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**EVALUATION OF AN INFORMATION LITERACY INTERVENTION OF
NURSING STUDENTS AT FOUR UNIVERSITIES OF TECHNOLOGY IN
SOUTH AFRICA**



**A minor dissertation submitted in partial fulfilment of the requirements
of the Degree of Master of Library and Information Science (MBibI)
Department of Library and Information Studies
University of Cape Town**

2012

**EVALUATION OF AN INFORMATION LITERACY INTERVENTION OF
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SOUTH AFRICA**

BY

**SELLO BOREPHE
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FOR

**A minor dissertation submitted in partial fulfilment of the requirements
of the Degree of Master of Library and Information Science (MBibI)
Department of Library and Information Studies
University of Cape Town**

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CO-SUPERVISOR: Assoc. Prof. Karin de Jager

IN

2012

PLAGIARISM DECLARATION

I know that plagiarism is not acceptable. I have used the augmented Harvard convention for citation and referencing. Each significant contribution to, and quotation in, this work, from works of other people has been attributed, and has been cited and referenced. This minor-dissertation is my own work. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

Sello Borephe

Date of Submission

University of Cape Town

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DEDICATION

I would like to dedicate this thesis to my late Parents, Mohlouoa Joseph and Maserame Emily Borephe who encouraged me to obtain excellent education as far as possible.

University of Cape Town

ABSTRACT

The delivery of high quality patient care and the preparation for lifelong learning requires that nursing students be afforded the opportunity to develop their information literacy (IL) skills. This study explored the IL skills offered to nursing students by the Universities of Technology (UoT) in South Africa. The objective of the study was to assess the effectiveness of an IL intervention for nursing students at four UoT. In South Africa, IL is recognised in higher education as one of the critical outcomes of a qualification. It covers the lifelong competencies of finding, locating, and using information to find solutions to daily problems, to enhance decision-making and to improve the creation of knowledge. The history of IL within academic libraries indicates its evolution from bibliographic instruction, user education and now IL. Most academic libraries in South Africa have placed it high in their strategic plans.

In South Africa there is little information on the evaluation of IL interventions for nurses. This study endeavours to investigate the effectiveness of IL intervention for nursing students undertaken by UoT in South Africa. It moves away from subjective evaluation methods in order to establish the extent to which nursing students have benefited from the intervention. The evaluation is learner-centred, and will inform the librarians concerned about the effectiveness of IL intervention. The American College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education were used to evaluate IL intervention at the four UoT that offer Nursing. These UoT are: Vaal University of Technology (VUT), Tshwane University of Technology (TUT), Durban University of Technology (DUT) and Cape Peninsula University of Technology (CPUT). The study used a questionnaire to assess students' IL after their training sessions. The findings suggest that the IL interventions were effective, but that attention should be paid to their integration into curriculum. The study provided an insight into how IL interventions should be improved and offered within UoT. It recommends that IL interventions should be credit-bearing.

ACRONYMS AND ABBREVIATIONS

ACRL	Association of College and Research Libraries
ALA	American Library Association
ANZIL	Australian and New Zealand Institute for Information Literacy
B-TECH	Baccalaureus Technologiae
CPUT	Cape Peninsula University of Technology
CINAHL	Cumulative Index of Nursing and Allied Health Literature
DUT	Durban University of Technology
IFLA	International Federation of Library Associations and Institutes
IL	Information literacy
LIASA	Library and Information Association of South Africa
LILAC	Librarians' Information Literacy Annual Conference
MEDLINE	United States National Library of Medicine's bibliographic database
OPAC	Online Public Access Catalogue
SAQA	South African Qualification Authority
SCONUL	Society of College, National and University Libraries
SPSS	Statistical Package for the Social Sciences
TUT	Tshwane University of Technology
UoT	Universities of Technology
VUT	Vaal University of Technology

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CHAPTER 1: BACKGROUND OF THE RESEARCH STUDY

1.1 Introduction

In today's competitive global environment of rapidly changing health care and information and communication technology (ICT), nurses require a broad range of skills sets. Among the fundamental skills required of all health professionals in this environment is information literacy (IL). IL has often been defined, but Owusu-Ansah (2003:222) has suggested calling a halt to defining the term and just getting on with the business of offering IL. The most generally accepted definition of IL is that of the American Library Association in 1989. IL is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (Campbell, 2004:1). IL also is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. For decades, academics and librarians have discussed a variety of literacies: print, visual, computational, cultural, computer, scientific and their importance in every student's education. Each of the literacies prescribes a process by which the student can easily negotiate the content unique to a particular area of study. IL, on the other hand, in academic libraries is seen as a potential tool of empowerment for all students, reached through a "resource-based" learning approach, which requires them to:

- ✓ recognize a need for information;
- ✓ identify and locate appropriate information sources;
- ✓ know how to gain access to the information contained in those sources;
- ✓ evaluate the quality of information obtained;
- ✓ organize the information; and
- ✓ use the information effectively. (Doyle, 1992:2)

For registered and working nurses returning to a university setting to study for a further qualification, becoming information literate is one of many challenges they face.

The purpose of the study is to evaluate the effectiveness of the IL interventions at four Universities of Technology (UoT) that are offered to postgraduate nursing students. The challenge is to determine whether the interventions can equip them with the knowledge and skills necessary for them to be information literate in global environment.

1.2 Information literacy in Higher Education

In the 21st century, with the rapid proliferation and increasing usage of digital information and the Internet, IL training has become even more significant for personal, as well as professional development and growth. This is relevant especially in the health-related fields, in which up-to-date and accurate information is essential to healthcare, health promotion and prevention, and health research. The promotion of IL has gained momentum in recent years, particularly in the health fields (Saranto and Hovenga, 2004:507).

In the digital information era, information and knowledge have become the most important assets to the society. To be able to function properly in a society that is oriented towards information and communication technologies (ICT), people need to become more information literate (Boekhorst and Britz, 2004:63). It is acknowledged that IL has become important in library training and education. The recent developments in ICT have made it easier for individuals to access information anywhere in different formats. The availability of the Internet and other electronic and digital resources enables people to use more methods and sources, to satisfy their information needs. However, this all implies a new set of skills for using and applying information, which have been encapsulated in the concept information literacy. In 1989, the American Library Association published the milestone *Presidential Report on information literacy* (American Library Association, 1989:2). The report put more emphasis on teaching and learning in higher education, and the growing emphasis on accountability for student success and engagement.

Although current students at various institutions of higher learning may have acquired the skills to send electronic mail, chat, sms, and download music, many have not learned how to effectively locate information, evaluate, synthesize, and integrate ideas and use information legally. Moreover, academics want to see an improvement in the quality of students' work, and students want to become more confident in their ability to complete assignments, carry out research projects, and become active, independent learners.

IL is emerging as one of the most critical literacies for researchers who will be living and working in the twenty-first century (Farmer, 1992:103; Bruce, 2002). Teaching students the critical thinking skills of how to identify, locate, access, and evaluate information is essential to scholarly learning in the digital information age. The new academic library will be a teaching library, and for librarians, teaching has become a fundamental responsibility. To fulfil the mission, librarians first need to develop a basic understanding of contemporary learning theories and become effective teachers in the new learning process.

Instruction in IL can be accomplished in various ways in higher education. It can be via IL courses, online tutorials, workbooks or course-integrated instruction, any of which can be either elective or required (Germain, Jacobsen, and Kaczor, 2000:66; Rice, 1986). Whatever the vehicle, IL efforts need to be embraced not only by the librarians, but also by academics (Spitzer, 1998:190).

Evaluation of library instructional programmes and student assessment is one of the most important components in pedagogy. The teaching of IL at higher education also needs to undergo assessment and evaluation. The purpose of the evaluation is to determine the extent of student development of IL skills, changes in student confidence levels in searching for information and to obtain data on students' IL skills.

The literature indicates that, while there are many examples of excellent evaluation of IL interventions documented, there is a continuous struggle to evaluate the effectiveness of such interventions (Ivey, 2003:111). According to Rockman (2003:613), a comprehensive evaluation of the effectiveness of IL instruction is a big and time consuming task, and difficult to separate from the overall outcomes of undergraduate education (Iannuzzi, 1999:304). Forms of evaluating student learning in IL programmes include quantitative and qualitative approaches, practical demonstrations and embedded assessment tasks that test learning in a discipline/class context (Rockman, 2003:613).

Any attempt to assess meaningful transfer of skills learnt in IL interventions requires the design, jointly by librarians and academic staff, of assessment that seeks evidence of the use of IL skills in the context of the classroom. Such assessment can include production of bibliographies and student assignments requiring research (Iannuzzi, 1999:112).

1.3 Research problem statement

Cadmus *et al.* (2008: 495); Koehn and Lehman (2008:210); Pravikoff, Tanner and Pierce., (2005:42) maintain that nurses lack necessary skills to be able to apply research to practice and also to participate in lifelong learning. This lack of skill is often attributed to insufficient attention being paid to developing IL in nursing education (Jacobsen and Andenæs, 2011:898). A systematic review by Hart (2008:323) of the informatics proficiency of the US nursing force endorses these findings. A national survey of the Swedish nursing population by Forsman *et al.* (2010:879) showed that the majority of newly qualified nurses did not use research findings to any great extent during the first two years of their professional careers. The study by Forsman *et al.* (2010:879) corroborates other research findings concerning the gap between nursing education and nursing practice with regards to the importance of research skills application.

The learning objective of an IL training course is to develop student skills in locating, evaluating and applying information for use in critical thinking and problem solving.

This study is focused on the IL intervention of the nursing students at four UoT: i.e. Vaal University of Technology (VUT); Tshwane University of Technology (TUT); Durban University of Technology (DUT) and Cape Peninsula University of Technology (CPUT). All the interventions were based on IL as key strategic planning outcomes of the libraries at all these institutions. The problem statement is:

Is IL intervention in the nursing programmes at four Universities of Technology (UoT) in South Africa effective?

The literature review in chapter two, has shown that students are entering UoT and Higher Education Institutions (HEIs) environments without fundamental research and IL skills (for example, the ability to formulate a research question, then efficiently and effectively find, evaluate, synthesize, and ethically use information pertaining to that question). South African Higher Education librarians are now adopting IL as a new field of activity, one appropriate for re-profiling the library as a pedagogical institution, and for mediating new competencies indispensable for a life in the knowledge economy and digital information society.

1.4 Research questions

The following research questions were formulated for this study:

- ✓ How effective is the information literacy intervention of nursing students at the four UoT offering nursing education?
- ✓ How much did the nursing students learn?

1.5 Aims and objectives of the study

The purpose of the study was to assess and evaluate the current information literacy intervention provided by training librarians to nursing students at four UoT in South Africa. The objectives of the study are the following:

Primary objectives:

- ✓ to evaluate the effectiveness of the information literacy intervention for nursing student at four UoT.

Secondary objectives:

- ✓ to determine whether the information literacy interventions have an effect on the confidence of nursing students
- ✓ to determine whether the information literacy interventions have made nursing students information literate

1.6 Significance of the study

In this study, IL is approached from the pedagogical perspective, essentially because this study is an exploration of the nature and effectiveness of the IL training offered to nursing students at four UoT in South Africa. Evaluation of instruction and IL interventions is a key component in determining the value of programmes, activities, and techniques within the educational process and to determine areas needing attention. University administrators are demanding justification for programmes through cost-benefit analyses of programmes and activities and requiring evidence of successful learning outcomes. Training librarians could use the data from these evaluations to improve their instruction programmes and to convince academics of the value of IL.

The principal aim of the study is to make a contribution in the area of IL education and training in South African Higher Education Institutions.

The ultimate benefit of the study is to highlight key considerations for programme design and delivery and to offer some practical suggestions for improving overall IL intervention effectiveness. In this respect, this study is expected to be of interest to both a national and an international audience which includes academics, researchers, and scholars in the field of IL. In addition, the implications of the empirical work will be of particular interest to policy makers within higher education institutions in South Africa and those involved in IL education and training.

1.7 DEFINITION OF CONCEPTS

1.7.1 Information literacy:

Several authors have defined “information literacy” (Bruce 1992; Weaver 1993:30; Fox, Richter and White, 1996; Cheek and Doskatsch 1998:243), many derived from that provided by the American Library Association (ALA): to be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information (American Library Association. Presidential Report on Information Literacy, 1989:1).

1.7.2 Health information literacy

Health information literacy (HIL) encompasses the set of abilities to recognize an information need, identify likely information sources and use them to retrieve relevant information, assess the quality of the information and its applicability to a specific situation, and analyse, understand, and use the information to make good health decisions (Rambo, 2004:11).

1.7.3 Programme evaluation research

“This is a means of supplying valid and reliable evidence regarding the operation of social programs or clinical practices, how they are planned, how they operate, and how effectively they achieve their goals” (Monette, Sullivan and De Jong, 1990:313). Mark (1996:230) concurs that programme evaluation is “a type of research that uses established social science research methods to evaluate the success or effect of a social service program”.

Programme evaluation research provides those with an interest in a social programme with information regarding intervention, the effectiveness of the programme, its efficiency, whether goals are met and information regarding what has led a programme to a success or failure (Mamburu, 2004:253).

1.8 Structure of the study

The study is composed of six chapters. Chapter 1 provides the background of the research study and the research methodology approach. It states the research objectives and the problem statement. Terminology used is defined including the scope of the study. Chapter 2 provides the literature view on IL assessment and evaluation of IL programmes. Chapter 3 deals with research design, the research instrument, sample population and sampling method, while Chapter 4 discusses data analysis and research findings of the study. Significant conclusions arise from the findings. Chapter 5 is the report of the findings and conclusions.

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CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the literature on the key themes of the study. It places IL programmes for nursing students in the context of IL as a whole by discussing IL in academic libraries, IL standards and their link to health IL. A literature review was done to determine:

- ✓ the nature and role of IL in university settings
- ✓ what research has been carried out with regard to the evaluation of information literacy programmes?
- ✓ what research has been carried out to determine the effectiveness of information literacy offered to nursing students?
- ✓ what work has been done on assessing and evaluating information literacy?

Information literacy concept

The concept of IL has existed, in some form, since Paul Zurkowski's 1974 paper, "The Information Service Environment: Relationships and Priorities" in which the author proposed means of achieving "universal" IL in the United States by 1984. Possibly encouraged by Zurkowski, the American Library Association (ALA) appointed a *Presidential Committee on Information Literacy* in 1987, charged to: "define information literacy within the higher literacies and its importance to student performance, lifelong learning, and active citizenship; to design one or more models for IL development appropriate to formal and informal learning environments throughout people's lifetimes; and to determine implications for the continuing education and development of teachers" (American Library Association, 1989:2).

The concept is defined differently by different researchers. Related terms such as information fluency, computer literacy, library literacy, media literacy, network or Internet literacy and digital (information) literacy have been created to emphasise different aspects of the phenomenon (Webber and Johnston, 2000:382; Bawden, 2001:219).

Empirical studies in IL have been conducted in educational contexts in order to obtain knowledge of the challenges and issues crucial in planning and enhancing IL. Academic libraries have played an important role in IL developments in South Africa.

In "Analysis of Instructional Environments," the Association of College and Research Libraries (ACRL) emphasized the need for libraries and librarians to be flexible and adaptable in order to meet and respond to changes adequately. The online report did not offer specific visions or possibilities for the future. Instead, it laid out a framework for institutions to follow in planning and preparing for the future (ACRL, 2008:2). A growing trend is to integrate IL skills into courses, or to design a separate course (Herron and Griner, 2000:12; Higgins and Face, 1998:17; Hollister, 2005:104; Johnston and Webber, 2003:335; Scales and Lindsay, 2005:514; O'Hanlon, 2007:169; Sharkey, 2006:71). In addition, Andretta (2005:181) states specifically that IL is a prerequisite and plays a crucial role within any e-learning initiative. Recently there has also been a rise in online IL Tutorials integrated in the curriculum (Hegarty, Quinton and Lynch, 2004:442; Merrill, Sebek and Erskine, 2005:24; Skov and Skoerbak, 2003:512). Many examples of IL programmes can be found on university web sites (Bianco, 2005:2; Correia and Teixeira, 2003:311; Hadengue, 2004:396; Hegarty, Quinton and Lynch., 2004:442). A great deal of the relevant literature pinpoints the need of a pedagogic framework for delivering effective IL programs (Arnold, 1998:2; Carder, Willingham and Bibb, 2001:181; Cooney and Hiris, 2003:213; Dennis, 2001:122; Doherty, Hansen and Kaya, 1999:1; Leadley, 1998:103; MacDonald, Rathemacher and Burkhardt, 2000:240).

The practice of nursing has been affected by the exponential growth in the amount and complexity of information in recent years. Verhey (1999:252) posits that information available to the nursing practice doubles every five years. Efforts to organize the practice of nursing around the efficient and effective use of information relevant to health profession have been supported by health librarians.

Wallace, *et al.* (1999:137) agree that the “evidence-based practice” approach in the health professions encourages research within the health-care practice and requires nurses to have skills to access, appreciate and apply pertinent research findings to their daily tasks. Information literacy standards clearly stipulate the outcomes expected from students. To sustain that competence in theory and practice throughout a nursing profession, it is argued that a nursing graduate must be able to “recognise, solve information problems and learn from information resources” (Bruce and Candy, 1995:1) and that all IL training needs to maintain, build on and expand IL skills.

The application of IL competencies is a foundation for critical thinking in nursing (Verhey, 1999: 252). Evidence-based practice in nursing education emphasises the need to ensure that students can independently identify and satisfy their information needs, finding information necessary for professional practice and evaluate information effectively throughout their practice (Snaveley and Cooper, 1997: 9).

2.2 Information literacy in academic libraries

Academic libraries are continuing to play an important role in IL developments globally. IL initiatives in higher education have taken a variety of forms: stand-alone courses or classes, Web-based Tutorials, course-related instruction, or course-integrated instruction. Literature studies have addressed the future of academic libraries as outlined in the following paragraph.

In 2005, Feret and Marcinek recreated a 1995 Delphi study to envision the future of academic libraries for the year 2015. Study participants predicted that “the role of the library in teaching and education will remain at the present relatively high level” (Feret and Marcinek, 2005:38). Reyes cited two major causes of pressure to create new modes of instruction: decreases in funding and changes in student expectation in terms of increased, instantaneous access and more interactive learning (Reyes, 2006:302).

She predicted that instruction librarians will need to offer more sophisticated instruction to meet the needs of new generations of students and that lack of staff and time will make direct instruction ineffective. Instead, Reyes foresaw librarians providing assistance to faculty in designing and implementing programmes that effectively incorporate IL principles. Librarians must consider better use of the virtual learning environment instead of continuing with traditional instruction (Reyes, 2006:302). Researchers are exploring the perceptions and practices of teaching with respect to the development of IL skills (Shorten, Wallace, and Crookes, 2001:86; De Jager and Nassimbeni, 2002:173; Bundy, 2004:7; Orr, Appleton, and Wallace, 2001:459).

