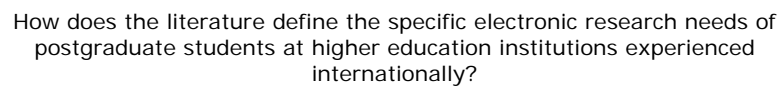# Chapter 2. Literature review

2.1 Introduction

This chapter reports on a literature review that describes international and South African research into the research needs (more narrowly defined as the "electronic research needs") of postgraduate adult learners at higher education institutions. The first research question is addressed by this literature survey (Figure 8).

Figure 8: Research question 1

How does the literature define the specific electronic research needs of postgraduate students at higher education institutions experienced internationally?

The literature review provided me with the conceptual foundation that I needed for conducting a needs assessment among South African postgraduate students at the University of Pretoria. I used the information that I obtained from the literature review to construct and refine the questionnaire that I designed for the analysis.

A great deal has been written about the information needs of various library client groups and many user studies have also been undertaken in order to determine as accurately as possible what these needs might be. But few of these surveys and studies focus on South African **postgraduate** needs and none of the literature refers specifically to "electronic research needs".

In this chapter I will relate what the literature does have to say about the needs of postgraduate students. But before the research needs of postgraduate students can be described, it is necessary first to explain the principles that underlie adult learning.

2.2   Addressing "adult learning principles"

One may describe the postgraduate students who enroll at the University of
Pretoria as adult learners because their average age is between 22 and 45. It was
therefore important for me while designing the questionnaire and undertaking the
research to keep the following assumptions about adult learners in mind (Leonard
2002, p. 7-8):

- Adults need to have good reasons (i.e. a rationale) for learning new
  information.
- Adults already have an established identity that enables them to be
  responsible for their own lives, to make decisions and to initiate action.
- Adults bring their own knowledge and life experience to the learning
  experience.
- Adults are more eager to learn when they see that the content of the
  learning experience will enhance their current life activities.
- Adults expect learning to be task-oriented and relevant to their jobs.
- Adults are mostly motivated by internal forces and longings such as the
  desire for better lifestyle, a better work environment, a better job, and so
  on.

Because postgraduate students are adult learners, their needs are different from
the needs of undergraduate students. It is the responsibility of the Academic
Information Service to identify and address those needs. The best way to
establish such needs is by means of a needs assessment. This assessment can
then be used as the basis for implementing the best strategies, products and
services for this important client community.

Although adult learners as a group have certain characteristics in common, each
adult nevertheless has a different personality type and learning style. Such
individual differences and styles need to be taken into account by the researcher
when he or she is profiling the needs of the e-researcher as a group. The
generation theory elucidates differences between the various generations that
have never previously been addressed and or taken into account by library
scholars.

2.3   The Generation theory

According to Graeme Codrington (2006), South Africa's leading generational theorist and author of the book, *Mind the gap*, we view the world only in one way – and that is through our own eyes. If this is true, then the challenge for librarians is to begin to observe the research process and library services through the eyes of students and not only through their own eyes and from the vantage point of their professional preconceptions. This is a necessary procedure because librarians (or any other professional group for that matter) by definition compose a group of people with somewhat restricted views, predictable attitudes and circumscribed values. No circumscribed professional group is in a position to understand the mindset of groups whose group or age profile is very different from theirs. Librarians would be in a better position to understand the needs of postgraduate users if they themselves were to become active postgraduate students. If librarians were to pursue this option, they would acquire a first-hand knowledge and understanding of the needs of postgraduate users. They could then use their newly acquired skills in postgraduate research to benefit the library in general and the library's clients in particular.

Codrington (2006) maintains that the generational trends he describes are caused by the effects of globalisation. According to him, clients from different generations share certain experiences, assumptions and attitudes because they are constantly faced by similar situations. One may say that this is also true of librarians as a group. It is because of these shared experiences and situations that people largely view the world in similar ways. One might thus hypothesise that librarians from the same generation probably share similar views on the way services should be delivered to clients – even if they have been working with staff from other generations for many years. It is sometimes difficult to get librarians to adapt their views, attitudes and routines so that they become more responsive to the constant innovations that are a feature of service delivery in an electronic age.

The same is true of postgraduate students and their research needs. Such students tend to be members of two of the generations identified by Codrington: the "Boomers" and the "Xers". "Understanding that different generations have grown up in different worlds, developing different worldviews and value systems, even if we've been working [for the same institution/library], is a great starting point to bridging the generation gap that threatens so many relationships at the

moment" (Codrington 2006). An example of this might be the relationship between a librarian from the "Boomer" (Baby Boomer) generation and a postgraduate student from "Generation X" – two groups with very different worldviews and experiences.

