these were also discussed.

The research instrument was a questionnaire that consisted of closed questions. According to Powell (1991: 88), the fixed response options took less time to answer and thus discouraged non-response. It not only increased the response rate by making it easier to complete the questionnaire, but also increased reliability because there was less variation between responses. The structured questions also facilitated the analysis of the questionnaire.

The questionnaire was based on the Information Technology Basic Skills Inventory which was developed in 1998 by Macquarie University Library's Information Technology & Training Unit (Australia). A self-evaluative questionnaire was developed, based on information technology and literacy skills identified by first year coordinators and interviewed relating to student abilities. It also included core information technology literacy competencies, and was developed around the Council of Australian University Librarians information literacy standards. It also drew on other institutions' information literacy assessments and competency lists, eg. the competencies developed by California State University were particularly useful as they arranged information literacy into a more meaningful process focussing on outcomes.

The questionnaire covered sections related to the researcher's work based on the research question and sub-questions linking the information literacy goals and objectives that are related to:
- to know the major information sources in the research;
- to evaluate the reliability and significance of relevant information found; and

- to use appropriate attribution and citation formats for print and electronic resources.

The students had to score their ability on a range of specific tasks in the following areas:

- Defining a research topic
- Establishing the information requirements for a research question
- Using technological tools for accessing information (including computers, web browsers, the library web site. The library catalogue, databases and the Internet)
- Locating and retrieving relevant information
- Evaluating information
- Organising and synthesising information
- Communicating and presenting information
- Understanding the ethical and legal issues surrounding information and information technology
- Judging the product and process.

Some information literacy questions required students to answer yes if they have the skill or no if they do not have the skill. If students answered yes, they would score and if answered no they would not score (Vickery & Cooper, 2003).

To evaluated the level of competency for each established information literacy goal it consisted of 20 outcome statements, worth a maximum of five points each. In addition to the traditional grade for the content of the research term project, the student received a score on a 100-point scale for their information literacy competency based on their accomplishment of each of the stated outcomes. The scale was developed to evaluate the students' information literacy competency. A simple scale similar to typical grading standards would work best. Establishing that any score under 60 would be considered a failure or not competent, two categories for "competent" and "very competent" would be appropriate for assessment purposes.

Information Literacy competency scale

80 – 100	**Very competent**
60 – 79	**Competent**
0 – 59	**Not competent**

_____

These results provided a means to evaluate the outcomes of the students' information literacy as evidence in the written term paper. The learning outcomes of the information literacy questionnaire were based in part on the style of a checklist developed by Delta College (1998), and adapted for the Physiotherapy course and expanded to include an information literacy competency scale and outcomes keyed to the established information literacy goals for the specific course (Samson & Millet, 2003: 84 - 98).

The analysis of data collected: the data collected was analysed using statistical as well as qualitative methods of analysis. The data was analysed for statistical significance using the McNemar Exact Test along with the Microsoft Excel package. Refer to chapter five for more detail.

1.6   The significance of this study

This study revealed that the outcomes thereof have advantages for students and faculty. The impact of this study was evident in providing reliable data to support recommendations for the need of a campus-wide information literacy course. At the same time, it promoted increased librarian-faculty collaborative relationships. This also created new opportunities for the librarian to determine student's information literacy skills in order to provide more appropriate services.

1.7   Definition of terms

1.7.1 Information It has been defined in innumerable ways. It's defined as "news or facts about something;" a meaning of a signal and some understand it as the signal itself. According to Losee (1997: 254) the term information is used differently by individuals in different walks of life, from information specialists to those in computing and cognitive sciences, as well as by people involved in less scholarly pursuits. People in different fields and professions differ on what information is or

how to evaluate the different definitions that are assumed explicitly or implicitly by different fields or social groups.

1.7.2 Knowledge with regard to any subject is built up over a period of time and continues to be added by the process of inquiry, argument and continuous testing. Knowledge is defined as information that is analysed and synthesized by the recipient to form concepts, which lead to understanding and thus knowledge. The difference between information and knowledge is well illustrated by Lenox and Walker (1992: 8):

> *Knowledge is orderly and cumulative … information tends to drive out*
> *knowledge. Being passive, information is 'easier' than knowledge. Yet*
> *being merely 'informed' is to be at the mercy of the sender of messages.*
> *One may be informed, but the thinking was done by others … in an*
> *Information society, information is slavery to the thoughts of others,*
> *knowledge is power and freedom to do one's own thinking".*

Thus, knowledge is information from every available source, and analysed and targeted to needs. The skills for doing this are what we mean by information literacy.
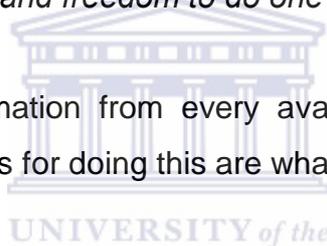
1.7.3 Information literate person is one who has learned how to learn. The skill of an information literate person is to be able to use information to in turn create knowledge. The information literate individual is empowered for life-long learning because he/she knows how to find and use information for any necessary task or decision (Kanter, 2003: 23).

1.7.4 Critical thinking Doyle (1994: 138) defined it as higher order processing skills, those requiring critical thinking, as the cognitive processes of comprehension, interpretation, flexible application of knowledge and skills, and assembly of information and resources. These higher order thinking processes produce new knowledge or knowledge in new forms; lower order processes reproduce knowledge from memory or through the application of routine.

Although characterised in many ways, the Foundation for Critical Thinking identifies the following of critical thinking: "Critical thinking is the intellectually disciplined

process of activity and skilfully conceptualising, applying, analysing, synthesizing, and/or evaluating information" (Scriven & Paul, n.d.).

When defined in this way, the relationship between critical thinking and information literacy is apparent and supports the idea that promoting and enhancing students' critical thinking is a necessary component of library instruction.

1.7.5 Lifelong learning refers to the ability to apply information skills throughout life; continuing on a path of education throughout life (Behrens, 1992b: 19).

1.7.6 Undergraduate research   Joyce Kinkaid (2003: 6) defines it broadly to include scientific inquiry, creative activity, and scholarship. An undergraduate research project might result in a musical composition, a work of art, an agricultural field experiment, or an analysis of historical documents. She also notes that such results are only one part of undergraduate research, the other part is the role of the mentor, who guides the novice researcher and initiates the student into the methods of a discipline**.**

1.7.7 Librarian-faculty collaboration
Collaboration is a process of shared creation. It is to work jointly with others, especially in an intellectual endeavour. Individuals with complementary skills should interact to create a shared understanding that none had previously possessed or could have come to on their own (Schrage, 1990: 51). Librarians are in a unique position to become partners with the faculty in curriculum reform and achieving resource-based learning for students. Evan Farber (1999: 232 - 233) described the ideal collaboration as "where both the lecturer and librarian's objective are not only achieved, but are mutually reinforcing – the lecturer's objectives being those that help students attain a better understanding of the course's subject matter, and the librarian's objectives being those that enhance the students' ability to find and evaluate information". Farber (1999: 233) also reminds librarians, working together is at the core of librarianship.

1.8   Limitations of the study

The specificity of the Physiotherapy students as well as the Occupational Therapy first year students as the focus of this study means that findings cannot be generalised to other departments, faculties and universities, although it may be helpful to other researchers.

1.9   Chapter outline

Chapter one is a background to the study which highlights the definition of information literacy, librarian-lecturer collaboration, definitions of terms, significance of the study, limitations of the study and the chapter outline. Chapters two and three present a review of the related literature to elucidate the research problem and support the study. They provide an overview of the concept of information literacy in relation to university education and redefining the role of the librarian in a collaborative relationship. In chapter four details of the research design and methodology is presented. In chapter five research findings, analysis and interpretation of the data collected are presented. Chapter six renders the conclusion and makes recommendations derived from the study.

1.10   Conclusion

This chapter outlined the rationale or background for the research project namely successful information literacy through librarian-lecturer collaboration. It also discussed the background to the aim and objectives, the research methodology, the limitations and the benefits of the study. The literature on the concept of information literacy in relation to university education and redefining the role of the librarian in a collaborative relationship will be reviewed in the next chapter.

CHAPTER TWO

THE IMPACT AND VALUE OF INFORMATION LITERACY: THE STUDENTS' PERCEPTIONS AND LIBRARIANS CHALLENGES

2.1   Introduction

This chapter focuses on the factors that influence students' attitudes and their perceptions regarding information literacy instruction activities. First year students are represented by different age groups, languages, cultures and abilities / skills, their information-seeking behaviour, research skills, technological skills and learning styles will differ as well. This chapter will also examine how students perceive and interact with information to allow the academic librarian to target information literacy initiatives better.

The goal of the literature review was to meet the sub-questions of the study, which flow from the research question of the study as depicted in chapter one. The main research question is to present how information literacy could be implemented through librarian-lecturer collaboration looking at:

- What are the use and understanding of resources by students and their perceptions, as well as the expectations of the faculty regarding information literacy skills?

- What are the preferences of students and faculty regarding information literacy education?

- What does faculty considers to be important services that should be provided by the librarian?

- Did faculty see any improvement in library services as a result of the collaborative partnership?

These formed the basis of the subtopic of the literature review. The literature review focussed namely on international countries. This chapter also focuses on the factors that influence in general, students' attitudes and their perceptions regarding information literacy instruction activities.

2.2 The characteristics of the information literate

Information literacy encompasses skills but goes beyond location skills to concentrate on the bigger picture of information gathering. It stresses the basic concepts of how information is organised, the formats it comes in and the structures used by different disciplines to record and transmit information. A few questions (B 6; 7; 8; 18; 19) in the questionnaire look at how students understand that information comes in different formats; the use and recording of it.

Information literate searchers are conscious of the research process as it takes place. Rather than concentrating on a single method for accessing information, theirs is a holistic view of information retrieval. Question B.1 and 15 in the questionnaire will show what students understand in forming search strategies.

Information literacy encompasses computer literacy. A computer-literate person can manipulate electronic information tools to gain access to information. Computers are part of the wider category of information tools and require their own search methodologies. They are just one of many information resources and should not be awarded greater value than other tools (Thornburg, 1997: 6). Question A10 in the questionnaire will show the computer skills of the students.

2.3 Examples of information literacy objectives

According to Thornburg (1997: 7) and Breivik and Senn (1994), the acquisition of information literacy involves mastery of certain skills, the development of specific knowledge, and the adoption of certain attitudes.

- Skills objectives

  Students will be able to:
  - Recognise an information need.
  - Design a research strategy that identifies the steps necessary to secure needed information.
  - Evaluate information and determine its relevance in relation to a given information need.
  - Use computerised information tools to locate information.
  - Summarise and analyse essential information from pertinent resources.

- Knowledge objectives

  Students will understand:

  - The range of resources in various formats for information-finding purposes.
  - The selection of tools such as indexes available to access information.
  - The organisation of information as it is represented in various access tools such as catalogues as well as its arrangement within specific disciplines.
  - The means by which information can be disseminated.
  - The publication sequence of information as it is transformed from ideas to the published word in book format.

- Attitudinal objectives

  Students will appreciate that:

  - An information search takes time and requires persistence.
  - Self-confidence in finding information increases with practise.
  - The information search process is learned gradually over an extended period of time just as the content of any subject area is mastered.
  - Carefully scrutiny of information-finding tools and resulting resources is essential to a successful search.
  - The information search process is an evolutionary process that transforms over the course of investigation as new information is acquired.

2.4 Information literacy: South African perspective

Although the intent of the South African Department of Education is clear that there should be inculcation of information and computer literacies in schools, in reality it is not so (Hart, 2000: 74). By the time students reach higher education institutions a vast majority of students have had little or no exposure to library and information resources and do not possess the skills to use them. Thus, the burden for information literacy education is greater at tertiary level than one would normally expect (De Jager & Nassimbeni, 2002: 170). The questionnaire (question A6) would reveal how many of the students were taught information literacy at school if any.

The Coalition of South African Library Consortia (Cosalc) (1999) has adopted information literacy education as a strategic direction for the consortia. With no set of

information literacy standards in place, in 1997; the South African Department of Education and the European Union Higher Education Program whose purpose was "to help redress the resource imbalances of the past in the Higher Education sector in the historically disadvantaged institutions, highlighted the importance of information literacy in the development program". Seventeen (17) South African academic institutions hired an information literacy librarian as information literacy education has been seen as an important aspect in the education and training component (De Jager & Nassimbeni, 2002: 172). Yet after 1994 the new government dismissed all the school librarians and the questionnaire (question A6) would indicate whether the students' secondary school had a teacher librarian.

As Prem Naidoo (2005) stated that South African first time student entrants needed to make informed decisions about the quality of South African educational institutions and programs which entailed an evaluation of the available information. As higher education universities profess quality, and make information literacy part of their mission statement, it was crucial for students to acquire quality literacy skills. Quality empowerment entailed the ability to participate and shape education. Students are also responsible in shaping quality by making correct choices, and play a positive role in promoting and enhancing the quality of education processes and outcomes.

In recognizing the value of information literacy, a pilot project for information literacy was established in South Africa in 1995. One of the primary objectives of the project – named the INFOLIT Project – was to investigate information literacy programs at higher education institutions (Underwood, 2002). Since then, there have been numerous efforts to establish information literacy programs at higher education institutions in South Africa. In 2001, De Jager and Nassimbeni launched a study at the five academic institutions in the Western Cape. No model for the provision of information literacy programs at higher education institutions existed then and the information literacy skills of students were very poor. They also showed that UWC students lacked information skills, inadequate provision of courses or modules in information literacy. Underwood (2002) identified some problems: the sporadic provision of courses in information literacy in higher education in South Africa; and a general lack of recognition by higher educational institutions of the importance of

information literacy in their mission statements and strategic plans, and that the lack of funds to implement information literacy education played a big role in stagnating all programs related to this initiative. Many South African universities have reviewed their mission statements and have included it.

Sayed (1998: 6 - 7) replied to the above study revealing the significant discrepancies between students from historically disadvantaged universities and white universities. He made it clear that information literacy facilitators in the South African context should recognize the fact that most students did not have equal access and exposure to educational resources of all kinds. Opportunities in which to develop skills were not available to the majority of entrants at the South African higher education institutions. Students brought with them a set of previous experiences, convictions and disciplinary traditions that may either hinder or enhance their learning and these should be taken into consideration in activities aimed at developing information literacy in students. According to Davis (2004: 305) the majority of South African students in academic institutions (especially from disadvantaged backgrounds) are weak in information searching, due to the lack of IT –related facilities in schools. The questionnaire will give a clear indication of how the previous leaning experience will influence the students' knowledge and skills in information literacy.

The University of the Western Cape (UWC: 2005) places primary emphasis on "educating for life" and providing "a foundation of skills, knowledge and versatility that will last a life-time, despite a changing environment" in its present mission statement. At UWC, there is some academic responsibility for inculcating information literacy in its students. It's department of Library and Information Science is teaching a module in information literacy education to some of its Arts and Education undergraduate students. Some departments in some faculties are attempting to provide information literacy education to their students, and lastly the faculties of Community and Health Sciences (CHS) and Economics and Management Science are providing information literacy education to all its students and staff in collaboration with the librarians.

It is the UWC Library's revised mission statement and new strategic plan that responded to this question to enhance teaching, learning and research by providing information literacy skills training to staff and students. The library also play an important role in information literacy as it is a central hub for students to access online materials, personal help, and other information resources.

Thus, a common feature of all academic libraries is their responsibility which is to support the information needs of students. This gives information literacy skills training a vital role to play in achieving this object.

2.5   Information literacy instruction

Defining information literacy within a South African context has been documented in the literature by the South African Qualifications Authority (SAQA) and the National Qualifications Framework (NQF) (2009). SAQA outlined the definition which states that the basics of information literacy education of library users are the following:

- The ability of users to analyse information needs at appropriate levels.
- The ability of users to select and identify appropriate information sources.
- Developing users who can independently locate and access information relevant to their needs.
- Guiding users in the evaluation of located information.
- Explaining the basic concepts of plagiarism, the ethical use of information and the need to acknowledge sources of information.
- Planning appropriate learning experiences in which the principles of information literacy are applied.

In short information literacy is the ability to read, write and retrieve information sources to solve problems and to use these skills to foster lifelong learning. With this in mind the goal of the information literacy education programme is to develop student's skills, in locating, evaluating and applying information for use in critical thinking and problem solving. Both SAQA and NQF (2009) have identified information literacy as a critical cross-field outcome, essentially stating that it cuts across all disciplines.

With the daily explosion of information and resources students are constantly challenged to use these resources effectively and responsibly. It is also viewed as a significant opportunity for change in education, with shifts towards increased student independence in learning. In order for this to happen, students need to develop the capability to deal with information. Training is needed to use the available data and information meaningfully and productively. Not only does one have to be literate, eg. to know how to read with understanding, but also be information literate, eg. possess cultural, visual, computer, technology, research and information management literacy (Rader, 2001).

Over the past decades, technology has become an integral part of academic life. Both academics and students make use of technology every day at university as they e-mail colleagues and/or friends all over the world, or are busy with word processing or searching for information. As technology improves and information is increasing on a daily basis, librarians have taken advantage of the new technologies to organize, provide access to, and archive this wealth of information. However, the extent to which first year students are able to identify, find, appraise and make effective use of the vast amounts of information available to them to address a specific problem poses a huge problem.

The UWC library responded by providing information literacy education to students to enable them to locate, manage, critically evaluate and use information for problem solving, research, decision making and continued professional development (Orr, Appleton & Wallin, 2001: 458). Information literacy requires a change in focus from teaching specific information resources to a set of critical thinking skills involving the use of information, and this change is reflected in the Information Literacy Competency Standards for Higher Education (American Library Association, 2000).

As tertiary institutions vary widely in their mission statement and student body, the information literacy programs must be designed not by a prescribed set of criteria, but must rather be designed to meet specific needs (Breivik, 1998: 30). So context plays a huge role in type of services provided. The implementation of such a

program also depends on many institutional and situational factors such as audience, purpose, budget, staffing, and time (Grassian & Kaplowitz, 2001: 57 - 59).

Sayed's (1998: 76 - 77) views illuminate the main challenges for information literacy training at South African universities that is information literacy or instructional librarians in academic libraries are faced with a unique situation. The South African social, economic and political situation, both past and present, means that "… all students have not had equal prior access and exposure to educational resources ". With this in mind, any information literacy program at UWC library, must take into account the informational / educational background of the students being trained. Librarians need to remember that students bring to higher education a set of previous experiences, beliefs and disciplinary traditions that may either hinder or enhance their learning (De Jager & Nassimbeni, 2003: 108).

Although information literacy instruction is provided on campus, there are some challenges including motivating students to learn information literacy skills; assessing student mastery of concepts and skills (Grassian & Kaplowitz, 2001: 38); advocating the value of information literacy (Bawden, 2001) in an environment of competing literacies (Snavely & Cooper, 1997a: 54).

Students need to perceive information literacy programs as valuable to their studies in order to be able, or motivated, to take this 'extra' learning on board. Julien (1998: 311) states that although students may receive user education at the beginning of the academic year, very often they are not aware of their information needs when busy with their assignments.

What does a young health professional, sociologist, biologist, economist, and scientist need to know in the 21st century to be an effective practitioner or scholar in that discipline? This could be across the curriculum, a technology which is well recognized and respected and which includes a large information component. Information literacy has become a major focus of academic libraries in recent times. Much of the discussion around this issue has arisen in recognition that we have entered an age where the quality and quantity of information needed to function effectively in society and the workplace continues to increase. Individuals must be

able to master rapidly changing information technology and possess the information literacy skills to act independently in this information rich environment. At UWC the librarians providing information literacy education, struggle to provide basic computer literacy skills to many students especially those coming from the rural areas or from poor areas where the IT facilities is not a priority, with no and little IT facilities or no Internet connectivity. The questionnaire's questions A8; 9; 10 will give the librarian an indication of students' computer skills and on accessing it.

Business and technology is continuously changing, it relies on people, knowledge and information. Organizations and businesses are creating, sharing and utilizing knowledge and information faster and with more technology than ever before. Employees must be capable of working effectively in an electronic information environment, thus possessing the necessary information literacy skills. It is a known fact that it is becoming a requirement that students must be prepared throughout their tenure in higher education to become productive and information literate, so that when students graduate from universities they understand how to use, apply and evaluate information effectively. Therefore it is of importance that students at UWC receive adequate education for productive work and scholarship in the technological information environment of the 21st century (Rader, 2001). The questionnaire's questions applying to performing search strategies will show whether the students received adequate information literacy education to be productive in a technological information environment.

Universities have always been very slow to change but a competitive learning and teaching environment and demands from the business world for higher productivity are pressuring universities to evaluate, rethink and restructure teaching methods, curriculum and outcomes. The literature is replete with articles and monographs on information literacy programs in academic libraries. Anna Johnson (2003) and Hannelore Rader (1995a: 270 - 278) provided an annotated review of the literature on information literacy, and later Rader (1995b: 83 - 90) followed it up by providing the background and trends in information literacy, concluding that librarians must be proactive in responding to curriculum reform and their role in the teaching and learning process.

There has been considerable investment at UWC library in making electronic resources available and accessible to the academic community. Making information available and accessible is not sufficient in itself. Students also need information-handling skills in order to be able to use it. Students do not merely require generic information skills, but a knowledge of the discipline and the capability to handle complex information.

Whilst it would be true to say that the emphasis was originally on the information needs of academics and researchers, there is now a change over to ensure that students have access to a number of collections and resources which are of high quality and relevance to them during their studies. Students can become independent learners in many ways by accessing and using information, making choices, weighing evidence and coming to conclusions themselves. As MacFarlane (1995: 64) emphasized a shift towards more independence in learning where students need to "manage their own learning processes to an unprecedented degree … to swim in a sea of information".

The researcher wants students to find resources for themselves, and know and understand how to distinguish popular from scholarly information or convincing from unconvincing evidence. The researcher also agrees with McDowell (2002: 257) that if students are to develop information literacy, including subject matter autonomy, the context in which they are learning must allow and encourage them to act as independent information users.

2.6   Factors influencing students' perceptual value of information literacy instruction.

2.6.1 Introduction

The learning habits that students bring with them are not profound, nor complex, they are borne out of misunderstanding and inexperience (Beasley & Pearson, 1999). To change these habits, information literacy is essential to the successful realization of these core academic skills because, by definition it's a set of abilities that enables one to locate, evaluate and use effectively relevant information. Information literacy forms the basis for life-long learning. It is problem-solving and continued professional development (American Library Association, 1989; Orr,

Appleton & Wallin, 2001: 457). All learning environments and all levels of education are essential to acquiring knowledge. Academic libraries worldwide have responded by providing instruction in information literacy (Orr, Appleton & Wallin, 2001: 457). In the case of first year students, this is a new way of thinking.

One realizes that the research process has become far more complex for students to acquire the necessary skills to be information literate on their own without guidance and instruction. The increase of different formats of information and the information overload contribute to the complicated research process, making it difficult even for the subject specialists to stay abreast in their respective fields. The multidisciplinary nature of a course draws its knowledge base from several other disciplines, thus requiring undergraduate students to be able to search and select from other resources.

2.6.2 Previous experiences

In making the transition from secondary school, students expect universities to be very different, and while they appear to be open to new experiences the elements of their previous education that could be transferred are not explicit. For example, libraries worldwide are essentially organised in the same manner. Using the catalogue is essentially a mechanical task and once this has been mastered previous experience should take over (Haycock, 2000: 25). However, some of the UWC first year students expressed confusion about how to locate items within the library collection and knowing which information to note down from the catalogue. Instead they would prefer to be shown which parts of the collection are relevant to their course of study.

At the beginning of the academic year, the UWC library provides a general user education program, but as students is not aware of their information needs yet they do not see the need to attend it. Many students would attend only if their lecturers enforce it. The researcher would further contend that students have a perception of their information needs that does not necessarily match the new academic environment they have entered. The students' learning is influenced by their previous experiences. The students' responses clearly indicate that they regard skills in information literacy as important but only in so far as they meet these skills to

produce what lecturers want. Students are busy and if they do not see any immediate need to, will not attend the library's user education training sessions. Also students may not believe that they lack these skills and so do not see that need for this kind of training (Brown, Murphy & Nanny, 2003: 386 - 387; Haycock, 2000: 24 - 25; King, 2007; Sayed, 1998: 6-7).

Students are often labeled by the academics as lazy, not intelligent enough or that their "literacy levels" are low (Boughey, 2000: 282). One must remember that the literacy practices that students bring with them from their homes and schools are different from that of the lecturers. According to Haberman (1993: 1), growing up in a disadvantaged environment would not produce students who represent textbook models, that is, how normal students are supposed to behave and think. Haberman (1993: 2) goes further in saying that what is normal in one set of circumstances seem abnormal in another. These students then are quite normal and are "making perfectly reasonable responses to those who raise them and to the life conditions under which they lived and grow".

At the same time, many of today's first year students seem to only know a world with the Web. They download music, participate in file sharing, and use the online chat and instant messaging software (mobiles). Resulting in multitasking and as far as they are concerned, "information is information" regardless of the format (Abram & Luther, 2004: 34; O'Brien & Symons, 2007). For some students, video and computer games have influenced their learning styles to be interactive, rather than passive (Abram & Luther, 2004: 35).

2.6.3 Diverse user groups

According to O'Hair & Odell, (1993: ix) students of today represent the most diverse, ie. different races, languages, backgrounds and learning styles, of user groups. Students come to the library with a greater polarity of skills, which makes it difficult for the librarians to pitch information literacy sessions at the right level (Moore & Abson, 2002: 35).

Distance learning mode has created another user, the distance user. The distance user has to connect with and use their library network from another town or country.

With library resources being available through the library website, the boundaries between a distance student and the on-campus student are blurred (Hope, Kajinara & Liu, 2001: 14 - 15).

2.6.4   Language and cultural barriers

South African universities including UWC are enrolling foreign nationals from Southern African Developing Countries and African nationals and local students, whose mother tongue is not English. English is either a second or additional language. This brings another set of needs and priorities to the library (Hope, Kajinara & Liu, 2001: 18).

Howze & Moore's (2003: 57 - 74) and Contech's (2003: 3) research have shown that the inclusion of students from diverse languages and cultures in the same information literacy sessions, adds to the complexity of instruction and the risk of misunderstandings. It is important to know how the student views the library. Aside from the language barrier, there are cultural barriers, where students perceive the library as a study hall. The students are reluctant to ask for help.

The English language is also a problem for quite a number of the students at UWC, because they come from rural schools where English was just one of their subjects, and they are not as fluent in English as students from urban schools. But even in urban schools where English is the second language, there are problems (Frier, 2009). Many black students approach higher education from the vantage point of English, as it being students' second or third language. Students coming from the Western Cape have some advantage as English is spoken in the home. From a historical point, English was spoken in defiance of having to speak the oppressor's language – Afrikaans. Students from countries outside of South Africa speak other languages, but where English is not spoken at all. This language barrier, and where tertiary level education is not taking place in the mother language of the student, places a significant burden on the librarian teaching information literacy education and who wants to engage students in information literacy education.

Having to use English as the learning language has implications for students' ability to cope academically at university where success is dependent on reading and

writing of academic texts in English (Niven, 2005: 777). Research has been done into the difficulties that first year students experience as they come to write in new knowledge communities (Boughey, 2000: 279 - 290; Orr, 1995: 189 - 197; Paxton 1995: 189 - 198). There is the assumption that reading is at the heart of academic success (Pretorius, 2002: 94). Given the centrality of reading at university, one might expect research into reading to be much more common. Good academic writing relies on wide reading. Students bring to the tertiary learning context their cultural shaped attitudes and assumptions about reading from their homes and schools. Mismatches arise between the students' frames about the nature and purpose of reading, and those implicitly accepted as normative by their lecturers. Most students have difficulties in achieving epistemological access in terms of a conflict of frames: both students and lecturers' understanding of the nature and purpose of "reading for a degree" differs (Niven, 2005: 785).

2.6.5 Library anxiety

Library anxiety is a characteristic prevalent not only to first year students, but all levels of students. Students frequently procrastinate, because of library anxiety. Firstly, first year students are overwhelmed by the size of the library, and for some students it is a first time in an academic library. Secondly, students feel incompetent utilizing the library resources, not knowing where to find it, not knowing what to do, and not knowing how to begin the research process. Their feelings of inadequacy, of not knowing how to, and not wanting to ask, would make them rather avoid the library. Their past experiences of not needing the library or not seeing it as important, is another fact leading to library anxiety if they must use it (Orr, 1995: 195; Paxton, 1995: 194).

Another issue is related to the students' perceptions of their library skills. Studies (Beaufils, 2000; Breivik, 1998; Jiao & Onwuegbuzie, 1997; Leckie, 1996; McDowell, 2002; Ren, 2000) revealed that students do not have the necessary skills for research and this leads to library anxiety. This fear and anxiety of using or even contemplating using the library is real and could have an affect on their academic success. The adult students are highly motivated and independent so they often do not want to reveal to others that they need help, they may also feel that they are the only ones that do not know how to find material on their own, which leads to high

levels of library anxiety. This also includes computer anxiety as many realize that their research skills are usually outdated.

The mentioned studies revealed that one of the main objectives of the students' education is to teach students to understand the scholarly body of knowledge in their discipline. So students must be able to find information beyond their textbooks and course materials, so that they have an in-depth understanding about publishing cycles and how information is generated and organized from a variety of sources. The questionnaire will be the assessment of measuring the students' information literacy skills and knowledge.

2.6.6   Searching skills

Students need to obtain skills in how to use information resources and databases in order to access relevant information. Many students come from the rural areas, and some of them do not have the necessary knowledge to use computers. Some of the UWC students are seeing an academic library for the first time in their lives.   It is often quite an effort to conduct these training sessions because the librarian sometimes has to (figuratively) hold students by the hand in order to show them how to use a mouse and keyboard.
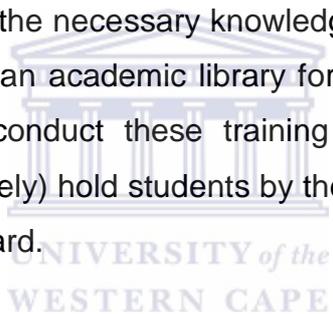
Students are frustrated by their failed search efforts. There is unwillingness amongst students to ask for assistance. They think they know how to search and the degree to which they are expected to work independently. There is also the assumption that if they work mostly on computers and in isolation, the inference they might make is that they need to succeed with the help of machines, and that asking for assistance will be regarded as evidence of incompetence. Whether the student is computer literate or not, is not a big concern. The main challenge is increased user expectations. They expect to find everything online and in full text. Even the less experienced Internet searchers have high expectations of finding information easily and quickly (Hope, Kajinara, & Liu, 2001: 15 - 19; Marcus & Beck, 2003: 33).

There is great concern about the ways most first year students utilize the library and web resources to locate, synthesize and use information. Research shows how first year students search both the World Wide Web and the library's information

gateways sources, often choosing the path of least resistance when it comes to finding information. They want instant success in terms of finding useful information as quickly as possible, use anything that they find, and always prefer on-line information over the print-based resources from the library's bookshelves. Students have an incomplete understanding of the diverse information environment. They often do not realize that some information can be found faster in the traditional sources of information and when pressed for time, they would tend to value convenience over quality (Bodi, 2002: 110 - 112; Cockrell & Anderson Jayne, 2002: 125 - 127; Hope, Kajinara, & Liu, 2001: 14 - 17; Valentine, 1993: 300 - 304). Bodi (2002: 113) also states that students are haphazard in their research approach and devastated when a search turns up little or no results on their topic.

2.6.7   Technological competence and information-seeking skills

The emergence of the World Wide Web has an impact on education that heralded an era of dramatic change. This forced the academics and students to reassess their methods of evaluating information for pedagogical purposes and indeed: "mandates to incorporate it into educational practice have proliferated" (King, 2002: 231).

We know that students are increasingly taking advantage of the Internet in their learning. In a survey done by Slaouti (2002: 105 - 124), to establish the role of the web as an academic tool, she found that students would generally use the web as part of their study, but they do not feel that they are encouraged to do so by the academic staff.

Even here most of them lack proper searching strategies to guide their information-searching behaviours efficiently when seeking information on the Internet. The researcher agrees with Murray, Hourigan, Jeanneau & Chappell (2005: 427) "that the wealth of information available on the web may represent an obstacle for some students who are unaware of special search engines or web sites that may be of relevance to their studies". They also rely on the Internet to provide accurate information without carefully ensuring the accuracy of the information they obtain. It has been found that while students appreciate the usage of the Internet to provide them with several information resources, the quality of these resources is not necessarily important to them (Cockrell & Anderson Jayne, 2002: 126; Metzger,

Flanagin & Zwarun, 2003: 274; Valentine, 1993: 300 - 304) or they do not understand it. In other words, students may rely heavily on the Internet for gathering information despite the evidence that it could be inaccurate and biased. With this as a known fact, students' information searching strategies on the Internet should be one of the important factors influencing their performances with their tasks. As Murray et al's (2005: 430) survey revealed that in order for students to be able to exploit the web as a learning tool, they need to acquire some training in how to use it correctly. Students are in need of the skills to differentiate between reliable and unreliable information, as the results of Metzger, Flanagin and Zwarun (2003: 288) found "there is cause to be concerned about students' use of the web as an information source. They rely heavily on the Internet, and most intend to continue to do so … there is a great need for greater focus on critical evaluation skills"

Some studies have been conducted to investigate students' searching strategies on the Internet (Beaufils, 2000; Hill, 1999; King, 2002; McDowell, 2002; Murray et al, 2005; Slaouti, 2002; Tsai & Tsai, 2003), and most of them concluded that whilst the majority of students may have the necessary skills for using the web, it is mostly used for recreational purposes. The idea of accessing this virtual setting for learning could emerge as a crucial issue. The questionnaire will show whether their computer skills will assist them when they are doing a search.