These researchers have shown that the majority of faculty believe that librarians should have the responsibility for teaching IL skills and that cooperation with faculty will give better results (Amstutz and Whitson, 1997:21; Boff and Johnson, 2002:278; Canon, 1994:525; Cooney and Hiris, 2003:213; Julien, 1998:305; Korobili and Tilikidou, 2005:522; Maynard, 1990:67; Cunningham and Lanning, 2002:344). "By definition, integrated IL programs must involve effective collaboration between faculty and librarians. Training librarians must therefore, also be active library liaisons to the faculty they work with" (Hollister, 2005:104).

Changing user profile

According to Griesel and Parker (2009:2), there has been a dramatic shift in student population in South African Higher Education Institutions. These shifts are reflected in a growing ethnic mix and in international students from all parts of the world.

Students come to Higher Education with diverse experiences, motivations, learning styles, educational demands and financial situations (Wilson, 2004:339). Technological changes are occurring rapidly at an uncontrollable pace. As a result, students entering universities or higher education institutions (HEIs) are bringing very disparate computer skills and attitudes to technology (Dupuis, 1997:93).

Some students are reluctant to embrace new technologies because they have not used them during their school days; others demand electronic resources for all assignments because they have been exposed to these technologies from their school days. These students who were exposed to these technologies, when they get to Universities as undergraduates the Internet is their first port of call beyond the reading list (Tuominen, Savolainen and Talja, 2005:339).

Bainton (2001:3) posits that when using Internet resources, undergraduates need to address questions relating to the provenance, accuracy and reliability of the material, a task which is largely unnecessary in established areas of academic publishing. All students need to know how to follow academic conventions and also apply critical thinking. Academic libraries worldwide have responded by providing instruction in IL (Orr, Appleton, and Wallace, 2001:457).

Information communication technologies (ICT)

Darch and Underwood (1999:285), have made it clear that any discussion of information and communication technologies (ICT) developments in South Africa has to acknowledge that their economic and social history have created a divided community. However, technological advancements coupled with drastic changes in users' information needs and expectations are having a great impact on library service, leaving librarians to wonder how programmes may evolve. Internet resources that are available in schools will encourage future users to expect academic libraries to meet their current information needs (Catts and Lau, 2008:13). The emergence of the digital information age has presented academic libraries with tremendous challenges. Information is growing at exponential rate and technologies for storing, organising and accessing information are developing and changing rapidly (Rader, 1997:47). The advent of the Internet in tertiary education has influenced the teaching and learning environment.

The Internet has equalised the power of academic libraries, it is no longer a matter of the size of your institution, or where or who you were. Users expect the same quality of service through the Internet. ICT have exacerbated the problem of information overload (Johnston and Webber, 2003:337; Wilson, 2004:339).

Social framework

Students entering academic libraries in the 21st century have spent their formative years in a world that has undergone profound social change. The changes were most visible in the increasingly information-based society, global interdependence and the accelerated pace of Web 2.0. The process of collaborating with others across the country in consortia, for example CALICO, and around the world, as if they were in the next room has gained momentum (Wilson, 2004:339).

Educational mandates

The South African government has called for a reform of the higher education system. Higher education institutions agree that students can no longer be expected to master a finite set of skills, but rather learn how to learn so that learning becomes a lifelong learning process (De Jager and Nassimbeni, 2002:168). Much emphasis is being put on research output and academic performance of the institutions. The learning process of students was drastically changed. One of the increased demands on students was sorting through and evaluating information. To be successful, they have to make good decisions about the use of information, thus IL becomes critical. People need education that includes IL to become productive and effective users of information. Critical thinking, deciding what to believe or how to act, becomes a survival skill (Rader, 1997:47; Wilson, 2004:339).

2.3 Pedagogy of information literacy

Pedagogy refers to the approach that a teacher assumes in imparting information and knowledge to students. Cognard (2004) observes that a teacher sieves out what is required to be taught in the curriculum, injects it with their personal vision, experience, style, ideals, knowledge and wisdom.

Cognard, (2004) maintains that the teacher may repackages it in a form that is easily digestible for their students' learning approach. Humes (1999:2) maintains that becoming information literate is an active process, requiring the seeking out of knowledge from multiple sources rather than passively receiving and repeating facts. The teacher's role must evolve from that of being the giver of knowledge into being more of a coach or guide.

Teachers must be prepared to “teach students to become critical thinkers, intellectually curious observers, creators, and users of information” (Lenox and Walker, 1993:313). The goal is to prepare students early on to “learn how to learn” and carry these skills into other areas of their lives so that they can be independent seekers and consumers of information throughout their lives. Teachers of all subjects must blend their traditional fact-based approach with an emphasis on learner-based inquiry and the scientific inquiry process (Lenox and Walker, 1993:313). Currently, librarians, educators and researchers are grappling with defining the standards and competencies associated with IL, developing effective new ways to engage learners and measure the outcome and impact of such learning. Teaching IL to students does not merely involve library instruction or the ability to use various information sources effectively. It also includes teaching critical and analytical thinking skills regarding the use of information (Kasowitz-Scheer and Pasqualoni, 2002). Hunt and Birks (2004:31) agree that approaches to IL teaching and learning have changed radically from the days of bibliographic instruction. The theories and principles of IL have been influenced by best practices in academic libraries. Currently we are looking at a much more dynamic and diverse approach to IL, incorporating a variety of teaching techniques in response to the varied learning styles we find in our classrooms. Any structurally sound library instruction programmes should be based on solid pedagogical principles. According to Skinner (1968:213), learning is measured as change in an individual's behaviour. To modify learners' behaviour, teachers need to produce instructions including information presentation, questioning, and positive feedback. Unlike behavioural learning theory, cognitive psychology emphasizes the learner's mental state.

Piaget believed that learning took place by assimilating new information into the existing cognitive structures or accommodating the cognitive structures to new information. Therefore, teaching methods should provide activities that challenge and engage students in order to cause assimilation and accommodation to take place (Furth, 1970:333).

The structuring of courses within higher education institutions (HEIs) to create student-centred learning environments where inquiry is the norm, must include high problem solving and thinking critically as part of the process. Outcomes-based education in South Africa requires active participation of learners in the learning environment. Such learning environments require IL competencies to be embedded (Association of College and Research Libraries, 2000:5). Gaining skills in IL multiplies the opportunities for students' self-directed learning. They become engaged in using a wide variety of information sources to expand their knowledge, ask informed questions and sharpen their critical thinking for still further self-directed learning. The greater emphasis on independent study, information seeking and problem solving requires information literate students and poses a challenge to the libraries that have to meet these requirements (Skov and Skærbak, 2003:327).

2.4 Information literacy standards in Higher Education

The definition of information literacy (IL) promotes a way of assessing literacy (or learning) and evaluation. In 2000, ACRL published "Information Literacy Competency Standards for Higher Education" which built on the work of ALA. These standards have been successfully applied in academic libraries. Still, it would be unfair to characterize the ACRL standards as the only such specification. Many other IL standards documents exist, such as, Australia and New Zealand (Bundy, 2004). In this section a general discussion of IL standards is offered, followed by examples from different countries. IL requires a shift in focus from training specific information resources, like databases, to a set of critical thinking skills involving the use of information. This change is reflected within the Information Literacy Competency Standards for Higher Education, developed by ACRL (Association of College and Research Libraries, 1989:2).

IL in academic libraries includes a variety of instructional approaches, such as course-related library instruction sessions, course-integrated projects, online tutorials and stand-alone courses (Spitzer, Eisenberg, and Lowe, 1998). Academic libraries running formal IL programmes need to consider curricular objectives, invoking combinations of instructional solutions over a period of time. HEIs in a number of countries have implemented different IL standards and guidelines as will be discussed below. These documents not only list the information-related competencies that students ought to possess and exhibit, but also make recommendations as to how these competencies can be integrated within faculties and the various strategies that can be implemented in order to effectively impart these competencies to students.

Information-related competencies range from specific IL skills to more procedural ICT skills (Mokhtar, Majid and Foo, 2008:93). An effective IL skills training intervention follows the continuous cycle of needs assessment, instruction, followed by assessment and evaluation. Many IL training and instructional programmes in South Africa use Information Literacy Competency Standards for Higher Education approved by the ACRL (Association of College and Research Libraries, 2000:2).

United States of America

The United States has developed and implemented IL standards and programmes. The Association of School Libraries' landmark publication "Information Power" and the ACRL publication, "Information Literacy Standards for Higher Education" have both become de facto standards for information literacy competencies from kindergarten through to college, not just across the United States but also in many nations throughout the world (Mokhtar, Majid and Foo, 2004:3). In 2000, the ACRL published "Information Literacy Competency Standards for Higher Education. ACRL builds on the work of the ALA Presidential Committee and established an explicit set of learning outcomes for IL.

These standards have been successfully applied in South African academic libraries (Davids, 2009:iv; De Jager and Nassimbeni 2005: 35-37), and as such they are used frequently in IL research and assessment. According to the ACRL Standards, information literate students need to meet with the following standards:

- ✓ Standard One: the student determines the nature and extent of the information needed.
- ✓ Standard Two: the student accesses needed information effectively and efficiently.
- ✓ Standard Three: the student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
- ✓ Standard Four: the student uses information effectively to accomplish a specific purpose.
- ✓ Standard Five: the student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally (Association of College and Research Libraries, 2000:2).

Australia and New Zealand

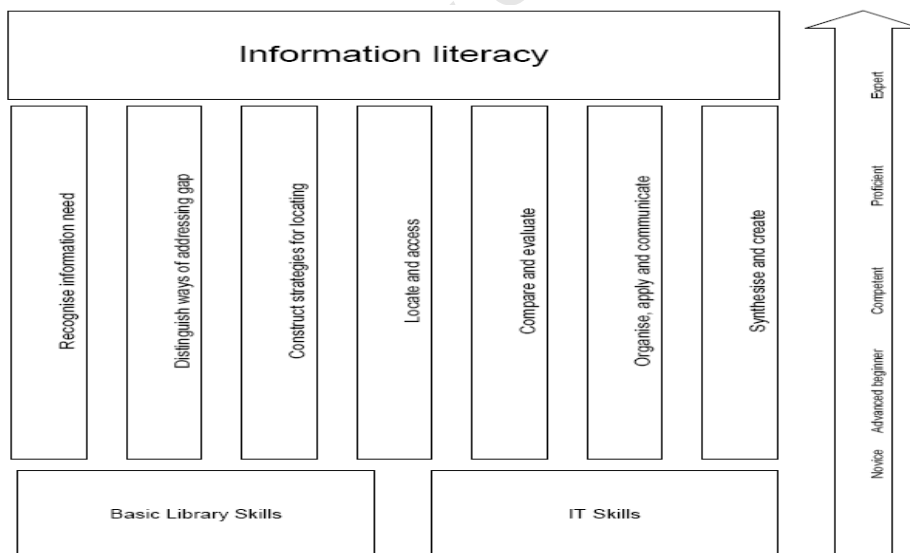
According to Mokhtar, Majid and Foo (2004:4), the Council of Australian University Librarians (CAUL) made up of representatives of various Australian and New Zealand universities, the schools sector, the Technical and Further Education sector and other related organisations, convened in September 2000 and reviewed the US 'Information Literacy Standards for Higher Education' by ACRL for adaptation and implementation in the region. Studies and practices by Australian researchers in the area were also taken into consideration when the standards were reviewed. CAUL approved the revision and adaptation of the US standards and named the set of benchmarks as 'Information Literacy Standards', which was specifically intended for higher education, although it could be applied to other educational sectors as well (Council of Australian University Librarians, 2001:1)

In 2003, the standards were revised, based on the recommendations and experiences of academics and librarians who had used the first edition. The second edition was renamed the 'Australian and New Zealand Information Literacy Framework' and essentially provided four guiding principles and more details for each of the six core standards (Bundy 2004:2).

United Kingdom

The Standing Committee for National and University Libraries (SCONUL) first convened and proposed the Seven Pillars of Information literacy skills in their position paper in December 1998 (SCONUL, 1999:1). The basis of research for the paper was the relationship between information technology skills and information handling skills. The task force sought to determine the difference between the two and the need for IL skills, especially in the UK higher education. Established and best practices in the area within the UK higher education sector and from abroad were also examined. The seven core skills were finally developed and proposed in October 1999 (Mokhtar, Majid and Foo, 2004:4).

Information literacy model (SCONUL, 1999: 8)



2.5 Integration of information literacy into curriculum

According to De Jager and Nassimbeni (2002:174) South African academic libraries have increasingly engaged in activities intended to help students to become critical thinkers, problem solvers, independent information seekers and lifelong learners. De Jager and Nassimbeni have noted a growing recognition that IL should be integrated into credit-bearing courses in curricula so that 'teaching information skills should be firmly embedded in subject knowledge' (2002:175). Derakhshan and Singh (2011:219) agree that concerns about integrating IL into the curriculum have been in the forefront of the higher education literature.

Derakhshan and Singh (2011:219) maintain that the voice of the faculty has been lacking in the development of IL programmes. The incorporation of IL skills into curricula requires the collaborative efforts of academics, librarians, administrators and the institutions in which they all work together. McDowell (2002:256) asserts that teachers and librarians should have complementary, though distinct, roles in helping students become information literate. A curriculum-integrated approach is one in which the development of skills and knowledge is integrated into the teaching, learning and assessment of curriculum objectives and content (Wallace *et al.*, 1999:137). Provision is made for developmental progression throughout the course. It, therefore, differs from knowledge transmission through stand alone or discrete subjects or through training programmes offered outside the formal curriculum. Wallace *et al.* argued that this approach allows students to develop the skills and knowledge that are associated with IL as part of the learning process itself. This integrated approach also allows IL development to occur incrementally at the same time, allowing students to transfer skills and knowledge throughout their undergraduate program. Curricular integration affords many possibilities for furthering the influence and impact of student-centred teaching methods such as problem-based learning, evidence-based learning and inquiry learning (Marcom, 2002:6). Curriculum-based instruction is not a new methodology for training IL skills.

Wallace defined it as “a course-integrated approach to the development of skills and knowledge that is integrated into the teaching, learning and assessment or curriculum objectives and content” (Wallace *et al.*, 1999:137). Gaining skills in IL multiplies the opportunities for students’ self-directed learning. Specific approaches include integration of IL objectives into general education and first-year programmes (Jacobson and Mark, 2000:257) and development of campus-wide information competency initiatives (Grassian and Kaplowitz, 2001). In these situations, librarians, faculty and others work together to provide IL at the point of need.

2.6 Health information literacy (HIL)

Sackett *et al.*(1996:71) indicate the importance of evidence based medicine (EBM) as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients”. Rosenberg and Donald (1995:1122) emphasise the importance of information literacy (IL) integration by suggesting that evidence-based medicine is practised by integration of clinical knowledge and skills from academic programme with the ability to perform literature search to retrieve evidence needed to support a clinical practice. Gruppen, Rana, and Arndt (2005:940) agree that the IL skills should be integrated into clinical teaching. Verhey (1999:253), Jacobs Rosenfeld and Haber (2003:323), and Shorten, Wallace and Crookes (2001:88) all report some measure of success in improving the IL skills of nursing students.

Rambo (2004:11) notes that in 2003, the Medical Library Association (MLA) formed the Health Information Literacy (HIL) task force to assist the association in addressing HIL issues. The task force considered the US Department of Health and Human Services (DHHS) definition of health literacy and the ALA’s definition of information literacy to develop the MLA’s definition of “health information literacy” as “the set of abilities needed to recognize a health information need, identify likely information sources and use them to retrieve relevant information, assess the quality of the information and its applicability to a specific situation, and analyse, understand and use the information to make good health decisions” (Rambo, 2004:11).

The necessary skill to search the literature effectively is essential if practising nurses are to implement evidence-based practice. Librarians are well placed to train these skills and spend large amounts of time training searching skills to nursing students. Training often focuses on searching electronic resources, in particular MEDLINE. Training librarians involved in health information literacy devote a large amount of time to training activities, yet there is limited evidence to demonstrate that the training they provide is effective (Eldredge, 2001:9).

Looking at the outcomes of health information literacy training allows the researcher to measure how far the training intervention has met the set objectives (Brettell, 2007:18). Health information literacy has to do with improving the nurses' awareness of, access to, and use of quality health information (Scharadt, 2011:1).

2.7 Evidence-based practice (EBP)

According to Sackett *et al.* (1997:35), evidence-based practice (EBP) is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with best available external clinical evidence from systematic research.” IL plays a critical role in EBP. Yeoh (2000:14) asserts that the skills of analysing and synthesising the evidence of research and practice are crucial to the underpinning of IL. Accessing and retrieving relevant and up to date literature is one of the major parts of EBP. It is also crucial for lifelong learning and continuous professional development (CPD) of nurses. The EBP benefits both clinicians and patients. In medicine, EBP has at least two distinctive benefits: clinicians can make good decisions for the best of the patients' interests, and thereby improve both cost-effectiveness and clinical effectiveness such as reducing patients' length of hospital stay, avoiding unnecessary treatments, and reducing the overall cost of treatment (Brasel, Weigelt, Christians and Somberg, 2003:605; Delaney, Barton, and Jacob, 2003:231; Fine *et al.*, 2003:343; Rosenberg and Donald, 1995:13).

Similarly, several studies of nursing education have shown positive health care outcomes as a result of nursing practice using an evidence-based approach (Angus, Hodnett, and O'Brien-Pallas, 2003:218; Berenholtz *et al.*, 2004:195; Dufault, Bielecki, Collins, and Willey, 1995:634). Nurses value and use several kinds of evidence that they can count on in their practice. Nursing is rooted in human needs and it adjusts to the needs that are affected by age, gender, culture, psychosocial states of patients, and pathological conditions and symptoms interfering with patients' normal daily functions (Henderson and Nite, 1997:45).

The medically led evidence-based practice and the clinical governance movement have impacted on the increasingly extended role of the nurse (Barnard and Cushing, 2001:12; Yeoh, 2000:14). It is essential for contemporary nursing education and clinical practice that all students are able to incorporate selected information from a range of knowledge sources and use information effectively to accomplish a specific health care and learning goals.

In addition, nurses need to understand the economic, legal and social issues surrounding the location, use, access and use of information ethically and legally. Academics in nursing practice have embraced the integration of EBP into the nursing education curriculum in numerous ways (Moch; Cronje and Branson, 2010:5). Evidence-based approaches are built upon long-standing commitments to helping students understand the scientific research process, think critically and develop the IL skills that will enable them to find the evidence that can inform their practice (Moch, Cronje and Branson, 2010:5). Many reports in the nursing pedagogy literature recount various strategies used to teach EBP to nursing students. Stevens (2001:6) maintains that the EBP approach includes a total process, such as, the Star Model of EBP which outlines a process that moves evidence through five stages. These stages include (1) production of knowledge through original research, (2) evidence summary, (3) evidence translation, (4) implementation and (5) evaluation. Scientific principles and methodologies are evolving for each step in this process.

2.8 Nursing and information literacy

The current environment in which nurses and health professionals' practise is rapidly evolving, resulting in changes in the skill sets and competencies required of new graduates. EBP models require that entry-level nurses have the ability to identify, locate and critically appraise research findings. EBP has been introduced into medicine, nursing and other healthcare professions during the last decade when the highest quality of care has been sought (Sackett, Richardson, Rosenberg, and Haynes, 1997:2; Shorten, Wallace, and Crookes, 2001:86) and medical errors need to be minimized.