We should keep the characteristics of "Boomers" and "Xers" that Codrington describes firmly in mind as we identify and address the needs of postgraduate students and also as we introduce new technology and e-developments into libraries for clients and librarians who belong to utterly different generations. Service delivery that focuses on client needs can only be improved if one appreciates that people from different generations have different approaches, needs and assumptions with regard to work, studies, careers, communication and research.

2.3.1 The Silent Generation (1930s and 40s)

"Raised by over-protective parents during the Depression and World War II, they grew up as children who 'should be seen and not heard', and learnt in the midst of failed banks and businesses not to trust others for their security. They are conformist, reasonably aloof and fairly authoritarian" (Codrington 2006). Since these people are currently between 75 and 85 years old, we do not expect them to become postgraduate students in any number (except for a very few individuals).

2.3.2 The Boomers (1950s and 60s)

This generation is perceived by other generations to be loud, brash and highly individualistic. They never stop talking and they are always "in the right". They believe that there's a solution to every problem and that anything is possible. They are happy to conform to authority provided that they themselves possess it. They are obsessed with health and wellness and they are more highly educated than any other generation in history. They are also prepared to pay to get what they want (Codrington 2006). Since people in this group are between 45 and 55 of age, one may expect to find a number of postgraduate students in this generation.

2.3.3 Generation X (1970s and 80s)

This generation is more sceptical of relationships. They were expected to grow up quickly. They tend to take more risks and are of the opinion that long-term commitment won't pay a dividend. Codrington (2006) describes the gap between "Boomers" and "Xers" as the biggest ever. Since they are between approximately 18 and 35 years old, a large percentage of postgraduate students will currently be from this generation. These students find themselves in a phase of their lives where they are now very much focused on further training and career development. "Xers" value diversity, technological literacy, fun, informality, self-reliance and pragmatism.

2.3.4 The Millennial Generation (1990s and 2000s)

This is the first generation not to remember the "old" South Africa. Since they were born between 1990 and 2006, they are still of school-going age. Confidence, assertiveness, optimism, obsessive brand-consciousness and aptitude for handling money are all characteristics of these children. To them style is more important than content. "They play video games, listen to music on digital compact discs, programme the family DVD-player and surf the Net for homework projects. They are smarter than their parents. They're civic minded, practical, get involved" (Codrington 2006). Some literature also refer to this group as the "Net Generation".

Librarians can make allowances for individuals if they learn to appreciate diversity among their clients and staff – especially the important differences between the "Boomers" and "Xers". They can help them to work harmoniously in the virtual research environment. They can also help people from different generations to make their own unique contributions – whether as members of the library staff or as postgraduate researchers.

2.4   The importance of a needs assessment

A "needs assessment" refers to "a structured process of collecting and analyzing users' assumptions, and the necessary or desired services to satisfy specific audiences. A needs assessment justifies the development and provision of services and allows for an effective distribution of resources to support the services" (Institute of Museum and Library Services 2003, p. 3).

A needs assessment can therefore be an important instrument of library policy. It can be used to support projects and to ensure that electronic support tools are responsive to user needs within both a traditional and virtual research environment – while acknowledging that the needs of different generations varies from one generation to another.

We will understand this kind of needs assessment and the potential importance better if we contextualise it within a South African context.

2.5   The South African context

The importance of research is supported by the Constitution of South Africa and has also been emphasized by the South African government in Education White Paper 3 (Dept. of Education 1997).

Academic freedom and scientific inquiry are fundamental rights that are protected by the South African Constitution. "In order to support the Constitution, it is the responsibility of Academic Libraries within Higher Education institutions to support and assist students in conducting the pursuit and practice of academic work" (Dept. of Education 1997, p. 7). The Academic Information Service has to account on a year-by-year basis to the governing bodies of the University of Pretoria for their results and achievements and also for the extent to which they have met their institutional policy goals and priorities. The larger institution (the university) has in turn to account for its actions, decisions and achievements to their own governing bodies as well as to society in general. It also has to demonstrate how it contributed to national policies and goals, how it achieved the results it did with the resources at its disposal, and account in detail for the spending of public funds (Dept. of Education 1997, p. 7). If the Academic Information Service does not achieve its goals and does not meet its goals, it will have a detrimental effect on the faculty and the university and also in the end on the larger South African community outside the university.