2.6.8 Overload of information

Although one is bombarded with information i.e. too much, too fast, too late, one does not get all the information when it is needed. Having access to this unlimited information does not necessarily make it any more comprehensible or accessible.

It is important to remember, more information will not in itself create a more informed student, unless they know how to use information effectively to solve problems. However although there is an abundance of information available, it is often difficult to obtain useful, relevant information when it is needed. Living in the information era, students will continuously be bombarded with information whether or not they actively seek it (Bruce, 1997: 14).

Librarians can recognize that students are not fully utilizing the vast amounts of information available to help them make decisions. This is partly due to the overwhelming amount of information available, but as Diana Pravikoff (2000: 99 - 100) pointed out, it is also due to ignorance and fear. Ignorance, because the students are not aware of all of the resources available to them, nor are they able to judge which one to use. Fear, because they are intimidated by the unfamiliarity of the resources and tools. Getting past the ignorance and fear is the goal of a collaborative effort of the librarian and lecturer at UWC to incorporate information literacy concepts into the Physiotherapy course to ensure that the students are equipped with the necessary skills to stay informed throughout their lifetime.

Living in the information age and as societies are evolving into information societies, it is characterized by heavy dependence on the use of information, information overload, highly dynamic information needs, life-long learning, resource-based learning and constantly changing information and communication technologies (Bruce, 1997: 12; Bundy, 2002; Doyle, 1994: 4). Students are now challenged to use all these resources effectively and responsibly. Their success will be determined by their ability and skills to access analyse, evaluate, use information from the different sources of information. To change information into knowledge and skills that are important for efficient decision making, problem-solving and creating of new knowledge for purposes of personal and socio-economic development. To be able to do all this, one needs to be information literate. Therefore academic libraries worldwide have responded by providing instructions in information literacy (Orr, Appleton & Wallin, 2001: 459).

How could new technology become a servant rather than the driver in the academic library? Leadership should be provided to bring faculty and students along. Technology is here to stay, as it will be used to accomplish campus and societal goals.

2.6.9   Critical thinking

When introducing information literacy, its main or primary goal is to engage students in critical thinking and research that are so important to learning. Doyle (1994: 84 - 89) defined critical thinking as higher order processing skills, those requiring critical

thinking, as the cognitive processes of comprehension, interpretation, flexible application of knowledge and skills, and the assembly of information and resources. These higher order thinking processes produce new knowledge or knowledge in new forms; lower order processes reproduce knowledge from memory or through the application of routine.

Students who participate in active, critical approaches to thinking, experience university and learning in an entirely new way. More students appreciate the fruits of their own intellectual works and that of others. They become aware of intellectual abilities they did not know they possess. Students learn that they must apply critical thinking skills to technology in order to become informed citizens. As Bruce (1997: 27 - 29) stated that information literacy is important in the higher education curriculum; it's the key to life-long learning in work and society; improves the teaching and learning environment, and is the survival skill for the 21st century.

The main aim of a university education is to equip graduates with the necessary knowledge and skills to be able to function effectively in a changing society. It is important that academics look at the knowledge and skills that the graduates have or possess. To ensure success, first year students need to understand how to thrive in an increasingly information-intensive environment. The ease with which vast amounts of information are available presents a new dilemma. It requires a rethinking of strategies for finding, evaluating, selecting and using these resources.

Sternberg (1985: 194 - 198) identified gaps between education and the real world which can be bridged by applying the processes of information literacy: one must identify the problem, formulate a search strategy, acquire resources, and evaluate the information to determine whether it successfully solves the problem. Critical thinking and information literacy skills need to be consciously merged. It must become part of the assessment criteria for students. While the critical thinking skills provide the theoretical basis for the process, information literacy provides the skills for practical, real world application. Students need to acquire competence with critical thinking and information literacy skills in experiences that are part of the core curriculum. These experiences must stimulate real life situations closely, so that students will have a better mastery of the core curriculum as well.

2.6.10   Research

Research is equally important and a valuable part of the undergraduate education. Even at first year level, engaging in research implicates students in the creation of knowledge. Understanding that knowledge isn't an inert substance they passively receive, but that it is continually created, debated and reformulated, and that they have a role to play in that process. Knowledge with regard to any subject is built up over a period of time and continues to be added by the process of inquiry, argument and continuous testing. Knowledge is defined as information that is analysed and synthesized by the recipient to form concepts, which lead to understanding and thus knowledge (Bruce, 1997: 14; Snavely & Cooper, 1997a: 57).

Thus, the skill of an information literate person is to be able to use information to create knowledge. Also knowledge is information from every available source, and analysed and targeted to needs. The skills necessary to do this are what we mean by information literacy. But students have not yet acquired an adequate knowledge of the discipline and its organization which limits their searching productivity and efficiency. They often lack the ability to identify experts and leading scholars in a chosen field. They become overwhelmed with the material and do not have the time or patience to read all the materials and evaluate them properly. Many are unaware of the relevant bibliographies and reference materials in their field and have little or no experience conducting literature reviews or using citations.

Research skills that are not integrated into courses frequently lack relevance, fail to reach the students, and seldom involve complex higher level critical thinking skills. Moreover, research skills - as with writing skills - are developmental and best situated within a curriculum sequence that can take advantage of this. Simply put, information literacy best manifests itself in the specific understanding of knowledge creation, scholarly activity, and publication processes found within disciplines (Gilton, 2004).

When students become thinkers they are able to find, evaluate, and act on information in the service of lifelong learning and problem solving. Students who participate in active critical approaches to thinking experience learning in an entirely

new way. Students learn that they must apply critical thinking skills to technology in order to become informed citizens. They will have to realize that they need accurate information in order to make informed decisions which will involve basic attitude changes toward learning. From a constructivist approach, the questions asked will have to be meaningful to students and opportunities need to be provided for them to explore real life needs for information. Connections need to be found between the searching and personal problem solving and this realistic approach is that which motivates students (Gilton, 2004).

2.6.11   Lifelong learning

Developing lifelong learners are also central to the mission of higher education institutions. One of the most important prerequisites for life-long learning is the possession of appropriate information skills. The world is beginning to experience major demographic changes that will result in fewer workers. Information literacy competency extends learning beyond formal classroom settings. It provides practice with self-directed investigations as individuals move into internships, first professional positions, and increasing responsibilities in all arenas of life. Because information literacy augments students' competency with evaluating, managing, and using information, it is now considered by several regional and discipline-based accreditation associations as a key outcome for college students (Emmons & Martin, 2002; Feast, 2003: 81 - 95; Hinchliffe, 2002: 95; Lupton, 2004a: 25 - 28).

When students are appointed in jobs, information is seen as the key to success for the organisation and many people have then to deal with an overwhelming load of information from many sources as part of their job. Here ignoring information cannot be afforded. Students must be prepared for business settings that demand a more specialized level of information fluency. Professional and personal survival in modern society clearly depends on our ability to take on vast amounts of new information which is growing at an exponential rate. Nowadays, employees are required to work in distributed teams and to share expertise and knowledge even at a global level. New workplaces have a greater need for people who are good at collaborating and sharing knowledge than smart indviduals who, when they leave the enterprise, take their skills and expertise with them (Marcum, 2002: 5 - 18).

At the same time, the need for highly skilled workers is rising and countries are in competition with other countries to retain them. Changes in information and communication technology have profoundly changed the demand for a well-educated and skilled workforce in all parts of the economy.

According to Thompson and Cronjé (2001: 3 - 14), given the requirements of the knowledge-based economy and the inclusion of information literacy in the desired characteristics of employees, one would assume that information literacy is a high priority in the schools in ensuring life-long learning. Unfortunately, there is little evidence that it is. They go further by stating that it's the premise of a university to equip graduates as information literates; with the necessary knowledge and skills to function effectively in an ever changing society. It is important that the academics look at the knowledge and skills that the graduates have. Subject knowledge is vital in information literacy. In today's society where information and knowledge are generated at such a rate skills in respect of finding and effectively using information have become paramount. The challenge for education is to develop creative and rational thinkers who can solve problems and who can be reflective. Connecting the old and new experiences will require students to think. As they prepare for the 21st century, the traditional basic courses in reading, mathematics and writing needs need to be coupled with communication, critical thinking and problem solving skills.

Summing up, as King (2007) concluded that the competence and proficiencies of most first year students at UWC are not adequate. They also do not attend the library instruction programs, but rely on their peers to find the information; they would rather prefer the web-based resources over the library-based resources, and will not evaluate retrieved information. Students not only struggle to find and use journals, but also to read it critically and synthesize from different texts and are then guilty of plagiarism. The English language possesses many problems for many of the Afrikaans and Xhosa speaking students. The result of her studies indicated that the need is expressed for compulsory credit-bearing information literacy courses to teach and guide students.

2.7 Librarian's challenges

The researcher has seen, experienced and will always maintain that the first year at university lays the foundation for successful progression through a course and that the way students experience their first year directly relates to their continuing participation and success in a course. Having said this, there are complex issues related to the way in which teaching, learning and assessment in the undergraduate curricula contributes to the development of students as lifelong learners and as information literate citizens. Every stakeholder must reconsider their practice so that the first year curriculum is perceived as the beginning of a student's journey into research.

The researcher has seen the agonies, fears and frustrations that the first year students encounter year after year trying to access information for assignments. In response to the information skills needs of first year students the UWC library offers library instruction sessions during the first quarter. These sessions consist of basic search skills and the OPAC (this refers to the library's catalogue – Online Public Access catalogue) training. During the second quarter, training is provided on individual databases. The sessions are voluntary and participation is typically poor. Why is it so? Because they do not understand why they should attend and see no need for it. It must be mentioned though, that the week during orientation, the first year students are informed about the library instruction sessions and are also informed about the difference between the library instruction sessions and the subject-orientated information literacy instruction sessions and why it is important to attend it.

From a librarian's perspective, the researcher sees the need to integrate information literacy into the undergraduate's curriculum so that students can develop information literacy skills. It is something academic librarians cannot do, but need to work in partnership with the academics. Academics have the responsibility to foster critical thinking skills and provide assignments that promote these skills.

The skills and knowledge students need to conduct research are vital not only to pursue academic questions, but also to actively contribute to their culture and society. The researcher sees first-hand how students struggle with navigating not

only the realm of academic information, but the information culture, and how student plagiarism stems from not understanding what it is and why it is bad. As many students are not fully prepared for university, and at the same time being information illiterate, they are largely unaware of the myriad information resources available to them. They would then rely on the Internet sites, course readers and textbooks. This practice severely undermines the academic research efforts of undergraduates. The researcher has dealt with many students who almost at the end of their undergraduate study years, claimed that they did not need the library up till then. But the moment when they are exposed to all the library's resources, they realize what they lack and that they should have had these skills from their first year. Librarians want students to know the librarians and consider the library as a dynamic and thriving learning environment. Students must feel comfortable and confident to learn in the library.

The UWC library has outstanding information resources available to its students, ranging from subject encyclopedias, monographs, periodical literature, dissertations, online catalogues, subscription databases, interlibrary loan services, but most of the UWC students are either unaware of these resources; they do not know how to use them or just do not use or need the library. The researcher sees how students move from course to course with only the necessary understanding about how to use research tools and how to evaluate resources. The reason for this is because the university does not require an assessment of information literacy as a condition of graduation.

The researcher can say that one cannot complain that the library is not valued and well populated, but has to admit that the students are going more and more to the web and bypassing the physical library as a first source for information. So to address this problem, the librarian-lecturer collaboration can help to record the students' use and understanding of the library resources and their perceptions and examine the preferences of students regarding information literacy.

The researcher has taught library or bibliographic instructions over the years. Currently the researcher continues with the change over to information literacy training. Today more than half of the students are computer literate. As the

researcher said in her paper which she presented at the UWC Teaching and Learning Colloquium, the student's computer literacy is more for entertainment. Ask them to show you Face book, You Tube, cover pages, borders, surf the Net for personal web pages, or many other exciting things, within moments they can do it. But that very same speed cannot be applied when they need to work the online catalogue or to do research (Mitchell-Kamalie, 2008: Unpublished).

Some academics try to help with the research process by giving a step-by-step instruction. Yet many students do not understand what is expected from them. In most of these instances the faculty had not informed the librarian about it, with the result that the librarians were not prepared when the students required the assistance. Then again, taking these situations into hand, these are opportunities librarians make use of to guide and teach students. It is a fact that students do not have the same experience and background as the librarians. If students want to become successful researchers, they need to be taught how to realize research objectives in this electronic world.

One challenge librarians face is to teach students how to search for information using different information sources. This will mean a change from the previous behaviour to a different one, from a previous belief to a new one and from a previous way of thinking to a new one. This mindset places more demands on instruction librarians it indicates a shift in their roles as librarians to teachers. This teaching role provides an opportunity to demonstrate an information literacy approach to life. The challenge, therefore, is in the use of the teaching methods and approaches that model information literacy practices (Hinchliffe, 2002: 95).

2.7.1 Cultural diverse instruction sessions

Like students, librarians also bring their cultural perspectives, attitudes, preferences, prejudices, stereotypes, misconceptions, values and hope to the information literacy instruction session. The way the messages are communicated and perceived by the students is important. Hadaway (1993: 61 - 62) agrees with Contech (2003: 22) that librarians must realize that their way is not the only way when facilitating in a culturally diverse environment.

Librarians should work efficiently and need to be sensitive to the students' language and their cultural barriers. Howze and Moore (2003: 62), remind librarians that they also share the obligation to actively remove barriers to communication and learning. Cloud (1993: 64) argues that librarians must acknowledge and respond to the cultures of its students in order to maximize participation in learning activities. Sayed (1998: 7) and de Jager and Nassimbeni (2003: 108) add to the previous experiences, the belief systems and disciplinary traditions that students bring to the library instruction session.

Librarians must be sensitive towards students experiencing library anxiety. When recognising the signs of library anxiety, it should be dealt with accordingly. Librarians must ensure that students become confident to be able to develop the appropriate library skills.

2.7.2 Librarians' teaching role

Librarians are also faced with the challenge of undergoing cognitive and behavioural changes within themselves. These changes affect the students' perceptions of information literacy instruction and their performance in the information session.

Change comes with new challenges, and the librarians' additional role is to teach information literacy. Nations-Johnson (1993: 3) points out that the aim of responsive facilitation is to maintain a balance between observation, listening and responding to the students, especially if there are more than 50 students in a session. When students are confused during the instruction session, the librarian must rather rephrase than simply repeating what was said. Furthermore demonstrate with some examples and give exercises.

The researcher agrees with Nations-Johnson (1993: 5) to assist with the performance of students who did not understand and solicit the help of students who did understand so that they can assist their peers. Students are quick to turn to their peers for help.

2.7.3 Focus on library instructions presentation format

When in an online environment, the librarian must use methods of teaching that work best with students so as to encourage active learning. It is important for the librarian to keep the pace and interest of both technically skilled and not so technically skilled students.   The technically skilled student could experience boredom, frustration and become discouraged when having to wait for the less technically skilled student struggling to keep up. These opportunities should be utilized to teach those technically skilled students some responsibility in asking them to assist with the less technically skilled students.

Small, Zakaria and El-Figuigui (2004: 99 - 114) maintain that for librarians to stimulate motivation, active learning strategies must be included in the instruction process to facilitate student participation and interaction. Ward (2001: 923 - 924) advises librarians to take time to understand students, as their issues and concerns to finding information on their topics, are real-world issues. Stubley (2002: 34) and Moore & Abson (2002: 34) go further in asserting the need for relevance in the information literacy sessions. This could be easier achieved in subject-orientated sessions.
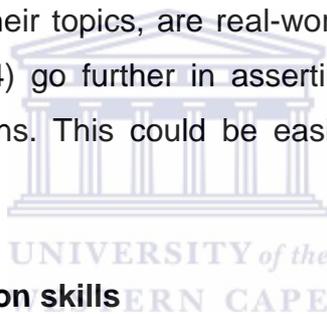
2.7.4   Building information skills

The librarian should ensure that the information literacy concepts are built into the system, so that the students can select and evaluate information independently. Information sources of all formats should be linked by subject and the student should be guided from the general to the specific sources. Students must understand the differences between the library's databases and the Internet (Hope, Kajinara & Liu, 2001: 21 - 24).

Time must be well spent on the basic search instructions, from a generic perspective as well as a subject-orientated perspective.

2.7.5   Focus on user independence

The librarian needs to focus on helping the student become more independent in locating and retrieving information. Hope, Kajinara and Liu, (2001: 27 - 29) stated that the instruction preparation must be proactive and anticipate some of the

students questions by asking why, how or when? According to Small, Zakaria and El-Figuigui (2004: 115 - 118), the librarian's knowledge and understanding of what motivates students and how they learn are essential to teaching critical thinking skills. Teaching information literacy is to stimulate intellectual curiosity, encourage information-seeking behaviours and promote a passion for lifelong learning.

At UWC, the need to improve student information literacy skills has risen in importance. Although it is difficult, the researcher is of the opinion that during the information literacy trainings the librarian should also enable the students to transfer the knowledge and skills gained from the training to the needs of other course or module assignments.

Experience has shown when students arrive at the university; their knowledge of the information research process is very limited or non-existing. The library offers information literacy programmes to the students, but it does not reach all the students. This is a great concern, because the impact of such a knowledge gap would definitely influence the student's academic success. Learners are not exposed to all formats or mediums of information, as seen in the research done by Hart (2000); Cloete (2000) and Zinn (2000).

During these last years, the academics have realised the importance of producing an information literate student. Some departments have implemented Academic Literacy Classes (ALC). This is a beginning. The researcher can comment that students were not really exposed to the resources in the library. It focussed a lot on reference writing and assignment writing.

The University of the Western Cape's mission is "the doors of learning shall be open". The doors have opened. It is for the new student to enter, to discover, to learn, to serve and to inspire. The researcher's vision is for 'UWC to become a research university'. Its present mission statement is committed to excellence in teaching, learning and research, to nurturing the cultural diversity of South Africa, and to responding in critical and creative ways to the needs of a society in transition. One of the objectives is to assist educationally disadvantaged students to gain

access to higher education and succeed in their studies, and to encourage and provide opportunities for lifelong learning through programs and courses.

These outcomes may be seen as directly linked to the development of "research skills" the endpoint to which the academic undergraduate endeavour is directed, since its research profile is one of the criteria by which a university is evaluated in the academic market place. The university is now seriously attending to lifelong learning as a graduate outcome. This is the opportunity for both librarian and the faculty to collaborate in ensuring that the students are information literate where the academics teach the subject knowledge and the librarians teach information literacy skills.

2.8   Conclusion

By implementing the partnership between librarian and lecturer to integrate information literacy education into the curriculum of the Physiotherapy first year student will ensure that the student will be information literate. They will be able to access, evaluate and effectively use information from a variety of sources. Once these skills are acquired, it can be applied to diverse information situations or problems throughout one's life. Since information literacy is the ability to locate, find, evaluate and use information – it is particularly critical to students in the Health Sciences field, not only in helping them to succeed in their courses, but also to succeed in their health careers. In light of the research question and sub-questions, the discussion above will enable the students to directly relate library resources and librarian support to their coursework. The librarian-lecturer partnership has led onto further collaboration and students could now accept librarians as members of the teaching team.

As previously stated, most first year students lack basic research and information literacy skills, and do not have a clear understanding of how to use the resources of their campus library. Students also lack the ability to synthesize knowledge gained from the academic classroom, the library, and information technology for the betterment of academic scholarship. The researcher had heard them saying they wish they were taught how to search for information when they were in their first year.

The High-Level Colloquium on Information Literacy and Lifelong Learning held at the Bibliotheca Alexandrina in Egypt during 2005 proclaimed that information literacy is one of the beacons of the information society, illuminating the courses to development, prosperity and freedom. It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion of all nations (Garner, 2005).

With a view to probe further these issues the next chapter describes building of the librarian-faculty collaboration relationship.

CHAPTER THREE

BUILDING THE LIBRARIAN - FACULTY COLLABORATION RELATIONSHIP

3.1   Introduction

This chapter focuses on the collaborative partnership, the formalization and enhancement of a long-standing librarian-faculty relationship, and the elements of the librarian-faculty collaborative framework for integrating information literacy and its assessment into an undergraduate course.

3.2   Academic libraries

Academic libraries have centrally positioned themselves in defining and implementing information literacy programs. The reasons for this being the following:

- academic libraries are intimately concerned with information;
- it acquires, describes, and makes available information in various formats: print, electronic, video and audio.
- academic libraries have also traditionally provided a place for quiet contemplation and scholarly pursuits as well as instruction in research methods.
- generally, the academic library is the university's primary access point to information.

However, the role of the academic library in the information age was relatively ignored. Thus, today it should not simply be a repository for information, and a quiet place, it should also be a dynamic gateway to information, and as such, provide an active laboratory for students and faculty to explore, investigate and retrieve information wherever it may be found: locally or virtually (Angeley & Purdue, n.d.).

3.3   Students

With all the technology available, students still need to develop the skills to locate authoritative information and to effectively analyse the quality, quantity and source of the information they retrieve (Majka, 2001: 60). Educating students in information literacy is not only a worthwhile goal, but an essential component in the development of students as lifelong learners. It is in fact so important that it is strongly supported

by many accrediting agencies (Association of College & Research Libraries, 2000). In chapter one, the discussion on standards for accreditation pertaining to Educational Offerings, the Middle States Commission on Higher Education stresses that "information literacy is vital to all disciplines and to effective teaching and learning in any institution". It also states that "collaboration between librarians and academics in teaching fostering information literacy is a fundamental element of educational offerings".

With many of the students becoming the leaders of tomorrow, it is essential that they become information literate in order to "lead in the 21st century information society" (Kanter, 2003: 23 - 24). Albrecht (2001a: 11) goes further in saying if we are to recognize the emerging roles of people as knowledge professionals, we must seek ways to make them more effective and productive.

3.4   Library versus Academic

Looking at the literature, the focus has moved beyond the library to the academic in general. According to Marcum (2002: 20 - 24) the learning process-specifically is essential in life-long learning rather than a matter of library instruction. Moving towards it, Breivik and Gee (1989) presented an early model for comprehensive information literacy in an academic setting. Shapiro and Hughes (1996: 31 - 36) created an information literacy curriculum model that took the field beyond the library, involving many areas of a university. Shapiro and Hughes (1996: 35) stated, "We are really talking about a new curricular framework: one that equips people not only with a world of knowledge and information, but including its origins and developmental trends, its definitions of experience and social life, its philosophical justification, biases and limits its potential for human emancipation and human domination, and for growth and destruction". This type of curricular framework cannot be supported by the traditional one-shot library instruction session.

3.5   Librarian-faculty relations

Kotter (1999) in a comprehensive review of the literature on librarian- faculty relations, points out the benefits of such relationships, and adds further that to improve the relationships would benefit both populations. He goes further in pointing out that this kind of partnership offers the possibility of improved instructional design,

classroom instruction and curriculum development. The researcher would add that the librarian must participate in the faculty development programs on campus, thus developing relationships with faculty members that will lead to implementation of successful information literacy initiatives. Together the librarian and the lecturer are sure that students are prepared to use resources throughout their academic career (Nesbitt, 1997: 8 - 9).

3.6   Embedding information literacy skills into the curriculum

For students to acquire information literacy skills at tertiary level, research (Bruce, 1997; Bruce & Candy, 2001; Doskatsch, 2003; Nimon, 2001; Wright & McGurk, 2000) suggests a preference for an approach of integrating and embedding information literacy skills into the curriculum. If information literacy is credited as part of the student's course, students will engage more in developing information literacy skills. The Association of College & Research Libraries (2000) advocates integrating information literacy into the curriculum in order to provide opportunities for problem-based learning, evidence-based learning and inquiry learning. According to the American Library Association (1989), Bruce (1997: 21) and Bundy (2004a: 3) the way students are taught needs to be changed in order to provide opportunities for them to develop information literacy skills. The challenges for educators are to create learning experiences. This could be problematic for the librarian teaching information literacy because time is needed for students to change the way they think and often time is in short supply for these kinds of programs. If faculty members are unwilling to give up their teaching time and it is their right to do so, then how can librarians justifiably be required to persistently ask these faculty members for more time to be devoted within their courses to sessions taught by librarians? Such is the contradiction and vicious entrapment of those who advocate more elaborate and effective instruction on the part of the librarian but would not concede the need for an independent course to find themselves in (Owusu-Ansah, 2004: 5 - 11).

3.7   Credit bearing course

Webber & Johnston (2003: 101 - 111) affirm that integration or a credit-bearing information literacy course can change students' conceptions of information literacy but this requires time and resources. As academics both Webber and Johnson,

know that it is possible that the academics may have more influence on students than the librarians. For them and others the importance of collaboration and of academics supporting information literacy is a theme in the literature (Association of College and Research Libraries, 2000; Spitzer, Eisenberg & Lowe, 1998). Ward (2001: 922 - 924) points out other important factors in the success of information literacy programs, such as explaining why the training is important, teaching at the point of need and providing materials that students can return to when needed.

3.8   Librarians' perceptions of information literacy

Academic librarians know that some academics perceive information literacy education as separate and distinct from the coursework, and prefer to leave the design and implementation of the instruction to the librarian. Many academics also do not attend these information literacy training sessions and students may notice this, leading them to mistakenly see it as irrelevant, not only to their assignments, but also to the remainder of their academic career (Paglia & Donahue, 2003: 321 - 326). Daugherty & Carter (1997: 29 - 32) demonstrated that collaboration between the library and the teaching faculty in the development of a context-specific library research instruction is highly advantageous to student learning. Instruction that is linked to course curriculum has the potential to maximize relevancy by creating a learning opportunity that enhances both discipline-specific and library-specific skills.

3.9   Academics' perceptions of information literacy

For the teaching faculty, information literacy is problematic. Whilst it is widely agreed by the academic that information literacy is an essential component of higher education, it is still unclear where it fits into the university curriculum. The researcher asked the question: who is responsible for information literacy? Information literacy transcends course content and can be developed through course work in all disciplines. It is possible for individual lecturers in faculties in any discipline to design assignments that provide the framework for a mastery of information skills, but it is the librarian who identifies essential library resources for undergraduate students and more importantly presents teaching strategies that foster the acquisition of information literacy skills in the university classroom. It can be argued that the academic librarians have a responsibility to teach students how to effectively use information technologies and according to Koltay (1996: 49 - 50) information literacy

programs that incorporate hardware and software components go far in supporting an educational mission of computer literacy, particularly if the university is technologically advanced. The skills that librarians bring to this kind of instruction argue for their inclusion in an instructional-technology support program. The information management skills could be incorporated with technology-literacy goals.

3.10   Academic librarians and collaborative partnership

Academic librarians are in the unique position of working in a collaborative partnership with the academics and the students while maintaining a current and relevant collection. At the same time they are in the position of being intermediaries between the academics and students as they interact with a wider cross-section of the student population (Valentine, 2001: 106 - 111). In supporting student research, the librarian needs to look at the faculty and students and their different roles in the academic community. Academics are more likely to remain in their positions and develop professionally within an institution. While their information-seeking behaviours for their own research projects might not support interaction with the library, the projects they assign to students do. Therefore the librarian needs to involve the academics to become more involved with the student's information literacy skills. If non-library-using academics continue to design courses and course assignments without consulting their library's collection or librarian, the student may not have access to resources essential to the completion of the course or project (Stamps, 1984: 90 - 92).   Therefore is it critical in creating an environment that fosters collaboration between the librarian and the faculty in information literacy instruction (Black, Crest & Volland, 2001). If lecturers attend the information literacy classes with their students, they have an opportunity to see what resources the library has in a particular discipline to support undergraduate research. Because the academics have the most potential long-term impact on the library and are the primary campus contacts for the students, librarians need to focus more attention on improving the interaction and collaboration between the lecturers and the librarian to facilitate the collection development that needs to occur to support undergraduate research assignments.

As beginning researchers, undergraduates usually do not know enough about specific disciplines to choose a focused area of research and to develop a

manageable research question. Because of the collaboration, the librarian knows what the lecturer expects from the students, and it is the role of the librarian to assist students in developing the focus and to avoid students concentrating on the false focus. The researcher agrees with Wood, Ford, Miller, Sobczyk & Duffin (1996: 79 - 92) and Ray & Day (1998) about students' sense of satisfaction of their search strategies. The students may be satisfied with the results that would be unsatisfactory to an information professional. Students may have low expectations, which are met with inadequate search strategies, so they see no need to improve their techniques. Even when students use electronic information sources, they tend to use only a limited number. Strangely, some students will learn the electronic information sources skills if encouraged to use sources by the academics.

3.11 Information literacy instruction integrating into discipline specific curriculum

According to Whitmire (2002: 251 - 263) integrating information literacy instruction directly into discipline-specific curriculum also supports the different information-seeking behaviours that are inherent to students within specific disciplines. Undergraduates majoring in the soft, pure and life disciplines engage in more information-seeking activities than undergraduates majoring in the hard, applied and non-life disciplines. There are great differences in information-seeking behaviour patterns between undergraduates majoring in the pure sciences versus applied disciplines. To address these differences in information-seeking behaviours by discipline, the only effective method is through information literacy training that recognizes these behaviours and addresses them directly. It can be accomplished by shifting information literacy skills instructions to the lecturer and using resources that complement course content (Leckie, 1996: 201 - 206). This shift can only occur through collaboration with the lecturers and the librarian to ensure that the lecturers have a comprehensive understanding of the resources available to the students. By having the lecturers more actively involved in information literacy instruction, students would be better prepared for research assignments and the lecturers would be more satisfied with the results.

3.12 Academic and the library

Doskatsch (2003: 111) sees the challenge to transform higher education and its pedagogy to impelled co-operative relationships between the academic and the library. Functional silos are being, though unevenly, superseded by a more seamless culture that fosters collaborative approaches to learning and teaching. The immediacy of information access is a particular vehicle to enhance partnerships between academics and librarians. Success in fostering faculty-librarian collaboration depends on understanding the preconceptions and perceptions of such a relationship, and the external forces that drive cross-disciplinary collaboration.

3.13 Librarian-faculty relationship

Studies indicate that building successful information literacy infrastructure begins with the creation of a foundation of strong librarian-faculty relationships in conjunction with faculty development programs and a close co-operation. Teaching appears to be engraved in the minds of the academics and classroom and experience shows that librarians are hardly regarded as being on equal footing with class faculty (Owusu-Ansah, 2004: 4 - 15) especially teaching involving awarding of credits. There appears to be conflicting perceptions and attitudes about librarians and their teaching capabilities, and this disputed status has in some instances been found to be a barrier to the development of collaborative teaching partnerships between academics and librarians. Bundy (1999: 249 - 250) proposes that librarians need to be assertive about their educational partnership role, rather than propose themselves as support agencies with self-limiting roles focused on information management and delivery. Information literacy is thus an issue for librarians, but not a "library" issue. It is an educational, societal and democratic issue which should be a fundamental concern to all those who call themselves educators.

Doskatsch (2003: 112) reflects critically on the value librarians contribute to teaching and learning, and to consider strategies and opportunities to promote the educative role of librarians with greater clarity and force.

3.14 The instruction librarian

According to LaGuardia (2001: 2 - 3) instruction librarians are made, they are not born with teaching skills. According to the researcher one can say the same about

the academics. Many of the librarians are placed, or find themselves in the instruction field because no one else wants to teach information literacy. In support of LaGuardia, Tuttle (2001: 144) maintains that the majority of librarians received little or no training in graduate school and have learned and refined the craft on the job. According to LaGuardia (2001: 5 - 12) the librarians require a specialized set of skills such as mastering the teaching techniques of preparation and presentation that can be applied in a variety of classes across disciplines, especially the continuous development and encouragement of instruction librarians. As there is little or no professional development as teachers, librarians have learnt to teach by experience and expected to have a working knowledge of the concepts that underscore pedagogy.

The librarians find themselves at the deep end, as they lack knowledge of the educational theories and methodologies that can be applied to information literacy instruction. According to Oberman (2002) the main challenge is that the learning of library instruction and information literacy programs is intertwined socioeconomic, political and cultural differences and librarians are neither in a position nor enskilled to handle such issues. Leadley (1998: 103 - 107) refers to this teaching skill as the "plight" of the librarian. According to the researcher more active involvement in the classroom, where attention is being paid to the issue of improving teaching, will benefit the librarian in many ways. There are options like participation in campus-wide conversations about teaching and involvement in teaching meetings, which will help librarians develop as teachers.

3.15   The librarian's role in the librarian-faculty collaboration

According to Rader (2001), the present environment in higher education is well suited for a librarian-faculty collaborative relationship. Librarians have the expertise in information and know how to teach information skills in the electronic information environment.   Librarians have been involved in and supported resource-based learning for many years. Academics are in need of acquiring new skills to work with the electronic information environment and to integrate that into their teaching. Here librarians can help them accomplish that. Resource-based learning teaches students to assume responsibility for their own learning and to become independent and life-long learners. Librarians can work with faculty to implement resource-based learning

in all disciplines. All stakeholders need to work together with their faculty and librarians to lead them in this important initiative to prepare students for life-long learning and information literacy.

The information literacy concept is to prepare students for lifelong learning in an information society. Librarians want to bring about learning in students, and this teaching role provides them with an opportunity to demonstrate an information literacy approach to life. The challenge, therefore, is to use teaching methods and approaches that model information literacy practices (Hinchliffe, 2002: 95 - 96). This is another opportunity for librarians to be aware of the students' limitations and needs.