The research study by Pravikoff, Tanner and Pierce (2005:40) about information-seeking needs of nurses found that 61% of nurses reported needing information at least once a week. The study also pointed out that journal articles, research reports and hospital libraries were seldom used; instead, nurses sought colleagues to answer their information questions. Nurses often perceive libraries to be "remote" from their workplace even if the library is within the same building or very close by (Dee and Stanley, 2005:3).

Health science librarians are well placed to work closely with nurses for all of their information needs. Health librarians may be surprised to learn that nurses do not know that the library and its resources are available to them (Hernando, 1997:105). However, once nurses know about the library's resources, they are usually very willing to learn how to use them. Librarians offer training in many different aspects of information seeking including database searching, what sources of information best answer nurses' questions, and formulating questions to assist with the search process. EBP is stimulated and facilitated by the development of information infrastructure in healthcare and the burgeoning of information and research published daily and available electronically, particularly in electronic databases and electronic full-text professional journals (Jacobs, Rosenfeld, and Harber, 2003:320; Sackett *et al.*, 1997:33).

Blythe and Royle (1993:433) suggest that each discipline has its own information-seeking style, and the sources and types of literature sought are influenced by disciplinary culture. Estabrooks *et al.*, (2003:80) maintain that nurses might lag behind in the use of Internet.

Nurses visit libraries infrequently and rarely subscribe to research journals (Blythe and Royle, 1993:433). It is a challenge for librarians to identify nurses' information needs and to determine how to meet them. Another contributing factor is their very busy and long working hours. Reasons for nurses' limited use of research literature include the overwhelming volume of information, lack of searching techniques, lack of time, and problems with library hours (Bunyan and Lutz, 1991:224). Society has moved towards evidence-based medicine, and health care consumers need to acquire not only basic health information literacy skills but also more advanced competencies. ACRL (2000:2), states that these required competencies include evaluation of the quality of health information resources, obtaining health information documents on narrow topics by conducting advanced searches, judging the trustworthiness of health information sources, and understanding the advantages and disadvantages of different media including the Internet.

It is an acceptable practice that the delivery of safe, effective nursing care requires the use of an evidence-based approach to practice (Shorten, Wallace and Crookes, 2001:86) which requires adequate access and the ability to synthesise information. The ongoing application of new clinical knowledge is seen as a vital component to maintaining competence in theory and practice over a career. Nurses in their daily duties need information to make patient-care decisions and answer patient questions all the time. Cogdill (2003:207) and Rasch and Cogdill (1999:94) maintain that nurse practitioners in a primary care setting reported that nurses regularly experienced information needs as part of their patient interactions. They consulted colleagues for answers to questions about diagnoses and print texts for drug-related questions. The health professions are faced with the same forces determining workplace practices globally, "information literacy" as a concept has relevance both to the education and practice of nursing.

Yeoh (2000:14) asserts that the skills of analysing and synthesising the evidence of research and practice are crucial to the underpinning of these literacies. Information literacy is associated with information-seeking behaviours, which mainly emphasize the information needs and uses (Dervin and Nilan, 1986:1).

2.9 Evaluation of information literacy

In South Africa, the current climate in HE demands for accountability and evidence of value for money. HE is faced with increased demands for evidence that they produce graduates armed with the knowledge, skills and abilities needed to live and work in the global village.

Faculties and student support programmes are required to assess their effect on student learning and development (Bell and Orr, 1998:1; Griesel and Parker, 2009:1). Academic libraries have long argued that they are an integral part to the teaching and learning mission of higher education institutions (HEI). Now, academic libraries must prove that they contribute to the production of quality graduates. Francis and Fisher (1995:496) posit that there are several reasons to evaluate IL training. An evaluation may help obtain more resources for a training programme, keep the programme alive, show faculties that their students are learning, or assist training librarians in making an individual class session more meaningful and relevant to the curriculum. Academic librarians have embraced the notion that libraries contribute to student learning and development. They have identified the skills students need to be successful and embrace lifelong learning approach: the abilities to determine information needs, locate, access, evaluate and use information. Librarians have communicated the significance of IL to their HEI, and they have created and deployed IL programmes to train students these skills. Now, librarians are charting a new path, assessing the effect of the programmes they have launched. Fox, Richter and White (1996:182) argue that the objective procedures should be used to facilitate the collection of dependable, unbiased data, but evaluation is not value-free and does involve judgment. The central goal of evaluation is to determine the value of whatever is being assessed.

The study conducted by Fox, Richter and White. (1996:183), compared the IL skills of nursing school graduates before and after IL sessions were introduced into the curriculum. The study found that graduates who completed IL in nursing school read a wider selection of professional journals and participated earlier in scholarly activities than graduates who had not received IL tuition.

2.9.1 Information literacy assessment

Angelo (1995:7) describes assessment as an on-going process of learning aimed at understanding and improving student learning. It involves making our expectations explicit and public; setting appropriate criteria and high standards for learning quality.

As Knight (2002:19) agrees that assessment is an on-going process. Academic libraries, to retain their central role in the academic mission of the university, must become more involved in this activity. Assessment of IL skills may take many forms. In *A Practical Guide to Information Literacy for Academic Librarians*, Radcliff *et al.* (2007:213) discusses various types of assessments, characterizing them by resource load, target audience, and the level of faculty collaboration, among other factors (Radcliff *et al.*, 2007:213). A multiple-choice test might be most appropriate for assessing the skills level of a large group of students, for example, while a focus group might be the best way to evaluate the effectiveness of a new library programme. Ultimately, Radcliff *et al.* conclude that the most useful assessment programmes are likely to use a variety of methods (Radcliff *et al.*, 2007:214). Bober, Poulin and Vilen (1993:195); Davidson *et al.* (2002:4); Iannuzzi (1999:305); and Knight (2002:15) argue that librarians assess learning and evaluate programmes for different objectives (Kirkpatrick, 1998:39). Rockman (2003:613) discusses a range of methods and puts forward the case for developing an assessment strategy by librarians that is realistic and embedded in the assessment strategy of the institution.

Johnston and Webber (2003:335) argue that assessment of IL is important and should be built into courses by academics and librarians working collaboratively. Dorner, Taylor and Hodson-Carlton (2001:132); Bresciani, Zelna and Anderson (2004:13) add to the description of students' assessment. Researchers confirm the role of assessment in programme improvement. Samson (2000:335) writes that assessment offers a value-added dimension to an IL programme. It provides a starting point to ascertain the program's effectiveness and to guide direction for future instruction.

Knight (2002:16) also acknowledges the importance of documenting both the strengths and areas of improvement in library instruction programmes. Even if assessment yields negative or unexpected results, it can still be used to improve instructional programmes. In fact, librarians can use negative results to argue for greater financial support by highlighting where funding could be used to improve the programme.

Knight (2002:16) suggests that it is important to view assessment programmes not as ends but as significant sources of information that foster feedback for change. Consequently, librarians should choose assessments that yield results that are useful for programme improvement. IL librarians are constantly striving for their own tools to assess aspects of IL. Scharf *et al.* (2007: 462) worry that, after the considerable body of work carried out in "defining and characterising IL; academics, librarians and administrators need tools to evaluate the IL abilities of students". Brettle (2007:19) points out that, in the case of IL training, some sessions are teaching knowledge (e.g. resources available or principles or literature searching), whilst others are teaching skills such as database searching or critical appraisal. The methods and measures used to evaluate training need to reflect these differences. To determine whether IL training has made a difference, it is necessary to evaluate what students know (cognitive domains or knowledge), what they do (behavioural domains, e.g. skills) and affective changes (changes in motivation, confidence) following training.

The outcomes criteria and measures are more likely to be measuring knowledge or cognitive domains of learning. Kellough and Kellough (1999:417) maintain that teaching and learning are reciprocal processes that depend on and affect one another. Thus, the assessment component deals with how well the students are learning and how well the teacher is teaching.

2.9.1.1 Methods of assessing an information literacy intervention

The range of assessment and evaluation methods are discussed in various research studies and includes both quantitative and qualitative approaches. Examples include: pre-tests and post-tests; recall and precision exercises; multiple-choice questions, skills checklists; satisfaction questionnaires; focus groups; interviews self-assessments; longitudinal surveys. Included are surveys of graduates and their employers; observation; and examination of completed work, such as (annotated) bibliographies, concept maps, learning diaries and research portfolios (Pausch and Popp, 1997:77; Williams, 2000:323; Rockman, 2003:616; Brettle and Greenhalh, 2004:5; Fox, Richter and White, 1996:182)

Some studies combine different methods to strengthen the evidence provided. Brettle and Greenhalh, (2004:5) found that students' self-assessed ratings of skills were higher than their scores indicated in objective tests, although Coupe (1993:190) found in his study that students' self-assessments were accurate.

Several studies discuss the use of pre- and post-test, in various formats (e.g. print or electronic multiple choice questions). These cover a range of subject areas and student levels (Verhey, 1999:252; Salisbury and Ellis, 2003:209; Lawson, 1999:73). Researchers like De Jager and Nassimbeni (2003: 8); Maughan (2001:71); O' Connor, Carolyn and Julie (2001: 167,171) and Pausch and Popp (1997:33) point out that there are a variety of both quantitative and qualitative methods that can be used to assess IL skills. Noe (2002:2) and Smith (1998:44) point out that an evaluation process has two purposes, formative and summative.

Formative evaluation measures how well the training is being organised and conducted, and how much the learners are benefiting from the programme. It aims to analyse how the training programme could be improved during the interaction with the students.

Summative evaluation aims to measure how much the learners have changed as a result, and this can be measured in terms of attitudes, knowledge, or new skills (Noe, 2002:2; Smith, 1998:45). Training can be evaluated using questionnaires, tests, interviews, observation, group discussion or cost-benefit analysis (Grassian and Kaplowitz, 2001:43).

Formative assessment

Radcliff *et al.* (2007:7) describe the use of in-class performance assessments as a means of evaluating student performance and gathering formative assessment data, and a study by Deleo, Eichenholtz and Sosin (2009:439) found that the use of an in-class assessment to measure students' existing IL facilitated differentiated instruction and increased student engagement. Formative assessment is particularly suited to IL instruction for graduate students because it alerts them and their teachers to their progress and any areas that need correction. Assessment provides information that librarians can use to improve their instruction skills (Knight, 2002:18), examine their understanding of student learning and evaluate their teaching (Warner, 2003:172). Librarians can use formative assessment to ascertain what to teach and for how long to teach it.

Summative assessment

Summative assessment is assessment that takes place after teaching and learning have come to an end; it is designed to be a final evaluation (Oakleaf, 2009:540). Training librarians have realized some success with summative assessment devices, such as tests and surveys. These questionnaires provide information about the students' IL skills before and after a sequence of IL programmes and/or research activities. The differences in scores can be analysed to determine statistically if knowledge and/or confidence has increased.

Marshall (1995:165) points out that a summative evaluation typically results in a written report assessing the extent to which the programme's objectives have been attained in the specified time period. It should provide a frank discussion of the programme's strengths and weaknesses with recommendations for continuation or modification of the programme, if appropriate.

Investigation of confidence

An investigation of confidence level assesses how well students' opinion on how much they have learned and retained the material from a particular instructional programme both immediately following and sometime after having participated in that IL programme. According to Bandura's (1997:191) theory of self-efficacy, there is a reciprocal relationship between an individual's performance and his or her self-efficacy beliefs. That is, performance is both the antecedent and the consequence of self-efficacy.

These calls for an accurate assessment of the students' level of search skills, on the basis of which, questions in the survey instruments are selected and sequenced according to levels of difficulty. Availability of practice facilities, encouraging searching environment and user-friendly point-of-use print and online instructional guides are also important contributors to gradual building up of self-efficacy (Ren, 2000:322). Self-efficacy is based on an individual's belief in their ability to perform a specific task. Ren (2000:311) found that an IL programme had a positive effect on students' self-efficacy. Methods used to investigate confidence levels include questionnaires, self-assessments and interviews (Branch, 2003:47, Julien and Boon, 2004:121, Fox, Richter and White, 1996:182, Roselle, 1997:390, and Shorten, Wallace and Crookes, 2001:2).

Fox, Richter and White (1996:185) observed that evaluation addressed both cognitive and affective domains in the assessment of students' achievement of information-literacy skills. Studies by Fox, Richter and White (1996:184) and Shorten, Wallace and Crookes (2001:3) investigated both skills and confidence.

They carried out a large, complex multi-dimensional evaluation of an IL programme for nursing students using questionnaires, students' grades, and tests, comparisons to other student groups, a survey of academic staff and a confidence questionnaire. This relevant research, which builds on a previous study by Fox and Weston (1993:33), illustrates that using a range of evaluation methods provides better evidence of effectiveness. A significant improvement was demonstrated in both the cognitive and affective domains. Shorten, Wallace and Crookes (2001:2), building on the work done by Wallace, Shorten and Crookes (2000:485), found that an IL programme increased students' skills and confidence and argue that increased confidence is an integral component of student motivation.

Investigation of skills

Baseline skills assessments are designed to measure students' proficiency at various IL related tasks, so that a comparison can be made at a later date, usually after a particular instruction programme. While a skills test provides the most rigorous measure of students' IL skill levels, the resources, time and coordination necessary to administer such an assessment on a recurring basis make it somewhat less feasible.

There are concerns that multiple choice questions test surface learning only (Webber and Johnson, 2004:24) but they are a widely used method of assessment of skills. Multiple choice tests are a useful method when establishing the baseline set of skills within a group.

2.9.1.2 Using tests

Mery, Newby and Peng (2011:100) maintain that designing a test internally provides the benefits of designing a test that measures what is taught in a specific IL training programme, the flexibility to use a variety of formats that fit local needs and an increased likelihood that the data will be used by training librarians.

“Fixed-choice” tests like multiple choice, matching and true-false tests, are quicker and easier to develop and deliver than other assessment instruments (Walsh, 2009:21). Fixed-choice tests are easy to administer and provide quantitative data that is easy to score and analyse (Oakleaf, 2008:233). Other characteristics of fixed-choice tests delineated by Oakleaf, are that, when they are used for pre and post-testing in a course, the tests are able to measure gains in student learning and can be used to compare one group against another. Fixed choice tests can be made highly reliable by making the test longer, i.e. having a large question bank.

2.9.1.3 Multiple choice questionnaires

Riddle and Hartman (2000: 61–62) used multiple choice questions as they do not overburden the already limited resources and time of the training librarians. Multiple choice assessments display great variation in length and detail with some questionnaires containing as few as six or eight questions that only test specific knowledge or skills covered in an IL training session (Houlson, 2007:102; Samson and Millet, 2003:89). Multiple choice questions may not be well-suited to the task of evaluating higher-order skills (Scharf *et al.*, 2007: 462). Such tests cannot assess the effectiveness of student search skills (Dunn, 2002: 28).

2.9.1.4 Pre- and post-intervention assessment

Studies by Bober, Poulin and Vileo (1995:195); Colborn and Cordell (1998:13); Fox, Richter and White (1996:184); Francis and Fisher (1995:492); Jacobs, Rosenfeld and Haber (2003:324); Julien and Boon (2004:126); Knight (2002:15); Lawson(1999:73); Jacobs, Rosenfeld and Haber (2002:603); Salisbury and Ellis (2003:208); Shorten, Wallace and Crookes (2001:9); Smalley (2000:86) and Verhey (1999:252) discuss the use of pre- and post-tests to both undergraduate and post-graduate students. Fox, Richter and White (1996:186) agree that the two tests can be compared to measure acquisition of knowledge and skill by individual nursing students.

2.10 Summary

Chapter 2 presented a literature review on IL instruction and assessment. IL in academic libraries and IL standards were presented. Health information literacy and evidence-based practice were also discussed because the study is about nursing students. Assessment and evaluation of various IL programmes were discussed. Recent published literature concludes that the exponential growth in information resources and new demands for the digital information have put increasing demands upon faculties and students to access appropriate information quickly, process that information with critical thinking skills and to communicate both verbally and in writing a product that is practical, interesting and meaningful. IL training needs to be evaluated periodically to validate the programme and to measure its effectiveness in addressing the IL skills needed by both the students and faculties.

University of Cape Town

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The chapter describes and justifies the research design and methodology used for this study. It discusses them in relation to an information literacy training intervention of postgraduate nursing students at four Universities of Technology (UoT) in South Africa. It returns to the research questions in Chapter 1 of this study. The chapter includes discussion of the overall approach, target population and research instrument used to collect data. The case studies of UoT are discussed in-depth as they played a significant part in the development of the methodology.

3.2 Research design

A research design is a plan or blueprint of the activities planned for the research and it is selected in accordance with the type of research questions asked (Mouton, 1996:304). The research design could therefore be viewed as a checklist which contains all the research process items necessary to be executed in order to perform an effective research project, for example, the population, sample, data collection method, data analysis and interpretation.

The evaluation of IL training intervention of nursing students at four UoT adopted a mixed method design. In this study, the empirical study consisted of two different questionnaires to obtain information from the nursing students and from the training librarians. As Maughan (2001:71) and Perrett (2004:63) highlight the fact that students tend to over-estimate their skill levels, consideration was given to asking students to rate their skill level using Likert scale questions. Such an assessment would be administered after attending an IL session at the end of the second semester. One online questionnaire was sent to each nursing student. Another online questionnaire was sent to the training librarians. The students would be given a short questionnaire, asking a series of questions about the student's perceived value of the IL session.

Most of these nursing students are registered as part-time. These UoT offer their information literacy training twice per year. Their IL training was curriculum-integrated. The objective of these two sessions is to train these nursing students in library skills (OPAC, services and facilities in the library) and Information literacy (Information seeking process, Discovery tools, Databases, Medline, Pubmed, MeSH, Referencing Styles and Plagiarism).

One of the unique features of nursing practice, as distinct from other branches of medicine, is that nurses are required to deal with any problem presented by any patient. Retaining and refreshing knowledge to support patient care and professional development across such a broad discipline poses special challenges. The nursing information literacy training which has been developed collaboratively by training librarians and academics from the Department of nursing, is offered annually. This information literacy takes place each first semester after the general library orientation.

The IL training intervention is based on each UoT's Information Literacy framework and syllabus of the nursing department. It also draws upon the ACRL 2000, Information Literacy Competency Standards for Higher Education and ALA, (1989:2). Key elements of the training include the identification of specific outcomes to be achieved, focussed learning activities that include the participation of librarians supporting the Department of Nursing.

A survey was therefore conducted among nursing students of 2011 at four UoT in South Africa because these UoT are the only ones that offer nursing education. These are:

Vaal University of Technology (VUT): In the 44 years of its existence, first as a College of Advanced Technical Education (1966 -1979) then as Vaal Triangle Technikon (1979 – 2003), Vaal University of Technology (VUT) has grown in stature as a higher education institution, drawing students from all over the country and 25 other countries (Vaal University of Technology, 2011). It is one of the largest Universities of Technology, with about 21 000 students.