The production, advancement and dissemination of knowledge and the development of high-level human resources are core functions of the higher education system. Research plays a key role in all sectors of the higher education industry, and may be regarded as the principal tool for creating new knowledge. "The dissemination of knowledge through teaching and collaboration in research

tasks are the principal tools for developing academic and research staff through postgraduate study and training" (Dept. of Education 1997, p. 20).

On 1 October 2004, Ms Naledi Pandor, the Minister of Education, opened the annual Research Indaba of the University of Pretoria. In her opening speech, she stated that "our students are earning MAs and PhDs abroad because we are not providing them with the requisite environment for research in both the physical and human sciences". She also added that South Africa needed to build:

> [a] new pool of researchers equipped to promote innovation and to pursue new areas of knowledge and investigation. Even more important is the need to ensure adequate research training and support is provided to all postgraduate students. Many institutions churn out postgraduates who never proceed to writing an article or who never participate in collaborative research activity (Pandor 2004).

As one of the key stakeholders in the university, the library plays a vital role in contributing to creating an enabling environment in which postgraduate students can conduct their research so that they will go on to participate on an international level.

2.6   The international context

Research into user studies that examines the needs of postgraduate students has been conducted abroad. I shall review this research in this section. This research identified the specific feelings and needs of postgraduate students who were using a library and explained the kind of skills that are necessary for librarians to cope with those needs and feelings.

2.6.1 Feelings of clients towards the library

The way in which students react emotionally towards the library influence the way in which they approach their research. Negative feelings and emotional stresses (occasioned by, for example, databases that are not easily accessible or that simply do not work, information specialists who are unwilling to help, unfriendly staff, resources that are not accessible online) compel students to use search engines rather than library databases or other online services at the library. "Although dropping out is often caused by financial and work related factors, the emotional stresses involved in completing the dissertation undoubtedly play an important role" (Glatthorn, quoted by Styles and Radloff 2000, p. 1). Since some authors regard the librarian as being a *de facto* co-supervisor (Macauley and McKnight 1998, p. 95), one may argue that a librarian is in a position in which he or she can influence the emotions that students experience when conducting postgraduate research and, by the same token, help to reduce whatever negative affects students may be feeling. This is supported by Macauley and McKnight (1998, p. 95) when they say that "[l]ibraries play a pivotal role in ensuring the success of higher degree research students".

It is not clear from the literature how the emotional needs of students should be addressed, especially within a virtual environment where face-to-face contact with the librarian is limited. New ways will have to be found to deal with the emotional stresses experienced by students and librarians themselves will need to become better equipped with the necessary skills to do so.

2.6.2 Role of the librarian/information specialist

The literature does make it clear that the role of the librarian is changing along with changes in technology. In order to address the specific needs of postgraduate students, librarians will need to develop certain skills that they were not taught in their professional studies.

2.6.2.1 Technological skills

Catalogues, journals, books and other information resources nowadays tend to be more available online than in printed sources. If librarians want to access these resources and so be in a position to offer current services to clients, they need to be skilled in the use of a wide variety of technology that include computers,

scanners and DVD-writers. Librarians not only need to know how to use the technology; they need also to be able to apply the technology. This means being able to design web pages, electronic transfer of information, use blogs and wikis, administer and use listservers, display library material by means of virtual exhibits, use an electronic whiteboard to present training sessions, add quality to modules on learning management systems such as WebCT™, deliver presentations using MSPowerPoint™ or Macromedia Captivate™, and use application software to practise other skills such as marketing and project management. Because IT departments are understaffed, librarians often have to solve problems themselves. Such problems are legion, but may include getting a recalcitrant printer to print, helping to set up an e-mail account for a client on a computer, and assisting a client when the computer will not log on to the network.

In-service training programmes in libraries can to some extent teach such skills. The training courses that an institution provides for its staff should be in line with that institution's skills development policy and should support the institution's e-strategy. Studies are still needed to identify precisely what skills are most needed by librarians if they are to be empowered to optimise service delivery within a virtual research environment.

2.6.2.2   Decision making skills

According to Boon, Bothma and Cronjé (2000), librarians are required more and more to be the providers of "just-in-time information at the time of need". Clients usually do not want everything that is available on a topic. In a time characterized by information overload, librarians need to be highly selective as they collect and collate electronic information for students. Very often they need to be able to decide *on behalf of a student* whether or not any given piece of information is relevant or not to the student's research needs.

Librarians can help students to identify relevant electronic lists, newsgroups, conferences and so on. They can also help students to create alerts for new articles on their topics of research. But it is often difficult for librarians to decide on behalf of students whether an article might be relevant to the student's research or not. Such decisions are often highly subjective, and no clear guidelines exist in the literature about such matters.