It is the opinion of the researcher that the librarian has a very important role to play, in helping students to recognize accurate and complete information, identifying potential sources of information, organizing and evaluating information, it cannot operate in isolation of other competencies that are necessary to make a person fully information literate. The shared goal of the university ought to be producing information literate graduates and faculty. The first task for the librarian therefore is to sensitize the faculty on the importance of information literacy skills, which are ideally transferable in any situation. So before the information literacy sessions can begin, the librarian needs to be proactive. Being so, the librarian needs to provide training to the lecturer. The librarian of course invites the lecturer to make arrangements for a lecture or hands-on presentation. In this way the librarian believes that it is essential for the lecturer to know what the student must know in order to be information literate. For some lecturers it is a first and for many a refreshing exercise.

A librarian needs to be open, approachable, friendly and interact with both the student and the lecturer. It is clear that regular informal contact with the librarian increases the serendipitous information gathering particularly about the library and information services (Wilson, 1977: 698 - 701).

3.16   Approaching the problems with solutions

With regard to student performance, the librarian needs to:

- identify the student's literacy needs,
- assist students who did not understand, and
- solicit the help of students who did understand to assist their peers.

The development of responsive facilitation techniques, including the ability to assist performance and to conceptually connect student and librarian, is of benefit to both parties as individuals and members of a group (Nations-Johnson, 1993: 7 - 8).

There are a few ways of approaching the presentation. There are the on-line tutorials and the information literacy instruction course. Where the lecture format is used as a training method, there is higher retention of concepts. By contrast, the online tutorial and guided hands-on lead to a higher retention of mechanical skills. The hands-on approach to instruction requires more resources and time for coaching. However the combination of both methods is worth investing in as it encourages students to adopt self-reliant search behaviours, develop a positive attitude and a strong motivation for students to continue to learn and practice their skills on their own (Ren, 2000: 323 - 326).

At the same time, it is alarming that a surprisingly significant number of first year students, are also in need of basic IT skills to enable them to exploit the electronic resources in the library, as well as writing of assignments. Once again the information literacy course includes assistance. With the necessary IT skills, their writing and presentation skills of their assignments could improve and lecturers could expect better results.

With all of above one can see why the integrated information literacy course is best, because effective teaching involves a change from presentation of information to student construction of meaning. Active learning experiences can help students become critical thinkers and problem solvers (Higgins & Cedar Face, 1998: 29). This could happen when both the librarian and lecturer are involved.

Doskatsch (2003: 112 - 113) goes further in stating that librarians need to respond to challenges by helping the academic create learning environments that require students to be actively involved in filtering, critically analyzing and synthesizing

information from a wide variety of information sources and formats outside the traditional lectures and set texts and books of readings. The librarian can contribute to the re-engineering of the teaching and learning environment:

- Resource discovery to support curriculum development;
- Facilitating the integration of information literacy into curricula by developing in collaboration with the faculty a range of online learning resources;
- Acting as intermediaries/facilitators to support access to resources and services in a complex information environment;
- Enabling simple, easy to use and direct access to resources and services;
- Ensuring that librarians are part of curriculum development committees.

In order to improve learning opportunities for the students, the librarian and the lecturer develop and implement an assignment-specific extended instruction session with the focus on identified objectives pertaining to the discipline. This approach to library instruction is the departure from the traditional bibliographic instruction sessions. This instruction session is not limited to a single class period, students actively engage with the material through hands-on exercises and a focus on the discipline is enhanced. The librarian and lecturer begin the collaboration by identifying the objectives in relation to the course objectives. The primary objectives identified should be:

- The ability to identify and to define a research topic
- The ability to identify resources appropriate for the assignment
- The ability to critically evaluate these resources and to syntheses this material effectively
- The reduction of library anxiety

The first three objectives are designed to focus on subject-specific and practical skills. The fourth objective addresses the concerns of students' comfort and self-confidence levels in using the library resources to complete their research assignments (Paglia & Donahue, 2003: 322).

After identifying the objectives for the sessions, both librarian and students will develop a partnership with the assignment in mind to demonstrate what they have learned.

According to Phillips & Kearley (2003: 352 - 353), the structure of the sessions would be based on the ACRL Information Literacy Standards, so that students go through the research sequence to:

- Investigate a research topic for possible information sources
- Search for information about a topic
- Locate the information within the UWC library
- Evaluate the quality of information located; and
- Utilize that quality information in a paper, speech or project.

According to Paglia and Donahue (2003: 327) true collaboration draws on the expertise of each of the partners and the possibilities for creating genuine teachable moments are great. Judd & Tims (1996: 21 - 30) and Tims & Judd (2001: 157 - 162) believe the best option or method for information literacy is course-integrated methods using a team-teaching approach with students and collaborative teaching efforts that strive to impart not only bibliographic knowledge, but also critical thinking and literacy skills (Henninger & Hurlbert, 1996; Sterngold & Hurlbert, 1998). Many academic librarians perceive a credit course as a viable option for teaching such skills. Davidson (2001: 162 - 163) concluded that credit-bearing courses do provide an important method for teaching library and research skills, and that a strong instructional program should provide this opportunity. Donnelly (2000: 59 - 72) believes the availability of a credit course demonstrates the campus commitment to information literacy and can change the way students perceive the library. Donnelly also pointed out that giving academic credit is the way in which higher education legitimizes learning; the way by which students are told that certain skills and knowledge are important. For Angeley & Purdue (n.d.), information literacy credit courses are taught as a linked or a cluster course to a discipline course. This type of instruction has created opportunities to collaborate with the faculty from all disciplines, ensuring that course content and research methodologies are aligned. These information literacy instruction sessions are also designed with the academics in the disciplines to ensure relevance and appropriateness for a particular research assignment.

As this study chronicles the librarian-lecturer collaboration at UWC in the development and teaching of information literacy instruction, building a successful

information literacy infrastructure begins by creating a foundation of strong librarian-lecturer relationships in conjunction with faculty development programs. Building relationships with faculty is the critical component in creating an environment that fosters collaboration between the librarians and teaching faculty for information literacy instruction.

However, to be able to build this collaborative foundation with the faculty, librarians must overcome the obstacle of reaching faculty who operate from a culture define by narrow content focus, autonomy, time constraints and resistance to change (Haynes, 1996:195). The librarian faces challenges in initiating collaborative relationships with faculty as faculty's established perceptions of the library, their attitude toward librarians, and their own research expertise, influences the information literacy instruction of their students.

While librarians may be hard pressed to identify faculty willing to participate in personality measurement, librarians are using a number of relationship building strategies including formal communication, campus involvement, and informal contacts.
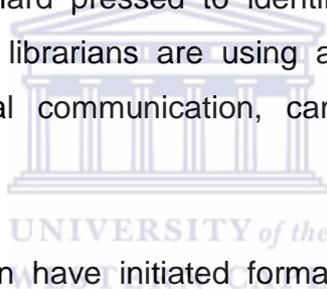
At UWC the CHS librarian have initiated formal communication with the faculty through liaison. These liaisons create a space for discussing information literacy. The Library-CHS faculty committee meetings were another platform to open dialog with academic department chairs and coordinate liaison activities. The librarian also agreed to meet on a formal scheduled planning meeting with the lecturers coordinating the first year students to plan information literacy activities. Some of these lecturers preferred to use written communication to ask for assistance in some of their trainings or teachings from the librarian.

For the librarian the faculty visitations worked the best. The one-to-one and face-to-face visitations have many advantages. Here the lecturer can identify which library services is important and what to expect from the librarian. The librarian could also identify what was important to her as well as to what to expect from the lecturer. Both could determine what the outcomes of the student's programmes should be. This was the best way of planning with the lecturer.

One of the quickest ways to become allied with the faculty is by identifying initiatives of the faculty and asking the question "how can information literacy help these projects?"

Less formal methods to attract the faculty's attention for information literacy programs include having librarians gain the support of campus administrators, participate in campus initiatives and open themselves to opportunities for informal contact with the academic.

Again the librarian can identify initiatives, projects or programmes on campus and also asking the question of how can information literacy help or play a role. Involvement in campus projects creates further opportunities for informal interaction between librarians and the academics.

Contacts can also be made through networking at campus events and social gatherings. For the librarian these informal contacts are often how collaboration with the faculty on information literacy instruction is initiated. Whenever and wherever possible, the librarian always utilized both formal and informal channels of communication in order to further the library's information literacy goals.

Technology also played its part. The librarian has used technology issues to further the library's information literacy program. Innovative lecturers have collaborated with the librarian in the creation of instructional website tailored to their courses. This happened after teaching their distance students her information literacy program.

The librarian would provide information literacy workshops for the whole faculty, for those who cannot make it, departmental workshops. The librarian found that this increased the lecturer's understanding of the importance of integrating information literacy into their courses. The librarian witnessed a change in the academics' attitude towards the librarian (s) as a result of the 'information explosion' caused by the Internet. The Internet creates demand for instruction for both academics and their students. Technology can lead to faculty development opportunities for the librarians. By improving the computer skills of the librarian, the librarian established

herself as a technology assistant in both lecturer development and in turn students' information literacy.

The librarian-lecturer relationship is built by the meetings, informal contacts and offering faculty development opportunities. Through these development sessions, not only are the lecturers exposed to the librarian's information literacy goals, but also welcomed into developing richer relationships with the librarian.

Through relationships built with the CHS faculty through formal and informal communication, informal contacts and the flexing of technological strength, the librarian has created faculty-wide information literacy initiatives. These successful initiatives included plagiarism workshops, critical thinking, information literacy classes, but most important of them all involves collaboration between the librarian and the lecturer(s) and all this to encourage the lecturers to integrate information literacy into the students' curriculum.

3.17   Conclusion

The development of the librarian-faculty collaborative framework offers a means to instruct students in information literacy, to assess their information literacy competency, and to enhance the level of collaboration between the lecturer and the librarian. Although grading was the primary responsibility of the lecturer, the grade for the information literacy component of the course could become the input of the librarian. The collaborative approach offers a unique opportunity for the librarian to read completed papers and to provide input into the scoring of the papers, not traditionally available to librarians providing instruction to classes. In addition, the collaborative approach offered a unique opportunity to the lecturer to enhance course content, learning outcomes assessment, and preparation of students as life-long learners.

The next chapter describes an appropriate research methodology to be used for this empirical investigation.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

The aim of this chapter is to explain the research methodology applied in the study, namely the research design, research approach, target groups, method of sampling, data collection method and analysis of data.

The research methodology seeks to find data that will yield answers to the study's research questions posed in chapter one.

This study supports the need for information literacy education for all first year undergraduate students at UWC and describes the use of a collaborative framework for integrating information literacy into their curriculum and for assessing the results. The framework provided a guide for a more structured and fuller collaboration between the librarian and the lecturer. A survey method was decided upon. It identified the baseline competencies of students, the need for information literacy initiatives and courses and identified gaps in competence that could be rectified. Within the collaborative relationship, the academics can assume that students have uniform basic information literacy levels. To answer the research question and sub-questions, the method or program is based on it in order to answer it.

4.2 Research design

A research design has been defined as a plan or strategy which moves from the underlying philosophical assumptions to specifying the selection of respondents, the data gathering techniques to be used, and the data analysis to be done (Bryman, 2004: 54; Maree, 2007: 70).

Research methodologies revolve around two major approaches, namely quantitative and qualitative (Powell, 1999). A quantitative study measures a phenomenon using numbers in conjunction with statistical procedures to process data and summarise results (Cresswell, 2003: 251-218; Cresswell & Plano Clark, 2007: 34; Locke, Silverman & Spirduso, 1998: 123).

On the other hand, qualitative research is conducted in a natural setting and it is concerned with viewing experiences from the perspective of those involved, and attempts to understand why individuals react or behave as they do (Cresswell, 1994: 2).

However, Kendal (2008: 134) makes out a strong case that the difference between the two approaches are technical rather than epistemological. That means that in practice researchers can mix the two approaches to what best fits the questions under study. The two approaches can be used together to demonstrate concurrently validity. The use of two or more methods to study a phenomenon is called triangulation (Anderson, 2008: 78; Cresswell & Plano Clark, 2007: 34; Denzin & Lincoln, 2003: 96). This study will use methodological triangulation because it bridges the issues of reliability and validity.

Qualitative and quantitative methods can therefore be complementary, used in sequence, or in tandem. This study therefore uses both quantitative and qualitative methodologies.
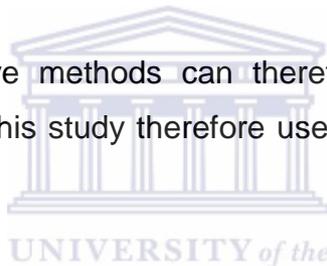
This combination research approach is suited to research amongst people from any educational level, language and culture. The use of both approaches also ensured that data collected was valid and reliable. The methodology utilized qualitative and quantitative measures of student perceptions of the information literacy program and the classroom sessions, as a pedagogical tool and focuses on documenting approaches and information literacy practices. The following qualitative data was analysed by the librarian and lecturer: 1) transcripts of the classroom sessions; 2) emails of the researcher, the lecturer and the students; and 3) field notes of the researcher. The following quantitative data was analysed: a survey instrument that compares the two delivery options: 1) the questionnaire; and 2) the research term paper and the List of the Information Tools used. This study, through the use of the research question and sub-questions, assessed the effectiveness of the classroom sessions and the research term paper.

4.3   Target group and sampling of research participants

4.3.1 Target group

The targeted or sampling groups for this study were only incoming first year Community and Health Sciences (CHS) students. Both the pre- and post-test questionnaires were completed by the CHS students enrolled for Physiotherapy 1 and Occupational Therapy 1. They were the respondents as the pre-group (Physiotherapy 1) and control group (Occupational Therapy 1).   Both these departments facilitate 50 students each. The number of the respondents would then be 100 students.

4.3.2 Sampling method

The sampling method used in the study can best be described as the purpose to increase the external validity of survey research. It involves selecting a sample which is a representative proportion of the survey population being studied. Therefore, this enables the results to be generalized from the sample to the population. A sampling unit is an element or set of elements which has the potential to be included in the sample. For researchers to be able to select a sample, they make use of a sampling frame which is a list of sampling units or an actual list (Babbie, 1990: 65 - 73).
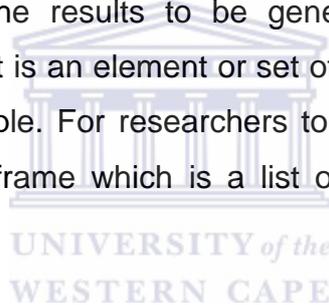
The sampling took place as follows. At a meeting with the faculty, when the researcher explained that the intended study is to be done in the faculty, she received the full support of all. The researcher was left with the choice of the departments again with the support of the faculty.

In 2006, one department was selected as the pre-group, and the information literacy skills training was provided in the first semester of 2007, one period per week. At the same time, the control group was selected from the other departments from the first year CHS students.

The criteria for one department selection as the pre-group were: which students would need the information literacy skills training sessions the most, as the CHS Faculty students are working in the communities or hospitals. The Physiotherapy students seemed to be the ones mostly off-campus and needed lots of hands on

information. They were then selected as the experimental or pre-group. The Occupational Therapy 1 was selected as the control group as they came second to the Physiotherapy students. For both these two departments the number of students allowed to study was 50. At the time of the start of the research, both departments had 49 students. Both the Physiotherapy 1 (as the pre-group) and Occupational Therapy 1 (as the control group) students gave the number of 98 (n=98) students to participate in this study.

4.4. Data collection methods

4.4.1 Format and administration of the questionnaires

The nature of the research undertaken was instrumental in determining the methodology applied. The method of survey research allows researchers to gather information about the target population. Field methods used to obtain survey research data generally consist of a combination of techniques such as questionnaires, interviews with respondents and participant-observation (Busha & Harter, 1980: 54). In this study the major data collection instrument was the questionnaire.

Questionnaires are used in studies that have individual people as units of analysis. It is also specifically designed to elicit information that will be useful for analysis (Babbie, 2005: 251 - 255). The advantages of questionnaires are that data is easy and quick to analyse. They produce statistics or numerical descriptions of some aspects of the study population. Questionnaires collect data from a small sample instead of the entire research population thereby saving money, effort and time without sacrificing the efficiency, accuracy and adequacy of information (Frankel & Devers, 2000: 115).

After a thorough review of the literature on similar assessment tools, it was decided to use questionnaires for the assessment of information literacy. The questionnaire was utilized by the researcher to gather data to provide an unbiased picture of the information literacy status of the UWC undergraduate first year Physiotherapy students, and also of the extent to which their levels of information literacy might influence their academic performance. Reasons for using questionnaires are to

assess large numbers of respondents, to assess a wide spectrum of information literacy aspects and to develop a tool that will suit UWC students.

To determine the impact that the information literacy program had, a questionnaire was developed. It was administered before and at the end of the program to measure improvement of information literacy skills. Assessing prior skills and knowledge will enable the researcher to quantitatively determine skills and knowledge gained during the program.

The questionnaire was an important instrument for evaluating the students' learning outcomes. The study also aimed to determine whether the information literacy program had an impact on students' information literacy levels. It determined whether the program resulted in a higher level of information literacy and if it will result in higher academic performance. It would also whether students would be able to acquire these skills without formal training.

The researcher took a long time designing the questionnaire with the purpose of making sure that it adhered to the research question and the identified sub questions and only essential questions were asked. The questions were relevant, simple, unambiguous, carefully positioned because the aim was to solicit only the data essential to the research question and the identified sub questions. This makes it easier when using questionnaires to assess large numbers of respondents, to assess a wide spectrum of information literacy aspects. The questions in the questionnaire followed numerically the same topic, but an illogical arrangement follows as certain questions were linked to follow the discussion of specific topics relating to the main research question and sub-questions.

The data-collection method considered was a questionnaire distributed and completed during class time. It was easier to distribute a pen and paper questionnaire which can be completed during class time and collected. This also ensured a 100% return of questionnaires. The aim of the questionnaire was to assess the level of the respondents' information literacy.

After marking the students' research term papers, the lecturer involved with the first year Physiotherapy 1 students also completed a questionnaire at the end. As she has prior experiences of students' research papers, she would only complete it once. In the beginning stages she was interviewed, the researcher had meetings and discussions with her.

Although the CHS lecturers coordinating the first year CHS students approved of the information literacy training, all of them were not able to make time available for it. The training for the faculty members involved would be very time consuming. Getting a few lecturers together for the training and the planning meetings, would have been a problem. The advantage of having the lecturer responsible for the first year Physiotherapy students involved, meant it would only be necessary to train one person and arrange the planning meetings as it were her students in the information literacy program and one questionnaire to be completed.

4.4.2 Design of the questionnaire

The questionnaire was utilized by the researcher to gather data to provide an unbiased picture of the information literacy status of the UWC undergraduate first year Physiotherapy students, and also of the extent to which their levels of information literacy might influence their academic performance. It was decided to design a pen and paper questionnaire to assess the level of the respondents' information literacy.

The questionnaire was designed in two sections. The first section of the questionnaire gathered demographic information, to assess the exposure to information literacy training, school and public library usage and computer literacy experience prior to university education. Twelve questions were used to profile the new first year Physiotherapy students at the UWC (see appendix B).

The second section of the questionnaire based on the study's main research question and sub-questions assessed the students' level of information literacy competence (see appendix B). It also served as the post-test for both the pre- and control groups. This section (twenty questions) covered most aspects of the information literacy process to test information literacy competence and were based

on general library and information skills; catalogue, databases, referencing and the Internet and WWW. All twenty questions were multiple choice questions giving the students the option to guess the correct answer. The questions gave a fairly wide range of quantitative data.

As the second part determined the baseline information literacy competence, it was based on the information literacy goals linked to the research sub-questions which were: that the students needed to know which were the information resources in the research (B5, 6, 8, 10, 12, 13, 17, 18 and 19); how to effectively search for information (B1- 4, 15 -16); how to evaluate the reliability and significance of information found relevant to research (B10); and how to use appropriate attributes and citation formats for the resources used (B6, 7, 9, 11, 14, 20). This served as the pre-test and as the post-test (See also chapter 4).

The same questionnaire was completed by the control group of CHS (Occupational Therapy) first year students. They were compared by using the t-test and the McNemar Exact Test with the pre-group who underwent the information literacy training to assess if the information literacy training made an impact in the pre-group's academic performance. Data was collected over a period of one year. Both groups completed the questionnaire in one session. As the questionnaires could be collected immediately after completion, it resulted in a 100% return of questionnaires. The paired data was compared by using the t-test.

The lecturer involved with the first year Physiotherapy 1 students, completed a separate questionnaire (see appendix C). Based on the research question and sub-questions, the lecturer also had to show whether the information literacy goals were achieved. The lecturer had to state whether her expectations regarding information literacy skills were achieved (Q1 - 2); whether she saw the change or improvements in the students' information literacy skills (Q3 – 5); the important services provided by the librarian (Q6 - 7); and improvement of library services because of the collaborative partnership (Q8 – 13).

4.4.3 List of Information Tools used

Students were requested to compile their List of Information Tools used for their research term paper. When they had to submit their completed research term paper to the lecturer, they had to submit the List of Information Tools used to the researcher who in turn evaluated their use of library resources and referencing. The list did not only provide the scoring information, but also provided an insight into the students' actual search strategy and the use of resources. The List of Information Tools used which was submitted was reviewed by the researcher to accurately assess the use of the library databases, OPAC, library resources and the Internet sites. This list made it possible to determine how the library databases and Internet sites were searched or whether the students had used the library resources. The list formed part of the 20% mark given towards the information literacy competency score.

In addition, the list also indicated of the research question and sub-questions that were achieved: students used and understood the resources, indicated their preference and an improvement of library services.

4.4.4 Pilot study

A pilot study was conducted with five first year undergraduate students and five faculty members across the Community and Health Sciences faculty at the University of the Western Cape. These undergraduate students were not part of the sample group. The aim of the pilot study was to test the reliability of the research instrument and the validity of the research method. The researcher reviewed the results of the pilot study before the first information literacy instruction session.

4.5 Data analysis and interpretation

Data analysis provides or explains the stage at which gathered data are transformed into information via the process of analysis (Mouton, 2001: 108-109).

Descriptive statistics were used to organise, summarise and visualise quantitative data. These statistics were very useful for the researcher to identify underlying patterns in the data and were used as evidence for his / her arguments and claims about the topic that the researcher investigated (Collins, 2000: 211).

Responses were captured using the Microsoft Excell spreadsheet. The following were also used in this study: tables and graphs, percentages, graphics presentations of frequency distributions, histograms and bar charts. The Microsoft Excel spreadsheet was used to analyse quantitative data and two tests namely the McNemar Exact Test and the t-test.

The t-test for paired data was used to determine if there would be significant changes between the pre-test and the post-test scores. Each individual's pre-test score was matched with his/her post-test scores to form the pairs. The information literacy pre-test and post-test scores were analysed for statistical significance. Each dimension (Define research topic and strategy / Locate and retrieve relevant information / Use a computer/ Use the library website / Use the library catalogue / Use databases / Search the internet / Evaluate information / Organise & synthesise information / Understand ethical & legal issues) was compared. This data was summarised and calculated by means of the McNemar Exact Test and the tables and graphs, percentages, graphics presentations of frequency distributions, histograms and bar charts were done by using the Microsoft Excel spreadsheets. Refer to chapter five for more detail.

4.5.1 Method of data capturing

As the size of the sample was easily manageable, one session was found to be sufficient. The first session of the program was used for the pre-test. No time-limit was set for the completion of questionnaires, but it was found that the time required for completing the questionnaires was enough, 20 minutes was enough. All the students completed the questionnaires during this session. At the end and after completing the program, the same questionnaire was again used as the post-test. The same students completed both the pre- and post-test. There was a 100% return of questionnaires distributed.

The other Community and Health Sciences students from the Occupational Therapy department were chosen to serve as the control group also completed the same questionnaire. The information literacy levels of both groups were compared which

determined the impact of the information literacy training. This was done by using the Information Literacy Competency Scale results.

The Information Literacy Competency Scale (Table 1) was developed to evaluate the students' information literacy competency. The lecturer and researcher agreed that a simple scale would work best. An easy point system of five points for each established information literacy goal and a correct answer and zero for an incorrect answer was used. In addition to the traditional grade for the content of the term paper, the student received a score on a 100-point scale for their information literacy competency based on their accomplishment of each of the stated outcomes. Any score under 60 would be considered a failure or "not competent"; above 60 would be "competent" and above 80 "very competent". The researcher and lecturer decided that the two passing categories "competent" and "very competent" would be appropriate for assessment purposes. The information literacy component in their research term paper counted 20% towards the final mark.

Table 1   Information Literacy Competency Scale

Information Literacy Competency Scale	
80 – 100 points	Very competent
60 – 79 points	Competent
0 - 59 points	Not competent

In order to motivate the students to give honest and reliable information during the completion of the questionnaire, the researcher stressed the fact that fellow students would not be able to establish private information divulged in each anonymous questionnaire, and that such information would be used for research purposes only. They were assured that the information would in no manner impinge on their present opportunities.

The data of only one year 2007 was gathered. The result of the questionnaire (only of the Physiotherapy 1) was used for guidance during their 2008 information literacy session. The researcher also realised that students would need follow-ups to strengthen their information literacy skills. During the students' second and third years of study one session was done (2008-2009). The two sessions to follow were

only with the Physiotherapy 1 students but did not continue with the Occupational Therapy 1 students.

The lecturer involved with the Physiotherapy 1 students also completed a questionnaire (see appendix C). This was completed after marking the students' research term papers.

4.6   Reliability and validity

Reliability and validity are two factors which any researcher should be concerned about when designing a study, analysing results and judging the quality of the study (Golafshani, 2003: 601). Both concepts are interrelated in that the validity presumes reliability (Bryman, 2001: 740).

Generally, reliability means the stability or consistency of the response or measurement (Punch, 2003: 42) the degree to which a test consistently measures what it sets out to measure, while at the same time yielding the same results (Babbie & Mouton, 2001: 119).

Validity means whether the data represent what we think they represent (Punch, 2003: 42). The issue here is whether respondents answer honestly and conscientiously. Measurement validity means the extent to which an instrument measures what it is claimed to measure. An indicator is valid to the extent that it empirically represents the concept it purports to measure (Punch, 2003: 97).

Thus validity is concerned with what a survey tool measures and its appropriateness, whereas reliability refers to the consistency with which the instrument measures whatever it measures. To ensure the reliability and validity of the data, the following steps were taken:

- The questionnaire was pre-tested using a sample of respondents (n=5) to make sure that it covers the research questions with regards to content and detail (Bryman, 2001: 155).

  The pre-test gave the researcher the opportunity to fine-tune and adjust the questions in line with feedback during the pre-testing. Pre-testing of the questionnaires was used as a tool for content validation and reliability.

- The questionnaire was accompanied by an introductory letter (appendix A) introducing the researcher and the subject of the study to respondents; and
- The anonymity of participants was protected in order to persuade them to answer freely. See appendix A.

4.7   Research program

4.7.1   The information literacy program

The following instruction module evolved from the original list of skills and collaborative efforts of the researcher as faculty librarian and the CHS faculty. The Collaborative Information Literacy Model (CILM) was designed and developed as an instructional plan for librarians and faculty academics which can be used as a guideline on initial collaborative efforts for information literacy education.

4.7.2   Elements of the collaboration framework

Martha Cooney and Lorene Hiris (2003: 213 - 232) gave a description of the elements of the librarian-faculty collaborative framework for integrating information literacy and its assessment into an undergraduate course. This was based on the formalization and enhancement of a long-standing librarian-faculty relationship. This was an opportunity to enhance the level of collaboration between the library and the classroom not only by attempting to integrate information literacy into the course, but also by making the librarian a partner. The primary value is that it provided a strategic approach to the information literacy education in the health sciences that benefitted students, faculty and librarians. This approach provided a framework and tool for identifying key skills and critical intervention points for information skills instruction in the health sciences. While the lecturer focused on the traditional role of evaluating the students' knowledge of the course content, the lecturer and the librarian collaborated on assessing and scoring the student's information literacy competency as evidenced in the completed term projects. The research term paper provided an ideal initial opportunity to formally establish information literacy goals and objectives and a collaborative framework for integrating these objectives into the course.

The librarian-faculty collaborative framework (Table 2) provided a system for the integration of information literacy skills and assessment measures into the course, and served as the contract of understanding between the librarian and the lecturer. The framework consisted of several inter-related steps, namely, initial librarian and lecturer collaborative relation; establishing goals and objectives; including an information literacy requirement in the course syllabus; designing and compiling assessment instruments; providing enhanced class instruction; incorporating an information literacy component into the research term paper; and assessing the learning outcomes. All of these elements facilitated an enhanced level of collaboration between the librarian and the lecturer and were essential for integrating information literacy and its assessment into the course. This collaborative effort engaged the students right from the start in the information literacy process.

Table 2 The Librarian-Faculty Collaborative Framework

The Librarian-Faculty Collaborative Framework
1. Librarian and lecturer collaborative relation. Establish team relationship on collaboration. Work out the program for all, students, faculty (lecturer), and librarian (researcher).
2. Goals and objectives. Develop goals and objectives in support of ACRL Information Literacy Competency Standards and Middle States, Characteristics of excellence.
3. Course syllabus. Integrate information literacy into the learning objectives and mode of instruction for the course.
4. Assessment instruments. Compile and administer the information literacy questionnaire prior to the first instruction class. Administer the information literacy questionnaire during the last class. Check the learning outcomes in support of the information literacy goals of the course.
5. Class instruction. Instruct students in identifying, evaluating, effectively using and using broad spectrum of authoritative and up-to-date information sources. Instruct students in appropriate attribution and citation formats.

6. **Research Term paper**. Students complete a major research paper and submit the List of Information Tools used. This will also serve as the means of assessing information literacy competency.
7. **Outcomes assessment.** Apply Learning Outcome Checklist to completed term research paper and tally score of information literacy competency. Attach score to completed term research paper. Review results of students' competency scores and revise instruction methods as needed.

The framework was developed by Martha Cooney and Lorene Hiris, Long Island University, Brookville, NY. and adapted and customized for this research at the UWC.

4.7.2.1 The librarian- lecturer collaborative relation

The qualitative aspect of the research focuses on documenting approaches and information literacy practices of the librarian and the lecturer. The librarian-lecturer collaborative partnership was the goal of the librarian-lecturer framework. The objective of this goal was that both the librarian and lecturer recognise common goals and objectives, shared tasks, and participate in planning and implementing to respond to a research / teaching request. The information literacy Standards have reinforced the importance of librarian and lecturers working together to realise the information literacy learning outcomes. As the research sub-question three required the important services expected from the librarian, these two, the goal and the research questions started the program.

The librarian and lecturer collaborative partnership started with the first arranged meeting in early December 2006 to plan for the 2007 information literacy program. The meetings involved interviews, planning, discussions, classroom delivery, and assessment stages of the instructional process. The interviewing included discussing the library and information skills of the lecturer, the training she required and everything she needed to know concerning the library and the resources. In the case of the librarian, it was vice versa what the librarian needed to know about Physiotherapy, requirements of the lecturer and students and the academic side of

the curriculum. Decisions needed to be made by the librarian and lecturer about what content would be covered by the librarian, where it would be integrated, how it would be integrated, and how the work would be divided. Specifically the collaboration also involved the development of course goals and objectives. The early meetings also consisted primarily of open discussion to determine what the information literacy goals were.

The information literacy goals set upon were that students would:
1. Know the major information sources in the research
2. know how to effectively search for information on the topic regardless of format
3. Evaluate the reliability and significance of information found relevant to research
4. Use appropriate attributes and citation formats for print and electronic resources.

Further collaboration involved the syllabus, research term paper, course-integrated library instruction sessions, and the assessment tools, including an information literacy competency pre-and post-test. The librarian and lecturer also had some additional goals guiding their collaboration: to develop students' information literacy competencies; fostering students' sense of themselves as global citizens; and facilitating students' awareness of the connections among lifelong learning, global citizenship and information literacy (Cooney & Hiris, 2003: 218).

Information literacy in this technology-driven society is very important. There are so many printed and electronic information sources covering an overwhelming number of topics. But how does one find the desired pieces that compose an accurate and balanced picture of any query? The fact that many sources of information may be neither authoritative nor accurate calls for more than the ability merely to find information, but also to evaluate critically its source. For the working health worker information literacy has expanded with bibliographic databases, databases and many more information sources. These universally available resources, which underlie the field of Physiotherapy, have a profound influence on how Physiotherapy can affect human lives (Frier, 2009).

The overriding aim was to increase the information literacy of the students. Based in part on these common concerns, both the librarian and the lecturer simultaneously

recognised the need for earlier and more extensive training in information research skills for the Physiotherapy students. The lecturer also realised that many students were not entering with the research skills needed to keep abreast of the constantly changing field of health care information. The lecturer also became aware of how important lifelong learning skills are to this profession. With the research questions in mind, what does the lecturer expect from the librarian? Since the students were entering with varying research skills, a format was chosen by the librarian which would ensure that all the first year Physiotherapy students would learn the new skills and understood it. The lecturer began by looking at the outputs: what did she want her students to be able to do? Next the outcomes and inputs, for this process were divided into skills, knowledge and objectives (values). Once the program content was described, it was analysed for its relevance for representative real world projects and activities (research term paper).

The librarian wanted to implement a literacy component in several key parts of the major upon which the lecturer agreed. Beginning with introductory Physiotherapy, the aim was to build progressive skills and develop in students a sophisticated ability to locate, evaluate, synthesize and communicate scientific information and knowledge. Both the librarian and lecturer had recognised the need for all first year Physiotherapy students to learn information research skills as early as possible in their university careers, so that they could better accomplish required assignments. The librarian and lecturer formed partners to address these challenges in a collaborative effort.