This position enables it to make a substantial contribution to the development of human resources in the Southern Gauteng region, the country and the continent. The following qualifications are offered:

- ✓ B Tech: Community Nursing
- ✓ NH Diploma: Community Nursing
- ✓ Diploma: Nursing Administration (Vaal University of Technology, 2011)

Tshwane University of Technology (TUT): TUT was established on 1 January 2004, with the merging of the former Technikon Northern Gauteng, Technikon North-West and Technikon Pretoria. At the time of the merger, the uniquely South African institutional designation of "Technikon" was dropped in favour for the internationally accepted "university of technology" designation (Tshwane University of Technology, 2011). The Adelaide Tambo School of Nursing Science is the only department of its kind at a University of Technology and is accredited by the South African Nursing Council to offer: B Tech degree in Nursing Science (Tshwane University of Technology, 2011).

Cape Peninsula University of Technology (CPUT): The history of the University goes back to 1920 when the foundation stone of the Long market street building of the then Cape Technical College was laid in Cape Town. In 1962 the Peninsula Technical College was established to cater for the steady growth in the number of coloured apprentices in a variety of trades (Cape Peninsula University of Technology, 2011). During 1979 both colleges were legally established as Technikons: Peninsula Technikon in Bellville and Cape Technikon in Cape Town. In October 2003 the Minister approved the address and new name, Cape Peninsula University of Technology, and announced that the status of Technikons would be changed to Universities of Technology. They would offer:

- ✓ M-Tech: Nursing
- ✓ B-Tech: Oncology
- ✓ B-Tech: Occupational Health
- ✓ B-Tech: Primary Health Care
- ✓ ND: Post-Basic In Nursing Administration (Cape Peninsula University of Technology, 2011)

Durban University of Technology (DUT): The Durban University of Technology is a result of the merger in April 2002 of two Technikons, ML Sultan and Technikon Natal (Durban University of Technology, 2012). It was named the Durban Institute of Technology and later became the Durban University of Technology in line with the rest of the Universities of Technology. The Nursing department is committed to responding to the health care needs of the people of South Africa and the rest of Africa. Programmes offered by the department:

- ✓ B-Tech: Nursing Science
- ✓ B-Tech: Nursing (Occupational Health)
- ✓ B-Tech: Nursing (Primary Health Care)
- ✓ B-Tech: Nursing (Nursing Management)
- ✓ M-Tech: Nursing
- ✓ D-Tech: Nursing (Durban University of Technology, 2012)

The online questionnaire to nursing students was administered at the end of semester two (Appendix F). The objective was to measure their learning outcomes and understanding of the content directly after they have completed the training programme. Another online questionnaire (Appendix E) was administered to training librarians of these respective institutions to collect data about how they offer IL training. The questionnaire for nursing students is attached as appendix F and for the training librarians as appendix E.

3.3 Research Methodology

The methodology used in this study to investigate information literacy training interventions is quantitative. The purpose of the study was to explore the outcomes of IL training intervention offered to nursing students by four UoT. A survey methodology was used to gather data about IL interventions. Creswell (1994:14) states that survey research provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population.

Leedy and Ormrod (2010:189) agree that survey methodology involves acquiring information about one or more groups of people. The ultimate goal is to learn about a large group of population by surveying them. Surveys include cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection with the intent for generalizing from a sample to a population (Babbie, 1992:243). Questionnaires are used with many modes of observation in social research. Structured questionnaires are essential to and most directly associated with survey research (Babbie, 1992:250).

The research questions posed in 1.3 of chapter 1 has guided the methodology to be used to evaluate IL training of nursing students at UoT. This was done immediately at the end of teaching and learning period, before the final examinations start. Academics coordinating the nursing programme were asked to distribute the questionnaire. The questions in the questionnaire (Appendix F) were based on the ACRL Information Literacy Competency Standards for Higher Education (Association of College and Research Libraries, 2000:2). The questionnaire was administered with the collaboration of both the training librarians and academics co-ordinating the nursing programme.

Haws (1987:173) and Person (1981:21) have shown that using attitudinal surveys distributed over a period of time after the completion of the instruction course are worthwhile in determining the impact of an instruction course on students. Therefore, the student test was distributed after the completion of the IL skills course. It was assumed that distributing the survey to students who should have been applying their new-found skills and knowledge for some months, would obtain details about students' library skills, their attitudes towards their information-seeking experiences and the overall impact of IL skills instruction. Questions about applying specific skills with library tools, whether instruction matched their discovered information needs, perceptions of utilizing library resources/services and present and future impact of IL skills instruction were included.

3.4 Target population

The definition by Mark (1996:105) of a population is “the collection of all individuals, families, groups, or organisations, communities, events and so on, that we are interested in finding out about. Rassel and O’Sullivan (1995:34) define a population as any group that is the subject of research interest. Black (1999:119) states that by defining the population, the researcher is saying: “this is the group from which I will select a representative sample for my study”. In this study, two populations are used, namely:

- Training librarians from four Universities of Technology (UoT).
 - ✓ TUT (n=2)
 - ✓ VUT (n=1)
 - ✓ DUT (n=4)
 - ✓ CPUT (n=2)
- Nursing students within Universities of Technology (UoT) are:
 - ✓ VUT (n=26),
 - ✓ TUT (n =72),
 - ✓ DUT (n= 129),
 - ✓ CPUT (n=85)

Mark (1996:237) noted that programme evaluation research “relies on information obtained from persons who are in position of knowing the needs and service use patterns”. The study focussed on n=312 Nursing students from four UoT in South Africa. All these nursing students are postgraduate and some of them are working nurses.

The training librarians of the respective UoT were also involved in the study. An evaluative questionnaire (Appendix E) was distributed to nine training librarians. The objective of the questionnaire was to collect information about the similarities of their IL training.

3.4.1 Population

The identified UoT also have nursing undergraduate programmes which were not considered for this investigation. The reason being other UoT do not have undergraduate programmes. The study focused on the postgraduate nursing students so it was necessary to make general findings based on a study of a subset of that population. That subset was the total of 312 postgraduate nursing students. These students have completed their undergraduate programme, which is the National Diploma. As part of the IL training intervention at the UoT, nursing students attend twice per semester unless their programme cannot accommodate them in that year. Training sessions are equivalent to the lecturing period.

3.5 Research instruments

Information relating to existing “conditions” of student IL skills was gathered; an element of comparability was inherent in the study; and suggestions for improvement of skills were an important consideration. The evaluative questionnaire (Appendix F) observed ACRL Information Literacy Competency Standards for Higher Education. It structured according to the following ACRL information literacy standards:

- ✓ The information literate student determines the nature and extent of the information needed.
- ✓ The information literate student accesses needed information effectively and efficiently.
- ✓ The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
- ✓ The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
- ✓ 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.

The instrument was designed to assist the researcher in collecting data about how effective the IL training was, whether the nursing students are now confident in information searching process and the extent to which they have acquired skills for life-long learning. The questionnaire (Appendix F) was used as the research instrument to collect data from nursing students. The questionnaire (Appendix F) for nursing students consisted of 29 closed questions and two open-ended questions. The questionnaire (Appendix E) for training librarians had 9 closed questions and 1 open-ended question. Both questionnaires are attached as appendix F and E respectively.

3.6 Data collection

Data was collected from four UoT. After the approval (Appendix B) by the respective Ethics Committees (see 3.8), the researcher sent the approval letter to the academics coordinating nursing training intervention. The same letter (Appendix D) was also sent to training librarians for their assistance in administering the online questionnaires. Academics and training librarians assisted the researcher in obtaining the total number of Nursing of each UoT. Data was collected from these nursing students by an online questionnaire. The data were analysed with the spreadsheet from Google Documents.

3.6.1 Questionnaire

In asking questions, the researcher may ask open-ended or close-ended questions. Closed-ended questions or structured questions require the respondent to select an answer from a list provided by the researcher. They are very popular in survey research because they provide greater uniformity of response and are more easily processed (Babbie, 1992:240). Open-ended questions or unstructured questions are designed to allow free responses from respondents rather than close-ended questions which are limited to specific alternatives (Powell, 1991:87). Open-ended questions are much more difficult to assess. It was decided to use multiple choice questions because these are easy to mark and nursing students are familiar with the format. The advantages and disadvantages of this type of question are discussed by Brown and Knight (1994:33).

Oakleaf (2008:235) supports the notion that locally developed tests have several additional benefits. First, they have the benefit of being adapted to local goals and student characteristics. The process of developing test questions can help librarians determine what they really want to know about student learning.

In this study, closed-ended questions were used to save time and lessen confusion. However, to give respondents the freedom to express their opinions and perceptions, two open-ended questions were added. Multiple choice questions were used as they have been found suitable for measuring IL knowledge in other studies (Gross and Latham, 2007:42 and Ivanitskaya, O'Boyle and Casey, 2006:4). A cover letter (Appendix C) accompanied the online questionnaire. The main aim was to briefly explain the purpose of the study and to stress the importance and ethical issues surrounding the study. The covering letter was written in a professional style with a letterhead in order to indicate the authority to conduct the study. Nursing students who undertook the IL training, were not compelled to return the online questionnaires or offered incentives and their anonymity was assured. Essentially, students volunteered to provide this information about their skills and knowledge. Questionnaires were developed to gather information about nursing students at UoT, their use of electronic resources and their information-seeking process. The surveys were intentionally designed to gather comparative information on this population.

The researcher distributed the questionnaires (Appendix F) which were to be completed online by the nursing students at UoT. The completed online questionnaires were to be submitted at the end of IL training session to the researcher. The online questionnaire designed for nursing students had four sections, namely:

- ✓ First Section: Demographic profile.
- ✓ A: Library skills.
- ✓ B: Information literacy skills.
- ✓ C: Information literacy intervention evaluation.

The questionnaire administered after the training intervention served as the only instrument to evaluate the IL intervention. The questionnaires included one question regarding the students' place of registration and one concerning their course programme. In addition, the questionnaire had 29 closed questions and one open-ended question, and concentrated on the students' self-assessment. The closed questions focused on their knowledge of specified bibliographic databases, the frequency they used bibliographic databases and search engines on the World Wide Web (WWW) in general as well as their skill in using these resources

First Section: Demographic profile

The first section of the online questionnaire collects data about the location of the students and the registered course programme. Here students mention their UoT and their degree.

A: Library skills

This section sought to establish whether the students have library skills. It covers information about the use of the library catalogue, previous IL training, copyright and legal use of information.

B: Information literacy skills

This section covers all aspects of IL, using the IL Competency Standards for Higher Education to formulate the questions. The outcomes on this section are a demonstration of the students' information literacy. A question on the investigation of confidence is also posed to assess the students' level of confidence.

C: Information literacy intervention evaluation

This section is a reflection of the IL training intervention students received in 2011. Here students were required to be honest and evaluate the training with the intention of improving it. They were asked to:

- ✓ Rate the information literacy training
- ✓ Indicate whether they have learnt
- ✓ Indicate how complex the training was to them

- ✓ Note whether there had been formative assessment during the session
- ✓ Note whether they had received summative assessment on assignments, project, etc.
- ✓ Comment on the relevance of the learning materials or hand-outs
- ✓ Indicate whether the information literacy training contributed towards lifelong learning.

3.6.2 Data analysis method

Data from both evaluative questionnaires were computed in tables. The analysis for training librarians is done according to section 1 personal information, section 2 library skills, section 3 self-assessment on the session and section 4 training programme's effectiveness. The analysis of data was done by Google Documents, using Spreadsheet, which assisted in the computation of data and design of graphs and tables. The results are presented in percentage terms with accompanying interpretation and their meaning to the research questions on chapter 1 of this study.

3.7 Limitation of the research study

The investigation was limited to nursing students from four UoT within South Africa. These are the fourth year students who have used the library before through their various level of academic development. The skills needed for the completion of the research were taught and reinforced throughout their past three years of studies. The online questionnaire assisted in collecting and reaching a number of nursing students. The response rate with the online questionnaire was high from both nursing students and training librarians as will be discussed in section 4.3.1.1.

3.8 Ethical considerations

The researcher approached the chairpersons of the Ethics Committees within the Faculty Research Committee (FRC) of the four UoT where the nursing departments reside. The chairpersons of the Ethics Committee advised the researcher to send a letter of application (Appendix A) and the research proposal for consideration by each Ethics Committee.

Each Ethics Committee of the UoT used their respective procedures and policies for consideration before giving their consent. Permission to conduct the study was obtained from each of the UoT from their Ethics Committees. An application letter, consent letter and research proposal were sent to these Ethics Committees for their considerations. The nursing students received written information about the study. It was, however, stressed that none of them were under obligation to complete the questionnaires. The nursing students' replies were anonymous. Furthermore, no identifying information was collected and students who chose not to participate remained unidentified. The researcher thanked all those who participated in the study for their time and cooperation.

3.9 Summary

This chapter reported on the research design and methodology used to collect data about the evaluation of the IL training intervention of nursing students at Universities of Technology (UoT) in South Africa. Students who participated were from four UoT in South Africa. The case study was based on these UoT because they are the only ones that offered nursing. The description of the online questionnaire and sampling procedure adopted were discussed.

CHAPTER 4: DATA ANALYSIS AND RESEARCH FINDINGS

4.1 Introduction

The chapter presents data from the evaluative questionnaires through the research methods described in chapter 3. Data collected from nursing students and the training librarians through the evaluative questionnaires were analysed. The analysis follows the structure of both online questionnaires with the interpretation of data between the sections as they appear on the online questionnaire.

4.2 Data analysis

For Royse (1995:40), “one of the purposes of analysis is to express the data in a way that is “mentally digestible”. Durrheim (1999:47) purports that the aim of conducting data analysis is “to transform that data into an answer to the original research question”. The information drawn will be used to inform recommendations and the conclusion. Data was screened for accuracy and to double-check unanswered, incomplete and unclear answers. Punch (1998: 203) used the term data reduction to refer to this process. This process is necessary for clustering data according to themes and patterns to facilitate the interpretation and analysis. Punch (1998:203) also suggests that after data reduction, data can be organized and assembled to gain meaning. Data display includes the use of tables, graphs and tables for the interpretation of data into meaningful information. This stage will be repeated for accuracy because it is an important stage of data analysis. After data reduction and data display, conclusions will be drawn based on the analysed data (Punch, 1998:204).

4.3 Findings and data interpretation

4.3.1 Nursing students

Nursing students, who participated in the study but not necessarily returned their responses, were n-312. A total of 250 students actually returned the questionnaire. Given that the researcher was relying on the goodwill of the student participants, the questionnaire return rate was 80% and considered excellent.

4.3.1.1 First section: Demographic profile

Demographic profile types of questions to the respondents were about their registered degree and the location (Table 4.3.1.1).

Table 4.3.1.1 Population

Universities of Technology (UoT)	Total	%	Returned Questionnaires
Vaal University of Technology (VUT)	26	100	26
Tshwane University of Technology (TUT)	72	80	58
Durban University of Technology (DUT)	129	75	97
Cape Peninsula University of Technology (CPUT)	85	81	69
Total	312		250

Question 2 of the online questionnaire (Appendix E) distributed to the training librarians indicates statistics kept about nursing students' participation in IL training. The online questionnaire was completed by n=250 nursing students. Table 4.3.1.1 above indicates the number of returned online questionnaire.

What is the degree for which you have registered?

Table 4.3.1.1.1 Degree registered.

B-Tech Nursing	247	99%
M-Tech Nursing	3	1%
Other	0	0%

Table 4.3.1.1.1 above shows the response of nursing students when they were asked to indicate the study programme. This is question 2 on the evaluative questionnaire (Appendix F).

4.3.1.2 A: Library skills

The section collected data about nursing students' previous experience in using the library services and facilities. It was necessary for the researcher to ask respondents about previous IL training in 2011. This information enabled the researcher to know whether these nursing students participated in previous IL training interventions.

Q1. Have you ever been to the library for an information literacy session in 2011?

Tables 4.3.1 2 Previous attendance

Yes, once	8	3%
Yes, more than once	242	97%
No	0	0%

The majority of respondents, 97% attended an IL training session earlier in 2011. Only 3% indicated that they attended once only.

Q2 to Q8 refer to the ACRL Information Literacy Competency Standards for Higher Education, in particular standards One to Three. Respondents were tested on their library skills whether they could:

- ✓ Identify an information need

- ✓ Locate information sources
- ✓ Evaluate information and its sources critically
- ✓ Use information sources legally

The results of Q2 indicate that 87% of nursing students were satisfied with the content of the IL instruction session. The majority found it very relevant to what they were expecting. Q3 tried to explore the basic use of the library catalogue and 99% of the respondents were certain that it assists them to locate books in the library. Q4 is intended to clarify the confusion between WWW, library catalogue (OPAC) and databases. It showed that the majority of respondents used the Internet to start searching for information. Only 2% start by searching the OPAC, which was not surprising because of the popularity of Google. The questions are shown in the table below.

Table 4.3.1.2.1 Application of ACRL standards one to three

	Response	No	%
Q2 The content of the information literacy training session was relevant to my studies	Very relevant	218	87%
	Partially relevant	32	13%
	Not relevant	0	0%
Q3 Which of the following is TRUE about the library online catalogue?		No	%
It indicates to you which books are in the library?		247	99%
It lists the titles of articles in the journal?		0	0%
It has information about full-text articles?		1	0%
Q4. If you had to write an assignment, where would you start looking for current and authoritative information resources?		No	%
Search World Wide Web?		55	22%
Search for databases available on your library homepage?		187	75%
Search your library online catalogue (OPAC)?		5	2%
Q5. What is a citation?		No	%
A summary of an article?		5	2%
Information about the source of information, i.e. author, date, title?		239	96%
A lengthy quotation?		1	0%
Index and bibliography together?		2	1%

Q5 concludes the assessment on library skills and assesses their knowledge of what a citation is, showing that 96 % of respondents got the question right. This indicates that they know what a citation is used for when writing.

Q6 when you critically evaluate information sources, which of the following should you consider?

Table 4.3.1 2.2 Evaluation of information

The credentials of the author	3	1%
The length of the information source	2	1%
The information source itself	244	98%

Q6 assesses critical evaluation of information sources. The majority of respondents which is 98% chose to consider the source itself, which is the correct answer.

Q7 the sole, exclusive right to profit from creative written work is called?

Table 4.3.1 2.3 Copyright

Trademark	0	0%
Fair use	0	0%
Copyright	195	78%
All of the above	54	22%

Q7 is about understanding copyright. The correct answer was selected by 78%. Only 22% selected all the answers. This indicates that respondents are less sure about copyright than about some of the other questions, suggesting a need for more training.

Q8 to plagiarise means?

Table 4.3.1.2.5 Plagiarism

Cut and paste a paragraph without citing	247	99%
Copy text	2	1%

The respondents indicated their knowledge of plagiarism. The majority of respondents understood “cut and paste a paragraph without citing” as plagiarism. Copying text is also a form of plagiarism, while in the Internet environment often there is emphasis on cut and paste.

4.3.1.3 B: Information literacy skills

Section B is about assessing the IL skills of nursing students. Q9 to Q20 covers all aspects of IL.

Q9 When I identify subject headings on the OPAC, I become

Table 4.3.1.3 Confidence level

Confident	246	100%
Not confident	0	0%

Q9 assesses the respondents' level of confidence when identifying subject headings during the information-seeking process. The response rate of 100% indicates that the majority of respondents claim that they are confident in identifying subject headings in the OPAC.