2.6.2.3   Supervisory skills

Macauley and McKnight (1998, p. 95) propose a collaborative co-supervisor model for librarians which they believe will result in "more and faster higher degree research completions, higher standards of research, an increase in research students' and supervisors' information literacy skills, improved research collections in university libraries, and reduced isolation for off-campus researchers".

They also propose that not only should academic librarians maintain and increase the efficacy of their traditional services but that a closer collaboration be instituted among librarians, postgraduate research students and their supervisors (Macauley and McKnight 1998, p. 95). "This new model suggests that librarians can assume the role of co-supervisor to ensure that the literature review component of a higher degree thesis is comprehensive and relevant. Librarians can also ensure that postgraduate research students and their supervisors are kept abreast of new information resources in their research disciplines" (Macauley and McKnight 1998, p. 95).

2.6.2.4   Planning skills

Librarians need to be able to plan and educate themselves in new forms of technology if they hope to stay abreast of new products, services, technology and resources. They also need to be able to take care of their time management needs, schedule after-hour appointments to accommodate their working clients, and plan ways to address problems that are being experienced by several students at once.

2.6.2.5   Facilitating skills

Librarians need the skills of teachers and facilitators when they conduct training sessions and compile training material, presentations and brochures. They also need to become familiar with technology such as the electronic whiteboard, e-learning management systems such as WebCT™, e-learning principles, instructional design principles, remote assistance software such as WebEx™ and MSN Messenger™, and electronic support systems such as "Ask a Librarian". "Ask a Librarian" allows the client to interact with the information specialist or librarian through chatting or e-mailing requests.

Librarians also need instructional design skills if they are to compile online tutorials that show users how to utilize some of the databases to which the library offers access. Products such as Macromedia Captivate™ - a software program used to compile animated online tutorials - has yet to be discovered by the library world. Vital research is waiting to be done on how the librarian can offer distance support within a higher education institution – as well as the role that the library and librarian play with regard to e-research in a WebCT™ (e-learning management system) environment.

2.6.2.6   Marketing skills

The web has an enormous potential for being used as a marketing tool for marketing library products, databases, services, etc. within its virtual environment. Librarians need to find ways to utilize the web for this purpose. They might, for example, send electronic newsletters to registered and prospective postgraduate students. They can also send virtual exhibits of library holdings and bibliographic lists on research topics of interest within a specific field to particular clients or utilize the default interfaces of desktop computers in the library to make important announcements such as those that deal with new products or database subscriptions. Since active researchers are always on the lookout for research material that has a bearing on their topic of interest, the library should therefore (as I mentioned in the introductory paragraph in chapter 1, p. 1), be "going to its patrons, rather than waiting for them to appear" (Basefsky 1999). New and effective ways in which the library could "be going" out to meet clients' needs still need to be identified by studies undertaken in this field.

2.6.2.7   Project management skills

Project management skills include the following activities and responsibilities:

- ❐ Planning and managing new projects such as an institutional repository for an institution
- ❐ Attending meetings with academic supervisors, students and other role players
- ❐ Identifying, together with other supervisors, students who are at risk (of failing) and giving them support and assistance
- ❐ Participating in electronic conferencing (such as, for example, WebEx™)

❐   Managing a project by means of project management phases (analysis, design, development, implementation and evaluation)

Project management skills are often neglected by librarians because they may feel that they lack competence and because they have no time to set aside for the purpose of becoming informed project managers. Because project management skills within a library environment are just as important as project management skills in any other field, they should be treated as such.

2.6.2.8   Communication skills

Librarians often find themselves in a position in which it is appropriate to offer clients various kinds of emotional support. In order to do this effectively, they need to have mastered various interpersonal communication skills. In the course of their work, they need to be able to communicate effectively with individuals and groups. They also need to be able to communicate effectively by fax, telephone and other online facilities, and should be able to communicate in at least two official languages one of which should be English.

2.6.3   Specific needs of students

A study that was conducted to evaluate the information requirements and practices of part-time and distance-learning students in higher education institutions in the United Kingdom revealed that university libraries "often do not cater for the specialized needs of part-time distance learners, which leads to an increasing use of the Internet and employer resources as a substitute for traditional information channels" (Rowland and Rubbert 2001, p. 741). According to Robertson (2003, p. 129), the information needs of students have changed slightly over the past five years. Although he refers specifically to "information needs", the same is true of all the other needs that students have. Coleman and Sumner (2004) state in an article that within the National Science Digital Library (United States), "a rich array of innovative services not traditionally associated with bricks-and-mortar libraries are being developed to support teaching and learning practices". These authors are referring not only to information access. The library they mention also offers services such as:

❐   Personalized content delivery
❐   Services for creating digital resources

❒   Communication and collaboration services

Increased international postgraduate enrolment at universities throughout the world is making ever-increasing demands on student support services such as those in academic libraries (Robertson 2003, p. 129). This increased pressure is apparent to the staff who work in the library of the University of Pretoria. Since students from all over the world are encouraged to enrol in the Faculty of Education, the composition and atmosphere of the faculty is becoming ever more self-consciously international in outlook and interests.