 The lecturer and librarian agreed to develop a project in which the students would be asked to research a specific set of questions revolving around a selected topic – hydrotherapy. The lecturer provided the input into the instructional pages, designed the research term paper that tied in with the information literacy concepts, and coordinated the asynchronous and synchronous communication between the students. All the information literacy education and library research skills instruction would then be directed toward accomplishing the research term paper, making concrete and immediately use what was being learnt.

Communication is an important ingredient in a successful collaborative partnership. Usually people establish patterns of communication appropriate to the project they working on. For this program, both the librarian and lecturer regularly gathered for planning sessions, but also communicated via email or by phone to get quick and efficient input from each other.

Regarding the classroom sessions, both developed the program for the information literacy education instruction sessions. The lecturer also had the responsibility of providing the content of the information literacy education sessions. The General Physiotherapy was chosen to be the lead-off course for the literacy initiative. Since General Physiotherapy is a prerequisite, the students would be prepared to build more sophisticated research skills in the course later, where all the components of information literacy initiative is planned. Students would first in General Physiotherapy be introduced to selected bibliographic databases for health then to the major health databases. That would help the students toward completing their research term paper and meet the goals of the information literacy education instruction program.

The librarian would meet with the students for fourteen class sessions, once a week. The lecturer would also be part of some of the sessions. For consistency and to ensure that the stated objectives were met, the librarian created an outline that would be followed in each session.

The planning, execution and assessment of an information literacy program developed by the librarian and lecturer at UWC would be implemented in the beginning of the year, starting with the first year Physiotherapy students of 2007.

4.7.2.2   Goals and objectives

Meetings were an ideal, convenient and efficient way to schedule interactions and instructions between the researcher and lecturer. Here brainstorming ideas and how to be creative were discussed. These meetings were also important to the researcher as it allowed the researcher to easily stay abreast of the class and their needs.

Important discussions were the establishment of specific information literacy goals and objectives, which were the key to developing the librarian-faculty collaborative framework (Table 2).

With this ultimate goal in mind, the following set of specific objectives for the information literacy education sessions were created:

1. To introduce the major information resources in the discipline, so that students not only identify, locate and use appropriate important information, but also that students could immediately and repeatedly benefit from this familiarity.

2. To be able to effectively search for information on the topic regardless of format:

   - To educate the students about the different types of literature so that they can distinguish between primary and secondary sources and the popular materials.

   - To guide the students through the process of efficiently using appropriate databases.

3. To be able to evaluate the reliability and significance of information found relevant to research.

4. To enable the students to identify and use appropriate attribution and citation formats and methods.

5. To provide the opportunity to practice the newly acquired research skills by linking the instruction to the research term paper.

This provided the means to evaluate the learning outcomes. So the first step to develop goals and objectives was to use the curriculum and the scheduled lectures as a guide. As goals frequently change, as a result of student's needs, it therefore needed frequent updating and revision. The goals and objectives identified how proficiencies and facilities were assessed and how the information literacy education supported the proficiencies identified in the class. Goals and objectives also promoted assessment. Implementing goals and objectives were a joint responsibility for achieving these objectives when and if they met the needs of the individual class(es).

The goals and objectives in Table 3 presented the goals and objectives that were customized for this project as well as developed in support of Association of College and Research Libraries (ACRL) Information Literacy Standards.

Table 3   Information Literacy Standards

Information Literacy goals and objectives
GOAL 1: Knows the major information sources in the research **Objective:** The student will be able to identify, locate and use appropriately specific important needed information relevant to the research. **Supports ACRL Standard #2:** The information literate student accesses needed information effectively and efficiently.
GOAL 2: Evaluates the reliability and significance of information found relevant to research. **Objective:** The student will be able to identify, locate and use the most reliable and authoritative information sources for their ………... **Supports ACRL Standard #3:** the information literate student evaluates information and its sources critically and incorporates ……..
GOAL 3: Use appropriate attributes and citation formats for print and electronic resources. **Objective:** The student will be able to identify and use appropriate attribution and citation formats and methods for print and electronic resources. **Supports ACRL Standard #5:** The information literate student understands many of the medical, economic, legal and social issues surrounding ……….

The first step, as agreed to by the researcher and the lecturer, was to integrate information literacy into the course, and the students needed to be informed about the importance of information literacy in the syllabus.

4.7.2.3   Training

The lecturer involved with the first year students underwent an information literacy training session. She was given the same training which the students received, in order for her to understand every aspect of the content of the information literacy sessions.

When most of the lecturers were students themselves, they did not have the advantages of electronic tools such as bibliographic databases; the benefit of

librarians to assist in their searches for them, and have not always had easy access to or understanding of computers. To stress the importance of information-seeking and information literacy to their students along with the professional obligation of career-long literature searching, they had to believe it and live it themselves. If they were inadequately trained, then this is serious as this is a time when information is abundant and the ability to filter and evaluate it, is vital.

Having gone through the training, the lecturer and the librarian collaborated on assessing and scoring the students' information literacy competency as evidence in the completed research term papers and List of Information Tools used.

The research term paper provided an ideal opportunity to formally establish information literacy goals and objectives and to test a collaborative framework for integrating these objectives into the course.

4.7.2.4   Critical components of an information literacy program

Bruce (2002) identifies four critical components of an information literacy program:
1. Resources to facilitate the learning of specific skills
2. Curriculum that provides the opportunity to learn specific skills
3. Curriculum that requires engagement in learning activities that require ongoing interaction with the information environment
4. Curriculum that provides opportunities for reflection and documentation of learning about effective information practice.

The first of these represents the resources base that supports learning skills underpinning information literacy, the second represents the curriculum which integrated information literacy, and the last two represent embedded information literacy education. Curriculum development, including course approval and review processes, may be used to monitor the inclusion of information literacy in the curriculum.

Operating alongside this model of information literacy education, are three critical elements of learning to be information literate:
1. Experiencing information literacy (learning)

2. Reflection on experience (being aware of learning), and

3. Application of experience to novel contexts (transfer of skills).

Successful information literacy programs do not focus on teaching information skills, it focuses on designing learning experiences that require the use of information skills.

4.7.2.5 The information literacy skills acquired as the important elements in an information literacy program

*   Understanding a need is to be able to recognize that information is needed; understanding why information is needed; what and how much; what kind of information is required, as well as any associated constraints (eg. time, format, currency, and access). One needs to be able to recognise that information is available in a wide range of formats in various geographical and virtual locations. An important skill for the research is the ability to articulate a question and so develop a focus. It is important to note that information may be available on papers (books, reference works, journals, magazines, newspapers, etc.), digitally (CDs, DVDs, Internet, World Wide Web, on one's own computer or network, etc), through other media such as broadcast, film or from a colleague or friend. It may or may not be conveniently close to hand and easily available or accessible, and quantifying your need and making a decision about the use of an information source may be tempered by the ease and speed with which an answer can be obtained (CILIP, 2006).

*   **Understanding availability** – it is here where one needs to be able to identify what resources are available for extensive use, where it is available, how to access it, the merits of individual resource types, and when it is appropriate to use it. It is suggested that it is important that availability requires an understanding of the types of resources, be it paper-based, electronic / digital, human, etc., one also needs to understand when to use each resource, what are the merits of the individual resource types, and what are the differences between them, eg., a journal article may be available in print, as part of an e-journal or as a record in a database of full-text articles. Not all databases and search engines offer the same facilities. A company

website, a research report, or the website of a national statistical organization may offer different views (CILIP, 2006).

Access channels to information resources may vary according to who or where you are, in that the exact same information sources can be reached by different people depending on the local channels available to them. Any resources may be subject to cultural, political, industrial, national or other bias, eg., newspapers are notoriously politically biased and this same bias is continued in Web news sources. It is also important to be aware that companies or groups, eg., lobby groups, religious groups / sects) create spin websites. The organization behind the information you are being given may have an ulterior motive (CILIP, 2006).

- **Understanding how to find information**. This is when one has the ability to search appropriate resources effectively and identify relevant information. Here strategies need to be tailored to the resources being used, so as to get the best results from those resources. It is possible that because of too many or too few resources, one needs to respond to search results, and also know when to stop searching. An information literature person would also understand that, in addition to purposive searching, information can be acquired by browsing, scanning and monitoring information sources in eg., searching across several resources; using the back- of-book index; using abstracting and indexing journals; scanning RSS and new feeds; participating in e-mails, discussion lists, bulletin boards, etc; using hypertext, URLs, bookmarks, etc; understanding and using Boolean logic; understanding and using truncation; understanding and using fielded data; de-duplicating search results and understanding and using relevance and relevance-ranked searching (CILIP, 2006).

- **Understand the need to evaluate results.** This means to be able to evaluate information for its authenticity, accuracy, value and bias. Also, to be able to evaluate the means by which the results were obtained in order to ensure that your approach did not produce misleading or incomplete results. This is not just whether the resource appears to answer the question, but

whether it is intrinsically trustworthy, eg. by using prior knowledge of the author, editor, series and or publisher. There is a need to examine relevance to problems/question/task in hand; appropriateness of the style for users; availability of index, notes, bibliography, illustrations, multimedia, etc.; authenticity and origin; authority (ownership, reputation, coverage, scope); bias or point of view; error rate/ accuracy; purpose/audience; currency/timeliness; consistency; design (output, presentation and arrangement); organization/ navigation (ease of use); and access and use (documentation, accessibility, comparison with other sources) (CILIP, 2006).

- **Understand ethics and responsibility of use.** One must know why information must be used in a responsible, culturally sensitive and ethical (professional, business, personal ethics) manner. Confidentiality must always be respected and credit must always be given to other people's work. There is a need to understand the nature and uses of bias, in order to report appropriately, and where appropriate, provide a balanced (unbiased) report. Also note that this could include issues of intellectual property, plagiarism, unfair practice, fair use, freedom of information, data protection, codes of practice and ethical principles as set out by your employers, institution or professional body (CILIP, 2006).

- **Understand how to communicate or share your findings.** One needs the ability to communicate/share information in a manner or format that is appropriate to be information, the intended audience and situation. It is important to note this goes beyond analysis to the synthesis, organization and /or creation of further information in an appropriate form, by understanding of the advantages and disadvantages of different communications channels (eg. Web page, presentation, written report); participating effectively in collaborative writing and publication, including use of collaborative software (eg. Student group report, internal knowledge base, collaborative blog, Wikipedia); understanding of appropriate writing styles (eg for reports, essays, presentation, etc); knowledge of citation style; use of footnotes/end notes; use of a succinct and easily understood style when reporting findings

verbally; and use of appropriate style and understanding of the conventions when using e-mail (CILIP, 2006).

4.7.2.6   Class instruction

The venue was the training room in the UWC University Library. The room had fully equipped computers that were utilized by students during classes. Being in the library gave students easy access to resources and facilities.

Session one

Students (n=49) were welcomed, informed again of the purpose of the study, and thanked for their willingness to participate in it.

Pre-test. Students entering the Physiotherapy I course in 2007 were given a questionnaire investigating their perceptions of the information world, their current use of the public and school libraries and their expectations towards the university information sources. The questionnaire also served to identify the learning needs of this particular group of students and formed the basis upon which the first information literacy activity was build. Every student completed the questionnaire within 20 minutes. This way ensured a 100% return of the questionnaires.

The first class started off with some house rules – honesty, trust, work and no copying. Plagiarism was discussed. Making mistakes was fine, as students learnt from and listened to one another. Everybody had a folder to file every week's work and tasks. It was also requested that students attend the trainings that the university offered, ie. E-mail and MS-Office programs.

An icebreaker was played. The game Whirl Word is a game of words lying in different directions. The aim of this game was to illustrate how one would look for information. The words used were all library-related terms. The goal of the game was to show how information was presented in different formats and the different ways of looking for it.

A video on the library layout and a brief presentation of the library services were given. This only took 5 minutes, as the Library orientation was still fresh in their memory. Its purpose was to give some guidance for the next task.

An assignment on the topic Hydrotherapy was given to them. It took the format which first assignments would normally be given to first year students, its requirements and expectations from the lecturers. The researcher only required two pages for the assignment on Hydrotherapy for the next week. The purpose of the assignment was to show what was expected from a university student when doing an assignment. From experience the researcher knew how first year students with their first assignments, focussed so much on the cover page, with poor content, and mostly no bibliography.

Session two

As predicted, the students submitted their assignment of which most of them had bright coloured pages with pictures as the cover page, no content page, bibliography or in-text referencing present. The assignments were handed out and students had to mark another student's assignment. The researcher gave the requirements of marking in a table form eg., cover page - presentation and details; content page; layout of the assignment – the introduction, body and conclusion; Bibliography; Referencing style; Content of the assignment. This exercise was an ice breaker, as they found it funny, but at the same time a shock. As the students marked each others assignments, not one received a mark above 50%. They realized all the mistakes that were made and why they would get low marks for their first assignments. The researcher recorded the assignment marks and returned the assignments to them to keep in their folders. The purpose of the exercise was they now knew what was expected from them to present any assignment or task with its necessary requirements. This assignment was a reminder of what could happen.

As students were not familiar with how to cite resources used, references were left out. This was the first opportunity to explain plagiarism. Throughout the sessions plagiarism was continuously dealt with.

Book education – students learnt about the cover, spine with the classification number, title page, content page, chapters, bibliography, glossary, and index. The student would understand the importance of the title page with regard to referencing. All this was introduced as to how it would reflect and be identified on the library catalogue (OPAC).

Exercise : finding the Library catalogue record and the books.

Dewey Classification system. Students would recognize that knowledge was organized into disciplines that influence the way information was accessed. Students would understand the purposes served by using a classification system to label and shelve materials about particular aspects of the topic. They would recognize the advantages and disadvantages of using the system to facilitate browsing as a search method. Although the students were able to use the library catalogue, it was the finding of the materials which was important.

The group was taught how the Dewey classification system worked and did some exercises. Five shelves of books were arranged in the classroom for students to understand how and where to find the books in the library collection and how to shelf read. They did hands-on demonstrations and practical exercises on how books are arranged according to the Dewey classification system in the UWC library.

They also used their own recreational technology: their mobile phones, and under their to-do-list, or notes menu, they loaded the classification numbers for the relevant subjects and all the main collection numbers, and the level to locate it in the library. They had the classification system on hand!

Exercise : classifications numbers to be arranged and shelf-reading.

Session three

The library catalogue also known as the OPAC (Online Public Access Catalogue) training. This involved the process of how to retrieve a record on the catalogue to the availability of the book and location of it in the library; the record on the catalogue was called up and all the fields were explained. Students must not only be able to

describe how to use the library catalogue, but also be able to use it in order to find information.

Students learnt the different types of searching ie. Basic / advanced / browse and multi-base; different searches, ie. Author / title / topic / subject; record identification ie. Books / journals / reference works / different formats, bookings, referencing, etc. Students were able to formulate a search strategy appropriate for a book catalogue and understood how search strategies for finding books differed from search strategies for finding journal articles.

Exercise: many exercises covering the author / title / topic / subject / place / publisher / date of publication / location / and availability. At the same time the students knew which information in the catalogue record to use for locating books and referencing. It was also during this time of the year when students were normally given a few tasks or assignments and by being able to use the catalogue they were able to locate the materials. The students also felt confident when they showed their peers how to find books using the catalogue. This was the beginning of a skill that was being transferred to another course.

Session four: Keywords

Session started with an icebreaker. The game Target Word was played. It is one block divided into nine (9) equal blocks with a letter in each. The center letter must appear in all the words. Each word must not be less than four letters. The goal was to use all the letters. The center letter was S, and if all the letters were used it spelt SEARCHING. They needed to build words around the letters. Many students at this point in time, were unknown to keywords or search terms.

In this session, students learnt to analyse and understand their assignment; they needed to understand the use of controlled vocabulary; be able to identify the key concepts and terms that described their information needs. They were able to construct a search by using those keywords; different spellings; synonyms; Boolean operators; and wild cards.

They knew how to find terms indexers use to describe the topic (eg using dictionaries, thesauri, encyclopedias, indexes, glossaries and online resources).

Exercises were given to cover the above and separately starting on their assignment by looking at keywords for their research term paper.

Session five: Different types of book materials.

Students understood the different types of books available to them in the library (textbooks, monographs, guides, manuals, references, etc). Students understood the scope of the library's book collection.

They learnt how to:

- Distinguish between scholarly and popular treatment of topics in the literature (eg recognize the publications intended audience and purpose).
- Develop an increase in awareness of information resources in the subject and related disciplines
- Be able to use other types of standard reference materials (eg specialized field-related bibliographies, encyclopaedias, handbooks, dictionaries, manuals, guides, statistical compilation directories, companions, etc).
- Be exposed to both the printed and electronic formats.

Exercise: all of the different types of information sources were on hand and with some exercises, the students did an exercise with the assistance of the researcher showing them how to use the materials.

Take home exercise: students drew up a list of fifteen (15) different types of sources which they used for their research term papers with all the bibliographic details (by using the title page) in the following order: author, date, title, place, and publisher. It was also arranged alphabetically. This led the way of making referencing easier.

Session six: Journals

Journal education – students learnt of the cover and spine giving the bibliographic details which included: the title of the journal, volume and issue or number; the content page; articles / content, single issue; bound volume. Students were able to

distinguish between the scholarly journals and popular magazines. Students were exposed to both the printed and electronic formats.

Students did an OPAC search on how to identify a journal record and which bibliographic details to use. Students learnt how to distinguish between a book and a journal; what was the purpose of a journal and how the frequencies of journals worked.

Take home exercise: students drew up a list of five (5) journal titles which they used for their research term papers with all the bibliographic details in the following order: author, date, title of the article, title of the journal, volume, issue/number and pages. The entry in the bibliography was according to the author of the article and arranged alphabetically. This made referencing easier.

Session seven: Citation / Abstract
Students learnt what a citation and abstract was, its purpose and they were able to decipher a citation. They learnt how to distinguish between a citation for a book, journal and the Internet. They also wrote short abstracts. They were able to write an abstract for a book, chapter in a book, journal article and the Internet.

They were exposed to using bibliographical references to expand a search; understood the concept of citation indexing (they used the Biological Index and Abstract); used abstracts as an aid to identify pertinent articles. They also identified ways of how to keep up to date on a subject in the printed and electronic versions. Students were able to use indexes and abstracting services relevant to the student's area of concentration (eg. indexes and abstracts to medical and health literature relevant to Hydrotherapy).

Take home exercise: students wrote the citation and a short abstract of a book, journal and an Internet article on their research topic. All three citations and abstracts were accompanied by the materials. They also received a list of citations of which they needed to find the materials on the OPAC (for the Dewey number and location) and brought it along to class.

Session eight: Critical thinking

This section was critical and much time was spent on it. Here again the importance of using different sources was demonstrated.

Critical thinking was practically done through an activity. A journal article was used three times in different ways.

The first time the researcher gave a layout of finding the journal article, and the students had to check their time spent on finding it and then explain what the article was all about, which was somewhat difficult (reading and alert skills).

After some demonstrations of how to retrieve the article, when they had to find it for the second time, they had to take note of certain things (eg. is it scholarly or popular), time spent finding it and writing a short abstract. It was discussed again, and the discussions became a little more focused and to the point.

Third time, they had to find the article again, but with an extra citation, just to compare the time spent on finding both. This time the discussions were about how would the information be used, evaluating it and how to use it effectively. Students had to understand how authority, expertise and accuracy played a role.

Exercise : the class was divided into two groups. The debate was centered around discussions for and against using the article. Students for the article were in the against group and the students against the article were in the for group. This showed how they had to focus both ways – for and against using the article.

Session nine: Database training

Students had to understand the basic concepts of computerized literature searching, learnt about its availability on and off campus, its value and appropriate use. They knew about the availability of databases relevant to the subject. Students were able to construct and refine a search using the more sophisticated search tools available in the database, such as the thesaurus, grade-level delimiters, document-type delimiters, citations and abstracts, etc.

Students understood how to find full text, how to email, save and download, how to determine whether the library owned a periodical title, and how to use the Interlibrary Loans services in the library to obtain articles not owned by the library.

Students understood the scope, medical and health coverage, and limitations of the EbscoHost platform and its databases. Students understood what ScienceDirect was, why it was important, and how it covered the field of medicine and health more comprehensively than general-purpose databases. Students were aware of the existence of other databases that supported the medical and health research, such as Psychinfo, PubMed, Medline and CINAHL. Students became aware of other online resources, such as Credo (reference works), other forms of electronic resources (DVDs, eBooks, etc.) and search engines such as Google Scholar.

As students understood how authority, expertise and accuracy played a role, they needed to be able to evaluate Web sites. Students understood the nature of the World Wide Web as a source of medical and health research and how it differed from using journal and book databases. Students were aware of web sites that provided health statistics and standards. Students understood how to use search engines to find information, and important to be clear on the difference between search engines and databases. Students learnt how the Web could be a powerful tool for identifying and locating subject-area experts and / or practitioners who could be contacted to assist in validating and clarifying information.

Exercise : students established a list of ten (10) online resources and a citation linked to each one on Hydrotherapy. They had to reference it all alphabetically.

Session ten: Referencing
Students understood why they needed to reference, and how to properly cite and use information in an appropriate and ethical way by adhering to rules of in-text referencing and compiling a bibliography of sources used.

They wrote and cited in the format and style of the Harvard writing style and the Publication Manual of SAPA (South African Professional Association) adapted from the American Professional Association. They demonstrated ethical behaviour in

using library resources (eg respect library policies and property, document use of all sources, etc.).

Exercise: a worksheet of twenty (20) items had to be referenced as required in the text and as a bibliography.

They were handed a bibliography on hydrotherapy to find some items and examine it for bibliographic correctness.

Session eleven: Assignment writing

Currently universities placed more and more emphasis on the written assignments. Written assignments are an important part of university education as it is based on reading and investigation. It gives the student a chance to exercise their skills at assessing evidence, developing and evaluating arguments, take a more critical and questioning attitude to knowledge and expressing their views. The students were given the following guidelines which were discussed for clarification.

Planning the assignment:

1. Read the question: this part is crucial. Analyse and brainstorm the topic. What does the question ask you to do? Next try asking; what, why, where, when, who, how, to what extend, etc.

2. Decode the questions: before start writing an assignment some research is needed. And in order to do that, you need to be certain what the question asks you to do: discuss; describe, distinguish, summarize, etc. find the keywords. What is the focus?

3. Researching for the assignment: check the guidelines for the assignment: length of the assignment; deadline; other requirements. Keep the question in mind as you start to gather information. Search and do active reading through all types of materials. Be selective and check the materials read and write down what is relevant.

4. Structure the assignment: you need to plan your assignment to give it a coherent and logical structure by mind-mapping, grids of pro's and con's.

5. Assignment outlines: to present the material, write an outline which shows the main points and subsidiary points.

Take a good and critical look over the first draft. Does it:

- Mention the facts you intended to include?
- Present the facts in a logical sequence?
- List the materials in a way that will make your case convincingly?

Final Draft

1. Cover page includes:
   - Title of assignment
   - Name
   - Student number /course
   - Department
   - Lecturer's name
   - Due date

2. Content page: This consists of the content of the assignment under the headings and subheadings which follow numerically, is linked with the page number.

3. Assignment content
   - Introduction: It should provide general introductory statement(s); focus in on the topic; give the contention of the assignment; and outline what is to come.
   - Discussion: each paragraph in the body of the assignment should include a topic sentence that tells the reader the main idea of the paragraph. Other sentences in the paragraph should develop the main idea by: citing a reference; giving examples; explaining terms; and giving more detail. The paragraphs need to summarise and paraphrase the ideas, research and argument of others. Direct quotes should be used sparingly. The order of the ideas in these body paragraphs should reflect the order outlined in the introduction.
   - Conclusion: the conclusion should summarise the main view presented. It should briefly review the ideas covered and could finish off with an overall comment on the topic.

- Bibliography: writing academic assignments always involves the citing of sources in-text and the inclusion of reference lists or bibliographies.

To summarise, a good assignment will:
- Develop a logical argument
- Be coherent, consistent and concise
- Provide evidence
- Acknowledge sources
- Conform to directions
- Use clear language.

Session twelve: Literature search

They learnt to understand the processes of a literature search.

To conduct a literature search, students were able to:
- Defined their research topic. Understood the broader and narrower aspects of Hydrotherapy and focused on it.
- Determined whether Hydrotherapy had been addressed previously, by whom, and what were the results. Identified books and articles on Hydrotherapy using the OPAC, both printed and online resources available.
- Understood the use of controlled vocabulary. Knew how to find terms indexers used to describe the Hydrotherapy.
- Used abstracts as an aid to identify pertinent articles.
- Identified ways of keeping current on Hydrotherapy.
- Interacted effectively with faculty librarians to learn about other ways to retrieve specific kinds of information.

Exercise: they conducted their literature search for their research term paper.

4.7.2.7 Assessment

The third step was assessment. Assessment was central to evaluating the effectiveness of the information literacy program and improving it.

Assessment referred to research and inquiry into the improvement of teaching and learning. Assessment was a process in which goals and learning objectives of a program or course were identified and data was collected from multiple sources to document student, teacher or program achievement of those goals and objectives. Multiple variations were possible: pre-test, post-test of students in a course; focus on faculty teaching styles; assessment of subject matter, and learning or critical thinking. Assessment included these essential components: stated goals and objectives and measurable results, with techniques for measuring learning outcomes. The librarians' assessment was normally based upon assumptions drawn from their experiences in training library users and the literacy of the information literate (Handbook of assessment strategies: Measurement of student learning and program quality, 1993: 4).

Assessment is an integral part of higher education today and is likely to stay for a long time. This situation attributed to two factors:

1. At the state level there has been increased emphasis on accountability. In higher education, faculty members and administrators must respond to accrediting bodies wanting evidence that students were learning or mastering specific competencies.
2. It is the growing interest in developing methods of measuring student learning beyond the traditional grading system. The new trend is to be more student-centered teaching and lifelong learning. Students must be provided with skills that they will need after graduation. Assessment played a role in all this efforts (Radcliff, 2007: 7).

It has become common practice to assess the information literacy level of incoming students at universities. These assessment tools (pre-testing) were used to gain information about the students' skills (technological, informational, research and library), attitudes (reading, library, etc) and competencies. Students who were not competent needed to undergo the information literacy program to be adequately skilled for further academic challenges (Miller, 2001: 304). King (2007) reported in her study that a theoretical framework and a method of assessment to assess information literacy of undergraduates were definitely needed. These emphasised

the need for a generally accepted assessment instrument for testing the general information competence of all incoming students.

When learning takes place, the outcomes must be measured. To ensure that learning is taking place, assessment measures are needed to achieve the desired outcomes and use the findings to improve the academic programs (Maughan, 2001: 74). The researcher agreed fully with Cameron (2004: 207 - 219) that assessment serves as a tool to determine the efficiency of the information literacy program. It determines the learning objectives, constructs the program and the tools to measure competence. Assessing information literacy means to incorporate the conceptual, technical and critical thinking skills and it becomes both the librarian and academics' responsibility to teach and assess (Iannuzzi, 1999: 304 - 305).

According to Smith (2003) information literacy assessment must focus on the competencies and proficiencies of the student in the program.

Gratch-Lindauer and Brown (2004: 179 - 196) identified three areas for assessing information literacy:
1. the learning environment (curriculum and learning opportunities)
2. the information literacy program (courses, reference desk services)
3. the student learning outcomes (tests and assignments).

The researcher agreed with Conteh-Morgan (2001: 33 - 35) that assessment can be done through four methods.
1. Immediate assessment
   Immediate assessment is accomplished when the librarian evaluated the assignments, task and worksheets. The librarian can then ascertain whether a skill was successfully learned. Feedback can either be given verbally or with written comments to students.
2. Lectures' assessment
   The lecturer can also during class time assess through interaction with the students and observe any improvements or differences.
3. Librarians' assessment

The librarian can also assess whether students frequently visit their office to discuss their project, problems or concerns. This is a very important goal of the information literacy program that students feel comfortable with the librarians and the library. The librarian can also do their own evaluation to receive information about how the students apprehend the lessons. They can ask simple questions like: what was good? What could have been done better? It is important that the evaluation of the module works well together with goals of information literacy education. So the way the librarian evaluates shows what can be expected what the student should know.

4. Review of the student projects

Reviewing the student's research term paper provided a different view through which to assess the effectiveness of the information literacy program. The librarian felt encouraged to review the research term papers that required library resources. The librarian then assessed whether the students succeeded in locating, evaluating, appropriately and ethically using the information resources.

The researcher agreed with Rader (2002: 244) that evaluation was limited to how librarians performed as teachers and what students gained of finding information, creating good bibliographies and using appropriate references. Today the emphasis is on evaluating the learning outcomes, research products and information skills of students. Mackey and Jacobson (2007) emphasized that constructive partnership between librarians and the faculty play a crucial role in effectively assessing and improving information literacy efforts. Collaboration is essential to improving the value of library services, personnel and instruction.

4.7.2.7.1   Assessment instrument

Two assessment instruments were developed; an Information literacy questionnaire (pre-test and post-test) and the lecturer's questionnaire. The researcher gave the Information literacy questionnaire to the students on the first meeting day as a pre-test to assess the students' information-seeking skills and behaviour. As all students did not have uniform basic information literacy levels, the pre-test was used to measure the baseline level of students' library knowledge, previous research experiences and self-confidence in the use of the library and information literacy

level (Rockman, 2002: 193). Such a test identified the need for information competence programs and gaps in competence. This also gave the opportunity to the librarian and lecturer to work together on the assumption that students had little or basic information literacy levels. The researcher reviewed the results of the questionnaires before the first information literacy skills training session.

The results showed that the students needed guidance on what were the information resources in the research (B5, 6, 8, 10, 12, 13, 17, 18 and 19); how to effectively search for information (B1 – 4; 15 and 16); how to evaluate the reliability and significance of information found relevant to research (B10); and how to use appropriate attributes and citation formats for the resources used (B6, 7, 9, 11, 14, 20). Refer to chapter five for more detail.

The outcomes of the post-test evaluated the level of competency for each established information literacy goal and consisted of 20 outcome statements, worth five points each. The students scored on a 100-point scale for their information literacy competency based on their accomplishment of each of the stated outcomes. Table 1 showed the scale that was used to evaluate the students' information literacy competency.
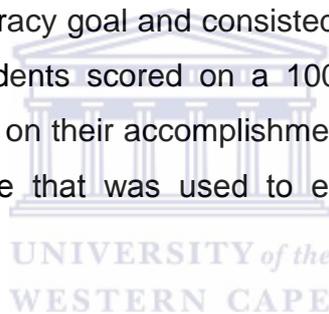
It also provided a means to evaluate the outcomes of the students' information literacy competencies as evidence in the written research term paper. It was based in part on an information literacy competency scale and outcomes keyed to the research question and sub-questions linked to the information literacy goals for the specific course. Refer to chapter five for more detail.

Assessments showed that skills must be mastered while students are learning. That it should measure students' ability to "do" and "know", so that knowledge and actions should enable students to access, select, analyse and evaluate information. It was important however that students should have opportunities to practice the information literacy skills acquired. They must be allowed some time for the learning of the skills to develop before being assessed again.

4.8   Conclusion

This chapter has outlined the methods and techniques that were used to investigate how successful information literacy can be taught through librarian-lecturer collaboration.

Data that was generated by the assessment programs, once interpreted, needs to be communicated to the faculties and decisions makers, as this is important for accountability purposes. Accountability requires more than just demonstrating that information literacy was being addressed in the undergraduate curriculum. Learning activities or online tutorials provided for students was not enough. Measures of program effectiveness and students' progress are also required (Iannuzzi, 1999; 304). Librarians in charge of teaching activities should also answer questions such as: What have students learned? How well have they learned? The data derived from the assessment activity should also be communicated to the rest of the campus community, so that everyone can become a shared resource for reflection and improvement.

The goal of the researcher was to give the student a tool for lifelong learning and knew that the best way to do this was to integrate the library and its resources into teaching, so that the library became an obvious part of education and research and that the faculty looked at the library as a pedagogic resource in the student's learning process.

The next chapter presents the data collected as well as the analysis and interpretation thereof.

CHAPTER FIVE

FINDINGS : PROFILE OF INCOMING UWC CHS
(PHYSIOTHERAPY 1 & OCCUPATIONAL THERAPY 1) STUDENTS

5. 1 Introduction

This chapter is concerned with the research data collected and extracted from the questionnaires which was completed by 98 respondents. In order to present the findings in a meaningful way, the chapter presents the statistical analysis of the research results.

To compile a profile of the new incoming Physiotherapy students at the University of the Western Cape, only the data of students in their first year of study were used. The control group was only students from the Occupational Therapy department in their first year of study. The data from the pre- and the control questionnaire were used for the profiling. The profile data that was used from the first part of the questionnaire included: personal information, school and public library access and computer skills (see appendix B).

The results of the twenty questions in the second part of the questionnaires tested the baseline information literacy competence of incoming CHS students. In order to determine the level of information literacy skills and proficiencies of incoming CHS students, individual answers to individual questions in the questionnaire were discussed. The results of both the pre- and control groups were given to reflect whether the post-group students picked up information literacy skills and knowledge. The results of the control groups are given to indicate whether students picked up these skills without formal training or part of other courses.

The Information Literacy Competency Scale (Table 1) was developed to evaluate the students' information literacy competency. An easy point system of five points for each established information literacy goal and a correct answer and zero for an incorrect answer was used. In addition to the traditional grade for the content of the term paper, the student received a score on a 100-point scale for their information literacy competency based on their accomplishment of each of the stated outcomes.

Any score under 60 would be considered a failure or "not competent"; above 60 would be "competent" and above 80 "very competent".

The t-test for paired data will be utilized to compute the statistical differences between the pre- and post-test scores. This data will be summarised and calculated by means of the McNemar Exact Test and the statistical analysis of responses as tables and graphs, percentages of frequency distributions, histograms and bar charts were done by using the Microsoft Excel spreadsheets.