Q10 When using an OPAC (online public access catalogue) to look for books, I become

Tables 4.3.1.3.1 Online public access catalogue (OPAC)

Confident	241	99%
Not confident	2	1%

Q10 has a response rate of 99%, which confirms the level of confidence these respondents have when using the library catalogue. The majority of the respondents know that the library catalogue is the primary tool that they can use to locate books in the library. The level of confidence shown is high, although their responses in table 4.3.1.3.1 show that they prefer to use the Internet in preference to using the OPAC to find material.

Q11. I am able to find books on the shelf using shelf-numbers

Table 4.3.1.3.2 Shelf-numbers

Yes	240	100%
No	1	0%

Q11 assesses the usage of shelf numbers in the library catalogue. The response rate of 100% indicates that the respondents think they know how to find books. All the respondents indicate that they are able to locate books using shelf numbers.

Q12 I struggle to find reference books on nursing as a subject using OPAC

Table 4.3.1.3.3 Reference books

Yes	8	3%
No	237	97%

Table 4.3.1.3.3 indicates how confident respondents are to locate reference books using the library catalogue. This shows that 97% said they did not struggle to find reference books in library catalogue. This might suggest that no further training is needed in finding reference books by using the library catalogue.

Q13 I can use bibliography at the end of the information source to find additional sources

Table 4.3.1.3.4 Using bibliography

Agree	238	98%
Disagree	6	2%

Q13 questioned library skills gained during IL instruction sessions. The response rate of 98% is an indication that the respondents know there is a bibliography with additional information at the end of information sources.

Q14. I can use Electronic Resources (e.g. EBSCOHOST, Medline) to find journal articles

Table 4.3.1.3.5 Electronic resources

No	19	8%
Yes	225	90%

Q14 produced a response rate of 90%, showing that respondents were less sure of the use of databases than they were using the OPAC. That indicates a need for more training.

Q15 If you need information about “bad eating habits as a factor in chronic diseases”, which one of the following search strategies would get you the best results from electronic databases?

Table 4.3.1.3.6 Search strategy

eating habits OR chronic disease	0	0%
eating habits NOT chronic disease	37	15%
eating habits as a factor in chronic disease	93	37%
eating habits AND chronic disease	118	47%

Q15 assesses the uses of Search strategies. Here the responses indicate confusion among the respondents. The scattering of response rate indicates that Search strategies are used incorrectly by more than half the respondents. This indicates that more training is needed on formulating search strategies.

Q16 I am confident to retrieve articles from printed journals at my library.

Table 4.3.1.3.7 Print journals

Agree	245	98%
Disagree	1	0%

Q16 indicates respondents think they are able to find information from printed journals. The response rate of 98% indicates the confidence the majority have to retrieve information from printed journals.

Q17 When I write an in-text citation in a bibliography, I become

Table 4.3.1.3.8 In-text referencing

Confident	248	100%
Not confident	1	0%

Q17 indicates a high response rate of 100% confidence in using in-text citation. This is an indication that the majority of the respondents think that they understand in-text referencing.

Q18 I am confident in compiling a bibliography from in-text citation.

Table 4.3.1.3.9 Compile bibliography

Yes	243	99%
No	2	1%

Q18 indicates that respondents think they understand how to compile a bibliography and that sources used in the body must be included in the bibliography list. The response rate of 99% indicates that respondents think they are able to compile a bibliography.

Q19 When finding information sources about nursing topics on WWW, I become

Tables 4.3.1.3.10 WWW

Confident	241	100%
Not confident	1	0%

Table 4.3.1.3.10 indicates the level of confidence the respondents have in using WWW. The response rate of 100% is a clear indication that respondents also think they can use the Internet.

Q20 Evaluating an Internet source for authority and bias

Table 4.3.1.3.11 Evaluating Internet source

Confident	246	98%
Not confident	2	1

Table 4.3.1.3.11 indicates 98% confidence rate in evaluating Internet sources of information.

4.3.1.4 C: Information literacy intervention assessment

Q21. What is your overall rating of the information literacy training you had at your UoT?

Tables 4.3.1.4 Overall rating of Information literacy session

1 -	Excellent	72	29%
2		161	64%
3		14	6%
4		0	0%
5 -	Bad	0	0%

Q21. As part of the IL intervention, evaluation is very important to nursing students and to training librarians irrespective of UoT. This question indicates their rating of IL instruction sessions. Table 4.3.1.4 indicates that 64% of the respondents rated the IL intervention high. The response rate of 29%, indicates that respondents are of the opinion that the content of their IL training sessions is excellent and they regard it as a good instructional programme.

Q22 How much do you feel you have learnt in those training intervention sessions?

Table 4.3.1.4.1 What has been learnt

1 -	More than expected	77	31%
2		157	63%
3		13	5%
4		0	0%
5 -	Almost nothing	0	0%

Q22 indicates knowledge gained during IL training intervention. The response rate of 63% indicates that respondents were satisfied but that there is room for improvement. Some respondents, 31 % indicate that the have learnt more than expected. This is an encouraging result but leaves room for more improvement.

Q23 Rate the difficulty level of information literacy training sessions you had at your library?

Table 4.3.1.4.2 Rate the difficulty level

1 -	Extremely difficult	2	1%
2		10	4%
3		228	91%
4		7	3%
5 -	Extremely easy	1	0%

Q23 indicates a fairly distributed response. The majority of the respondents, 91% indicate that the IL training intervention session was pitched at the appropriate level.

Q24 Rate the value of the in-class activities for your information literacy training (discussions, hand-on practice, etc.)?

Table 4.3.1.4.3 In-class activities

Valuable	243	100%
Not valuable	0	0%

Table 4.3.1.4.3 indicates a response rate of 100%. All the respondents found the hand-out and discussions valuable to them.

Q25 Rate the value of the outside class tasks related to this information literacy training intervention sessions (assignment, homework, projects, etc.)?

Table 4.3.1.4.4 Outside class tasks

Valuable	248	100%
Not valuable	0	0%

Table 4.3.1.4.4, indicates that all the respondents found the tasks valuable. This might be an indication that knowledge gained in the IL session was transferred into the assignments and other outside classroom activities.

Q26 rate the learning materials used in this information literacy training sessions (exercises, websites, quiz, etc.)

Table 4.3.1.4.5 Learning materials

Valuable	248	100%
Not valuable	0	0%

Q26 assessed respondents' opinion of the learning materials used during the IL training session. There is 100% agreement that they were valuable.

The overall response rate indicated that nursing students have confidence is using the library catalogue. Their overall library skills and confidence seem to be good. There was room for respondents to receive further training on copyright. The respondents' information literacy skills indicated that they were less sure of the use of databases and search strategies. The overall response rate indicated that there was room for further training on information literacy skills.

4.3.2 Training librarians

Training librarians of four UoT participated in assisting the researcher to collect data. Below follows a discussion of the results of the questionnaire to the training librarians.

4.3.2.1 First section: Demographic profile

What is the name of your University of Technology?

Table 4.3.2.1 Name of UoT

Tshwane University of Technology	2
Vaal University of Technology	1
Durban University of Technology	4
Cape Peninsula University of Technology	2

These are the names of the Universities of Technology that participated in an online questionnaire. The response indicated training librarians involved in IL training. Of the nine, only five completed the questionnaire.

4.3.2.2 A: Information literacy intervention

Q1 How many nursing students have you trained in information literacy sessions in 2011?

- ✓ VUT (n=26),
- ✓ TUT (n =72),
- ✓ DUT (n= 129),
- ✓ CPUT (n=85)
- ✓ **Total = 312**

Q1 indicates nursing students who attended information literacy training intervention sessions. A total of n=312 nursing students were trained. The classes varied in size per UoT.

Q2 How many times do you offer training per year

Tables 4.3.2.2 Training per year

Once per year	0
First semester only	0
Second semester only	0
Both first and second semester	5

Q2 indicates the frequency of information literacy training intervention sessions per academic year. The response rate of 100% indicates that all the training librarians offer IL training at least twice per year.

Q3 What is the scope of your information literacy training?

Table 4.3.2.2.1 Scope of information literacy

How to use the library catalogue or OPAC	0
How to find articles using Databases	3
How to formulate a search strategy	1
Plagiarism, how to use information legally	0
Library orientation	1

Q3 tries to find out what these training librarians cover during their training. The response rate is distributed across key learning areas. No training librarians responded to “how to use the library catalogue or OPAC” or “plagiarism, how to use the information legally”. It was established that these two questions are addressed by all librarians in first semester of their training. They indicated that they offer training twice per year. In the second semester, more emphasis is put on training nursing students on how to find articles using Databases. The respondents were three. Library orientation has low response rate, which indicates that it lacks importance. The library catalogue and plagiarism are not topics covered in the second semester.

Q4 Do you use Pre-tests before information literacy training?

Table 4.3.2.2.2 Pre-test assessment

Yes	1
No	4

Q4 tries to understand if training librarians find it prudent to identify learning needs before the commencement of IL training intervention session. The four training librarians indicated that a pre-test was done only rarely.

The reason is because the IL training was seen by academics as a necessity to all students. All students in class are encouraged by academics to be present in those IL training interventions, so pre-tests were not required to select students who needed training.

Q5 Do you use Post-tests on your information literacy training?

Table 4.3.2.2.3 Post-test assessment

Yes	5
No	0

Table 4.3.2.2.3 indicates a different picture. The five training librarians indicated that they have used the post-tests. This is a good response rate and indicates that training librarians are concerned about the effectiveness of their training and how they can improve it.

4.3.2.3 B: Contents of the sessions

Q6 According to your experience, in which information skill area have nursing students improved?

Table 4.3.2.3 Nursing students' improvement

Keyword searching	3
Finding information by Database searching	4
Locating information sources by using Open Public Access Catalogue (OPAC)	4
Evaluating information received from various sources	2
Making legal use of the information received	2
Using scholarly literature	2

Q6 is a critical assessment question. The responses of nursing students on these areas indicated that more training was needed. Nursing students' response rate to making legal use was 90%. On search strategy, nursing students were not sure of the formulation and use of Boolean Operators. The response from training librarians on table 4.3.2.3 indicated that nursing students had received training.

Four responses indicated that the use of the library catalogue and database searching had been taught. The keyword searching was taught by three, which shows that they thought that it is important to impart skills on this learning area. The mastering of keyword searching is applicable to all databases. The identification of keywords on the research topic enables user to use them when retrieving information from all databases. There were two responses for evaluation of information sources, legal use and use of scholarly literature.

Q7 Which information sources do nursing students use most?

Table 4.3.2.3.1 Most used information sources

Journals	3
Books	4
WWW	1
E-Books	0

Q7 was about information sources used by the students. Four responses indicated that they mostly used books. The journals and WWW are used but not as much as books.

According to table 4.3.2.3.1, response rate of 2% indicated that nursing students start with OPAC when searching for information. Four training librarians indicated that nursing students use books more as compared to other information sources. That suggests that nursing students know where their books are on the shelves, they do not have to search the OPAC for location.

Q8 Do you offer individual training after information literacy sessions in class?

Table 4.3.2.3.2 Individual training offered

Yes	5
No	0

Q8 establishes if there is an individual training programme or face-to-face consultations from the respondents. All respondents have indicated that there was individual training as well. By offering individual training, the five respondents indicate that there is a need to encourage nursing students to consult training librarians on their own.

4.3.2.4 C: Information literacy intervention evaluation

Q9 How much do you think nursing students have learnt in those training sessions?

Table 4.3.2.4 How much has been learned

1 -	More than expected	2
2	Expected	3
3	Less than expected	2
4	Nothing	0
5 -	Almost nothing	0

Q9 tries to establish from training librarians whether nursing students indicated to them how much they have learnt. Three responded by saying nursing students learnt as they expected.

It indicates that nursing students agreed to have gained skills and the relevancy of the IL training to them is good. Two responses indicate that they think the nursing students have learnt more than expected.

Q10 Please list things you think can improve information literacy training intervention sessions.

- ✓ In-text referencing
- ✓ How to use full-text databases
- ✓ How to reference.
- ✓ Never copy

- ✓ Blending recent technologies with traditional information literacy training methods
- ✓ Putting LCD screen in a library which shows them library procedures and how to use them randomly because they take time to understand the system
- ✓ Cooperation from their lecturers
- ✓ They must improve their computer literacy skills.
- ✓ Attitude of gratitude of being responsible.
- ✓ They must learn to be self-reliant
- ✓ Curriculum integrated training
- ✓ Collaboration with academics

Q10 indicates responses received from five respondents on an open-ended question about how the IL can be improved. Above are the views of training librarians in no particular order of UoT.

4.4 Summary

The chapter covered findings of the two online questionnaires for nursing students (Appendix F) and the training librarians (Appendix E). The findings were presented in tabular format. Headings used in the online questionnaire were used to structure this chapter.

CHAPTER 5: INTERPRETATION OF FINDINGS AND CONCLUSION

5.1 Introduction

The purpose of the study was to assess and evaluate current information literacy training provided by training librarians to nursing students at four Universities of Technology (UoT) in South Africa. The online questionnaires were distributed to nursing students (Appendix F) and training librarians (Appendix E). Section 1 of both online questionnaires had demographic information about the respondents. Subsequent sections included multiple choice questions and open-ended questions. Both online questionnaires were centred on the objectives of the study. These objectives were to establish the following:

Primary objectives:

- ✓ to evaluate the effectiveness of information literacy intervention of nursing students at four UoT.

Secondary objectives:

- ✓ to determine whether information literacy interventions have an effect on the confidence of postgraduate nursing students.
- ✓ to determine whether the information literacy interventions have made the nursing student information literate.

The interpretation of the findings below is based on the results the researcher considered significant. This chapter interprets and the findings to understand the research problem and the objective of the research study. The curriculum-integrated information-literacy intervention for nursing students described in this study is merely the step towards equipping nursing students to be effective researchers. This IL intervention provides the foundations for a systematic approach to seeking resources for assignment, learning and research.

The IL intervention aims to increase nursing students' awareness of available research; assists them to start to develop skills for accessing available research through electronic data sources; and guides them in their steps towards an appreciation of research findings. It is well recognized that a large part of what academics seek to change in nursing students has to do with their attitudes. Enticing a nursing student to approach the task of learning itself or to consider a particular issue in a different way, can be the start of an enduring change for that nursing student. A culture of curriculum-based instruction is needed within the library to ensure the continued success and evolution of instruction initiatives. There are changes in the overall work environment of a library, from the daily tasks to the overall strategic plan.

5.2 Findings from survey of nursing students (Appendix F)

The overall response rate for the questionnaire was 80% of the 312 post-graduate nursing students at four UoT. Those who completed their online questionnaire were 250. Initial questions related to the library skills, IL skills and the evaluation of the training session. Questions specific to the library services were whether students used the library, and if so, whether they used resources, such as the online catalogue, journals and databases. The results of questions pertaining to use of library services are in section 2: library skills.

These results show that almost 95% of the students had used the library at the time of the survey. Overall, it was shown that the UoT libraries and information services were used, however, it could be even better. One reason for the apparent satisfactory use of library services by graduate nursing students, discussed below, is that, it was in the second semester when the investigation was conducted. It was towards the end of the academic year.

5.2.1 First Section: Demographic profile

The demographic data of the respondents described their individual UoT and attributes such as degree. Gender and age were not included as they were not regarded as relevant. The 250 respondents indicated that they have registered for nursing. In relation to respondents' location:

- ✓ TUT 57 (23%),
- ✓ VUT 27 (11%),
- ✓ DUT 97 (39%)
- ✓ CPUT 69 (28%).

Total = 250

The highest numbers of respondents were from DUT with 39% of the total.

5.2.2 A: Library skills

The test for library skills and self-confidence after the training intervention provided an opportunity to measure the overall progress of students over the course of the semester. The results of the tests for library skills show that the nursing students indicated high confidence in most of the questions.

The respondents were asked nine questions pertaining to their library skills. The greatest proportion of the respondents 242 (97%), indicated that they had attended previous IL sessions in the library. The response rate of 99% (247) indicates that respondents think they know how to use the library catalogue in their respective UoT. Q5 of the online questionnaire shows that 239 (96%) of respondents claimed to know what a citation is. This is a crucial question in library skills assessment. In Q7 about copyright, 195 (78%) of the respondents say they know what it is. This lower percentage indicated that nursing students were less confident when answering the questions. In this section the majority of respondents claimed to have good library skills.

5.2.3 B: Information literacy skills

This section assessed the respondents' view of their information literacy skills. It has twelve questions, starting from Q9 to Q20. Q9 was about the subject headings according to ACRL standards in higher education. The majority of respondents, 247 (99%) said they understood what plagiarism is. The response rate of 97% (237) indicated that respondents are comfortable to use subject searches when searching the library catalogue.

In relation to the use of electronic resources in Q14, 225 (90%) indicated that they can find articles using databases. Q15 indicated that respondents are comfortable in using search strategies. The response rate of 47 % (118) indicated that the respondents said they recognised a good search strategy. The response is not satisfactory because most health sciences databases use Mesh where subject searching is required. The confidence level of the respondents was tested. Q9, Q10, Q17, Q19 and Q20 assessed the confidence levels of respondents after training. The majority of the respondents indicated high levels of confidence in their library skills. In Q9, 246 (100%) of the respondents were confident in identifying subject headings in the library catalogue. Q10 supported Q9 on the confidence of using the library catalogue. Q16 which has the response rate of 98% (245), showed that respondents have high level of confidence in using the printed journals in the library. Respondents' high level of confidence indicated that the previous IL sessions were effective in training them in library skills.

5.2.4 C: Information literacy intervention assessment.

Q21 to Q28 evaluated the IL training. When answering Q21, 64% (161) rated the IL training as good. The majority of the respondents in Q22 indicated that they have learnt more than expected from the IL training sessions.

5.3 Findings from survey of training librarians (Appendix E)

The online questionnaire to training librarians (Appendix E) had the following sections:

5.3.1 First section: Demographic profile

The demographic data of the respondents described their individual UoT. Gender and ages were not included. The location where they were training was important for the study. It assisted the researcher to ascertain the availability of the IL training intervention. Data was collected about demographic profile of training librarians. In relation to respondents' location, the response rate was:

- ✓ TUT 2
- ✓ VUT 1

- ✓ DUT 4
- ✓ CPUT 2

5.3.2 A: Information literacy intervention

Q1 to Q5 assessed IL training sessions offered by librarians. Here the researcher wanted to know if there was any IL training offered in the academic year of 2011. According to Q1, all the UoT offered training to their nursing students. Q3 assisted the researcher to identify the frequency of the IL training per year. All the training librarians indicated that they had training in both first and second semesters. The scope of their IL was important to the researcher.

Three responses indicated that training emphasized “how to find articles using databases”. This response indicates that librarians have realized that library skills training were covered at undergraduate level, and they needed to put more emphasis on IL skills. On the question of assessing training needs through tests after the interventions, four of the training librarians indicated that they only use tests after training to assess the effects of their training.

5.3.3 B: Contents of the sessions

This section on self-assessment of the training librarians of the four UoT, was based on Q6 to Q9. These questions tried to establish from the training librarians themselves whether they thought that their nursing students found their IL training effective. They are about the feedback they received from their respective students. Q6 asked “according to your experience, in which information skill area have nursing students improved? Responses from the nursing students indicated that they have used the following options below:

The use of Databases and OPAC to find information were noted by four training librarians respectively. According to four training librarians, nursing students have improved their skills in these areas. The response rate indicated that more students use books and articles in writing their research projects. This response rate is an indication of how well the training was received by nursing students.

Q7 supports the responses of Q6. According to the responses of Q7, nursing students indicated that journals (38%) and books (50%) are used as their sources of information. The response rate for books (50%) is higher than that of journals. This indicated that training librarians need to place more emphasis on the use of journal articles. Q8 asked the training librarians if they offer individualised training after IL training. Responses from all the training librarians indicated that it is done.

5.3.4 C: Information literacy intervention evaluation

The section tried to establish if the nursing students indicated to the training librarians whether there were weaknesses in their IL interventions. From the results obtained, few observations and interpretations can be made. The evidence demonstrates that training librarians thought their IL training intervention made a difference to nursing students' knowledge and skills, as shown in the training librarians' responses (Q9). When training librarians were asked how much do they think their nursing students have learnt from their IL training, they thought nursing students have learned a lot. Training librarians had favourable perception of the amount learned during the training interventions. Two training librarians indicated that nursing students have learnt more than they expected and three indicated that they have learnt more skills in those sessions. Q9 indicated that the training librarians are of the opinion that their training met the expectations of the nursing students.

5.4 Conclusion

The evaluation process is a significant part of any IL intervention. Poyner (2005:40) points out that evaluation of IL skills training can be regarded as a form of two-way communication. It can assist the librarians by assessing library performance, redesigning training materials and making the librarian think about training methods. It can also demonstrate whether or not the librarian's end-users are making the best use of the available resources in the library.

Findings of the investigations were discussed. What emerged from the findings was that nursing students at four UoT thought they had high levels of information literacy skills. Responses to IL training in the second semester had a high return rate. To a large extent, IL training for nursing after the evaluation was found to have been effective. As stated in chapter 1, the problem statement was “to evaluate the effectiveness of IL training of nursing intervention at four Universities of Technology (UoT) in South Africa” which has now been done.

The research questions were formulated as follows for this study:

- How effective are the IL training intervention of nursing at four Universities of Technology (UoT)?
- How much did they learn?

In order to assess and evaluate IL training interventions, a method of assessment was required. The literature review of chapter 2 provided the basis to answer the research questions. It gave an overview of IL in academic libraries, international standards used, assessment methods and evaluation for IL. Evidence-based practice was discussed in the context of IL and health information literacy. Online questionnaires were designed for both nursing students and training librarians to collect data to assist in assessment and evaluation. Both online questionnaires were divided into sections, to assist the research to arrive at a conclusion. The questions were multiple-choice and two and one open-ended respectively for nursing students and training librarians. The online questionnaires were sent to both nursing students and training librarians to assist in evaluating the effectiveness of the IL training at these four UoT. Data from the online questionnaires offered interesting insight and optimism for training librarians of the four UoT.

The theoretical approach from chapter 2 and empirical data were integrated in analysing the findings. These findings are used to arrive at the conclusion of the research study. The findings can be summed up according to sections as follows:

Nursing students

First section: Demographic profile. There were n=312 nursing students, of which 250 (80%) returned the completed online questionnaire. This indicates that there was high interest from nursing students to participate in the assessment.

A: Library skills. Responses for this section were high. A response rate of 97% has shown that these nursing students did attend previous IL training sessions. Their use of the library catalogue and of both printed books and journals was good. On nursing students' responses, the use of the library catalogue which was lower than the use of databases indicated that more students used journals.

B: Information literacy skills. The response rate to Q14 indicated that respondents' level of confidence when using databases and information sources after the IL training is 90%. Respondents claimed that they used subject headings, search strategy, bibliography, in-text referring and plagiarism. This section indicated that the IL training at the four UoT was regarded as effective. The outcomes of ACRL standards for higher education were met by the respondents. These respondents demonstrated that they:

- ✓ recognize a need for information;
- ✓ identify and locate appropriate information sources;
- ✓ know how to gain access to the information contained in those sources;
- ✓ evaluate the quality of information obtained;
- ✓ organize the information; and
- ✓ use the information effectively

C: Information literacy intervention evaluation. Q20 showed that 64%, of the respondents thought IL training had been satisfactory. Responses to the next question indicated that the respondents regard the sessions as being more informative than they expected.

Q21 which has a response rate of 63%, demonstrated that respondents had IL skills in the sessions. A large majority of the nursing students found that their IL training at the four UoT had been effective. One may therefore conclude that the objectives of the investigation have been achieved. The IL interventions of four UoT are effective, although some areas requiring additional training have been identified.

Training librarians

First section: Demographic profile. The section aimed at identifying training librarians from four UoT. A total of 5 training librarians completed and returned the online questionnaire.

A: Information literacy training. The question enquiring about the frequency of information literacy training offered to nursing students seems to confirm results received from the online questionnaire sent to nursing students, showing that they received training more than once. Q2 to training librarians confirmed that IL training was offered twice per year. Q3 was about the scope of the training. Library skills and IL skills were offered to nursing students. It was found that the contents of tested students on how to find, locate, retrieve and use information legally.

B: Contents of the sessions. Q6 asked in which information literacy skills areas have nursing students improved. Responses from four out of the five training librarians indicated that library skills such as OPAC use and IL skills, that is, database searching had improved. Q7 also supported high increase in information literacy skills such as the use of journals and e-books. Responses of four training librarians indicated that library books were the most used information sources.

C: Information literacy intervention evaluation. A total of five training librarians indicated on their responses that nursing students have gained IL skills in their sessions. When asked about the area that needs improvement, all indicated the need to emphasis in-text referencing and accessing full-text databases.

Graduate nursing students are expected to have basic IL skills. Knowing how to locate and select relevant information, and then utilize that information is a necessary IL skill in the health sciences in today's digital-age. In the health-care sector, the rise in evidence-based medicine has brought into perspective the significance of IL skills for nurses.

In the UoT case described, findings have indicated that IL skills are integrated in the curriculum and strengthened in collaboration with the library staff. The results demonstrate that the IL intervention was effective in developing nursing students' ability to identify, locate and evaluate information. This evidence of its positive effect on nursing students' skills is similar to findings elsewhere (Shorten, Wallace and Crookes, 2001; Fox, Richter and White, 1996).

The assessment of nursing students and the evaluation of the IL training is necessary to improve the programme. Assessment is a cumulative process. Though isolated, "one-shot" assessment can be better than none, as was the case here, improvement is best fostered when assessment entails a linked series of activities undertaken over time (Astin *et al.*, 1993). Gaining skills in IL multiplies, the opportunities for students' self-directed learning, as they become engaged in using a wide variety of information sources to expand their knowledge, ask informed questions and sharpen their critical thinking for furthering self-directed learning (Barnard, Nash and O'Brein, 2005:511).

IL competencies are generally accepted as being useful in nursing student learning and in developing independent learners and future knowledge workers. However, the training of IL competencies cannot be left to chance or spontaneous methods. Instead, it should be researched, deliberately planned and synergized with appropriate pedagogical approaches to ensure effective learning, retention and applicability amongst nursing students. It is anticipated that IL training approaches, which are infused with sound pedagogical methods, would yield more effective nursing student learning and skills application in various tasks and assignments, as well as better academic achievement.

5.5 Recommendations

The library of the 21st century should aim to improve students' IL competencies. As Curzon (2004:44) says, “when our students have mastery over IL, librarians and faculty have done their job as educators”.

This is, however, not all about technology. Roberts and Levy (2005:221) remind us the “the new learning environment is blended, demanding the best in face-to-face learning and teaching, and the use of technologies to add value to the learner's experience”. An ideal university library is, as Kope (2006) suggests, a learning center combining learning, writing, research and technology. To achieve this end, it requires not just a change in the facilities of the library but an even bigger change in librarians' minds, concepts, and relationships with students. There are a number of recommendations emanating from the investigation. Academics and librarians need to understand that IL forms part of the package of producing researchers and graduates. It is imperative for librarians and academics to be educated in IL as a life-long skill needed by students. In the health care environment, nursing students are constantly confronted with the need for health information literacy. Consumers of health care services expect nurses to provide and to access health related information. It is recommended that the IL training intervention at UoT have the following attributes:

- ✓ compulsory health information literacy for all the levels,
- ✓ postgraduate nursing students be offered IL more frequently
- ✓ information literacy be emphasized at undergraduate level

Nursing students made use of all available resources and were trained. Alternative means of preparing nursing students to cope with increasing amounts of available information have implications for teaching and learning strategies and the way academics traditionally worked. Achieving competency in IL requires an understanding that this cluster of abilities is not extraneous to the curriculum but is interwoven into the curriculum's content, structure and sequence (Bruce, 1997; Orr, Appleton and Wallace, 2001; Verhey, 1999).

All students need to develop skills for searching, evaluating and managing information if they are to be effective as nursing students and as professionals in the health profession. Well planned and effective IL skills are seen as a crucial element in reducing plagiarism in higher education. IL needs to be central to the education of students. In other words, the teaching of the skills and abilities inherent to being information literate needs to move out of the traditional library venue and be integrated into courses and programs across the curriculum.

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REFERENCE LIST

American Library Association. 1989. *Presidential report on information literacy. 1989. Final report*. Chicago: American Library Association. Retrieved July, 2011, from:

<http://www.ala.org/ala/acrl/acrlpubs/whitepapers/presidential.cfm>

Amstutz, D., Whitson, D. 1997. University faculty and information literacy: who teaches the students? *Research Strategies*, vol. 15(1):18-25.

Andretta, S. 2005. From prescribed reading to the excitement or the burden of choice information literacy: foundation of e-learning. *Aslib Proceedings: New Information Perspectives*, vol. 57(2):181-190.

Angelo, T. 1995. Reassessing and defining assessment. *The AAHE Bulletin*, vol. 48(2):7-9.

Angus, J., Hodnett, E. and O'Brien-Pallas L. 2003. Implementing evidence-based nursing practice: A tale of two intrapartum nursing units. *Nursing Inquiry*, vol.10:218–228.

Arnold, J. 1998 I know it when I see it': assessing good teaching. *Research Strategies*, vol. 16(1):1-28.

Association of College and Research Libraries (ACRL). (1989). Presidential Committee on Information Literacy: Final Report. Retrieved 14 July 2011 from: [http://www.ala.org/ACRLPrinterTemplate.cfm?Section=White Papers and Report](http://www.ala.org/ACRLPrinterTemplate.cfm?Section=White_Papers_and_Report) &Templ...

Association of College and Research Libraries. 2000a. *Information Literacy Competency Standards for Higher Education*. Chicago: American Library Association. Retrieved 14 July, 2011, from: <http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm#ildef>.

Association of College and Research Libraries (ACRL). 2000b. Information Literacy Competency Standards for Higher Education. Chicago: ACRL.

Association of College and Research Libraries. 2001. *Objectives for Information Literacy Instruction: A Model Statement for Academic Librarians*. Chicago: American Library Association. Retrieved 14 July, 2011, from: <http://www.ala.org/ala/mgrps/divs/acrl/standards/objectivesinformation.cfm>.

Association of College and Research Libraries. 2003. Characteristics of Programs of Information Literacy that Illustrate Best Practices: A Guideline. Chicago: American Library Association. Retrieved 14 July 2011, from: <http://www.ala.org/ala/mgrps/divs/acrl/>

Association of College and Research Libraries Instruction Section. 2008. Analysis of Instructional Environments. American Library Association, (retrieved 23 September, 2011, from:) <http://staging.ala.org/ala/mgrps/divs/acrl/acrlbucket/is/publicationsacrl/instructionalenvironments.cfm>

Astin, A.W; Banta TW; Cross K.P; El-Khawas E; Ewell P.T; Hutchings P; Marchese T.J; McClenney K.M; Mentkowski ,M.; Miller M.A; Moran E.T and Wright B.D. 1993. Principles of good practice for assessing student learning, *Leadership Abstracts*, vol. 6(4):1-3.

Babbie, E. 1992. *The practice of social research. 6th edition*. Belmont, CA: Wadsworth.

Bainton, T. 2001. Information literacy and academic libraries: the SCONUL approach (UK/Ireland). *67th IFLA Council and General Conference August 16-25*, retrieved 23 September 2011 from: <http://ifla.queenslibrary.org/IV/ifla67/papers/016-126e.pdf>

Bandura, A. 1977. Self-efficacy: towards a unifying theory of behavioural change. *Psychological Review*, vol. 84:191–213.

Barnard, A., and Cushing, A. 2001. Technology and historical inquiry in nursing, In R. Locsin (Ed.), *Advancing Technology, Caring and Nursing*. pp. 12-21. Westport: Auburn House.

Barnard, A.G., Nash, R.E., and O'Brien, M. 2005. Information literacy: developing lifelong skills through nursing education. *Journal of Nursing Education*, vol.44 (11):505-513.

Bawden, D. 2001. Information and digital literacies: a review of concepts. *Journal of Documentation*, vol. 57(2):218-259.

Bell, M and Or, E. 1998. The crossroads between lifelong learning and Information Technology a challenge facing leading Universities. *The Journal of Computer-Mediated Communication*, vol. 4(2):1-15.

Berenholtz, S.M.; Milanovich, S.; Faircloth, A.; Prow, D. I.; Earsing, K.; Lipsett, P.; Dorman, T. and Pronovost, P.J. 2004. Improving Care for the Ventilated Patient. *Joint commission journal on quality and patient safety*, vol. 30(4):195-204.

Bianco, C. 2005. The design of the Wilson's Library Literature online tutorial. *Library Philosophy and Practice*, vol. 8(1):1-16.

Black, T.R. 1999. *Doing quantitative research in the social sciences: an integrated approach to research design, measurement and statistics*. London: Sage Publications.

Blythe, J. and Royle, J.A. 1993. Assessing nurses' information needs in the work environment. *Bulletin of the medical library association*, vol. 81(4):433 – 435.

Bober, C., Poulin, S. and Vilen, L. 1995. Evaluating library instruction in academic libraries: a critical review of the literature 1980-1993. *The Reference Librarian*, vol.5152:195-202.

Boekhorst, A.K and Britz, J.J 2004. Information literacy at school level: a comparative study between the Netherlands and South Africa. *South African Journal of Libraries and Information Science*, vol. 70(2): 63-71.

Boff, C. and Johnson, K. 2002. The library and first-year experience courses: a nationwide study. *Reference Services Review*, vol. 30(4):277-87.

Bouma, G.D. and Ling, R. 2004. *The research process*. New York: Oxford University Press.

Branch, J. 2003. Instructional intervention is the key: Supporting adolescent information seeking. *School libraries worldwide*, vol. 9(2): 47–61.

Brasel, K.J., Weigelt, J.A., Christians, K.K. and Somberg, L.B. 2003. The value of process measures in evaluating an evidence-based guideline. *Surgery*, vol. 134(4):605-12.

Bresciani, M.J., Zelna, C.L., and Anderson, J.A. 2004. *Techniques for assessing student learning and development in academic and student support services*. Washington D.C.: NASPA.

Brettle, A. and Greenhalgh, J. 2004. Made to measure: developing a template to assess the effectiveness of information skills training. *CILIP Health Libraries Group. Variety is the Spice of LIFE (Libraries and Information for Evidence), Conference*, 6–8 September, Belfast, 2004. Available from: <http://www.cilip.org.uk/groups/hlg/conf2004/presentations/Brettle%20and%20Greenhalgh.ppt> (Retrieved 1 August 2011).

Brettle, A. 2007. Evaluating information literacy skills training in health libraries: a systematic review. *Health Information and Libraries Journal*, vol. 24(Suppl. 1):18–37.

Brown, S. and Knight, P. 1994. *Assessing learners in higher education*. London: Kogan Page.

Bruce, C.S. 1992 Developing students' library research skills. *HERDSA green guide number 13*. Higher Education Research and Development Society of Australasia: New South Wales.

Bruce, C. 1995. Information literacy: a framework for higher education. *The Australian library journal*, vol. 44(3): 158-70.

Bruce, C. 1997. *The seven faces of information literacy*. Adelaide: Auslib. Press.

Bruce, C.S. and Candy, P.C. 1995. Developing information literate graduates: prompts for good practice, In Booker, D. Ed. *Information literacy in practice*. Sydney: AUSLIB Press.

Bundy, A. 2004. *Australian and New Zealand Information Literacy Framework principles, standards and practice. Second edition*. Retrieved 11 July 2011 from:

<http://www.caul.edu.au/content/upload/files/infoliteracy/InfoLiteracyFramework.pdf>

Bunyan L.E, Lutz E.M. 1991. Marketing the hospital library to nurses. *Bulletin of the Medical Library Association*; vol. 79(2):223-5.

Cadmus, E.; Van Wyman, E.A.; Chamberlain, B.; Steingall, P.; Kilgallen, M.E.; Holly, C. and Gallagher-Ford, L. 2008. Nurses' skill level and access to evidence-based practice. *The Journal of Nursing Administration*, vol. 38(11):494–503.

Campbell, S. 2004. Defining information literacy in the 21st century. *Paper presented at the World Library and Information Congress: 70th IFLA General Conference and Council*, August 22-27, Buenos Aires. Retrieved 11 July 2011 from: www.ifla.org/IV/ifla70/papers/059e-Campbell.pdf

Canon, A. 1994. Faculty survey on library research instruction. *RQ*, vol. 33(4):524-41.

Cape Peninsula University of Technology (CPUT). 2011. *Faculty of Health and Wellness Sciences*. Retrieved 14 July 2012 from: <http://www.CPUT.ac.za/faculties/health-wellness-sciences>

Cape Peninsula University of Technology (CPUT). 2012. *History*. Retrieved 14 July 2012 from: <http://www.CPUT.ac.za/about/history>

Carder, L., Willingham, P. and Bibb, D. 2001. Case-based, problem-based learning information literacy for the real world. *Research Strategies*, vol. 18(3):181-90.

Catts, R. and Lau, J. 2008. *Towards information literacy indicators*. UNESCO (United Nations Educational, Scientific and Cultural Organization). Information Society Division Communication and Information Sector UNESCO (ed.). IFAP: Information for All Programme, Document code: CI.2008/WS/1, Paris. UNESCO.

Cheek, J and Doskatsch, I. 1998. Information literacy: a resource for nurses as lifelong learners. *Nurse education today* vol.18:243 – 250.

Cogdill, K.W. 2003. Information needs and information seeking in primary care: A study of nurse practitioners. *Journal of the Medical Library Association*, vol. 91(2003):203–215.

Cognard, A. 2004. *Cognard's philosophy: Find the 'Ah' moment*. Retrieved 20 February 2012 from

http://www.usatoday.com/news/education/2004-06-09-cognard-teaching_x.htm

Colborn, N.W., and Cordell, R.M. 1998. Moving from subjective to objective assessments of your instruction program. *Reference services review*, Vol.26(3-4):125-37

Cooney, M. and Hiris, L. 2003. Integrating information literacy and its assessment into a graduate business course: a collaborative framework. *Research Strategies*, vol. 19(3-4):213-32.