After marking the completed research term paper, the lecturer involved with the Physiotherapy 1 students also completed a questionnaire (see appendix C).

Table 4 below indicates that of the total of the 98 respondents, 49 were the Department of Physiotherapy's first year students and the 49 of the Occupational therapy's first year students.

Table 4   Respondents

Respondents			
	Pre	Control	Total
Respondents	49	49	98
% total Respondents	50%	50%	100%

5.2   Biographical detail

The first part of the questionnaire contained the personal information. Both the Physiotherapy and Occupational therapy first year students were required to indicate their age, gender, race, home language and their region where they are from.

5.2.1 Age

Both groups of students were required to indicate what their age was. Tables 5 and 6 show the distribution of the respondents by age.

Table 5   Age of youngest and oldest respondents

Respondents			
	Pre	**Control**	**Total**
Youngest	18	18	18
Oldest	29	29	29

The age range of students in the control group was the same (18- 29 years old) as that of the pre-group (18-29 years old). Table 5 showed both groups recorded the same age 18 years as the youngest age. Both the pre- and control group also recorded the oldest age: 29 years old. The average age of both the groups was 23 years and 6 months. Although in the pre group 18 years was the youngest (14.29%), the 19-20 years age groups were 71.14% students who made the biggest group. The control group's 19-20 age groups were 63.27% students who also made out the biggest group of the ages. The 19 – 20 age groups in both groups made out 67.20% together, and all 98 students were enrolled for the first time. It is noteworthy that out of the 98 students 17 students (17.34%) were between 23 and 29 years of age. This could be explained that these students might be students that worked after completing their schooling to earn money for studying or could be students of the Recognition of Prior Learning system where students got admitted to the university because of their working experience.

Table 6   Age

	Pre			**Control**			**Total**	
Years		**%**	**Years**		**%**	**#**	**%**	
18	7	14.29	18	8	16.32	15	15.30	
19-20	35	71.14	19-20	31	63.27	66	67.20	
21-22	3	6.12	21-22	7	14.29	10	10.20	
23-24	1	2.04	23-24	0	0	1	1.02	
25-29	3	6.12	25-29	3	6.12	6	6.12	
30-+	0	0	30-+	0	0	0	0	
Total	49			49		98		

5.2.2 Gender

The distribution of respondents according to gender is shown in Table 7 and figure 1. Of the ninety-eight students 75 (76.54%) were found to be female while 23 (23.46%) were male. Significantly more female students were enrolled for the

Physiotherapy 1 course (pre-group) as well as for the Occupational Therapy 1 course (control group). The numbers and percentages for the two groups respectively were females 31 (63.27%) pre-group and 44 (89.80%) control group and males 18 (36.73%) pre-group and 5 (10.20%) control group. This distribution indicates an uneven ratio of females to males found in both the Physiotherapy 1 and Occupational therapy 1 departments. It could be assumed that there are fewer males entering these two professions as they only make out a quarter of the total respondents.

This trend corresponds with the general intake of students in the Community and Health Sciences Faculty as well as that of the University in general.

Table 7   Gender

	Pre-group		Control		Total	
Females	31	63.27%	44	89.80%	75	76.54%
Males	18	36.73%	5	10.20%	23	23.46%

To obtain a clearer profile of both groups Table 7 and figure 1 gives the female results 76.54% of the two groups together and of the males 23.46%.

Figure 1   Gender
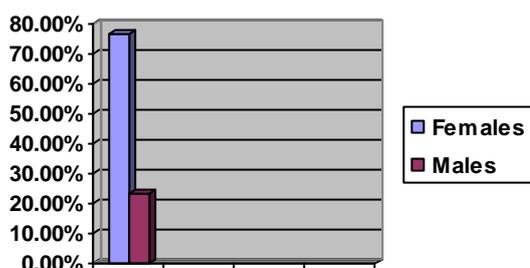
5.2.3 Race

The students were asked to indicate their race group. This is presented in Table 8 and figure 2. In both the pre-group (61.22%) and the control group (59.18%), the Coloured students stood out as the biggest group. Out of the 98 students, 59 students were Coloured students, the African students counted 16 (16.33%); Asians 13 (13.27%); Whites 8 (8.16%) and other 2 (2.04%). This correlates with the

university wide intake (2007) of students: Coloureds 49.92%; Africans 37.09%; Asians 7.7%; Whites 3.5%; and others 1.79%.

Table 8   Race

Pre			Control			Total	
Race	Total	%	Race	Total	%	#	%
African	7	14.29	African	9	18.37	16	16.33
Asian	6	12.24	Asian	7	14.29	13	13.27
Coloured	30	61.22	Coloured	29	59.18	59	60.20
Other	2	4.08	Other	0	0.0	2	2.04
White	4	8.16	White	4	8.16	8	8.16
Total	49		Total	49		98	100

Figure 2   Race
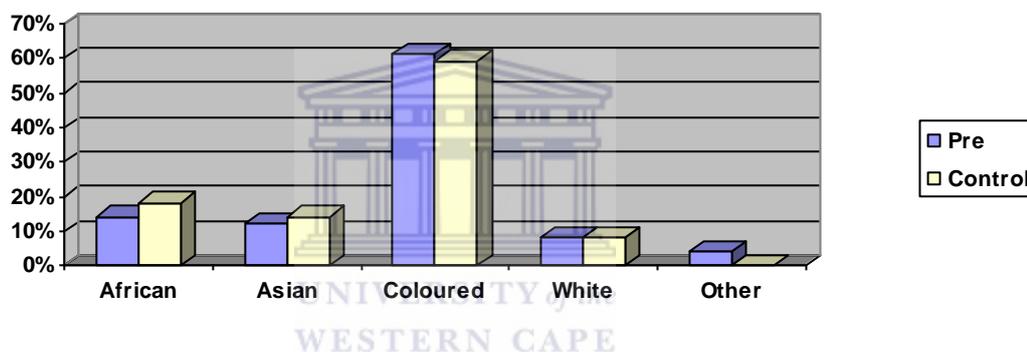
5.2.4 Home language

The home languages that were recorded are listed in Table 9 below. From this table it is clear that the home language of the majority of students in the pre-group was English (75.52%) and also the control group 67.35%. Out of the 98 students, 70 (71.43%) students indicated English as their home language.

English was indicated as the home language to be spoken by the most students, to be followed by Afrikaans 13.27%; then Xhosa (8.16%) and then by Zulu (3.06%). The rest Tswana (2.04%), North Sotho (1.02%) and other (1.02%) are the mother tongue of the minority groups of students.

The Apartheid divisions somehow still loom over the language landscape. Many black students approach higher education from the vantage point of English, which

is the lingua franca in South Africa, being their second language. The Coloured students were not only in the majority (71.43%), but are having an advantage as English is spoken at home. In the past decades the Coloureds protested against Afrikaans as the mother language and adopted English as their home language especially in the Western Cape.

Table 9 Home language

Pre			Control			Total	
Afrikaans	5	**10.20%**	Afrikaans	8	**16.32%**	13	13.27%
English	37	**75.52%**	English	33	**67.35%**	70	71.43%
North Sotho	1	**2.04%**	North Sotho	0	**0.0**	1	1.02%
Tswana	1	**2.04%**	Tswana	1	**2.04%**	2	2.04%
Xhosa	3	**6.12%**	Xhosa	5	**10.20%**	8	8.16%
Zulu	2	**4.08%**	Zulu	1	**2.04%**	3	3.06%
Other	0	0.0	Other	1	**2.04%**	1	1.02%
Total	49		Total	49		98	100%

5.2.4.1   English as home language

When looking at language and information literacy, English as a language does play an important role. Most of the literature appears in the English language. This makes it difficult for other home languages spoken other than English. Table 9 indicated that more than two thirds of the students spoke English which will make the information literacy process easier. Nineteen students did not have English as their mother tongue. Of the nineteen students 18 could still understand the English language. The one student who was from China came to improve his English language skills at UWC. The English language influences the information literacy of students, the baseline information literacy skills of students with English as home language will be of great benefit to them compared to those students who have another language as their mother tongue.

Figure 3   Mother tongue Languages
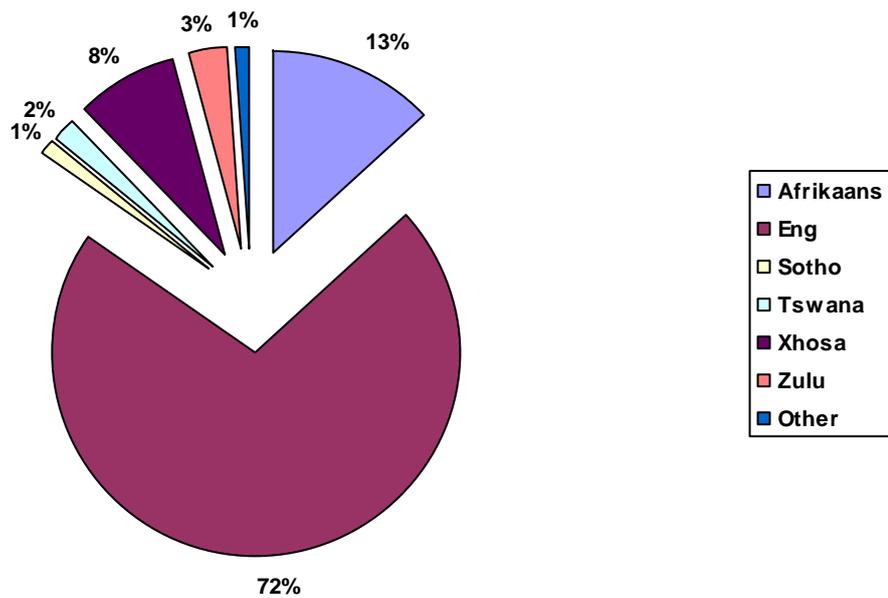
5.2.5 Home regions

Students were asked to indicate on the questionnaire the region where they were from. Students coming to UWC do come from different regions in South Africa, Africa and also internationally. Table 10 indicated that students from the Western Cape Province were the most in both groups. There were also students who were not from South Africa and one student from outside Africa.

Table 10 Home regions

Pre			Control			Total	
Province Eastern Cape	3	6.12%	Province Eastern Cape	5	10.20%	8	8.16%
Province Gaugteng	1	2.04%	Province Gaugteng	0	0.0	1	1.02%
Province Kwa-zulu	4	8.16%	Province Kwa-zulu	2	4.08%	6	6.12%
Province Mpumalanga	1	2.04%	Province Mpumalanga	0	0.0	1	1.02%
Province North West	0	0.0	Province North West	0	0.0	0	0.0
Province Northern Cape	1	2.04%	Province Northern Cape	3	6.12%	4	4.08%
Province Northern	0	0.0	Province Northern	0	0.0	0	0.0
Province Orange Free state	0	0.0	Province Orange Free state	0	0.0	0	0.0
Province Western Cape	37	75.51%	Province Western Cape	36	73.47%	73	74.50%
SADC Botswana	1	2.04%	SADC Botswana	2	4.08%	3	3.06%
SADC Namibia	0	0.0	SADC Namibia	1	2.04%	1	1.02%
Other	1	2.04%	Other	0	0.0	1	1.02%
Total	49		Total	49		98	100%

Figure 4 Home regions

132
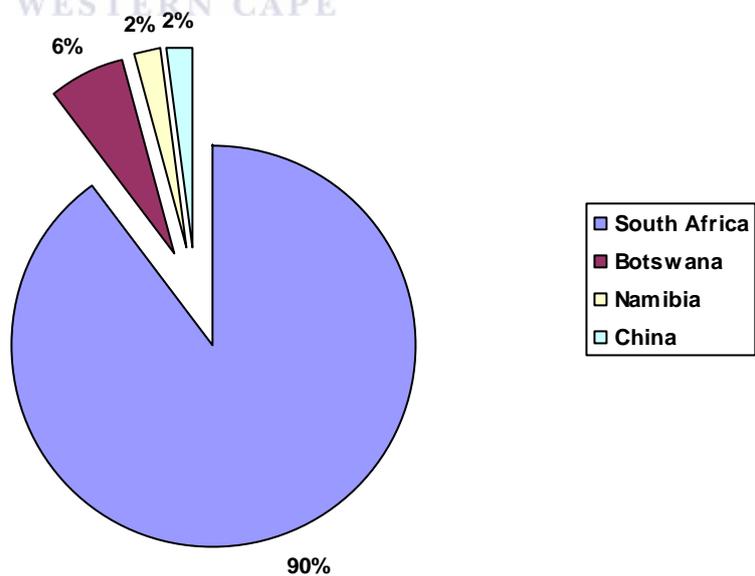
5.2.5.1 Home regions outside Africa

According to table 11 one (2.04%) student came from a country outside Africa. The student came from China. Chinese students enrol at UWC because English is the teaching medium, this assists them to improve their English language skills.

Table 11   Home regions outside South Africa

Pre			Control			Total	
Other	1	2.04%	Other	0	0.0	1	1.02%

5.2.5.2 Home regions in Africa (not South Africa)

Four students came from Africa outside South Africa. As table 12 showed 3 (6.12%) came from Botswana and one from Namibia.

Table 12 Home regions in Africa

Pre			Control			Total	
SADC Botswana	1	2.04%	SADC Botswana	2	4.08%	3	3.06%
SADC Namibia	0	0.0	SADC Namibia	1	2.04%	1	1.02%
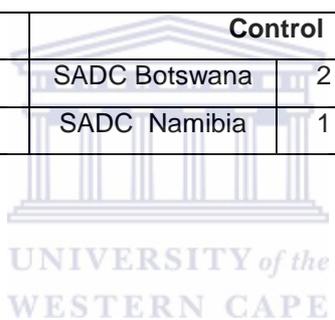
5.2.5.3 Home regions in South Africa

Of the 98 students, 93 (89.80%) were from the RSA and 5 (10.20%) were from outside South Africa and Africa. As indicated in table 13 students from the Western Cape Province were the most in both groups (75.51% and 73.47%). Of the 98 students, 73 (74.50%) came from the Western Cape Province. Eastern Cape Province was next with 8 (8.16%) students, followed by Kwa-Zulu Province (6.12%), Northern Cape Province at 4.08%, Gauteng and Mpumalanga Provinces both with 1.02%.

Table 13 Home regions in South Africa

Pre			Control			Total	
Province Eastern Cape	3	6.12%	Province Eastern Cape	5	10.20%	8	8.16%
Province Gaugteng	1	2.04%	Province Gaugteng	0	0.0	1	1.02%
Province Kwa-zulu	4	8.16%	Province Kwa-zulu	2	4.08%	6	6.12%
Province Mpumalanga	1	2.04%	Province Mpumalanga	0	0.0	1	1.02%
Province North West	0	0.0	Province North West	0	0.0	0	0.0
Province Northern Cape	1	2.04%	Province Northern Cape	3	6.12%	4	4.08%
Province Northern	0	0.0	Province Northern	0	0.0	0	0.0
Province Orange Free state	0	0.0	Province Orange Free state	0	0.0	0	0.0
Province Western Cape	37	75.51%	Province Western Cape	36	73.47%	73	74.50%

Figure 5   Home regions in South Africa
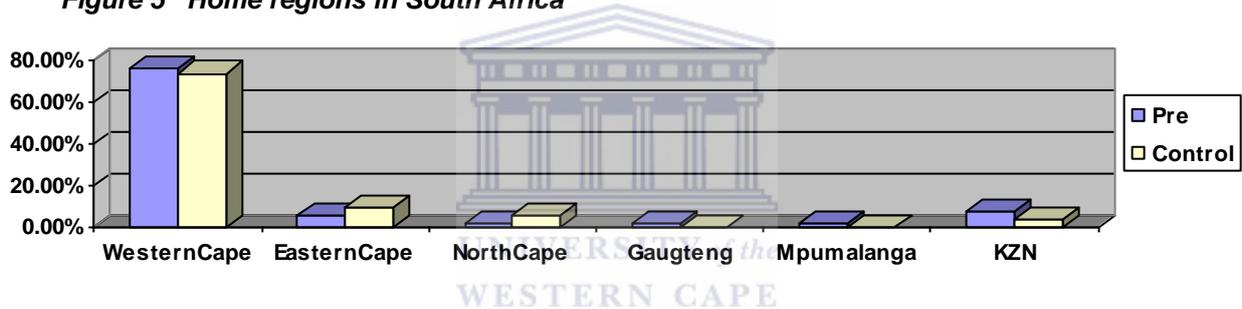
5.2.5.4   Home language and home region

The results of Table 9 Home language and Table 10 Home regions showed that the majority of students (74.50%) whose home language is English (71.43%) are from the Western Cape Province although Afrikaans are also spoken as a home language. The University of the Western Cape is situated in the Western Cape Province, and will attract most of its students from the Western Cape Province. Historically, UWC was the university established to provide tertiary education for Coloured students. In second place, Afrikaans followed (13.27%). Afrikaans is also indicated as the home language of the students in the Northern Cape; just as Xhosa is the home language in the Eastern Cape Province (8.16%). Six students came from Kwa-zulu Province, of which 3 student's mother tongue was Zulu, but understood the English language.

5.2.6 School libraries

The questionnaire requested students to indicate whether or not their secondary or high school had a library. According to table 14, 66.33% of the schools attended by the pre- and control group students had a library and 33.67% schools did not have a library. Although many of the schools had libraries, only 33.67% of them had a teacher librarian, while 66.33% did not have a teacher librarian. The percentage of schools that had a teacher librarian correlates with the percentage who received book education, namely 33.67%. What is disturbing is the fact that a low percentage received information literacy skills training (9.18%) compared to 90.82% who did not receive information skills training. This is an indication that the majority of the respondents were not information literate.

Of interest is the fact that the 30.61% students of the pre-group who had a teacher librarian at their school would ask for assistance. While 16 (32.65%) of the control group would do it irrespective of having 18 teacher librarians. One would assume that all students at a school with a teacher librarian present at a library would ask for assistance. The results show that 31 (31.63%) of the 33 (33.67%) of the whole group would do it. The high percentage not asking for assistance correlates with the availability of a teacher- librarian and the teaching of book education.

Table 14 School (secondary) libraries

Pre				Control				Total	
Did your school have a school library?	Yes	31	63.27%	Did your school have a library?	Yes	34	69.39%	65	66.33%
	No	18	36.73%		No	15	30.61%	33	33.67%
Did you have a teacher librarian?	Yes	15	30.61%	Did you have a teacher librarian?	Yes	18	36.73%	33	33.67%
	No	34	69.39%		No	31	63.27%	65	66.33%
Did you receive book education?	Yes	15	30.61%	Did you receive book education?	Yes	18	36.73%	33	33.67%
	No	34	69.39%		No	31	63.27%	65	66.33%
Were you taught any information literacy skills?	Yes	5	10.20%	Were you taught any information literacy skills?	Yes	4	8.16%	9	9.18%
	No	44	89.80%		No	45	91.84%	89	90.82%
For your information needs did you ask for assistance?	Yes	15	30.61%	For your information needs did you ask for assistance?	Yes	16	32.65%	31	31.63%
	No	34	69.39%		No	33	67.35%	67	68.37%

*Figure 6 **School libraries facilities of both pre-and control groups***
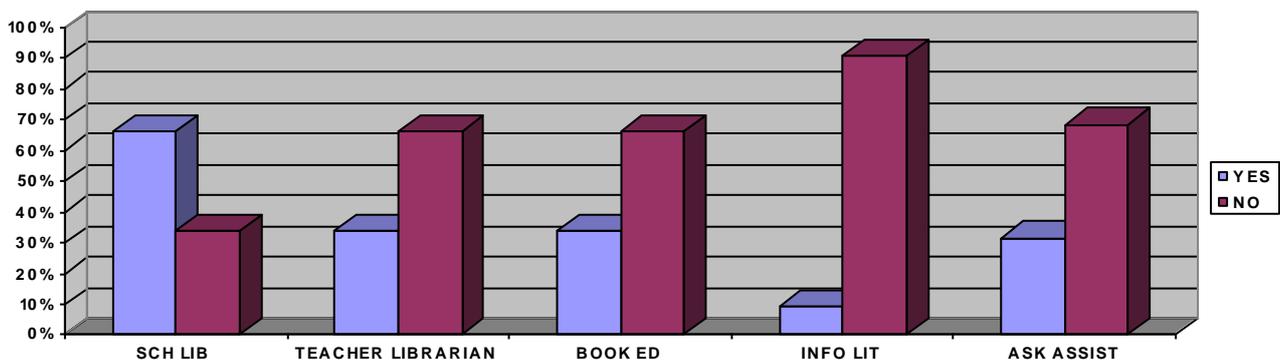
All this results underline the fact why students are underprepared when entering university. This will also influence the answering of the questions in the questionnaire on the information literacy section. This can contribute to low results when students have to answer the questions on library resources and information

literacy skills education, as only 9 (9.18%) of the 95 students received information literacy education.

With this prior learning in information literacy skills in mind (Sayed, 1998: 76 – 77), both the librarian and lecturer based the main research question and sub-questions on teaching information literacy skills education with the assistance of both the librarian and the lecturer within the students' studies.

5.2.7 Public libraries

The questionnaire required students to indicate whether they have a library card. Of the 98 students, 80.61% students had public library cards, and 19.39% students did not have. Of the 19 students without a library card, 8 indicated that they did not have access to a public library as there was no public library and the rest indicated that they did not belong to a public library with no reason given for it. But of the 98 students, 91 (92.86%) read library books, and only 7 (7.14%) students did not read library books. One of the 8 students who did not have access to a library, read library books when visiting family members. The seven students, who did not read, indicated that they did not have library cards or a library.

The questionnaire required from the students to indicate whether they visited the public library. This would indicate if they have access to a public library. Of both groups, 91.84% of the students had visited the public library and 8.16% did not visit a public library. The eight students that did not visit the library came from rural areas and countries where there were no public libraries. These eight students also had no access to a school library.

Table 15 indicated that of the 98 students, 52 students would ask for assistance, and 46 would not ask for assistance.

When students were asked if they used the public library's resources, the results showed 58.16% used the library resources and 41.84% not. If 58.16% students are using the public library's resources, it is more than half the number of students that is exposed to library resources.

Table 15   Public libraries

Pre				Control				Total	
Do you have a library card?	Yes	38	77.55%	Do you have a library card?	Yes	41	83.67%	79	80.61%
If no, why not?	No	11	22.45%	If no, why not?	No	8	16.33%	19	19.39%
Do you visit the public library?	Yes	44	89.80%	Do you visit the public library?	Yes	46	93.88%	90	91.84%
	No	5	10.20%		No	3	6.12%	8	8.16%
Do you read library books?	Yes	44	89.80%	Do you read library books?	Yes	47	95.92%	91	92.86%
	No	5	10.20%		No	2	4.08%	7	7.14%
For your information needs did you ask for assistance?	Yes	29	59.18%	For your information needs did you ask for assistance?	Yes	23	46.94%	52	53.06%
	No	20	40.82%		No	26	53.06%	46	46.94%
Did you use the public library's resources?	Yes	31	63.27%	Did you use the public library's resources?	Yes	26	53.06%	57	58.16%
	No	18	36.73%		No	23	46.94%	41	41.84%

Figure 7   Public libraries
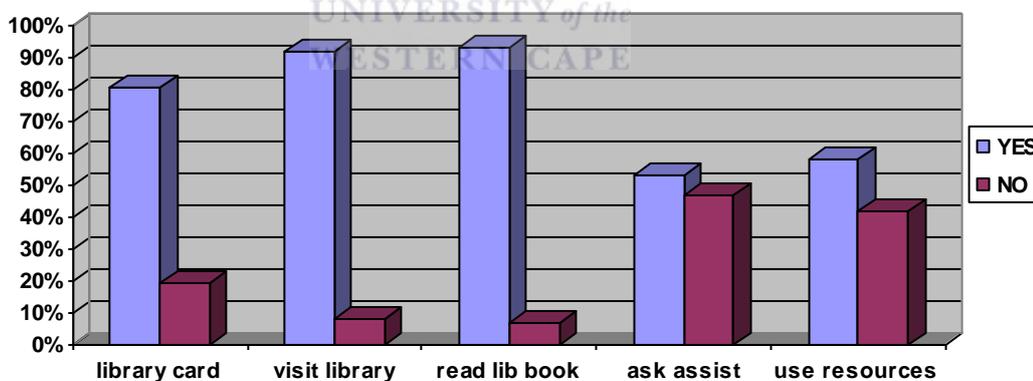
When the students worked on their assignments, it could mean that they had some exposure to library / information resources. Table 15 indicate that 58.16% of the students made use of the library's information resources. Being a member of the public library or using the resources, gave students some exposure to the available library resources and asking for assistance. This will also enable students to answer some of the information literacy skills questions in the questionnaire.

If comparing the results it showed that the public libraries and its resources were used more or is more accessible than the school library. Most of the school libraries were not accessible for students in that some school libraries were most of the time closed and that most school libraries closed the same time as the school. This resulted in students not being able to use the school library or the library's resources. Students could use the resources of the public library whether they were library members or not and at any time. As seen from results in table 15 of the 98 students 52 (53.06%) students would ask for assistance for their information needs, and 46 (46.94%) would not.

5.2.8   Computers

It was important to get information on how experienced respondents were with regards to the use of computers. It was necessary because computer literacy, or as it is called today, digital academic literacy is part of being information literate. As computers are part of technology it plays a huge role in accessing the online information resources in searching, retrieving and evaluating information and information resources. This is also important as of the questions in the information literacy skills section of the questionnaire relates to computer knowledge or skills of online information resources.

5.2.8.1   Own computer

The questionnaire required from students to indicate whether they had their own computer before arriving at UWC. Table 16 showed that 29 (59.18%) students in the pre-group and 31 (63.27%) in the control group possessed their own computers. In all, sixty students had their own computers while 38 (38.77%) students do not have their own computers. It can be concluded that approximately one third of the incoming CHS students did not have their own computers.

Table 16   Own Computer

Pre			Control			Total	
Yes	29	59.18%	Yes	31	63.27%	60	61.23%
No	20	40.82%	No	18	36.73%	38	38.77%

Figure 8 Students with own computers
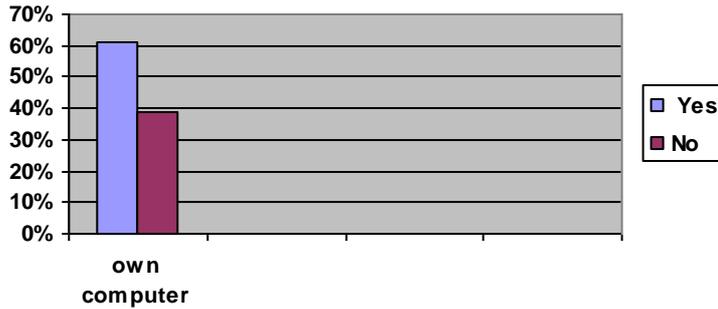
5.2.8.2   Computer access

The questionnaire requested students to indicate whether they had other options to getting access to computers. The students were given six options: parent's work; friend; school library; public library; Internet café and no access. The results of both tables 16 and 17 indicated that of the 98 students, 38 did not have their own computers, but of the 38 students 35 had other means of getting access to computers, while 3 students did not have access at all to computers.

Table 17   Computer Access

Pre			Control			Total	
Parent's work	2	4.08%	Parent's work	1	2.04%	3	6.12%
Friend	8	16.32%	Friend	9	18.37%	17	36.69%
School library	1	2.04%	School library	1	2.04%	2	4.08%
Public library	6	12.24%	Public library	4	8.16%	10	20.41%
Internet Café	2	4.08%	Internet Café	1	2.04%	3	6.12%
No access	1	2.04%	No access	2	4.08%	3	6.12%

Figure 9   Computer access for both pre-and control groups

140
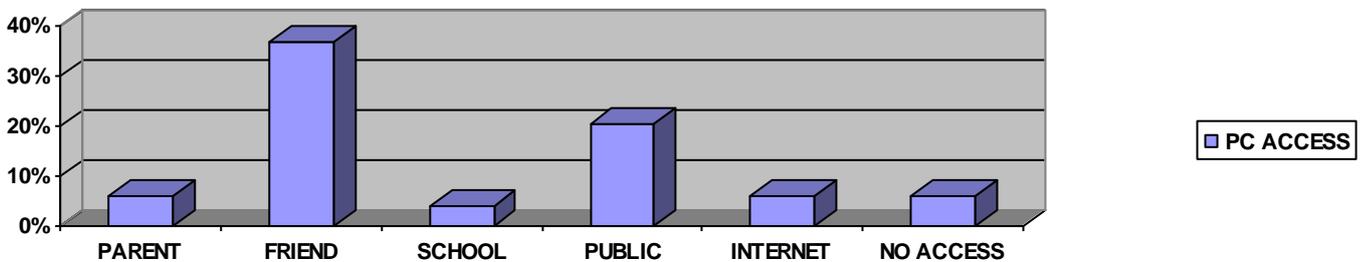
5.2.9 Computer literacy

Table 17 above showed that 3 of the 38 students have no access to computers, this could mean that the 3 students could have no or very limited computer literacy skills. The thirty-five students, who had no computers but limited access to computers, could have most of the necessary computer literacy skills.

Students were asked to indicate (table 18 question 8), by marking either the yes or no option on the questionnaire, whether they had access to their own computers prior to arriving at the University of the Western Cape. Computer literacy skills were determined under question 10: 1) Can you save a file/document?; 2) Save to a flashstick?; and 3) Print a Web page? Eighty-seven students (88.78%) indicated that they could do all three activities. The control group had 8 students (16.33%) who would need these computer skills and 3 (6.12%) students from the pre-group. The fact that incoming students do not have their own computers and that only a small percentage have access to a computer correlates with the findings of De Jager & Nassimbeni (2002: 179) and Hart (2000: 78) who indicated that most tertiary students are not computer literate because they were not exposed to computers during their school years.
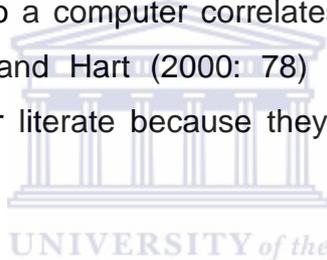
The three students from the pre-group, who had no computer exposure, will be assisted in the information literacy program. They could be assisted by the researcher as well as the group and will not retard the progress of the program.

If students do not have these basic computer literacy skills it will be difficult during the information literacy skills program when students are taught about the electronic information resources. With respect to the research sub-question regarding the information resources, it will then be a problem for these students to use and understand it.

Table 18   Computer literacy skills

Pre				Control				Total	
Can you save a file/doc?	Yes	46	93.88%	Can you save a file/doc?	Yes	41	83.67%	87	88.78%
	No	3	6.12%		No	8	16.33%	11	11.22%
Save to a flashstick?	Yes	46	93.88%	Save to a flashstick?	Yes	41	83.67%	87	88.78%
	No	3	6.12%		No	8	16.33%	11	11.22%
Print a Web page/doc?	Yes	46	93.88%	Print a Web page/doc?	Yes	41	83.67%	87	88.78%
	No	3	6.12%		No	8	16.33%	11	11.22%

Figure 10 Computer literacy skills
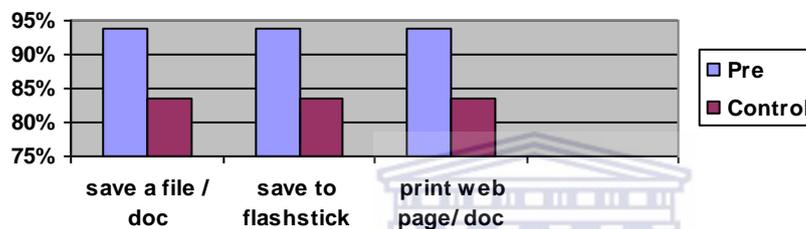
Students were asked (questions 10.4; 10.5; and 10.6) whether they use e-mail; access the WWW; and locate information resources on the Internet. The pre-group used the email (93.88%); WWW (93.88%); and the Internet information resources (93.88%) slightly more than the control group (83.67% respectively). From both groups 11 students were not familiar with searching the WWW when they registered as students at the University of the Western Cape.

Table 19   Use of e-mail; WWW; and Internet resources

Pre				Control				Total	
Do you use email?	Yes	46	93.88%	Do you use email?	Yes	41	83.67%	80	81.63%
	No	3	6.12%		No	8	16.33%	18	18.37%
Do you use the WWW?	Yes	46	93.88%	Do you use the WWW?	Yes	41	83.67%	87	88.78%
	No	3	6.12%		No	8	16.33%	11	11.22%
Locate information resources on Web page?	Yes	46	93.88%	Locate information resources on Web page?	Yes	41	83.67%	87	88.78%
	No	3	6.12%		No	8	16.33%	11	11.22%

Figure 11 Use of e-mail; WWW; Internet resources; and use English on Internet
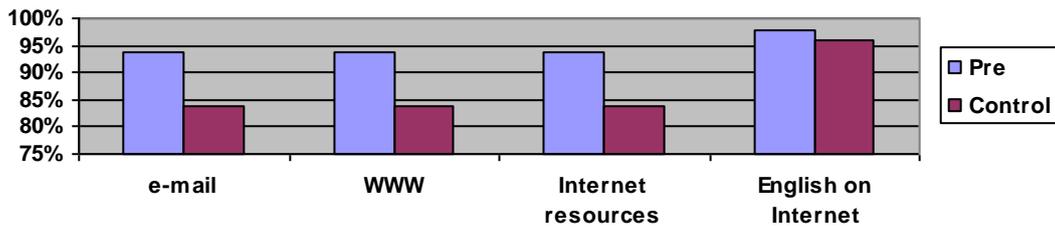
It can be presumed that students with their own computers or those that have access to computers and Internet will probably experiment with e-mailing and surfing the Internet and that only 11 students (11.22%) from both groups may experience computer skills and Internet navigation problems.