Correia, A.M.R. and Teixeira, J.C. 2003. Information literacy: an integrated concept for a safer internet. *Online Information Review*, vol. 27(5):311-320.

Council of Australian University Librarians (CAUL). 2001. *Information literacy standards*. Canberra: Council of Australian University Librarians.

Council of Australian University Librarians (CAUL). 2004. *Information Literacy Standards*. Canberra: Council of Australian University Librarians.

Coupe, J. 2003. Undergraduate library skills: two surveys at Johns Hopkins University. *Research Strategies*, vol. 11:188–201.

Creswell, J.W. 1994. *Research design: qualitative and quantitative approaches*. Thousand Oaks: Sage.

Cunningham, T.H. and Lanning, S. 2002. New frontier trail guides: faculty-librarian collaboration on information literacy. *Reference Services Review*, vol. 30(4):343-8.

Curzon, S. 2004. Developing faculty-librarian partnerships in information literacy. In Rockman, H., Associates (Eds), *Integrating Information Literacy into the Higher Education Curriculum: Practical Methods for Transformation*, San Francisco, CA: Jossey-Bass: pp.29-45.

Darch, C. and Underwood, P.G. 1999. Dirt road or yellow brick superhighway? Information and communication technology in academic libraries of South Africa. *Library Hi Tech*, vol. 17(3):285-297.

Davids, M. 2009. Evaluating an information literacy intervention for first year engineering students at the Cape Peninsula University of Technology. Cape Town: UWC.

Davidson, J.R., McMillen, P.S., Maughan, L.S. 2002. Using the ACRL information literacy competency standards for higher education to assess a university library instruction program. *Journal of library administration*, Vol.36(1-2):97-121

De Jager, K. and Nassimbeni, M. 1998. Roadmaps for the highway: the evaluation of an information literacy training programme for the South African students. *South African journal of Libraries and Information Science*, vol. 16(2):16-36.

De Jager, K. and Nassimbeni, M. 2002. Institutionalizing information literacy in tertiary education: lessons learned from South African programs. *Library Trends*, vol. 51(2):167-184.

De Jager, K. and Nassimbeni, M. 2003. An exploration of the current status of information literacy tuition in South African tertiary institutions and proposals for curriculum design. *South African Journal of Libraries and Information Science*, vol. 69(2):108-114.

De Jager, K. and Nassimbeni, M. 2005. Information literacy and quality assurance in South African higher education institutions. *Libri*, 55 (1):31–38

Dee, C.R, Stanley, E.E. 2005. Nurses' information needs: nurses' and hospital librarians' perspective. *Journal of Hospital Libraries*, vol. 5(2):1-13.

Delaney, S., Jacob, S. and Barton, M. 2003. Estimation of an optimal radiotherapy utilization rate for gynaecologic carcinoma. *Cancer*, vol. 101(4):671–681.

Deleo, P.; Eichenholtz, S. and Sosin, A. 2009. Bridging the information literacy gap with clickers. *The Journal of Academic Librarianship*, vol. 35(5):438-44.

Dennis, N. 2001. Using inquiry methods to foster information literacy partnerships. *Reference Services Review*, vol. 29(2):122-31.

Derakhshan, M and Singh, D. 2011. Integration of information literacy into the curriculum: a meta-synthesis. *Library Review*, vol. 60(3):218-229.

Dervin, B. and Nilan, M. 1986. *Information needs and uses*. New York: Knowledge Industries.

Doherty, J.J., Hansen, M.A. and Kaya, K.K. 1999. Teaching information literacy skills in the information age: the need for critical thinking. *Library Philosophy and Practice*, vol. 1(2):1-9.

Dorner, J.L., Taylor, S.E., and Hodson-Carlton, K. 2001. Faculty-librarian collaboration for nursing information literacy: A tiered approach. *Reference Services Review*, vol. 29(2):132-140.

Doyle, C. 1992. *Outcome Measures for Information Literacy within the National Education Goals of 1990 Final Report to the National Forum on Information Literacy Summary of Findings 1992*. (ERIC document no. ED 351033) Washington, DC: US Department of Education.

Dufault, M. Bielecki, C. Collins, E and Wiley, C. 1995. Changing nurses' pain assessment practice: a collaborative research utilisation approach. *Journal of Advanced Nursing*, vol. 21 (4): 634–645.

Dunn, K. 2002. Assessing information literacy skills in the California State University: A progress report. *Journal of Academic Librarianship*, vol. 28 (1/2): 26–35.

Dupuis, E.A. 1997. The information literacy challenge: Addressing the changing needs of our students through our programs. *Internet reference services quarterly*, vol. 2(213):93-111.

Durban University fo Technology (DUT). 2012. Faculty of health sciences: handbook. Retrieved 14 July 2012, http://www.DUT.ac.za/faculty/health_sciences/nursing

Durrheim, K. 1999. Quantitative measurement. In Terre Blanche, M and Durrheim, K. 1999. *Research in practice: applied methods for the social sciences*. Cape Town: University of Cape Town Press.

Eldredge, J.D. 2001. The most relevant and answerable research questions facing the practice of health sciences librarianship. *Hypothesis*, vol. 15(1):9-17.

Estabrooks, C.A., O'Leary, K.A., Ricker, K.L. and Humphrey, C.K. 2003. The Internet and access to evidence: how are nurses positioned? *Journal of Advanced Nursing*, vol. 42, 73–81.

Farmer, D.W. 1992. Information literacy: overcoming barriers to implementation. *New Directions for Higher Education, No. 78 (Information Literacy: Developing Students as Independent Learners)*, vol. 20:103-12.

Feret, B. and Marcinek, M. 2005. The Future of Academic Libraries and the Academic Librarian: A Delphi Study Reloaded. *New Review of Information Networking*, vol. 11(1):37-63.

Fine, M.J, Stone, R.A, Lave, J.R, Hough, L.J., Obrosky, D.S. and Mor, M.K. 2003. Implementation of an evidence-based guideline to reduce duration of intravenous antibiotic therapy and length of stay for patients hospitalized with community-acquired pneumonia: a randomized controlled trial. *The American Journal of Medicine*; vol. 115:343-51.

Forsman, H.; Rudman, A.; Gustavsson, P.; Ehrenberg, A. and Wallin, L. 2010. Use of research by nurses during their first two years after graduating. *Journal of Advanced Nursing*, vol. 66(4): 878–890.

Fox, L.M.; Richter, J.M. and White, N.E. 1996. A multidimensional evaluation of a nursing information-literacy program. *Bulletin of the Medical Library Association*, vol. 84(2):182–190.

Fox, L. M., and Weston, L. 1993. Course-integrated instruction for nursing students: How effective? *Research Strategies*, 11:89-99.

Francis, B.W. and Fisher, C.C. 1995. Multi-level library instruction for emerging nursing roles. *Bulletin of the Medical Library Association*, vol. 83(4):492–496.

Furth, H.G. 1970. Piaget for Teachers. Englewood Cliffs, N.J: Prentice-Hall.

Germain, C., Jacobson, T., Kaczor, S. 2000. A comparison of the effectiveness of presentation formats for instruction: teaching first-year students at SUNY Albany", *College and Research Libraries*, vol. 61(1):65-72

Grassian, E.S. and Kaplowitz, J.R. 2001. *Information literacy instruction: theory and practice*. New York: Neal Schuman.

Griesel, H. and Parker, B. 2009. *Graduates attributes: A baseline study on South African graduates from the perspective of employers*. Pretoria: HESA and SAQA.

Gross, M., Latham, D. 2007. Attaining information literacy: an investigation of the relationship between skill levels, self-estimates of skill, and library anxiety. *Library and Information Science Research*, Vol.29 (3): 332-53.

Gruppen, L.D; Rana, G. and Arndt, T.S. 2005. A Controlled Comparison Study of the efficacy of training medical students in evidence-based medicine literature searching skills. *Academic Medicine*, vol. 80(10):940–944.

Hadengue, V. 2004. What can e-learning do for university libraries? *Library Review*, vol. 53(8):396-400.

Hart, G. 2006. The information literacy education readiness of public libraries in Mpumalanga Province (South Africa). *Libri*, vol. 56:48-62.

Hart, M.D. 2008. Informatics competency and development within the US nursing population workforce. *Computers, Informatics, Nursing*, vol. 26(6):320–329.

Haws, R. 1987. An Attitudinal study of students toward a required library Instruction course. *Research Strategies*, vol.3 (Fall):172-179.

Hegarty, N., Quinlan, N. and Lynch, T. 2004. A portrait of Olas as a young information literacy tutorial. *Library Review*, vol. 53(9): 442-450.

Henderson, V. and Nite, G. 1997. *Principles and practice of nursing: 6th ed.* New York: Macmillan.

Hernando S. 1997. Promoting library services to qualified nurses: towards a market-led approach. *Health library reviews*, vol. 14(2):105-119.

Herron, P.J. and Griner, L.G. 2000. Research strategies and information sources in Latin American studies: a one-credit, web-based course. *Research Strategies*, vol. 17(1):11-21.

Higgins, C. and Face, C.M.J. 1998. Integrating information literacy skills into the University colloquium: innovation at Southern Oregon University. *Reference Services Review*, vol. 26(3-4):17-31.

Hollister, C. 2005. Bringing information literacy to career services. *Reference Services Review*, vol. 33(1):104-111.

Houlson, V. 2007. Getting Results from One-shot Instruction: A Workshop for First Year Students, *College and Undergraduate Libraries*, vol.14 (1): 89-108.

Humes, B. 1999. *Understanding Information Literacy*. Retrieved 23 September 2011 from: www.ed.gov/pubs/UnderLit/

Hunt, F. and Birks, J. 2004. Best practices in information literacy. *Libraries and the academy*, vol.4 (2004):27–39.

Iannuzzi, P. 1999. We are Teaching, but are they Learning: Accountability, Productivity and Assessment. *Journal of Academic Librarianship*, vol. 25(4):304-3.

Institute of Medicine of the national academies. 2004. *A prescription to end confusion*. Washington, DC: The Institute. Retrieved 15 Aug 2011 from: <http://www.iom.edu/Reports/2004/Health-Literacy-A-Prescription-to-End-Confusion.aspx>

Ivanitskaya, L.; O'Boyle, I. and Casey, A.M. 2006. Health information literacy and competencies of information age students: results from the interactive Online Research Readiness self-assessment (RRSA), *Journal of Medical Internet Research*. Retrieved 14 July 2011 from: <http://ukpmc.ac.uk/articlerender.cgi?artid=715139>,

Ivey, R. 2003. Information literacy: how do librarians and academics work in partnership to deliver effective learning programs? *Australian Academic and Research Libraries*, vol. 34(2):100-13.

Jacobs, S.K., Rosenfeld, P., and Haber, J. 2003. Information literacy as the foundation for evidence-based practice in graduate nursing education: A curriculum-integrated approach. *Journal of Professional Nursing*, vol. 19(5):320–328.

Jacobsen, H.E. and Andenæs, R. 2011. Third year nursing students' understanding of how to find and evaluate information from bibliographic databases and internet sites. *Nurse Education Today*, vol. 31(8):898-903.

Jacobson, T.E., and Mark, B.L. 2000. Separating wheat from chaff: Helping first-year students become information savvy. *Journal of General Education*, vol. 49(4):256-278.

Johnston, B. and Webber, S. 1999. *Information literacy as an academic discipline. Paper presented at the 3rd British-Nordic Conference on Library and Information Studies, Swedish School of Library and Information Science. Sweden: University of Boras.*

Johnston, B. and Webber, S. 2003. Information literacy in higher education: a review and case study. *Studies in Higher Education*, vol. 28(3):335-352.

Julien, H. 1998. User education in New Zealand tertiary libraries: an international comparison. *The Journal of Academic Librarianship*, vol. 24(4):304-13.

Julien, H. and Boon, S. 2004. Assessing instructional outcomes in Canadian academic libraries. *Library and Information Science Research*, vol. 26 (2004):121–139.

Kasowitz-Scheer, A. and Pasqualoni, M. 2002. *Information Literacy Instruction in Higher Education: Trends and Issues*. ERIC Digest. Syracuse, New York: ERIC Clearinghouse on Information and Technology.

Kellough, R.D. and Kellough, N.G. 1999. *Secondary school teaching: a guide to methods and resources; planning for competence*. Upper Saddle River: New Jersey: Prentice Hill.

Knight, L.A. 2002. The role of assessment in library user education. *Reference Services Review*, vol. 30(1):15-24.

Koehn, M.L. and Lehman, K. 2008. Nurses' perceptions of evidence-based nursing practice. *Journal of Advanced Nursing*, vol. 62(2):209–215.

Kope, M. 2006. Understanding e-literacy. In Martin, A., Madigan, D. (Eds), *Digital Literacies for Learning*, London: Facet, pp.68-79.

Korobili, S. and Tilikidou, I. 2005. The necessity of information literacy education in a marketing department. *New Library World*, vol. 106(11-12):519-31.

Lawson, M. D. 1999. Assessment of a college freshman course in information resources. *Library Review*, vol. 48(1999):73–8.

Leadley, S. 1998. Teaching meetings: providing a forum for learning how to teach. *Reference Services Review*, vol. 26(3-4):103-118.

Leedy, P.D. and Ormrod, J.E. 2010. *Practical research: planning and design*. New Jersey: Pearson Prentice Hall

Lenox, M. F. and Walker, M.L. 1993. Information literacy in the educational process. *The Educational Forum*, vol. 57(2):312-324.

MacDonald, M.C., Rathemacher, A.F. and Burkhardt, J.M. 2000. Challenges in building an incremental, multi-year information literacy plan. *Reference Services Review*, vol. 28(3):240-247.

Mamburu, D.N. 2004. The evaluation of the impact of a community empowerment programme on rural communities. MA (Social Work). Pretoria: University of Pretoria

Marcom, J. 2002. Rethinking information literacy. *The Library Quarterly*, vol. 72(1):1-26.

Mark, R. 1996. *Research made simple: a handbook for social workers*. Thousand Oaks. London: Sage.

Marshall, J.G. 1995. Using evaluation research methods to improve quality. *Health libraries review*, vol. 12:159 – 172.

Maughan, P.D. 2001. Assessing information literacy among undergraduates: A discussion of the literature and the University of California-Berkeley assessment experience. *College and Research Libraries*, vol. 62(1):71-85.

Maynard, J.E. 1990. A case study of faculty attitudes toward library instruction: The Citadel experience. *Reference Services Review*, vol. 18(2):67-76.

McDowell, L. 2002. Electronic information resources in undergraduate education: an exploratory study of opportunities for student learning and independence. *British Journal of Educational Technology*, vol. 33(3):255-266.

Medical Library Association. Health information literacy: definitions [Internet] Chicago, IL: The Association. Retrieved 15 August 2011 from: <http://www.mlanet.org/resources/healthlit/define.html>>.

Merrill, M., Sebek, R. and Erskine, L. 2005. Designing and building online information literacy instruction. *Virginia Libraries*, vol. 51(2):24-32.

Mery, Y.; Newby, J.; and Peng, K. 2011. Assessing the reliability and validity of locally developed information literacy test items. *Reference Services Review*, vol. 39(1):98–122.

Moch, S.D.; Cronje, R.J. and Branson, J. 2010. PART 1. Undergraduate nursing evidence-based practice education: Envisioning the role of students. *Journal of Professional Nursing*, vol. 26(1):5–13.

Mokhtar, I.A.; Majid, S. and Foo, S. 2004. Measuring information Literacy in education. *Proceedings Conference on Information Literacy: Information, Learning, Innovation*. Brunei: Delivering Global Knowledge, October 4-7.

Mokhtar, I., Majid, S. and Foo, S. 2008. Teaching information literacy through learning styles: the application of Gardner's multiple intelligences. *Journal of Librarianship and Information Science*, vol. 40(2):93-109

Monette, D.R.; Sullivan, T.J. and De Jong, C.R. 1990. *Applied social research: a tool for the human sciences. Second edition*. Philadelphia: Harcourt Brace Jovanovich College.

Mouton, J. 1996. *Understanding social research*. Pretoria: Van Schaik.

Noe, R.A. 2002. *Employee training and development*. New York: McGraw-Hill.

Oakleaf, M. 2008. Dangers and opportunities: A conceptual map of Information Literacy assessment approaches. *Portal: Libraries and the Academy*, vol. 8(3):233–253.

Oakleaf, M. 2009. The information literacy instruction assessment cycle: A guide for increasing student learning and improving librarian instructional skills. *Journal of Documentation*, vol. 65(4):539–560.

O'Connor, L. G., Carolyn J. R. and Julie A. G. 2001. Assessing information literacy skills: Developing a standardized instrument for institutional and longitudinal measurement. *Conference presentation, ACRL 10th national conference Denver, CO*. Retrieved 11 July 2011 from:

<http://www.ala.org/ala/acrl/acrlevents/oconnor.pdf>

O'Hanlon, N. 2007. Information literacy in the university curriculum: challenges for outcomes assessment. *Libraries and the Academy*, vol. 7(2):169-184.

Orr, D., Appleton, M., and Wallace, M. 2001. Information literacy and flexible delivery: Creating a conceptual framework and model. *Journal of Academic Librarianship*, vol. 27(6):457-463.

Owusu-Ansah, E.K .2003. Information literacy and the academic library: a critical look at a concept and the controversies surrounding it, *Journal of Academic Librarianship*, vol. 29(4):219-30.

Pausch, L.M. and Popp, M.P. 1997. Assessment of Information Literacy: Lessons from the Higher Education Assessment Movement. Retrieved 23, September 2011 from:

<http://www.ala.org/ala/mgrps/divs/acrl/publications/whitepapers/nashville/pauschpopp.cfm>

Perrett, V. 2004. Graduate information literacy skills: The 2003 ANU skills audit. *Australian Library Journal*, 53(2):161-171.

Person, R. 1981. Long-Term evaluation of bibliographic instruction: Lasting encouragement. *College and Research Libraries*, vol. 42(1):19-25.

Powell, R.R. 1991. Acquisition and use of pedagogical knowledge among career-change pre-service teachers. *Action in teacher education*, 13 (4):17–23.

Poyner, A. 2005. *Enabling end-users: information skills training*. Oxford: Chandos.

Pravikoff, D.S.; Tanner, A.B.; and Pierce, S.T. 2005. Readiness for U.S. nurses for evidence-based practice. *The American Journal of Nursing*, vol. 105(9): 40–52.

Punch, K.F. 1998. *Introduction to social research: qualitative and quantitative approaches*. London: SAGE.

Radcliff, C.J., Jensen, M.L, Burhanna, K.J., and Gedeon, J.A. 2007. *A Practical Guide to Information Literacy Assessment for Academic Librarians*. Westport: CT: Libraries Unlimited.

Rader, H.B. 1997. Educating students for the information age: the role of the librarian. *Reference Services Review*, vol. 25(2):47-52.

Rambo, N. 2004. Exploring health information literacy. *MLA News*. 363(Feb):11

Rasch, R.F. and Cogdill, K.W. 1999. Nurse practitioners' information needs and information seeking: Implications for practice and education. *Holistic Nursing Practice* vol. 13:90–97.

Rassel, G.R. and O'Sullivan, E. 1995. *Research methods for public administrators*. N.Y.: Longman Publishers.

Ren, W.H. 2000. Library instruction and college student self-efficacy in electronic information searching. *Journal of Academic Librarianship*, vol. 26(5):311-22.

Reyes, V. 2006. The future role of academic librarians in Higher Education. Portal: *Libraries and the Academy*, vol. 6(2):301-9.

Riddle, J.S. and Hartman, K.A. 2000. But are they learning anything?' Designing an assessment of first year library instruction. *College and Undergraduate Libraries*, vol. 7(2):59-69.

Roberts, S. and Levy, P. 2005. Emerging professional identities and practices. In. *Developing the New Learning Environment: The Changing Role of Academic Librarian*. London: Facet, pp.223-42.

Rockman, I.F. 2002. Strengthening connections between information literacy, general education, and assessment efforts. *Library Trends*, vol. 51(2):185–198.

Rockman, I.F. 2003. Integrating information literacy into the learning outcomes of academic disciplines: a critical 21st-century issue. *College and Research Libraries News*, vol. 64(9): 612-615.

Roselle, A. 1997. Using the ALA's evaluating library instruction. *Journal of Academic Librarianship*, vol.23:390-97.

Rosenberg, W. and Donald, A. 1995. Evidence based medicine: an approach to clinical problem-solving. *British Medical Journal*, vol. 310(1995):1122–1125.

Rosenfeld, P., Salazar-Riera, N. and Vieira, D. 2002. Piloting an information literacy program for staff nurses: lessons learned. *CIN Computers, Informatics, Nursing*, 20:236–41.

Royse, D. 1995. Research methods in social work. Second edition. Chicago: Nelson-Hall.

Sackett, D.L., Richardson, W.S., Rosenberg, W., Gray, J.A.M and Haynes, R.B. 1996. Evidence-based medicine: What it is and what it isn't? *British medical journal*, vol. 312(1996):71–72.

Sackett, D.L., Richardson, W.S., Rosenberg, W., and Haynes, R.B. 1997. *Evidence-based medicine: How to practice and teach EBM*. New York: Churchill Livingstone.

Salisbury, F. and Ellis, J. 2003. Online and face-to-face: evaluating methods for teaching information literacy skills to undergraduate arts students. *Library Review*, vol. 52(5):209-17.

Samson, S. 2000. What and when do they know? Web-based assessment. *Reference Services Review*, vol. 28(4):335-342.

Samson, S. and Millet, M. 2003. The learning environment: First-year students, teaching assistants, and information literacy. *Research strategies*, 19 (2): 84–98.

Saranto, K. and Hovenga, E.J.S. 2004. Information literacy – what it is about? Literature review of the concept and the context. *International Journal of Medical Informatics*, vol.73:503–513.

Scales, B.J. and Lindsay, E.B. 2005. Qualitative assessment of student attitudes toward information literacy. *Portal: Libraries and the Academy*, vol. 5(4):514-526.

Schardt, C. 2011. Health information literacy meets evidence-based practice. *Journal of medical library association*, vol.99:1-2.

Scharf, D., Elliot, N., Huey, H., Briller, V. and Joshi, K. 2007. Direct assessment of information literacy using writing portfolios. *Journal of academic librarianship*, vol. 33 (4): 462–78.

SCONUL Task Force on Information literacy skills. 1999. *Information literacy skills in Higher Education*. London: Standing Conference of National and University Libraries.

Sharkey, J. 2006. Towards information fluency: applying a different model to an information literacy credit course. *Reference Services Review*, vol. 34(1):71-89.

Shorten, A., Wallace, C. and Crookes, P.A. .2001. Developing information literacy: a key to evidence-based nursing. *International Nursing Review*, vol. 48(2):86–92.

Skinner, B.F. 1968. *The technology of teaching*. New York: Appleton-Century-Crofts.

Skov, A. and Skoerbak, H. 2003. Fighting an uphill battle: teaching information literacy in Danish institutions of higher education. *Library Review*, vol. 52(7):326-32.

Smalley, T. N. 2000. Do students actually become better researchers through information literacy instruction supported by class sessions in the library? Assessing learner outcomes in a lower division anthropology course, 2000. Available from:
<http://www.cabrillo.edu/services/instruction/learneroutcome/tsmalley.pdf>
(accessed 11 August 2011).

Smith, A. 1998. *Training and development in Australia*. Sydney: Butterworth.

Snavey, L. and Cooper, N. 1997. The information literacy debate. *Journal of Academic Librarianship*, vol. 23(1):7-14.

Spitzer, K.L., Eisenberg, M.B., and Lowe, C.A. 1998. *Information literacy: essential skills for the information age*. Syracuse, N.Y.: ERIC Clearinghouse on Information and Technology, Syracuse University. (ED 427 780). Retrieved 23 September 2011 from, <http://ericit.org/toc/infoliteracytoc.shtml>

Stevens, K.R. 2001. An introduction to evidence-based practice. *Newborn and Infant Nursing Reviews*, vol. 1(1):6–10.

Tshwane University of Technology (TUT). 2011. Faculty of science. Retrieved 23 September 2011 from, <http://www.TUT.ac.za/Students/facultiesdepartments/science/departments/Pages/default.aspx>

Tuominen, K., Savolainen, R. and Talja, S. 2005. *Information literacy as a socio-technical practice*. *Library quarterly*, vol. 75(3):329-345.

Vaal University of Technology (VUT). 2011. Faculty of applied and computer sciences. Retrieved 23 September 2011 from: <http://www.VUT.ac.za/new/index.php/faculties-aca>

Verhey, M. 1999. Information literacy in an undergraduate nursing curriculum: development, implementation and evaluation. *Journal of Nursing Education*, vol. 38(6):252-261.

Wallace, M.C.; Shorten, A and Crookes, PA. 2000. Teaching information literacy skills: an evaluation. *Nurse Education Today*, vol. 20(6):485-489.

Wallace, M., Shorten, A., Crookes, P., McGurk, C., and Brewer, C. 1999. Integrating information literacies into an undergraduate nursing program. *Nurse education today*, vol.19: 136–141.

Walsh, A. 2009. Information literacy assessment: Where do we start? *Journal of librarianship and information science*, vol. 41(19):19–28.

Warner, D. 2003. Programmatic assessment: turning process into practice by teaching for learning. *The journal of academic librarianship*, vol. 29(3):169-76.

Weaver, S.M. 1993. Information literacy: Educating for lifelong learning. *Nurse educator*, vol. 18 (4):30–32.

Webber, S. and Johnston B. 2000. Conceptions of information literacy: New perspectives and implications. *Journal of information science*, vol. 26(6):381-397.

Williams, J. 2000. Creativity in assessment of library instruction. *Reference services review*, vol. 28(4):323–34.

Wilson, L.A. 2004. What a different a decade makes: transformation in academic library instruction. *Reference services review*, vol. 32(4):338-346.

Yeoh, J. 2000. Nursing information needs: what next? *Health libraries review*, vol. 17(1):14-16.

Zurkowski, P.G. 1974. *The information service environment relationships and priorities*. Washington DC: National Commission on Libraries and Information Sciences (Paper No. 5, p. 6) (ED100391).

APPENDIX A
LETTER OF INTRODUCTION

University of the Witwatersrand
Private Bag x1
Wits
2050

Chairperson: research Ethics Committee
Tshwane University of Technology (TUT)
Private Bag X680
Pretoria 0001

Dear Dr W.A. Hoffmann

I am a registered master's qualification (Mbibl) student at University of Cape Town (UCT) in the field of Library and Information Science. As part of my studies, I have to distribute a questionnaire to nursing students at Tshwane University of Technology. My minor thesis is entitled: **Evaluation of information literacy intervention of nursing students at four Universities of Technology in South Africa**. Associate Professor M Nassimbeni and Associate Professor K. De Jager are my supervisors.

I hereby request permission to distribute questionnaire to nursing students within your faculty. The letter is an assurance that the information collected from these nursing students will be treated with the utmost confidentiality and respondents will remain anonymous. Respondents have the right not to participate.

The following documents have been enclosed for your convenience: research proposal, consent letter to nursing students and questionnaire.

Yours sincerely

Sello Borephe
Senior Librarian: Faculty of Humanities
University of the Witwatersrand
Wartenweiler Library
☐ 011 717 1912
☐ 0865361269
Sello.borephe@wits.ac.za

APPENDIX B
PERMISSION TO CONDUCT RESEARCH AT DUT



D U R B A N
UNIVERSITY of
TECHNOLOGY

Centre for Research Capacity Development
Durban University of Technology
Trosano Annex, Steve Biko Campus
P.O. Box 1324, Durban 4000
Tel: 031-2732767
Fax: 031-2732048
Email: rcd@dut.ac.za

16th November 2009

Mr S Borephe
Department of Library and Information Studies
University of Cape Town

Dear Mr. Borephe

PERMISSION TO CONDUCT RESEARCH AT THE DUT: "An evaluation of information literacy intervention of B Tech Nursing Students within a University of Technology (UoT) in South Africa"

Your email correspondence dated 30th October 2009 in respect of the above refers. I am pleased to inform you that the Institutional Research Committee (IRC) has granted permission for you to conduct your research at the Durban University of Technology.

We would be grateful if a summary of your key research findings can be submitted to the IRC on completion of your studies.

Kindest regards,
Yours sincerely

A handwritten signature in black ink, appearing to read 'D. Pillay', written over a horizontal line.

PROF. D. PILLAY
DIRECTOR: RESEARCH CAPACITY AND DEVELOPMENT

cc: Prof. A. Jordaan - Acting DVC (TIP)
Prof. M. Nassimbeni - Dept. of Library and Information Studies, UCT
Prof. K. de Jager - Dept. of Library and Information Studies, UCT

APPENDIX C
QUESTIONNAIRE COVERING LETTER

University of the Witwatersrand
Private Bag x1
Wits, 2050

Tshwane University of Technology (TUT)
Private Bag X680
Pretoria, 0001

Dear Nursing students

Questionnaire on: **Evaluation of an information literacy intervention of nursing students at four Universities of Technology in South Africa.**

Dear Nursing students

I am a registered master's qualification (Mbibl) student at University of Cape Town (UCT) in the field of Library and Information Science. As part of my studies, I have to distribute a questionnaire to nursing students at Tshwane University of Technology. My minor thesis is entitled: **Evaluation of an information literacy intervention of nursing students at four Universities of Technology in South Africa** Associate Professor M Nassimbeni and Associate Professor K. De Jager are my supervisors.

I would like to thank you in advance for your willingness to participate in this research study, and particularly, your availability to complete this questionnaire. I need your co-operation in completing this questionnaire which should take about 15 minutes of your time.

Data collected from the questionnaire will provide me with information that will be used to develop better information literacy skills training for nursing students, and to also improve information literacy training. This is the post-test questionnaire after the training you had with your training librarians. Your name is not required on this or any other questionnaire and the privacy and confidentiality of your responses is assured. Please tick the appropriate boxes in each question unless otherwise indicated throughout the questionnaire.

Thank you for your participation.

(Mr) Sello Borephe
Senior Librarian: Faculty of Humanities

Appendix D
Recruitment e-mail sent to training librarians

Dear Training librarian

I am a registered master's qualification (Mbibl) student at University of Cape Town (UCT) in the field of Library and Information Science. As part of my studies, I have to distribute a questionnaire to nursing students at Tshwane University of Technology. My minor thesis is entitled: Evaluation of information literacy intervention of nursing students within Universities of Technology in South Africa. Associate Professor M Nassimbeni and Associate Professor K. De Jager are my supervisors.

I would like to thank you in advance for your willingness to participate in this research study, and particularly, your availability to distribute and complete this questionnaire. I need your co-operation in completing this questionnaire which should take about 10 minutes of your time.

Data collected from the questionnaire will provide me with information that will be used to develop better information literacy skills training for nursing students, and to also improve information literacy training. This is a way you can share with me how you offered information literacy training to nursing students at your institution. Your name is not required on this questionnaire and the privacy and confidentiality of your responses is assured. Please tick the appropriate boxes in each question unless otherwise indicated throughout the questionnaire.

Thank you for your participation.

(Mr) Sello Borephe
Senior Librarian: Faculty of Humanities

Appendix E

Questionnaire for training librarians

Information literacy training intervention at Universities of Technology (UoT)

The survey is made up of questions and should only take you about five minutes to complete. Simply click the answer that suits you best for each question. Please note that all questions (EXCEPT where specified) pertain to Information literacy training intervention you offered in your library)

FIRST SECTION: DEMOGRAPHIC PROFILE

What is the name of your UoT? *

Tshwane University of Technology

A: INFORMATION LITERACY INTERVENTION

TELL US ABOUT INFORMATION LITERACY TRAINING YOU HAVE OFFERED

1 How many nursing students have you trained in information literacy sessions in 2011? *

- 10 -20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70

2 How many times do you training per year

- Once per year
- First semester only
- Second semester only
- Both first and second semester

3 What is the scope of your information literacy training intervention?

- How to use the library catalogue or OPAC
- How to find articles using Databases
- How to formulate search strategy

- Plagiarism, how to use information legally
- Library orientation

4 Do you use Pre-test on information literacy training intervention?

- Yes
- No

5 Do you use Post-test on your information literacy training intervention?

- Yes
- NO

B: CONTENTS OF THE SESSIONS

Please rate yourself on the following:

6 According to your experience, in which information skill area have nursing students improved?

- Keyword searching
- Finding information by Database searching
- Locating information sources by using Open Public Access Catalogue (OPAC)
- Evaluating information received from various sources
- Making legal use of the information received
- Using scholarly literature

7 Which information sources do nursing students use most?

- Journals
- Books
- WWW
- E-Books

8 Do you offer individual training after information literacy sessions in class?

- Yes
- No

C: INFORMATION LITERACY INTERVENTION EVALUATION

Kindly supply us with objective assessment of information literacy interventions you offered at your library

9 How much do you think nursing students have learnt in those training sessions?

1 2 3 4 5

More than expected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Almost nothing
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10 Please list things you think can improve information literacy training intervention sessions.

Thank you

Thank you for taking the time to fill out this survey! This information you give, will be used to improve information literacy training interventions for nursing students and provide the best possible Health Information Literacy sessions within UoT

Appendix F

Questionnaire for nursing students

Information literacy training intervention at Universities of Technology (UoT).

Evaluation of an information literacy intervention of nursing students at four Universities of Technology in South Africa. It is for partial fulfilment of MBIBL degree at University of Cape Town (UCT). The survey is made up of questions and should only take you about five minutes to complete. Simply click the answer that suits you best for each question. Please note that all questions (EXCEPT where specified) pertain to Information literacy training intervention you had in your library)

FIRST SECTION: DEMOGRAPHIC PROFILE

KINDLY TELL US ABOUT YOUR SELF

What is the name of your UoT? *

Tshwane University of Technology

What is the degree you have registered?

- Nursing
- M-Tech Nursing
- Other

A: LIBRARY SKILLS

TELL US ABOUT WHAT YOU HAVE LEARNT ABOUT USING THE LIBRARY AND ONLINE CATALOGUE

1 Have you ever been to the library for an information literacy session in 2011? *

- Yes, once
- Yes, more than once
- No

2 The content of the session was relevant to my studies

- Very relevant
- Partially relevant
- Not relevant

3 Which of the following is TRUE about the library online catalogue (OPAC)?

- It indicates to you which books are in the library?
- It lists the titles of articles in the journal?
- It has information about full-text articles?

4 If you had to write an assignment, where would you start looking for current and authoritative information resources?

- Search World Wide Web?
- Search for databases available on your library homepage?
- Search your library online catalogue (OPAC)?

5 What is a citation?

- A summary of an article?
- Information about the source of information, i.e. author, date, title?
- A lengthy quotation?
- Index and bibliography together?

6 When you critically evaluate information sources, which of the following should you consider?

- The credentials of the author
- The length of the information source
- The information source itself

7 The sole, exclusive right to profit from creative written work is called?

- Trademark
- Fair use
- Copyright
- All of the above

8 To plagiarize means?

- Cut and paste a paragraph without citing
- Copy text

B: INFORMATION LITERACY SKILLS

Please rate yourself on the following:

9. When I identify subject headings on the OPAC, I become

- Confident
- Not confident

10. When using an OPAC (online public access catalogue), to look for books, I become

- Confident
- Not confident

11 I am able to find books on the shelf using shelf-number

- Yes
- No

12 I struggle to find reference books on Nursing as a subject using OPAC

- Yes
- No

13 I can use bibliography at the end of the information source to find additional sources

- Agree
- Disagree

14 I can use Electronic Resources (e.g. EBSCOHOST, Medline) to find journal articles

- No
- Yes

15 If you need information about "bad eating habits as a factor in chronic diseases", which one of the following search strategies would get you the best results from electronic databases?

- eating habits OR chronic disease
- eating habits NOT chronic disease
- eating habits as a factor in chronic disease
- eating habits AND chronic disease

16 I am confident to retrieve articles from printed journals at my library

- Agree
- Disagree

17 When I write in-text citation in a bibliography, I become

- Confident
- Not confident

18 I am confident in compiling a bibliography from in-text citation?

- Yes
- No

19 When finding information sources about nursing topic on WWW, I become

- Confident
- Not confident

20 Evaluating an Internet source for authority and bias

- Confident
- Not confident

C: INFORMATION LITERACY INTERVENTION ASSESSMENT

Kindly supply us with objective assessment of information literacy interventions you had at your library

21 What is your overall rating of information literacy training intervention you had at your UoT

1 2 3 4 5

Excellent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Bad
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22 How much do you feel you have learnt in those training interventions sessions?

1 2 3 4 5

More than expected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Almost nothing
--------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

23 Rate the difficulty level of information literacy training intervention sessions you had at your library?

1 2 3 4 5

Extremely difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely easy
---------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

24 Rate the value of the in-class activities for your information literacy training intervention (discussions, hand-on practice, etc.)?

- Valuable
- Not valuable

25 Rate the value of the outside class tasks related to this information literacy training intervention sessions (assignment, homework, projects, etc.)?

- Valuable
- Not valuable

26 The learning materials used in this information literacy training intervention sessions (exercises, websites, quiz, etc.)?

- Valuable
- Not valuable

27 Please list one or two things you learned in those information literacy training intervention sessions that you will use in your own research.

A large, empty rectangular text input box with a thin black border. It features a vertical scrollbar on the right side and a horizontal scrollbar at the bottom, both with standard arrow and scroll buttons.

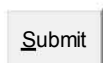
28 What would you still like more help with? Feel free to list anything you think should have been covered or questions you still have about the information literacy training intervention

sessions

A large, empty rectangular text input box with a thin black border. It features a vertical scrollbar on the right side and a horizontal scrollbar at the bottom, both with standard arrow and scroll buttons.

Thank you

Thank you for taking the time to fill out this survey! This information you give, will be used to improve information literacy training interventions for nursing students and provide the best possible Health Information Literacy sessions within UoT

A rectangular button with a thin black border and the text "Submit" centered inside.