Table 20   Use of English and Internet

Pre				Control				Total	
Do you use English when using Internet?	Yes	48	97.96%	Do you use English when using Internet?	Yes	47	95.92%	95	96.94%
	No	1	2.04%		No	2	4.08%	3	3.06%

Of the 98 students 95 indicated that they have experience in using English when using the Internet and 3 not (figure 11). Of the 98 students 70 students: 37 (75.51%) from the pre-group and 33 (67.35%) from the control group do have English as their home language. With the exception of the 3 students, the rest of the respondents from both groups were students with different mother tongue languages, but are familiar with searching the Internet in English and students who had English as a second language but they all understood how to search the Internet in English. The one student (2.04%) from China could have a problem to search the Internet in English as he came to UWC to improve his English language skills. In China the Chinese language is used online and not English. For the other two students it could be because they do not have access to computers and the Internet.

5.2.10 Conclusion

After analyzing the data gathered from the biographic section: school library access, public library usage and computer access prior to registering at UWC, the following

profile of incoming CHS students in Physiotherapy 1 and Occupational Therapy 1 at UWC emerged out of the questionnaire:

There were more females (76.54%) than males (23.46%) doing Physiotherapy 1 and Occupational therapy 1. The age of the incoming CHS UWC student ranged from 18 to 29 years old, with an average age of 23 years and 6 months.

English was the mother tongue language for the majority students 71.43%; followed by Afrikaans (12.24%) then Xhosa (8.16%). But students could understand English even if it was a second or third language.

The majority of the students 74.49% came from the Western Cape and 16.22% came from the Eastern Cape. Only 8.16% came from African countries outside South Africa and one (2.04%) from outside Africa.

Of the students (66.33%) attended secondary schools where the library is managed by a teacher librarian (33.67%) received book education (33.67%) and information literacy skills training (9.18%). The respondents used the public library more than the school library. The reason might be that they had more access to the public library and its resources. The schools might have a school library but it was not always accessible to students especially after school closure and not all school libraries had a librarian. The majority of the students (80.61%) were members of the public library.

Two thirds (61.23%) of the students owned a computer and 88.78% were familiar in using the Internet. The majority of students had English as their mother tongue and as their second or third language they used English to search the Internet (96.94%) with (3.06%) of students having problems searching the Internet in English. As the majority of the students were fluent in English, it is a factor that influences the information literacy of the students. Being able to be computer literate (save/download/print); email; WWW; locate Internet resources and understanding it all in English will play a huge role in their information literacy training. All the mentioned factors will contribute to the search strategy in the online databases.

5.3   Information literacy competency skills

The pre- and post-tests were adopted as it offered the opportunity to code and analyse students' responses and therefore to measure their performance in terms of 'scores', which identified the level and the areas of improvement.

The pre-and post-test results were recorded and analysed using Microsoft Office Excell. For each student the correct answers were calculated and compared before and after the information literacy education training program. Each question was then analysed in terms of correct results before and after the program with the aim of identifying the critical issues in students' learning. The questions with less than 50% of correct responses were considered worth being given particular attention, as they represented a 'failure' in students' 'learning'. With regard to the information literacy competency score it meant 'not competent'. The data that was analysed after completion of the pre-test suggested that there was no difference between the pre-group and control group, and therefore it could be presumed that the two groups were equivalent before the administration of the experimental program. The average score for both groups was 21.24 which were very low.

In this section the purpose and results of the twenty questions in the second section of the questionnaires testing the baseline information literacy competence of incoming UWC CHS Physiotherapy and Occupational Therapy 1 students will be summarized in tables and discussed. The questions in the questionnaire followed numerically the same topic, but an illogical arrangement followed as certain questions were linked to follow the discussion of specific topics relating to the main research question and sub-questions.

In order to determine the level of information literacy skills and proficiencies of the respondents, individual answers to individual questions in the questionnaire were discussed. The results of both groups will be given to reflect whether the students in the pre-group gained information literacy skills and knowledge. The results of the control group will also indicate whether they gained these skills without formal training and part of other courses. The next section will cover how the students faired as individuals.

5.3.1 Search strategy

For question 1, see table 21, the students were asked when performing research what they will do as the important part of forming a search strategy. Four options were given: a). Locate books using the library's online catalogue; b). Ask the faculty librarian for assistance; c). Analyse a topic to identify keywords/concepts; d). Check the Internet for background information on your topic.

Table 21   Search strategy

1. When performing research, the important part of forming a search strategy is to:					
		P/Pre	P/Post	C/Pre	C/Post
a). Locate books using the library's online catalogue	#	7	2	10	9
	%	14.29	4.08	20.41	18.37
b). Ask the faculty librarian for assistance	#	13	1	14	9
	%	26.53	2.04	28.57	18.37
c). Analyse a topic to identify keywords/concepts	#	3	46	5	11
	%	6.12	93.88	10.20	22.49
d). Check the Internet for background information on your topic	#	26	0	20	20
	%	53.06	0.0	40.82	40.82

The purpose of the question was to determine if students were able to identify a common problem that researchers face, namely, that the words they use to describe their topic did not correspond with those employed by the search tool. The identification of related terms or keywords used to represent a subject is an important component of the search strategy and improves retrieval of relevant documents. For this statement, option (c) was the best option.

From responses reflected in Table 21 it was clear that students in the pre-group (53.06%) and the control group (40.82%) considered the Internet as the first option. These students are from the Net generation, believing that the Internet will provide all their answers for their information needs.

In both the pre-group (26.53%) and control group (28.57%) the second highest percentage of students selected assistance from the faculty librarians. Students indicated that they would ask for assistance from the faculty librarians in searching for information when it was apparent that they did not understand the topic. From their prior public library experience, they would ask for assistance and expected that

the faculty librarians would assist them at the university library. The UWC library's orientation video for new incoming students also informed students that they could ask for assistance from their faculty librarians and use the UWC library catalogue. Both the pre-group (14.29%) and the control group (20.41%) selected the library catalogue as the third option.

Figure 12 Search strategy
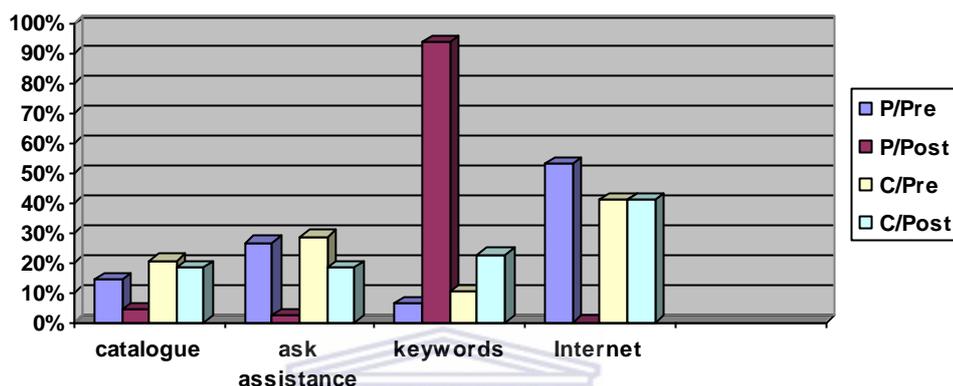
Of the pre-group only 6.12% and of the control group 10.20% of the students selected the correct option to analyse a topic to identify keywords/concepts. At the end of the information literacy program the percentage of students in the pre-group who indicated that they would analyse a topic to identify keywords/concepts, was significantly higher (93.88%) while students of the control groups improved to 22.49%.

Question 15, table 22, will form part of the search strategies. Students were asked which search strategies they would follow with their research topic.

Table 22 Which search strategy to use

15. You are unfamiliar with your research topic – Traditional church celebrations in South Africa. What search strategy should you employ?		P/Pre	P/Post	C/Pre	C/Post
a). Search "South Africa" and "church" as keywords in the OPAC.	#	9	0	5	43
	%	18.37	0.0	10.20	87.76
b). Consult the topic index contained in the 'Encyclopedia of Religion' available in the reference area.	#	33	0	39	0
	%	67.35	0.0	79.60	0.0
c). Check a database for available full-text articles on 'Church' and 'celebrations'.	#	2	0	3	4
	%	4.08	0.0	6.12	8.16
d). All of the above strategies may be used successfully.	#	5	49	2	2
	%	10.20	100	4.08	4.08

Figure 13 Which search strategy to use
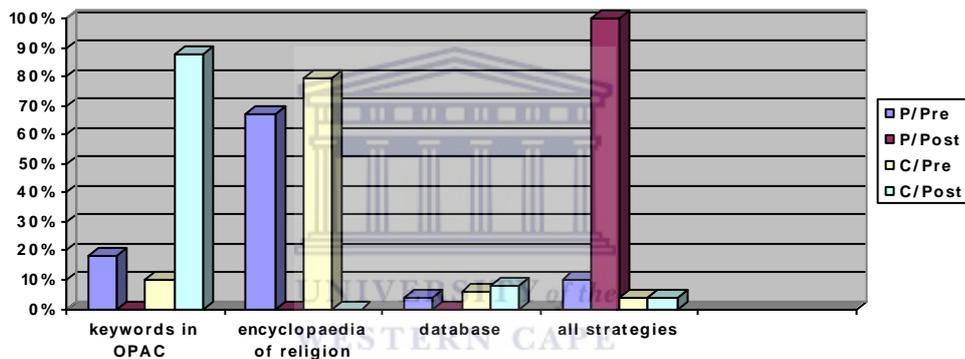
The purpose of this question was to determine whether the students knew how to do library research, understood how documentation was organized, that search tools are similar from one to another, and that the acquired research skills are transferable.

Again the word 'encyclopedia' popped up and the 33 (67.35%) of the pre-group and 39 (79.60%) of the control group choose it as the answer. The rest of the options seemed like guesses. The post-test results showed that the information literacy training program taught the pre-group that there are many different formats of search tools and that acquired information literacy skills are transferable. Their results showed a significantly improvement from 5 (10.20%) to 49 students (100%). The control group by then focussed on the OPAC as 43 (87.76%) students selected the

OPAC answer in their post-test. This results of the control group it can be deduced that they will struggle with their search strategy as they do not know of the different search tools available to them and how to use it.

5.3.2   Keywords

In question 2 students were asked which keywords they would use when searching for their assignment. The purpose of the question was to examine how the respondents select concepts/ keywords in their search strategy. Do they hold to the wording of the statement of the problem? Are they able to distinguish between significant terms and non-significant or meaningless words? Do they include all the appropriate terms? In table 23 and summarised in figure 14, students were asked which keywords they would use when searching for their assignment.

Table 23 Keywords

2. Your assignment is to "describe the effects of hydrotherapy in Physiotherapy." Which of the following keywords examples may yield the best results in a database search?		P/Pre	P/Post	C/Pre	C/Post
a). hydrotherapy	#	3	0	3	1
	%	6.12	0.0	6.12	2.04
b). hydrotherapy and physiotherapy	#	10	49	12	13
	%	20.41	100	24.49	26.53
c). effects of hydrotherapy	#	7	0	11	10
	%	14.29	0.0	22.45	20.41
d). effects of hydrotherapy in physiotherapy	#	29	0	23	25
	%	59.18	0.0	46.94	51.02

Figure 14 Keywords
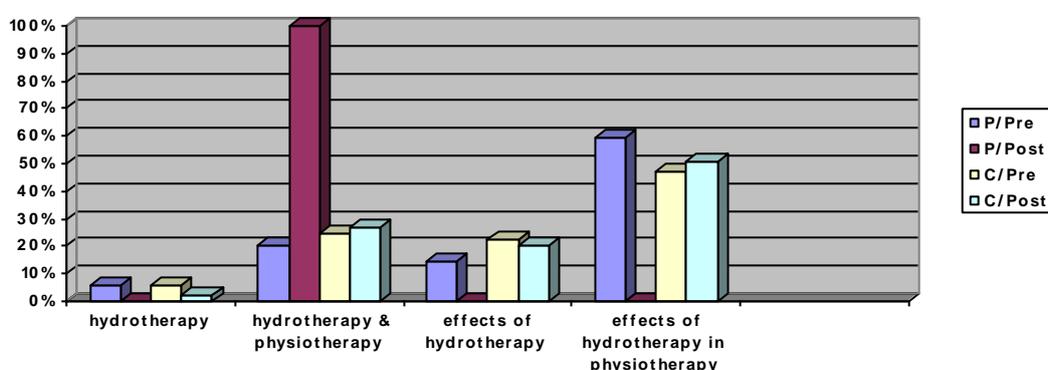
The correct answer for the question on keywords was selected by 20.41% of the pre-group and 24.49% of the control group. As Davis (2004: 306) states to find keywords (a concept which is new for all new students) is difficult especially if English is their second or third language.

For the pre-group this improved significantly to a 100% in the post-test and for the control group to 26.53%. During the information literacy program with the pre-group, much time was spent on search strategies and keywords. In comparison with the pre- and post testing after the information literacy program, the students were much more confident in analyzing their topic and identifying their keywords, and knowing how to perform their search strategy. The impact of information literacy training was huge from 20.41% to a significantly 100% improvement. In addition the control group did not appear to be able to distinguish between significant and non-significant terms when formulating a search statement as they selected options which included the non-significant term "effects" and remained the same (26.53%). These results coincide with the responses recorded in table 23 on the search strategy. This trend correlates with findings of Rockman (2002: 195) and Zondi (1992: 205) which indicate that students do not understand controlled vocabulary or how to do a subject heading search.
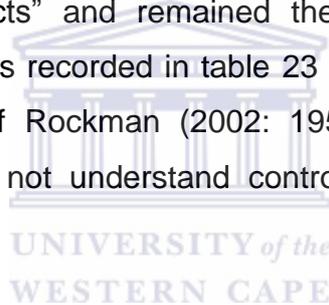
5.3.3   Truncation

Question 3 asked the students which answer was the correct example of truncation. The purpose of the question was to determine if students are able to use truncation in their search strategy when using search engines or databases. An understanding of truncation, used by most search tools, is essential for developing a sound search strategy. Students had to indicate which example of truncation would retrieve all the terms for cats and kittens.

Table 24   Truncation

3. Which of the following is a correct example of truncation?		P/Pre	P/Post	C/Pre	C/Post
a). puppies not (kittens)	#	10	0	10	11
	%	20.41	0.0	20.41	22.44
b). *kitt and dogs	#	14	1	9	9
	%	28.57	2.04	18.37	18.37
c). dog (or cat)	#	13	0	21	20
	%	26.53	0.0	42.85	40.81
d). cat* and kitten*	#	12	48	9	9
	%	24.49	97.96	18.37	18.37

Figure 15   Truncation
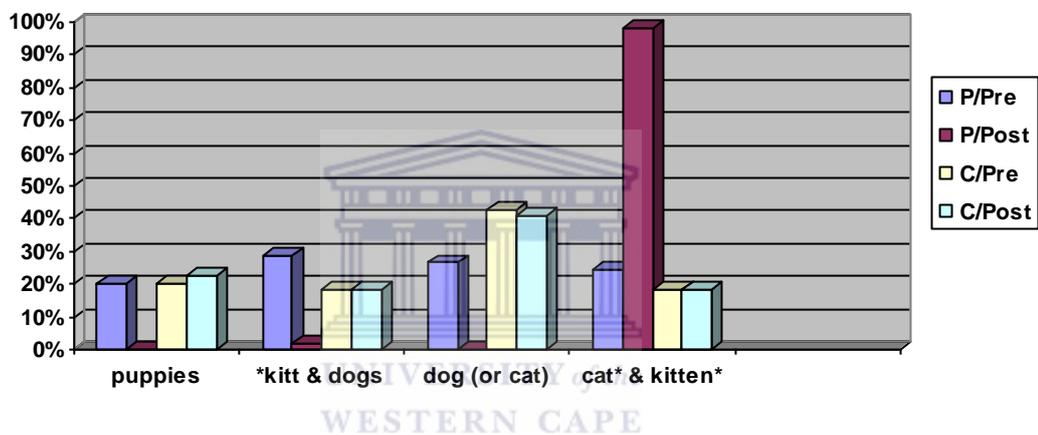
The answers were equally spread in both groups except for the control group's answer in the pre-test where the answer: dog (or cat) had a high result. It seemed that students did not have a clue what truncation was and guessed the answer. This is an indication that they are not familiar with the concept of truncation. This is a new concept for students, but not for the students who received information literacy skills' training at school for they will remember what truncation was. The results of the pre-group's post-test improved from 24.49% to a significant 97.96%. The control group remained the same. Responses are listed in table 24 and summarised in figure 15.

5.3.4   Boolean logic

The purpose of question 4 (table 25) was to assess if students were familiar with Boolean operators, specifically the "OR" operator. An understanding of Boolean logic, used by most search tools, was essential for developing a sound search strategy: it could be used to formulate a query that reflected the logic of the original question and clearly indicated to the system the relationship between the keywords.

Table 25   Boolean logic

4. In order to find more documents on your topic you can include synonyms in your search statement, to connect those synonyms in your statement, you use:					
		P/Pre	P/Post	C/Pre	C/Post
a). OR	#	13	49	10	8
	%	26.53	100	20.41	16.32
b). AND	#	36	0	39	41
	%	73.47	0.0	79.59	83.68
c). NOT	#	0	0	0	0
	%	0.0	0.0	0.0	0.0
d). I don't know	#	0	0	0	0
	%	0.0	0.0	0.0	0.0

Figure 16   Boolean logic
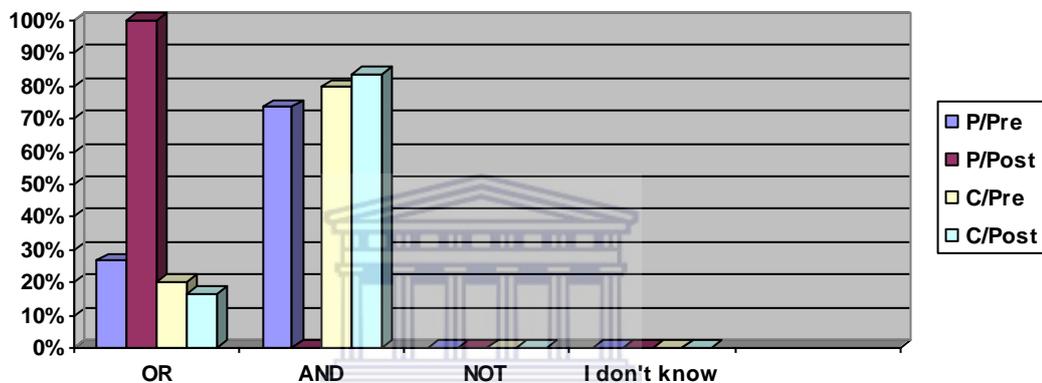
In this question both groups answered it by selecting either the AND or OR, and both groups did not select the other two options. After the information literacy training program, the right answer in the post-test seemed to be easy and resulted in a 100% for the pre-group. The pre-group understood that with synonyms or related terms, the search operator to use was "OR". This operator tells the system to include in the search results all the documents that contain one or more of the query terms. This basic concept escaped the majority of the students. The "AND" operator which had the opposite effect to "OR" in limiting the search to documents contained all the terms. The pre-group understood the difference between "OR" and "AND" and had a significantly improvement from 20.41% to 100%. The control group did not understand this difference, although it was easy to select AND as the correct answer, the control group only improved by 4.08%, while the pre-group improved significantly by 73.47%. Responses summarised in figure 16.

The researcher knew from experience that it is best to spend a great deal of time on how to search, and questions 1, 2, 3 and 4 showed the significant improvement in the pre-groups' post-test results after the information literacy program. With limited or no guidance from the academics the control group remained the same.

5.3.5   Referencing

The purpose of the following questions was to determine if students were able to interpret a bibliographic reference and recognize the document type to which it corresponded. This knowledge was important for the following reasons: first, the way to query the catalogue to locate a particular document varied according to the document type; and second, the nature, specificity and currency of information varied according to publication type. As a result, the ability to identify a document type from a given citation was useful in assessing the relevance of a source for one's information needs. It was therefore important to be able to identify the document type corresponding to a citation.

Table 26   Book citation

7. Stein, Edward. 1968. Guilt: theory and therapy. Philadelphia: Westminister Press. The above reference is a bibliographic citation for a:		P/Pre	P/Post	C/Pre	C/Post
a). journal article	#	9	0	10	9
	%	18.37	0.0	20.41	18.37
b). personal interview	#	0	0	0	0
	%	0.0	0.0	0.0	0.0
c). WWW	#	1	0	2	0
	%	2.04	0.0	4.08	0.0
d). book	#	39	49	37	40
	%	79.59	100	75.51	81.63

Figure 17   Book citations
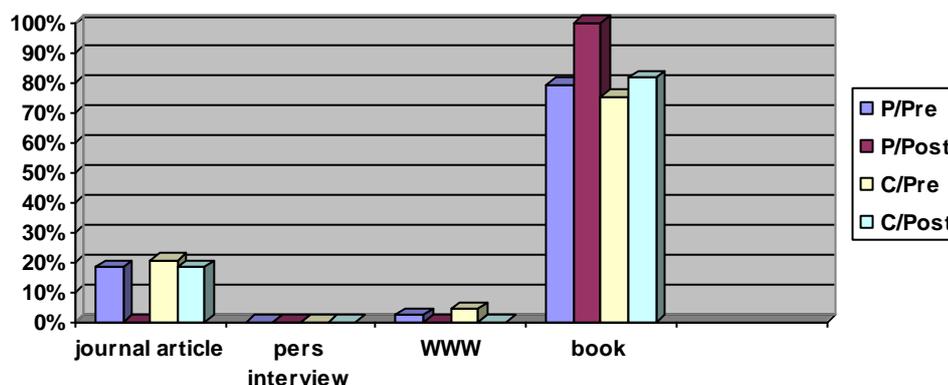
The students were requested (question 7) to choose one of the options provided that reflected the correct answer to the citation of a book. The options are journal article; personal interview; WWW; and book. Results are summarized in table 26 and figure 17. In both the pre- (79.59%) and control groups (75.51%) the most students choose the option of book. The post-test result for the pre-group was a 100%, and the control group 81.63%. It could be presumed that the control group's improvement was the result of attending the UWC library instructions programs or could they could have become familiar with the citations in the reading lists of their courses.

5.3.6 Journal citation

The students were requested to provide the correct answer to the journal citation. The options are listed in table 27 and summarised in figure 18. The results of the correct answer of the pre-group were 18.37% and the control group 24.49%. The rest (69.38%) of the pre- and control groups were unable to identify the citation associated with a journal article which gives an indication that the students had no idea of the different citations. Of the 98 students 28 answered it as a book citation and 48 students saw it as an encyclopaedia citation. It could also be assumed as to why they saw it as an encyclopaedia citation because they probably recognised it when using the encyclopaedias in the public libraries (working on their assignments). It is worth noting that the control group remained (55.10% to 53.65%) with the encyclopaedia as the correct answer. It could be the volume; number; and page in its citation that is similar to the journal. The pre-group scored a 100% in their post-test.

Table 27 Journal citation

9. Blake, N. 2003. Health facilities for all. *Health education*, 24 (3) : 1-50. the above reference is a bibliographic description of a:		P/Pre	P/Post	C/Pre	C/Post
a). book	#	18	0	10	8
	%	36.73	0.0	20.41	16.32
b). WWW	#	1	0	0	0
	%	2.04	0.0	0.0	0.0
c). journal	#	9	49	12	15
	%	18.37	100	24.49	30.61
d). encyclopdia	#	21	0	27	26
	%	42.85	0.0	55.10	53.06

Figure 18   Journal citation
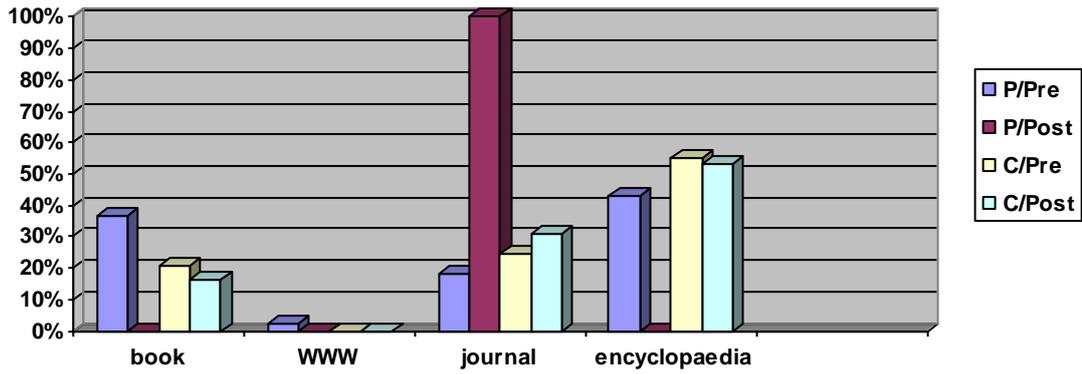
5.3.7   In-text-referencing

Table 28   In-text-referencing

11. Read the following original book passage from *Slavery* written by David Turley : "Although there is some debate on the subject, differences of colour or race seem to have mattered relatively little to the ancient Greeks, but 'otherness' in terms of ethnicity and language counted for a great deal" now, choose one of the following choices as an acceptable example of paraphrasing according to the Harvard style, which does not constitute plagiarism:		P/Pre	P/Post	C/Pre	C/Post
a). In ancient Greece, slavery was generally based on the differences between people in terms of background and language.	#	22	1	9	7
	%	44.89	2.04	18.36	14.29
b). "Otherness" in terms of ethnicity and language counted for a great deal to the ancient Greeks.	#	13	0	4	2
	%	26.53	0.0	8.16	4.08
c). In ancient Greece, differences between people in terms of background and language mattered quite a bit (Turley,1999:28)	#	5	45	7	10
	%	10.20	91.84	14.29	20.41
d). Differences of colour seem to have mattered little to the Greeks, but ethnicity and language meant a great deal.	#	9	3	29	30
	%	18.36	6.12	59.1	61.22

Generally, students would never or seldom give in-text-referencing as they either do not know or find referencing or citing sources used difficult. If students received information literacy skills education at school level, it would make a difference. A low percentage students gave the correct answer of question 11 (pre pre-group 10.20% and the control group 14.29%). This correlates with the small number of students who received information literacy education (9.18%) at school. The possibility exists

that if they received information literacy at school they would have known of the in-text referencing.

The pre-group improved significantly from 10.20% to 91.84% and the control group from 14.29% to 20.41%. This could be the result of students attending some of the UWC library instructions offered or some academics giving some guidelines for their requirements for their assignments.

The differences of improvements between the pre-group and control group were a result of the training and guidance that the pre-group acquired from the information literacy program as shown in figure 19.

Figure 19   In-text-referencing
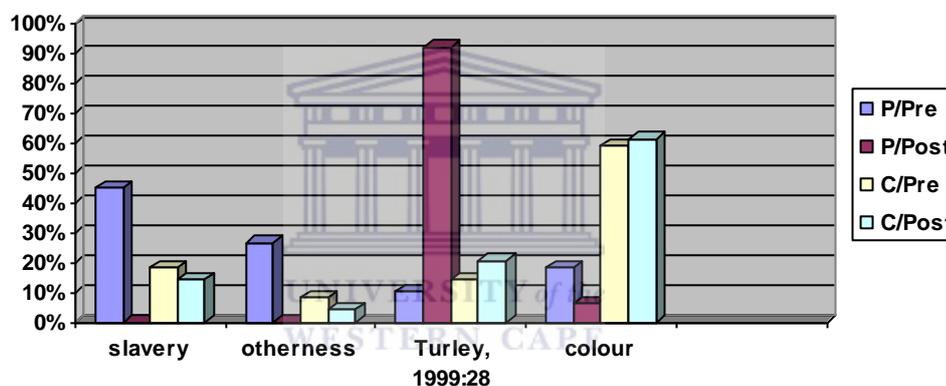
To sum up, the answers to these 3 questions in tables 26, 27 and 28 indicated how important continuous exercises on referencing were. The pre-group's post-test results showed a 100% in the book and journal referencing, and bibliography and 92% in-text-referencing. By the end of the referencing session the pre-group knew which details were needed for referencing a book, journal and web site, and the difference between it.

Students from the control group were requested to indicate the referencing of a book and journal and it seemed that they were guessing the answer. It seemed that question 7's reference of a book (table 26) looked familiar as they did not know what a journal was and it could not be an interview or web site. The results to question 9 (table 27) indicated that they did not know what a journal reference was and

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encyclopedia scored the highest in both the pre- and control groups in the pre-test. The results of the control group gave an indication that students struggled with referencing and do not get enough guidance about referencing techniques. It can be deduced that if the control group were asked to locate documents using a bibliography, they would have serious difficulties. This correlates with the findings of Cameron (2004: 213) and Fitzgerald (2004: 20) that tertiary undergraduate students in general find it difficult to reference and cite sources used.

5.3.8   Plagiarism

The purpose of the questions was to see if students knew when to include a reference to the source of the information used. When repeating someone's words or opinions, it is important to mention the author of the original text so the reader may refer to the text. Repeating the text word for word or paraphrasing it without documenting the source constitutes plagiarism. It is important for students to be familiar with the principles of the ethical use of information.

Table 29   Citing original work

14. You have to read an article which is placed on the reserve section in the library. After reading it, you describe its content in a short written paper. What is your obligation as you write the paper?					
		P/Pre	P/Post	C/Pre	C/Post
a). Because the paper is short, there is no need to cite the original work in your paper.	#	7	0	15	13
	%	14.29	0.0	30.61	26.53
b). Check a database for full-text availability of this particular article. You then copy and paste it without having to cite the article.	#	24	0	21	23
	%	48.98	0.0	42.86	46.94
c). Even though you paraphrase the content you must cite the original work in your paper.	#	5	49	7	10
	%	10.20	100	14.29	20.41
d). If you don't plan to publish, you won't need to cite the article, especially if you re-paraphrase it in your own words.	#	13	0	6	3
	%	26.53	0.0	12.24	6.12

Figure 20   Citing original work
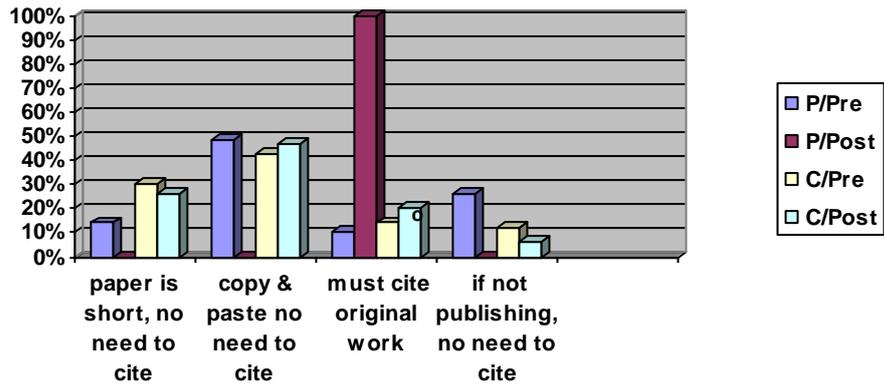
Question 14 (table 29) covered plagiarism and of the 98 students 12 (24.49%) students who received information literacy training seem to know the correct answer and remembered that one is obligated to acknowledge your sources.

The post-test of the pre-group resulted in a 100%, and the control group with a 20.41%. Plagiarism was covered throughout the program to ensure pre-group students knew what plagiarism really is. With no guidance the control group will continue with committing plagiarism due to the fact that they do not understand and what is expected of them.

Table 30   Citing image

20. You saved an image from a website you've visited because it's related to your research topic and now you've decided to paste it into a class PowerPoint presentation you are preparing. What is your next step?					
		P/Pre	P/Post	C/Pre	C/Post
a). You need to request permission of the website owner to include the image	#	7	1	7	2
	%	14.29	2.04	14.29	4.08
b). You need to cite the original source of the image.	#	6	47	7	8
	%	12.24	95.92	14.29	16.33
c). Since the image was obtained for free on the internet, there is no need to cite it; you only need to cite purchased items.	#	31	0	28	20
	%	63.27	0.0	57.14	40.82
d). You do not need to cite the image.	#	5	1	7	19
	%	10.20	2.04	14.28	38.77

In question 20 the students had to choose one of the options provided reflecting the obligation when saving someone's work from the Internet, that it must be cited. In the pre-test the pre- and control group students seem not really to be aware of the need to quote sources when saving images from the Internet. The correct answer which was (b) 6 (12.24%) students from the pre-group and 7 (14.29%) from the control group selected the correct option. The other 73.97% demonstrated a partial knowledge of when to include bibliographic references or had no idea at all when to quote a source.

After the information literacy training, 47 (95.92%) pre-group students, indicated that all sources need to be cited and of the control group 16.33%. Of the 2 pre-group students, the one student who indicated that permission is needed from the owner of the image showed some form of acknowledgement, while the other student did not see the need to cite an image from the Internet.

Figure 21   Citing images
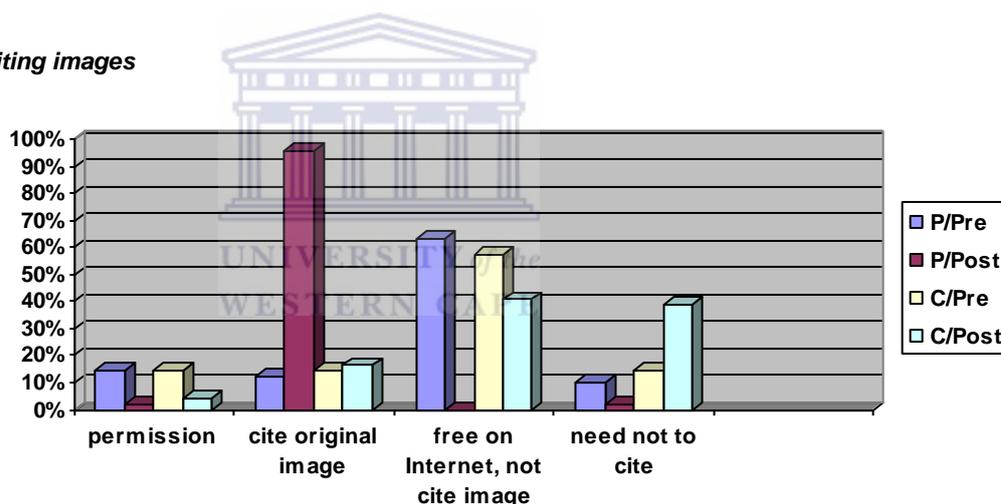
Comparing this to the control group, they remained the same from 7 to 8 students who selected the correct action; from 28 (57.14%) to 20 (40.82%) students thought that since the image is free on the Internet, it is not necessary to cite it; from 7 (14.29%) students to 2 (4.08%) students selected the option that one need the permission of the owner of the image; but from 7 (14.29%) to 19 (38.77%) students indicated that you do not need to cite the image. The results of the control group indicated that they did not know the answer and guessed.

Students should be aware of the need to quote the source when they reproduce a text word for word, regardless of whether or not it was a magazine article or a web page. However, students were unaware of the need to quote sources when

paraphrasing or saving web images or information. The results of the pre-test of both groups were clear that most students in both groups regarded the Internet as a vague magical computer somewhere producing information. Only eight (16.33%) students of the control group during the post-test thought that it was necessary to cite materials used, compared to the pre-groups' 47 (95.92%) students who indicated that the source must be cited.

Question 11 (table 28) can also be seen in the context of plagiarism, namely, in-text referencing. All three questions 11, 14 and 20 from the pre-test indicated that both groups did not care whether they committed plagiarism or not. According to Lampert (2004: 354) it could be of ignorance for the high occurrences of plagiarism at tertiary institutions.

Summed up, together all these questions showed that the information literacy program made a significant difference in the pre-group, whilst the control group will continue with what they know. Plagiarism is a serious issue. The importance of plagiarism started at the beginning of the program and continued throughout the program right up to the end. The pre-group was on a continual basis faced with referencing. When they committed plagiarism they were punished with referencing exercises. This they took in a good spirit as they learnt from it. Referencing almost became second nature to them. Even in discussions, they had to cite where they got their sources from. It took some time for students not to commit plagiarism and it was for this reason that the researcher spread it throughout the program and not just have one session on plagiarism. The control group proved that if students are left to their own devises, the problem will become bigger as summarized in figures 18 - 20. The university has a system called 'turn-it-in' in place. The purpose of it is to assist students in an effort to prevent plagiarism. The researcher saw and experienced students' problems and frustration with it, as they do not understand plagiarism fully. As seen from the results of the pre-group's post-test on referencing that one or two students after the training program were still unsure of one or two issues. Students need guidance and training from all stakeholders involved with their studies.

5.3.9 Bibliography

The purpose of the question was to determine if students knew what a bibliography was. Students were asked to indicate what information (addresses, phone numbers or information sources) they would find when using a bibliography.

Table 31   Bibliography

6. A bibliography is a list of:					
		P/Pre	P/Post	C/Pre	C/Post
a). Addresses	#	16	0	10	11
	%	32.65	0.0	20.41	22.45
b). Phone numbers	#	3	0	7	5
	%	6.12	0.0	14.29	10.20
c). Information sources	#	30	49	29	31
	%	61.23	100	59.18	63.27
d). I don't know	#	0	0	3	2
	%	0.0	0.0	6.12	4.08

Question 6 as indicated in table 31 that of both the pre-group, 30 (61.23%) and 29 (59.18%) of the control group students knew that a bibliography would give them more sources to information. This could possibly be of the book education and information literacy trainings that they had at school. The pre-group scored a 100% in the post-test, while the control group made a small improvement of 6.12%.

The rest of the students 39 of the 98 could not give the correct answer. It could be assumed that these students were either not familiar with the term or do not know of using bibliographies or how to use it.

Figure 22   Bibliography
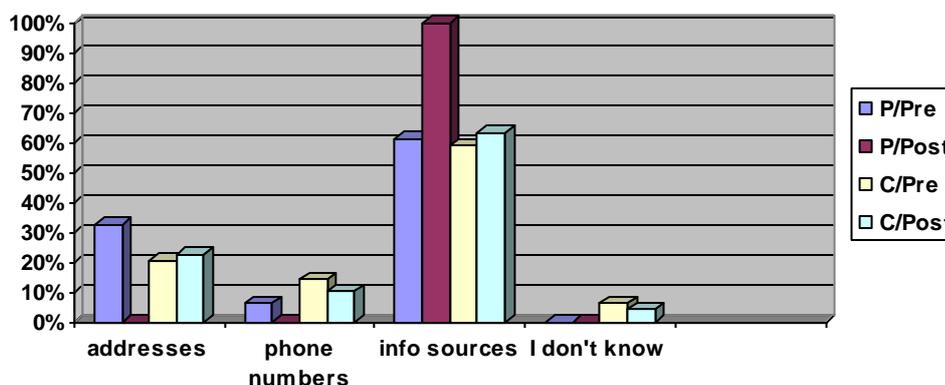
It was important for them to understand the added value of the bibliographic references selected by the author. Such references enabled them to find other documents on their topic, thus enhancing their awareness of existing knowledge (table 32).

Table 32   Using bibliography

12. You have found a book that is right on your topic. Which section of the book will you consult to find other documents on the topic?					
		P/Pre	P/Post	C/Pre	C/Post
a). the glossary	#	2	0	2	2
	%	4.08	0.0	4.08	4.08
b). the index	#	13	0	15	14
	%	26.53	0.0	30.61	28.57
c). the bibliography	#	30	49	29	31
	%	61.23	100	59.19	63.27
d). the table of content	#	4	0	3	2
	%	8.16	0.0	6.12	4.08

Figure 23   Using bibliography
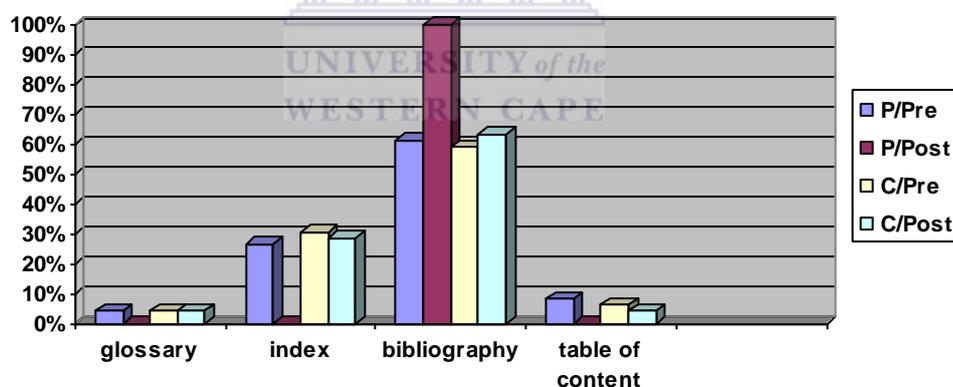
Of the control group there was a slight difference from 59.19% to 63.27% of students who knew bibliography was the answer. But all the above results relating to referencing of the control group gave an indication that these students were either not familiar with the term or do not know of using bibliographies or how to use it. They will struggle with referencing if they do not get enough guidance about referencing techniques.

The results showed the correct answer for the pre-group was a 100% in their post-test. The results showed that all the pre-group students became familiar with the

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bibliography as a tool. The pre-group did not only learn about bibliographies in theory, but had hands-on experience and had to create a bibliography for their assignments. This contributed to their knowledge about bibliography.

5.3.10 Scholarly journals

The purpose of the question was to see if students' knowledge of various document types enabled them to distinguish between scholarly journals and popular magazines. It is important to be able to distinguish between these types of publications when conducting research as they do not have the same objectives nor are they written for the same audience. A scholarly journal contains current theoretical discussions or research results for a specialized public whereas a popular magazine provides information in layman's language for the general public.

Table 33   Scholarly journals

5. Which of the following is a characteristic of a scholarly journal?		P/Pre	P/Post	C/Pre	C/Post
a). Colourful advertisement	#	33	0	34	6
	%	67.35	0.0	69.39	12.25
b). Peer-reviewed articles on a topic	#	4	42	6	33
	%	8.16	85.71	12.25	67.34
c). In-text referencing and bibliographies are used to cite sources	#	3	7	4	6
	%	6.12	14.28	8.16	12.25
d). Limited use of graphs and chart data	#	9	0	5	4
	%	18.37	0.0	10.20	8.16

Figure 24 Scholarly journals

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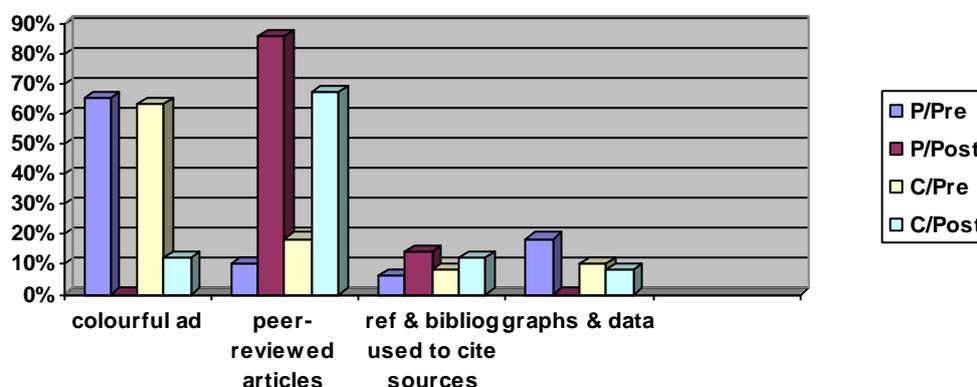
The pre-test indicated that both pre- and control groups did not have a clue what scholarly journals were. Of the four options from table 33 and figure 24 it is clear that in both the pre-group 33 (67.35%) and 34 (69.39%) of the control group selected the first answer that a scholarly journal is a colourful advertisement. They probably recognised the advertisements in magazines and selected it as the answer. For the pre-test only 4 (8.16%) of the pre-group and 6 (12.25%) of the control group selected the correct answer that characterized the scholarly journal. This result could be the result of the prior learning of information literacy skills education taught at school (Sayed, 1998: 76-77).

The post-test results of the pre-group 85.71% showed they identified the correct answer that a scholarly journal is peer-reviewed articles on a topic. Although seven students gave the incorrect answer, they selected option (c) which stated that in-text-referencing and bibliographies are used to cite sources. They did realise that referencing is important.

The results of the control group also showed a 67.34% correct answer. From table 33 it can be derived that from 6 (12.25%) to 33 (67.34%) control group students were able to identify the correct answer for a scholarly journal. Of noteworthy for question 5 (a) except for the 6 control group students of the 34, 28 realised that a scholarly journal is not a colourful advisement. But one can assume at the time of the post-test, many of the students realized that the journals they see or use in the library do not resemble the magazines they know. That the journals are different in that they did not see colourful advertisements in the journals or the journal articles they used. The students could also have attended the library's training which teach students the differences between books, magazines and journals.

In a context where the importance of critically assessing information is emphasized, it is important that students be familiar with this characteristic of the scholarly journal and that they be made aware that most other types of documents do not share it.

5.3.11 Finding journal articles

The purpose of the question was to test whether students understood the fact that journals contained peer-reviewed articles. The choice of an information source is related to knowledge of it when having to find certain types of documents.

Table 34   Finding journal articles

13. You are required to locate current peer-reviewed articles on a topic that was assigned to you in class. Which is the best option to find this information?		P/Pre	P/Post	C/Pre	C/Post
a). Popular magazines	#	7	0	8	6
	%	14.29	0.0	16.32	12.24
b). encyclopaedias	#	37	0	35	32
	%	75.51	0.0	71.43	65.31
c). journals	#	4	49	5	11
	%	8.16	100	10.21	22.45
d). newspapers	#	1	0	1	0
	%	2.04	0.0	2.04	0.0

The best answer was option (c) because the search tool that enabled one to search for current peer-reviewed articles was the journals and it is also the well-known characteristic of journals. The pre-test results showed only 4 students (8.16%) of the pre-group and 5 (10.21%) of the control group selected it.

Of the 98 students 67, of which 37 (75.51%) pre-group and 35 (71.43%) control group students selected encyclopaedias as the best tool. Although an encyclopaedia would supply background information on the topic, the source that supplied the current information (peer-reviewed articles) to write an academic assignment from the given options would be (c) journals. It was assumed due to prior experience (Sayed, 1998: 76-77) that students still relied on encyclopedias as the answer.

The pre-group's post-test results showed a 100% as they could distinguish between what a journal was and what a popular magazine was as their post-test results indicated a 0% for popular magazine. Again the time spent during the information literacy sessions proved to be successful as their results showed the significant difference. The students were compelled to use journals and become familiar with it. The pre-group students realized the importance of journals and as they experienced

during the program how much they had to use journals, while the control group's results remained the same. The incorrect answer in their post-test indicated that they did not know the difference between the scholarly journal and the popular magazine. Staying with the encyclopaedia answer to current peer-reviewed journals, these students will have difficulties in understanding the demand for current information for their assignments or tasks. Responses are recorded in table 34.

Figure 25   Finding journal articles
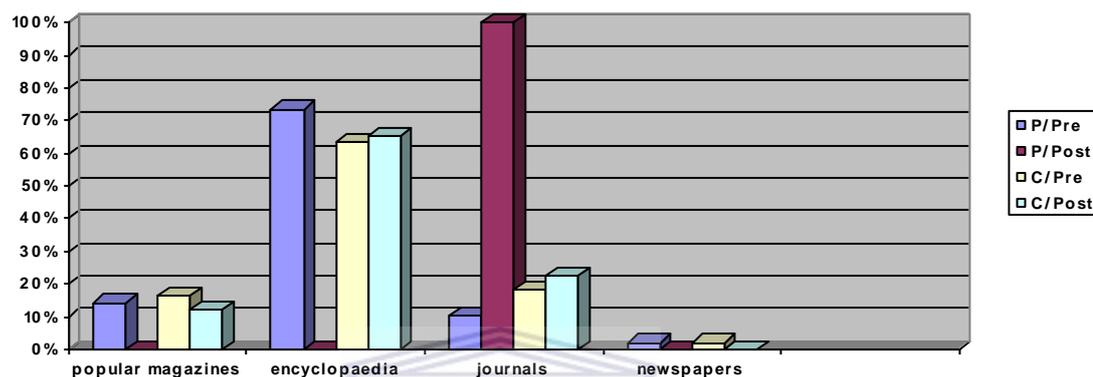
These results showed that very few students entering university were familiar with journals despite the fact that they would have to use them to find journal articles to complete their assignments. To be successful in their research, students need not only be familiar with journals, but also understand the characteristics of journal for finding journal articles. According to Knight (2002: 17) and Mitchell & Viles (2001: 314), students will rather use books as sources and not include the latest trends and developments in a discipline. Responses are recorded in figure 25.

5.3.12   Online Public Access Catalogue (OPAC) and resources

The purpose of this question was to determine, whether students knew how to use the library catalogue known as OPAC (Online Public Access Catalogue). It was also to find out whether students knew which information sources the on-line catalogue as a retrieval tool could retrieve and for what types of searches it could be used.

Table 35   Familiarizing with Online Public Access Catalogue (OPAC)

16. In order to become fairly familiar with a subject you know very little or nothing of, to find out which information sources the library holds you consult:		P/Pre	P/Post	C/Pre	C/Post
a). Journals	#	32	0	29	2
	%	65.31	0.0	59.18	4.08
b). a specialized database	#	1	0	2	6
	%	2.04	0.0	4.08	12.24
c). Online Public Access Catalogue (OPAC)	#	6	49	10	41
	%	12.24	100	20.41	83.68
d). I do not know	#	10	0	8	0
	%	20.41	0.0	16.33	0.0

As indicated in table 35 question 16 asked students which retrieval tool to consult to become familiar in their subject with the library's information sources, and the pre-test results of both pre- and post-groups showed that they did not know. Only sixteen (32.65%) students 12.24% of the pre-group and 20.41% of the control group recognized the correct answer was that the OPAC could be consulted. This result could have come from the Information literacy education taught at school. A total of 18 students of both the pre- (10) and control (8) groups indicated that they did not know. Sixty-one students of the pre- (32) and control (29) groups' results showed that they would use journals to become familiar with their subject.

Table 35 showed the confidence of the students of both the pre- (100%) and the control (83.68%) groups as reflected in the post-test results. Of the control group 31 students identified the library catalogue as the retrieval tool for the library holdings. This could be the result of students attending the UWC library OPAC training sessions; students beginning to use the OPAC; librarians enforcing students to use the OPAC and students themselves trying to find what are available in the library collection. Responses summarised in figure 26.

Figure 26   Familiarizing with Online Public Access Catalogue (OPAC)
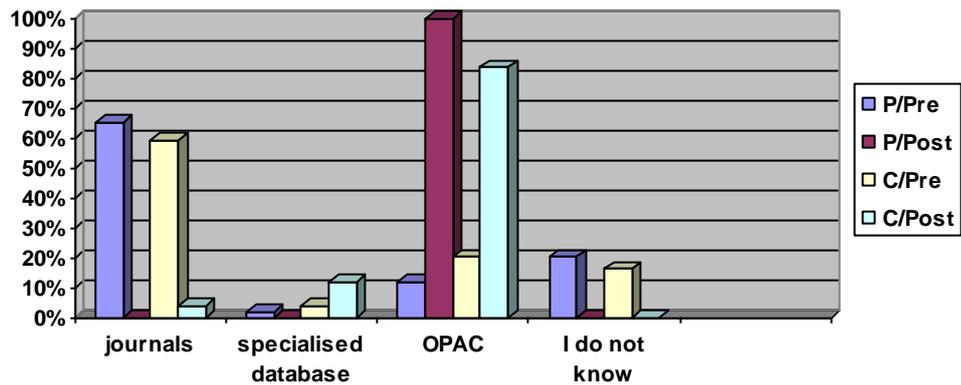
The purpose of question 18 in table 36, sought to evaluate students' knowledge of the library catalogue, specifically what kind of documents or information can be found using the catalogue and what is available in the library collection.

Table 36   Using Online Public Access Catalogue (OPAC)

18. Why should you consider the Online Public Access Catalogue (OPAC) a useful aid to your research project dealing with Hydrotherapy?		P/Pre	P/Post	C/Pre	C/Post
a). OPAC is useful if you travel to other universities in the area, but unfortunately I can't.	#	1	0	2	0
	%	2.04	0.0	4.08	0.0
b). Using OPAC, you can often locate research material which can target very specific topics in a particular discipline.	#	3	3	11	38
	%	6.12	6.12	22.45	77.55
c). OPAC generally finds information already available in the library's collection.	#	6	46	7	11
	%	12.24	93.88	14.29	22.45
d). I have never heard of OPAC.	#	39	0	29	0
	%	79.59	0.0	59.18	0.0

Figure 27   Using Online Public Access Catalogue (OPAC)
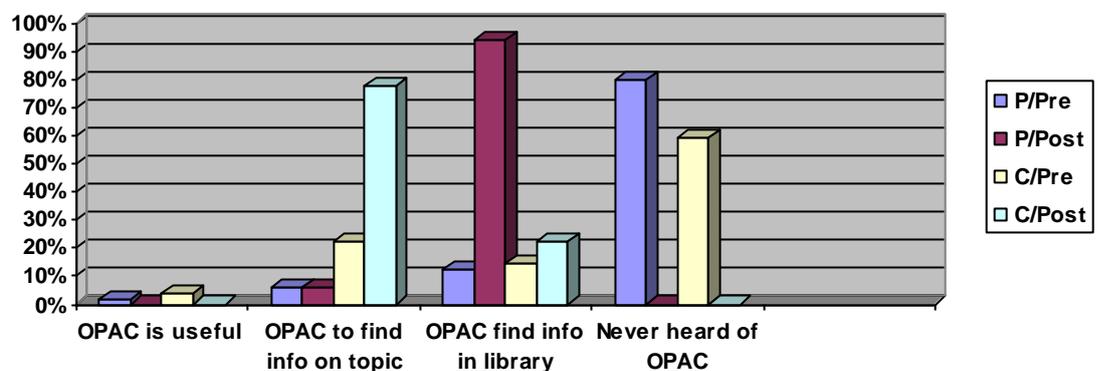
A better understanding of the structure and content of search tools would enable students to avoid wasting time and to be more efficient when searching. But the pre-test results of both the pre- and control groups in table 36 showed that poor information research skills indicated that many students failed to understand the library catalogue.

The pre-test showed of the 13 students, 6 (12.24%) of the pre-group and 7 (14.29%) of the control group students demonstrated a knowledge of what a catalogue contained. The fact that of 98 students 68 (62.24%) choose 'I don't know' was also noteworthy.

The catalogue is the search tool that enables library users to find documents available at their library, whether in print, audiovisual or electronic format. It is therefore essential that students have a good understanding of the content and use of this tool. With the post-test the pre-group's results (93.88%) demonstrated this understanding. But the control group's post-test resulted in a 22.45% showing that students do not understand the library's catalogue. Although the other 38 control group students selected (b) using OPAC can locate research material which can target specific topics in a particular discipline, they realised that the OPAC can find information on your topic in your discipline. Table 36 and figure 27 listed the responses.

Question 19 as indicated in table 37, looked at other types of resources available on the OPAC. Students should look at the catalogue record and be able to identify the type of document.

Table 37   Conference proceedings

19. Why should you consider conference proceedings a useful aid to your research paper dealing with Hydrotherapy?		P/Pre	P/Post	C/Pre	C/Post
a). Conference proceedings often present recent findings which can be valuable to research in a particular discipline.	#	0	49	0	0
	%	0.0	100.0	0.0	0.0
b). Conference proceedings are only useful if you can obtain them from other universities, but unfortunately we can't.	#	0	0	0	0
	%	0.0	0.0	0.0	0.0
c) Conference proceedings generally discuss information already researched in books, and so, are of little value.	#	0	0	0	0
	%	0.0	0.0	0.0	0.0
d). I have never had to use conference proceedings for research.	#	49	0	49	49
	%	100	0.0	100	100

Figure 28   Conference proceedings
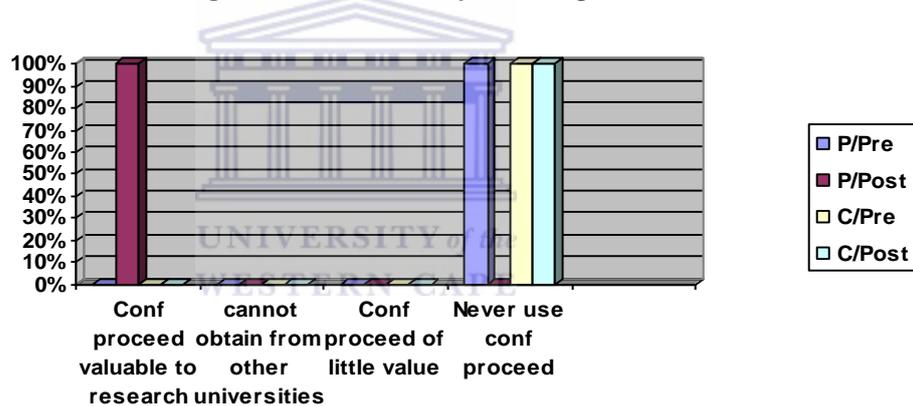
The results of question 19 were expected that it would show that not many of the students have heard about and seen conference proceedings. This argument is valid for most first year students irrespective of whether they understand what conference proceedings are or not. But the possibility that any-one might show they had an idea that information is available in different formats that could also supply information. Responses are listed in table 38 and summarised in figure 28.

The information literacy training session showed how important it was to expose students to the different types of documents in which information was related and relevant to their topic. The results of the pre-group showed the huge difference from 0% to 100% it made whilst the control group remained unchanged. The control

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group in their post-test still remained with the option of 'never use conference proceedings for research'.

5.3.13   Databases

The purpose of this question was to assess students' understanding of the different types of internet search tools. Since the use of the Internet as a source of information is on the rise, it is becoming increasingly important for students to distinguish between the various categories of web search tools and to understand the particularities and limitations of each. Students should be able to distinguish between search engines and databases.

Table 38   Databases

8. An electronic database:					
		P/Pre	P/Post	C/Pre	C/Post
a). Contains all information available on any given topic	#	26	0	13	10
	%	53.06	0.0	26.53	20.41
b). Contains only well-researched and accurate information	#	3	46	23	26
	%	6.12	93.88	46.94	53.06
c). Can be used as a starting point for research	#	14	3	10	11
	%	28.57	6.12	20.41	22.45
d). I don't know	#	6	0	3	2
	%	12.24	0.0	6.12	4.08

Question 8 required students to indicate what electronic databases are and the pre-test of the pre-group 6 (12.24%) students and 3 (6.12%) indicated that they did not know what an electronic database was and guessed the answer. The pre-group's results showed a difference from 3 students (6.12%) to 46 (93.88%) in their post-test of what a database was, though 3 students (6.12%) saw it as a starting point for research remained with that option. Only three students (6.12%) from 23 to 26 students improved in the control group who indicated that the electronic database contained well-researched and accurate information. It is worth noting that the control group selected the correct answer in their pre-test whether it was a guess or not, and that they stayed with the answer in their post-test and even improved with 6.12%.

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Figure 29   Databases
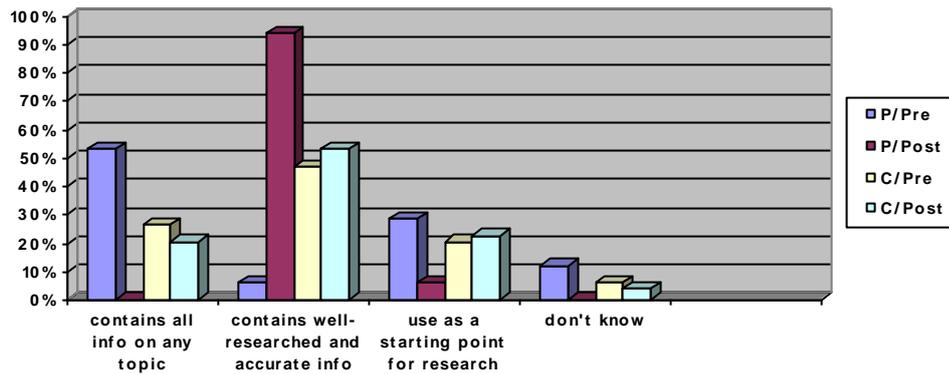
The students in the pre- and control groups were not familiar with UWC library databases except with Google. Question 17 as indicated in table 39, the majority of students (79.59% in the pre- and 83.67% in the control group) thought that the search engine Google would supply all their information needs. Only one (2.04%) and 2 (4.08%) students respectively in the pre- and control groups have chosen the correct answer which could have being a guess. Six (12.24%) students (4 from the pre-group and 2 from the control group) indicated that they are not familiar with any of the electronic databases or search engines. Responses are listed in table 39 and summarized in figure 30.

Table 39   Which database to use

17. Which of the following is a database containing only journal articles which you will use for your information needs?					
		P/Pre	P/Post	C/Pre	C/Post
a). Google	#	39	27	41	44
	%	79.59	55.10	83.67	89.80
b). Electronic encyclopaedia	#	5	0	4	2
	%	10.20	0.0	8.16	4.08
c). Ebscohost	#	1	22	2	3
	%	2.04	44.90	4.08	6.12
d). I am not familiar with any of these databases.	#	4	0	2	0
	%	8.16	0.0	4.08	0.0

Figure 30   Which databases to use
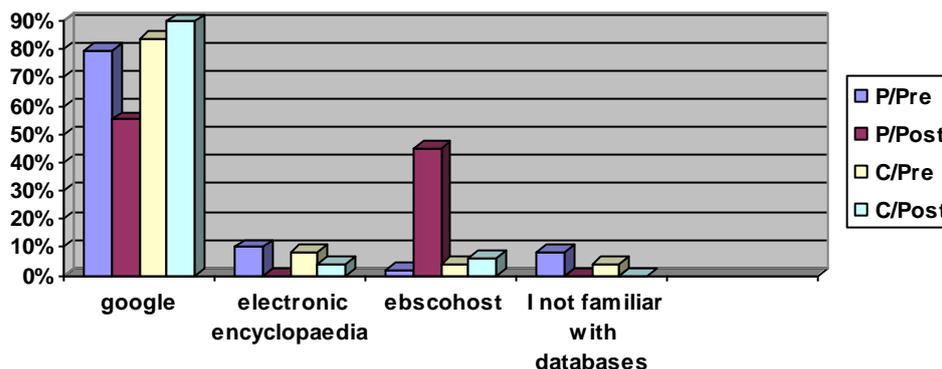
The control group still thought that Google was a better option (from 83.67% to 89.80%). The pre-group's pre-test result to use Google as a database was 79.59% and in their post-test it was down to 55.10%. After completing the information literacy training program the pre-group still thought that Google was easier or a quicker way to assess than the electronic database Ebscohost in finding information. Although the pre-group knew search engines are not appropriate tools for finding documents, Google as a search engines represented many students' first recourse or the alternative to find information. According to Seamans (2001) students prefer to use search engines to databases for their information needs and this is clearly illustrated in figure 30.

5.3.14   Evaluation of web information

The purpose of the question was to see if students knew which criteria to use to evaluate the quality of a web site. Today's students often look to the Internet to meet their information needs. Since the information on a web site is not always evaluated or checked before it is posted, it is imperative that students be made aware of the need to critically evaluate it.

Table 40 Evaluating web information

10. Which of the following is the most important criterion that you should use to evaluate information found on a web site?		P/Pre	P/Post	C/Pre	C/Post
a). Browser configuration	#	20	0	21	11
	%	40.82	0.0	42.86	22.45
b). File size	#	21	0	24	25
	%	42.86	0.0	48.98	51.02
c). Authority	#	3	49	2	4
	%	6.12	100	4.08	8.16
d). Bandwidth	#	5	0	2	9
	%	10.20	0.0	4.08	18.37

Figure 31 Evaluating web information
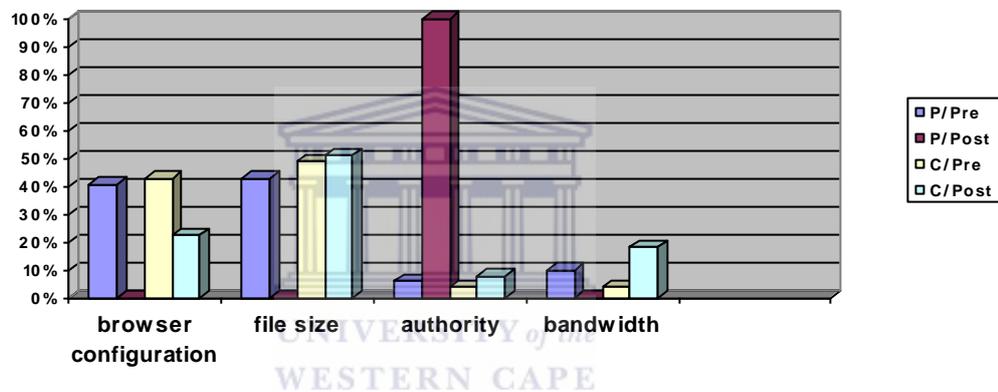
In table 40 question 10 required from students which criteria they would use to evaluate information found on a web site and among all the options, 3 (6.12%) of the pre-group and 2 (4.08%) of the control group selected what was considered to be the correct answer (c). The pre-test results showed that students did not know what was meant to evaluate the information on the web.

Although the pre-group had a 100% correct answer in their post-test, the control group (from 4.08% to 8.16%) still did not know how to evaluate information on the web. The control group's pre-and post-test results showed that students need guidance on evaluating the Internet information. Knowledge of how to evaluate a web site is essential for any user. The results obtained for this question indicated

that the concept of evaluation did not appear to be well understood by the control group.

This is as important as it formed part of referencing and plagiarism and because students' preference to use the electronic resources for most of their research. According to Albrecht (2001b: 27); Coupe (1993: 198); and Knight (2002: 18) undergraduate students lack the ability to evaluate and verify retrieved information from the Internet. As students believe all information from the Internet as true, they need guidance on the evaluation of Internet information. Therefore during the information literacy program a great deal of time was spent on evaluating information and electronic information sources.

5.3.15   Conclusion

To sum up, the post-test results of the questionnaire showed that the goals and objectives of the information literacy skills program were achieved. It was very time consuming, but the researcher knew from experience that its best to spend as much time as possible on search techniques, and questions 1, 2, 3, 4, 15 and 16 showed the significant improvement in the pre-groups' post-test results after the information literacy program. The control group remained the same.

Questions 5, 6, 8, 10, 12, 13, 17, 18 and 19 indicated that the pre-group significantly improved by knowing the major information sources, how to evaluate the reliability and significance of the information found relevant to their research. The results of the control group indicated that they will struggle doing their searching.

Questions 6, 7, 9, 11, 14 and 20 indicated how important continuous exercises on referencing and for different formats of information resources were. Initially both groups did not know much about referencing and just went with what was familiar to them. The results of the control group showed that students struggle with referencing. If they do not get enough guidance about referencing techniques, they would have serious difficulties. Plagiarism will continuously be committed.

The importance and seriousness of plagiarism was taught at the beginning of the program and continued throughout the program right up to the end. The pre-group

was on a continual basis faced with referencing. The results of the control group showed that students are struggling with referencing and need guidance otherwise the problem will become bigger.

5.4 Correlation

This section presents the results of the statistical analysis of the intervention under investigation. The *t-test* for the paired data (the McNemar Exact Test) was used to determine if there would be significant changes between the pre- and post-test scores. Each student's pre-test score was matched with his/her post-test score to form the pairs. Detailed responses are reflected in table 41 below:

Table 41   Values presented as count (present)

Variables	Pre-group				Control group			
	Pre-test correct answer		Post-test correct answer		Pre-test correct answer		Post-test correct answer	
searchstrategy	3	6.12%	46	93.88%	5	10.20%	11	22.44%
hydrokeyword	10	20.40%	49	100%	12	24.48%	13	26.53%
Truncation	12	24.49%	48	97.95%	9	18.37%	9	18.37%
Synonyms	13	26.53%	49	100.00%	10	20.81%	8	16.33%
scholarjnl	4	8.16%	42	85.71%	6	12.25%	33	67.34%
Bibliography	30	61.22%	49	100%	29	59.18%	31	61.26%
Bookcitation	39	79.59%	49	100%	37	75.51%	40	81.63%
electrodatabase	3	6.12%	46	93.88%	23	46.94%	26	53.06 %
jnlcitation	9	18.37%	49	100%	12	24.49%	15	30.61%
evalinfoweb	3	6.12%	49	100%	2	2.04 %	4	8.16%
referencing	5	10.20%	49	100%	7	14.29%	10	20.41%
consultbibliog	30	61.23%	49	100%	29	59.18 %	31	63.26%
peerreviewjnl	4	8.16%	49	100%	5	10.20%	11	22.45%
citingreference	5	10.20%	49	100%	7	14.29%	10	20.41 %
Opac	6	12.24%	49	100%	10	20.41 %	41	83.68 %
opacuse	6	12.24%	49	100%	10	20.41 %	41	83.68 %
usedatabase	1	2.04%	22	44.90%	2	4.08 %	3	6.12 %
usesearchstrategy	5	10.20%	49	100%	2 %	4.08%	2	4.08%
conference	0	0.0%	49	100%	0	0.0%	0	0.0%
imagewebcite	6	12.24%	47	95.92%	7	14.29%	8	16.33%

The results compared in table 41 showed that the control group remained the same. A significant improvement on variables: scholarjnl indicated a 6 912.25%) to 33 (67.34%); and opac and opacuse indicated a 10 (20.41%) to 41 (83.68%) improvement.

Table 42 McNemar Exact Test for the pre- and post-test of the Pre- and Control groups
Test Statistics[c]

	Pre-group			Control group		
	Chi-square[a]	Asymp.Sig.	Exact Sig (2-tailed)	Chi-square[a]	Asymp.Sig.	Exact Sig (2-tailed)
searchstrategy	41.023	.000				.031[b]
hydrokeyword	47.020	.000				.000[b]
Truncation	34.028	.000				1.000[b]
Synonyms			.000[b]			.500[b]
scholarjnl			.344[b]			.500[b]
Bibliography			.000[b]			.500[b]
Bookcitation			.002[b]			.031[b]
electrodatabase			.001[b]			.500[b]
jnlcitation	38.025	.000				.250[b]
evalinfoweb	44.022	.000				.500[b]
referencing	38.025	.000				.250[b]
consultbibliog	31.030	.000				1.000[b]
peerreviewjnl	43.022	.000				.008[b]
citingreference	42.023	.000				.250[b]
Opac	42.023	.000				1.000[b]
opacuse	41.023	.000		29.032	.000	
usedatabase			1.000[b]			1.000[b]
usesearchstrategy	38.025	.000				.125[b]
imagewebcite			.125[b]			.000[b]

a. Continuity Corrected

b. Binomial distributed used

c. McNemar Test

Table 42 reflected the test statistics of the McNemar Test for both the pre- and post-test of the pre- and control groups above.

Table 43 below reflects the pairing differences between the pre-test and post-test of the pre-group. This statistics indicate the information literacy programme effect at the post-test.

Table 43 McNemar Exact Test

Variables	Improved	Staythesame	Deteriorated	Significant
Searchstrategy	46	3	0	.000
Hydrokeyword	49	0	0	.000
Truncation	48	1	0	.000
Synonyms	49	0	0	.000
Scholarjnl	42	7	0	.344[b]
Bibliography	49	0	0	.000
Bookcitation	49	0	0	.000
Electrodatabase	46	3	0	.000
Jnlcitation	49	0	0	.000
Evalinfoweb	49	0	0	.000
Referencing	49	0	0	.000
Consultbibliog	49	0	0	.000
peerreviewjnl	49	0	0	.000
citingreference	49	0	0	.000
usesearchstrategy	49	0	0	.000
Opac	49	0	0	.000
Usedatabase	22	27	0	1.000[b]
opacuse	49	0	0	.000
Conference	49	0	0	.000
Imagewebcite	47	2	0	.125[b]

Data was summarized in the above table (43), calculating the total of respondents that improved, stayed the same, or deteriorated. The number improved were compared with the number deteriorated by means of the McNemar Exact Test. P<.000 (significant). Results displayed in table 43 indicated that all the variables (searchstrategy; hydrokeyword; Truncation; Synonyms; Bibliography; Bookcitation; electrodatabase; jnlcitation; evalinfoweb; referencing; consultbibliog; peerreviewjnl; citingreference; Opac; opacuse; and Opackeyword),   except 3 (scholarjnl; usedatabase and imagewebcite) yielded significant differences.

As reflected in table 43 the same 3 variables which showed no change made between the pre-test and the post-test that good deductions could be made. However, the variable usedatabase (question 17), showed that although students

knew of the databases, as indicated with the results of the variable electronicdatabase, they will still use Google as an alternative. Question 5 (scholarjnl) and especially question 20 (imagewebcite) showed significant differences between the pre-test and the post-test. It could be deduced that the 2 incorrect answers, still indicates that an image must be cited so that a good deduction could be made from it.

Thus it can be concluded that the students performed significantly better on the post-test than on the pre-test on these variables with the implication that there was a great improvement or change that the information literacy program made in the students.

5.5   Information literacy scores

5.5.1 Introduction

Based on the main research question of this study, the post-test contained 20 assessment outcomes:

•   8 for "students had to know the major information sources in research";

•   4 for "students must be able to evaluate the reliability and significance of information relevant"; and

•   8 for "students must be able to use appropriate attributes and citation formats for resources".

A correct answer was each worth 5 points for a maximum score of 100 points. A simple scale similar to typical grading standards worked best. Any score under 60 would be considered failing or not competent, a 60-79 score would be competent and 80-100 very competent (Table 1). The information literacy component accounted for 20% of the research term paper. This provided a means to evaluate the outcomes of the students' information literacy.

5.5.2   Information literacy scores of the Pre-group

The t-test for paired data (the McNemar Exact test) was used to determine if there would be significant changes between the two test scores. The average score of the pre-group was 20.61 and the control group 21.88. If 100 were considered the perfect score, it could be concluded that the information literacy score of the

students in the pre- and control groups could be rated as very low, although the control group was higher than the pre-group. See table 44 below.

Table 44   Information literacy score: Post- and Control groups

		Score for Pre-group	Score for Post-group
PRE-GROUP	Minimum	.00	60.00
	Maximum	75.00	85.00
	Median	15.00	75.00
	Percentile 25	10.00	75.00
	Percentile 75	25.00	75.00
	Average	20.61	74.80
	Standard deviation	17.78	3.22
CONTROL-GROUP	Minimum	.00	15.00
	Maximum	75.00	80.00
	Median	15.00	25.00
	Percentile 25	15.00	20.00
	Percentile 75	25.00	35.00
	Average	21.88	32.24
	Standard deviation	16.59	16.14

5.5.3 Information literacy scores of the Post-group

As summarized in table 44 above gave the results of the both post- and control groups' post scores. The average score of the post-group was 74.80 and the control group 32.24.   If 100 were considered the perfect score, it could be concluded that the information literacy score of post-group students 74.80 could be rated as significantly high. As the information literacy score ranged from 60 to 79 as 'competent' and 80-100 as 'very competent', and with their high score, the post-group could be rated both as 'competent'.

The low score of the control group 32.24 could be rated as very low, equal to a fail. As the information literacy score ranged from 0 to 59 as 'not competent' then the control-group could be rated as 'not competent'.

5.5.4 Comparison of information literacy scores.

It can be seen from figure 32 below that the minimum score of the control group was zero and therefore did not appear on the chart. The average information literacy scores of the pre- and control groups did not differ much (20.61 and 21.88). The average information literacy score of the control-group's post-test results was 32.24 which were very low. This indicated that the guidance given by the academics and the UWC library information literacy trainings was not enough to ensure information literate students. The average information literacy score of the pre-group showed significantly high (74.80). It is an indication that the students were more information literate after doing the information literacy skills education program than before they did it.

Thus it could be deducted from this results that a lack of formal structured information literacy training could influence students academic performance as a whole.

Figure 32   Information literacy scores
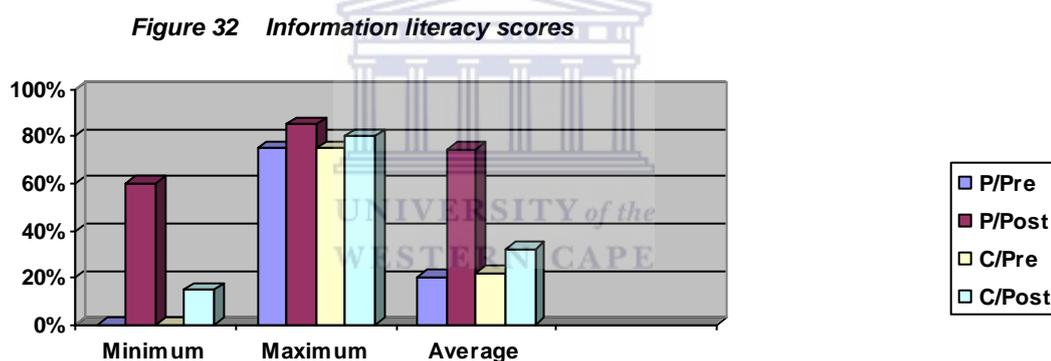
5.6 Lecturer's assessment

The lecturer's assessment was based on whether she has seen any improvement in the students' performance as a result of the information literacy training program and the collaborative partnership.

As an additional assessment, a questionnaire consisting of 13 questions was completed by the UWC Physiotherapy lecturer involved with the first year Physiotherapy students who were the pre-group or experimental group. She completed the questionnaire after marking the pre-group's research term papers and

assessed them. The questionnaire had some yes and no options; strongly disagree to strongly agree ranging from 1-5; and some open questions (Appendix C).

Questions 1 and 2 asked the lecturer whether she attended an information literacy session and found it effective to which she answered yes and scored it a strongly agree 4. Question 3 asked whether she would recommend that all first year students undergo information literacy training and why to which she answered positively and that it helps with referencing, finding appropriate literature, etc. Question 4 asked whether she experienced any differences in the first year students after attending the sessions and gave a score of strongly agree 5.

Question 5 asked to explain the skills acquired by the students and she answered to:

- Locating information: - *the students seemed to find the process easier.*
- Evaluating and selecting information: - *the students were able to select or analyse what was important and evaluate the positive or negatives in the information.*
- Critical thinking: - *this will develop over time but they could at least think about the information obtained and analyse it critically!*
- Plagiarism: - *referencing improved!*
- Bibliography present: - *yes (with a big right tick)!*
- Presentation: - *this was wonderful especially in terms of layout and use of diagrams and pictures etc.*

Question 6 asked whether it was evident after viewing the 'works cited' from students' papers that (a) students found appropriate information for their research topic ; and (b) that students understood the meaning of and appropriately used scholarly and popular information, to which she scored both answers a strongly agree 4. When comparing this to the pre-groups' post-test on scholarly journals, this also came through with their post-test results.

Question 7 asked the lecturer whether the librarian (the researcher) provided effective support to the students (the pre-group) and how, she responded yes and by being physically involved in their assignments and helping in their searches. She also selected a yes to question 8 that she integrated the information literacy program

into her course design and timing of assignments. For question 9 she scored a strongly agree 5 that the students would benefit from the information literacy program. She scored a strongly agree 5 to question 10 that students could transfer their new acquired information literacy skills to the rest of their courses.

Question 11 asked the lecturer what worked best and why to which she responded by having the information literacy training sessions and assignment at the same time. And question 12 asked what was the least effective of the information literacy program and what did not work, she responded with the answer – nothing!

Question 13 asked the lecturer what was the out-come of the term papers? She responded a very good. The research papers marks averaged from 65% to 75%. Even 80% and 90%'s. In the past the students would not achieve such high marks for their first assignment.

The researcher checked the scores with the students. Of their marks:
- 3 students got between 67% to 69%
- 33 students ranging between 70% - 89% and
- 3 students got between 92% - 94%

When the researcher and lecturer compared these scores on the Information literacy competency scale (table 1) it gave the whole group a "competent and very competent" result.

Information literacy competency scale	
80-100 points	Very competent
60-79 points	Competent
0-59 points	Not competent

The questionnaire concluded with suggestions or comments from the lecturer to which she positively responded to continue the information literacy program as it made a difference especially regarding referencing and plagiarism; writing and thinking skills.

To sum up, based on the main research question on how information literacy can be implemented through librarian-lecturer collaboration, the questionnaires covered sections related to the researcher's work based on the research sub-question 1 and the information literacy goals and objectives: that students must use and understand the use of information sources; to evaluate the reliability and significance of relevant information found and to use appropriate attribution and citation formats for print and electronic resources. This was reflected in the List of Information Tools used.

5.7   List of Information Tools used

The students were asked to submit a list of information tools used with their completed research term paper in order to evaluate their use of library resources.

This was to evaluate their use of the library OPAC, databases, resources, Internet, etc. The list provided an insight into the students' actual search strategy not usually available to the librarian and provided feedback on the use of resources in the library as well as the use of resources remotely. All the students indicted that they have used the library's OPAC to access print materials which included Physiotherapy and Medical specialised information. All the students used the Main Library as much as possible, its different formats of materials, databases on- and off-campus. The electronic resources that were helpful were those that were links from the UWC library homepage, the catalogue, databases, free Internet resources and new trial databases. Many students responded that the use of the library's databases, keywords, citations, abstracts, and indexes made a huge difference in finding information. This also gave a clear indication when comparing the sources used. It also became clear from the list of information tools, of all the sources used, the students had used a wide range and authoritative scope of print and online sources and Internet sites. This points to an on-going challenge in explaining the difference between library databases and Internet sites to students.

The students who scored 'very competent' described using a wide range of print and online resources.

5.8 Conclusion

This chapter has dealt with the analysis and interpretation of the data collected from the questionnaires completed by first year students from the CHS faculty. The data represent the results of this investigation derived from the two assessment tools used, namely the questionnaires and the research term project (and the additional List of Information Tools used).

The Information literacy questionnaire as a pre-test assessed the students' information seeking skills and behaviour and to assist the librarian in planning the information literacy program. It was also to be used in evaluating the outcomes of the information literacy component of the program by comparing the questionnaire to the information literacy competency score.

The pre-test results of the information literacy questionnaire indicated that both groups' of the students did not know how to do library research, and that they were unfamiliar with the university library and its resources.

The outcomes of the post-test evaluated the level of competency for each established information literacy goal. The post-test results also provided a means to evaluate the outcomes of the students' information literacy competencies as evidence in the written research term paper. It was based partly on an information literacy competency scale and outcomes keyed to the established information literacy goals. Students were very competent and competent in mastering goal one: know the major information sources in the research; goal 2: evaluate the reliability and significance of information found relevant to research; and goal 3: to use appropriate attributes and citation formats for print and electronic resources. This was answering the main research question.

Students also had to submit a List of Information Tools used with their completed research term paper in order to evaluate their use of the UWC library databases and resources and giving the librarian an insight to the students' actual search strategy and the use of library resources.

The higher scores obtained by the post-group students are an indication that the information literacy training had a positive impact on the levels of information literacy. The data also showed that the faculty guidance and the library initiatives did not help make the control group information literate compared to the pre-group who attended the information literacy program.

This chapter discussed the framework, relating the main research question in support of information literacy competency standards and to assess the information literacy outcomes. The librarian-lecturer collaborative framework offered a means to assess the students' information literacy competency, and to enhance the level of collaboration between the librarian and lecturer. Although grading was the responsibility of the lecturer, the librarian graded the information literacy component. The collaborative approach offered the librarian the opportunity of reading students' completed researched papers. This is an opportunity for the librarian to enhance course content, learning outcomes assessment and preparing students as life-long learners.

In chapter six the conclusions and recommendations will be discussed.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1   Introduction

This chapter contains a summary of the findings of the study on how information literacy can be implemented through librarian-lecturer collaboration. This chapter addresses the research question and sub-questions through a discussion of the findings reached through the data analysis.

Recommendations and suggestions for future research are made. The summary of the findings are based on chapter 5 which presented and interpreted the research data.

The aim of the study was to answer the following research question: how can information literacy be implemented through librarian-lecturer collaboration? In order to address this question, the following sub-questions were asked:

- What are the use and understanding of resources by students and their perceptions, as well as the expectations of the faculty regarding information literacy skills?
- What are the preferences of students and faculty regarding information literacy education?
- What does faculty considers to be important services that should be provided by the librarian?
- Did faculty see any improvement in library services as a result of the collaborative partnership?

6.2   Summary of the findings

This study provided an initial opportunity to establish information literacy goals and objectives in support of information literacy competency standards and to assess information literacy outcomes. The main aim is to increase the information literacy of students and to provide them the opportunity to find, evaluate, organize and to communicate accurately to others information about a specific topic.

6.3   Findings of the main research question

The main research question is "how information literacy can be implemented through librarian-lecturer collaboration?" The main findings are

The data collected, presented and analysed in chapter 5, the review of the literature presented in chapters 2 and 3, have all provided the study with a basis for making relevant recommendations that will enhance the implementation of information literacy through librarian-lecturer collaboration.

It showed that the development of the librarian-lecturer collaborative partnership offered a means to instruct students in information literacy, to assess the students' information literacy competency (from 65.00 to a significantly high 85.00), and to enhance the level of collaboration between librarian and lecturer. It enhanced the level of collaboration between the library and the classroom not only by integrating information literacy into the course, but also made the librarian a partner. This collaborative effort engaged the students right from the start in the information literacy process. While the lecturer focused on the traditional role of evaluating the students' knowledge of the course content, the lecturer and the librarian collaborated on assessing and scoring the student's information literacy competency (an average of 74.80) as evidenced in the completed term projects (ranging from 67% to 94%). The research term paper provided an opportunity to formally establish information literacy goals and objectives and a collaborative framework for integrating these objectives into the course.

The study provided answers to questions relating to how information literacy can be implemented through librarian-lecturer collaboration. In addition to the research term paper and to establish whether students mastered the information literacy skills (65.00 to 85.00), they had to submit a list of information tools used with their completed research term papers in order to evaluate their use and understanding of the library resources. The list ensured that the research sub-question 1 that students' understanding and using the information resources was achieved. The list also provided a glimpse at the students' actual search strategy which is not usually available to both the librarian and lecturer. It also provided feedback on the use of resources in the library. When comparing the sources used and the information

literacy competency scores, the students who listed the fewest information sources used received the 'lowest' information literacy scores (67%). The 'very competent' information literacy scores (80% – 94%) described using rich and authoritative range of print and electronic sources.

6.4   Findings of the main research sub-questions

Sub-question 1: What are the use and understanding of resources by students and their perceptions, as well as the expectations of the faculty regarding information literacy skills.

Findings with regard to empirical studies relating to the use and understanding of resources by students and their perceptions, as well as the expectations of the faculty regarding information literacy skills are that:

- Skills for interpreting a research task so that they could understand what evidence, both print and electronic, is needed to complete it successfully (search strategies 10.20% to 100%).
- Means of recognizing text types, such as scholarly versus popular writing, primary sources versus secondary sources, regardless of format (using OPAC 12.24% to 93.88%; finding journals articles 8.16% to 100%; databases 6.12% to 93.88%).
- Greater familiarity with research traditions in the discipline and current research tools (OPAC 12.24% to 100%).
- The ability to find information appropriate for a task by choosing relevant tools, selecting options, interpreting citations, and formulating their needs as they learn more on their topic (keywords 20.41% to 100%; boolean logic 26.53% to 100%).
- The ability to assess the authority of sources (evaluating web information 6.12% to 100%).
- An understanding of how to use evidence in their research, both in terms of how to write from sources and how to avoid plagiarism (plagiarism 10.20% to 100%).
- A clearer understanding of how knowledge is produced and the role of those who know (conference proceedings 0% to 100%).

- Attitudinal objectives students would appreciate that self-confidence in finding information increases with practise (search strategies 10.20% to 100%).
- The information search process is learned gradually over an extended period of time just as the content of any subject area is mastered.
- The information search process is an evolutionary process that transforms over the course of investigation as new information is acquired.

The expectations of the faculty regarding information literacy skills:
- Revised course offerings that intentionally involve students in learning research methods through thoughtful assignments and structured support activities (information literacy skills trainings).
- Greater familiarity with research tools, print and electronic, and how they might benefit the curriculum (search strategies 10.20% -100%).
- Tools for assessing students learning in the classroom and in writing assignments (information literacy scores ranging from 65.00 to 85.00; research term paper ranging from 67% to 94%).
- Closer working relationships with librarians in fostering student engagement in research.
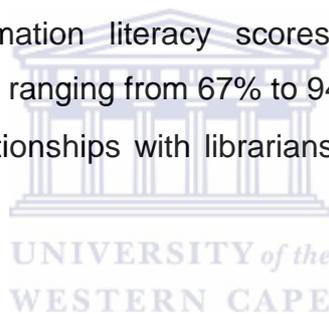
Sub-question 2 What are the preference of students and faculty regarding information literacy education?

The findings in relation to "what are the preference of students and faculty regarding information literacy education?" are that:

Making information available and accessible is not sufficient in itself. Students also need information-handling skills in order to be able to use it. High percentages were achieved in accessing books (100%); journals (100%); databases (100%) by using search strategies (100%); keywords (100%); Boolean logic (100%); bibliographies (100%) and the OPAC (100%). Students do not merely require information skills, but a knowledge of the discipline and the capability to handle complex information.

Whilst it would be true to say that the emphasis was originally on the information needs of academics and researchers, there is now a changeover to ensure that

students have access to a number of collections and resources which are of high quality and relevance to them during their studies. Students can become independent learners in many ways by accessing and using information, making choices, weighing evidence and coming to conclusions themselves (as seen in their research term papers marks ranging from 64% - 94%).

That collaboration between the library and the teaching faculty in the development of a context-specific library research instruction is highly advantageous to student learning. Information literacy instruction that is linked to course curriculum has the potential to maximize relevancy by creating a learning opportunity that enhances both discipline-specific and library-specific skills.

Sub-question 3   What does faculty considers to be important services that should be provided by the librarian**?**

Findings on "what does faculty considers to be important services that should be provided by the librarian?" are that:
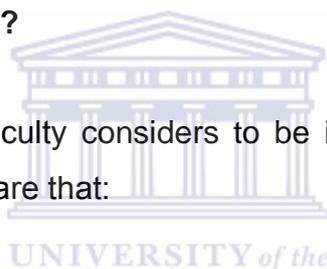
The librarian-lecturer collaborative framework served as the contract of understanding between the librarian and the lecturer. The faculty members consider information literacy skills to be a prerequisite for academic success. Faculty commitment to and involvement in the information literacy program is critical to the success of such programs, as they believe that librarians should have the responsibility to teach students how to use the library resources. Academics also recognised that their students were not fully utilising the vast amount of information available to help them make critical decisions in their practices. The librarian gave guidance to students 12.24% - 93.88% in search strategies; using the library catalogue 12.24% - 100%; plagiarism 10.20% - 100%; information resources regardless of format 6.12% - 100%. Librarians must work extensively with and have the cooperation of the faculty who teach these classes.

Undergraduates usually do not know enough about specific disciplines to choose a focused area of research and to develop a manageable research question. Because

of the collaboration, the librarian knows what the lecturer expects from the students, and it is the role of the librarian to assist students in developing the focus and to avoid students concentrating on the false focus (improving their search strategies 10.20% - 100%).

Librarians have the expertise in information and know how to teach information skills in the electronic information environment (both databases and evaluating web information 6.12% - 100%; and citing images 12.24% - 100%). Librarians have been involved in and supported resource-based learning for many years. Academics are in need of acquiring new skills to work with the electronic information environment and to integrate that into their teaching. Here librarians can help them accomplish that. Resource-based learning teaches students to assume responsibility for their own learning and to become independent and life-long learners. Librarians can work with faculty to implement resource-based learning in all disciplines. All stakeholders need to work together with their faculty and librarians to lead them in this important initiative to prepare students for life-long learning and information literacy.

Sub-question 4. Did faculty see any improvement in library services as a result of the collaborative partnership?

Findings on "did faculty see any improvement in library services as a result of the collaborative partnership?" are that:

The collaborative approach offered a unique opportunity to the researcher as librarian to read completed papers and to provide input into the scoring of papers, not traditionally available to librarians providing training to students. The collaborative approach offered an opportunity to the researcher in providing important services for enhancing course content, learning outcomes assessment, preparing students as life-long learners, and integrating the empirical data from the survey with the theoretical approaches of the earlier chapters. Certain findings were made which can be used as evidence to reach a conclusion for the study. These findings are:

- Prior to arriving at UWC, the majority of the CHS students (59.18%) owned their own computer and 93.88% was computer literate, 63.27% had school libraries, but 89.80% no information literacy trainings, 77.55% were members of the Public library and 63.27% used some of the library resources.

- The results of the pre-test indicated that the baseline information literacy levels of the first year CHS students were low (pre-group 20.61 and control group 21.88).

- The comparison of the pre-test and post-tests of the pre-group indicated that the information literacy training program had a positive impact on the students' information literacy scores. The average information literacy scores showed a 74.80 out of a score of 100. The maximum score was 85.00.

- With regard to the information literacy indicators (variables) evaluated in this study, although the number of variables in the study was limited, the results provided tangible proof and indicated that the need for information literacy training is very real (control group's information literacy score was 32.24).

- All the students used the Main Library as much as possible, its different formats of materials, databases on- and off-campus. They responded that the use of the library's databases, keywords, citations, abstracts, and indexes made a huge difference in finding information. This also gave a clear indication when comparing the sources used (67% for the lowest mark). It also became clear from the list of information tools, of all the sources used, the students had used a wide range and authoritative scope of print and online sources and Internet sites scored 70% up to 94%.

6.5   Recommendations

Based on the results discussed the following recommendations can be made:

- The findings presented in this research support the need for collaborative information literacy training and its assessment for the first year students. The Collaborative Information Literacy Model (CILM) provided an excellent means to enhance the level of collaboration between library and the classroom and a structured way to integrate information literacy in the first year students' curriculum and to assess learning outcomes. It also enhances the level of collaboration between the librarian and the lecturer. The framework of the model also provided an effective way to continuously improve instruction

methods. It builds on a strong level of collaboration and is student centered which aim to develop a framework that would assist to improve the skills and knowledge required in information literacy training.

- It proposes that the Collaborative Information Literacy Model (CILM) be implemented for successful information literacy through librarian-lecturer collaboration. Collaboration between academics and university librarians is necessary to ensure effective learning and the implementation of information literacy competencies and proficiencies, critical thinking and lifelong learning. It proved to be an effective model to teach incoming students at the UWC with their unique needs, cultural diversity, multilingualism and lack of information literacy competencies and experiences. The program succeeded in not only ensuring that the Physiotherapy students 1 become information literate, but that they also mastered the information literacy goals and objectives. It also resulted in them becoming effective library users and improved their assignment writing skills.

- The CILM could also articulate the role and responsibilities of the University's key contributors to the development of information literate graduates, and establish consultative mechanisms for the stakeholders.

- All first year or undergraduate students at the UWC must be supported to develop information literacy. The model developed in this study could be used in another faculty and if it provides the same results it can be used to integrate information literacy into the curriculum of the first year students of the UWC.

- The development of information literate students is a shared responsibility. Teaching and learning are undergoing major revisions and opportunities abound for librarians to collaborate with the academics in bringing about changes in the curriculum. Key partners in this collaborative partnership are the academics, the University library, Teaching and learning unit of UWC, the University executive and the students of the UWC. They could work together to integrate this information literacy program into the curriculum of the first year or undergraduate students.

- The researcher arranged an informal session with the pre-group after the completion of the program. She explained to them how their research term papers scored their information literacy scores of being "competent" and "very competent". Both the students and researcher discussed what their problems and difficulties were. Out of this discussion a request followed that they the students needed more exposure to in-depth reading and to improve their critical thinking. This request could be linked to the comment made by the lecturer in her questionnaire and the students' post-test results. Both the researcher and students agreed to that the following year the information literacy session will cover the request of in-depth reading and critical thinking skills when they will be doing their research term paper. There should be continuous training.

- There existed a few difficulties. The attitude towards information literacy; students confusing information literacy with library education; lecturers confused with information literacy themselves; courses not always problem-based; and databases in English. But there are coping measures as well. Collaboration; teach the teacher (librarian teach the lecturer information literacy); train the trainer (lecturer train the librarian how to teach and assess); continuous feedback from the lecturers to the librarians.

- The challenges are bigger for the librarians, but again the coping measures are having discussions and reading around the information literacy topic; teaching together; evaluating each other as teachers with the assistance of the academic; use the feedbacks from the students and lecturers; and keep up to date with new developments namely, the rapid dissemination of information, software tools and the new challenging devices and benchmark. To be successful, librarians need to be alert, creative and informed about what is happening on UWC campus.

- Librarians are in a unique position to become partners with the faculty in curriculum development and achieving resources-based learning for students. To achieve this role, the librarian needs to break out of their traditional ways and become innovators in their interaction with their faculty, serve on the Faculty academic development committee. Resources-based learning

involves active learning where students utilize a variety of information resources to solve problems. Librarians are qualified to partner with the faculty to provide the resource expertise and their uses. Teaching information skills will be the expertise which librarians bring to the partnership. They teach students in finding, evaluating, organising and applying information to problem solving.

- Finally, the UWC library does offer library information literacy trainings, this practice must be continued but there is room for improvement. The faculty librarians generally find that the time allotted during courses for information literacy training is insufficient and that the training provided is fragmented and partial. Students do not obtain a complete picture of the research process. While the questionnaire dealt with a limited number of bibliographic research skills, it is clear that information literacy competencies go beyond this in that the survival of individuals and organizations now depends on their ability to use information effectively.

6.6   Suggestions for further research

The rise of information literacy training / instruction as a strategic direction for libraries, require librarians to act as teachers as well. To be part of a collaborative partnership, they have the responsibility to effectively articulate a vision and systematic plan for instruction that will affect students' perceptions and performance during information literacy sessions.

As this study is centered on the collaborative partnership of all stakeholders involved in information literacy training, further research is needed to help redefine the role of the instruction librarian in the information literacy training and as a teacher.

6.7   Conclusion

The study achieved its main research question and sub-questions of successful information literacy through librarian-lecturer collaboration. Several recommendations on how to implement a model such as the proposed Collaborative Information Literacy model were made. Recommendations have also been made on areas that require further research.

Information literacy skills play an important role in academic achievement and lifelong learning and it has an impact on academic achievement, as well as personal and professional development.

This study gained insight into the manner in and extent to which information literacy would be instrumental in enhancing the students' academic performance. As a means of determining the effect of information literacy, it started with the goals that the information literacy program will result in a change in the academic development and information literacy skills of the students. The pre-test proved that the CHS first year students' information literacy competencies were very low. The control group proved that limited guidance from the academics and the UWC library information literacy initiatives together did not guarantee information literate students. The post-group proved that the information literacy training program within the collaborative partnership improved the academic development and information literacy skills of the students. One may conclude that the critical variable information literacy skills had a meaningful effect on the students, that information literacy has the potential of exercising a beneficial influence in the academic make-up of the student.

In summary, the study's conclusion is that this investigation provided an opportunity to establish information literacy goals and objectives in support of information literacy competency standards and to assess information literacy outcomes. The development of the Collaborative Information Literacy Model (CILM) offered a means to instruct students in information literacy, to assess each group's information literacy competency, and to enhance the level of collaboration between librarian and lecturer.

How can this collaboration be successful? The findings presented in this investigation support the need for information literacy education and its assessment for new incoming UWC students. The collaborative framework provided an excellent means to enhance the level of collaboration between the library and the classroom, and a structured way to integrate information literacy into the first year UWC student curriculum and to assess learning outcomes. In addition, the CILM framework

provides an effective way to continuously improve instruction methods. So the CILM can be successfully implemented at UWC or at a tertiary institution when needed.

As Ernest Boyer (1987: 173) points out, "the challenge is not only to teach students how to use the new technology but also to encourage them to ask when and why it should be used".

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APPENDIX A

LETTER OF PERMISSION FOR RESEARCH

Dear Professor
Physiotherapy/Occupational Therapy Department
UWC

REQUEST TO CONDUCT RESEARCH INTO INFORMATION LITERACY SKILLS
TEACHING

I am a Doctoral student in the Department of Library and Information Science at
UWC and I am conducting research on Information Literacy Skills of first year
Students at UWC. The title of the dissertation is: *Successful information literacy
through librarian-lecturer collaboration*. The study is being conducted under Prof. G
Fredericks, Department of Library and Information Science (presently Acting Dean of
Arts Faculty).

I would like this investigation to take place in your department, Physiotherapy, and
with your first year students. I realise that there are many demands on your time, but
I hope you and your staff will assist in this study. I would appreciate it if you would
permit me the time to explain the research.

Thanking you in anticipation

Yours sincerely

Lilian Mitchell-Kamalie