A survey of the literature suggest that the specific needs of postgraduate students may be divided into the following categories:

2.6.3.1 Administrative needs

My investigations enabled me to identify the following administrative needs of postgraduate research students:

❒   How to register as a library user
❒   How to register as an inter-library loan user
❒   How to request an inter-library loan (Macauley, as quoted by Macauley and McKnight 1998, p. 99)
❒   How to obtain a letter of introduction to an academic library other than the home library
❒   How to request research material online
❒   How to apply for a postal loan service for distance students (Rowland and Rubbert 2001, p. 757)
❒   How to lend books, receive photocopies of articles etc. (for distance students) (Macauley, as quoted by Macauley and McKnight 1998 p. 99)
❒   When to qualify for courier service or postage satchels (Macauley, as quoted by Macauley and McKnight 1998 p. 99)

Although libraries are currently moving towards offering an integrated service by means of OCLC (WorldCat™ and FirstSearch™, the international cataloguing system) and Google Scholar™, these facilities are not yet available and a lot of work needs to be done before they come into general everyday use.

2.6.3.2 Access needs

My investigations enabled me to identify the following access needs:

- ❒ A need for extended library hours
- ❒ A need for longer opening hours during vacation periods (Rowland and Rubbert 2001, p. 749; University of Massachusetts at Amherst Library Needs Study, n.d.)
- ❒ A need for short-loan collections that cannot currently be fully utilized because of a 24-hour return policy
- ❒ A need for improvements in the inter-library loan services of some institutions whose services only operate after long delays (Rowland and Rubbert 2001, p. 749)
- ❒ A need for easier access to support (Support should be available 24/7)
- ❒ A need for easier access to library staff (University of Massachusetts at Amherst Library Needs Study, n.d.)
- ❒ A need for special library opening and closing hours for part-time postgraduate research students. Many postgraduate students can only study after hours when librarians have all already left the library for the day. Access to library staff should be easier during such additional opening hours (University of Massachusetts at Amherst Library Needs Study, n.d.; Rowland and Rubbert 2001, p. 757)

2.6.3.3 Database access needs

My investigations enabled me to identify the following database access needs:

- ❒ According to members of The Science Advisory Board, limited access to full-text documents is the most annoying aspect of online literature searches (The Science Advisory Board, 2004). This obstacle often emerges with a search engine such as Google^{TM}. If a student wants to access an article published by a commercial database, he or she is prompted to enter a subscription password. The study conducted by Macauley and McKnight (1998, p. 97) indicates that students require reliable cost-efficient access to information. They don't want to struggle to access information and they need clearer instructions about when they will be required to use passwords and what passwords they need to use if they are required to do so. Open access to scholarly publications e.g. through DOAJ (*Directory of*

Open Access Journals) nowadays offer a wide variety of authoritative titles which illuminates the frustration of having to use passwords to access scientific articles published in these journals.

❑ The interfaces of various databases are often far too complicated and are not coordinated with one another (they all differ). Information should be easily accessible by using, for example, user-friendly desktop interfaces that offer trouble-free access to electronic resources (Van den Haak, De Jong and Schellens 2003, p. 344). One solution to this problem would be to use a *federated search engine*, of which many commercial versions are available. Research into the ones that would be best for South African needs still needs to be conducted. The products themselves have also not yet had enough time to mature.

❑ One frequently mentioned problem in the literature is that postgraduates are often uncertain about when they should use an electronic database (Starkweather and Wallin 1999; Robertson 2003, p. 129). Students are often overwhelmed by the sheer range of databases, e-prints, e-text and e-journals (Robertson 2003; Macauley, as quoted by Macauley and McKnight 1998, p. 99). Other requirements are that the number of specialized indexes available online should be increased (Starkweather and Wallin 1999), that standalone CD-ROM databases should be converted to online, that access should be given to more databases that are easy to use, and that there should be better integration between the original text-based library system and web-based resources.

❑ Technical library terminology is often very confusing to clients (Van den Haak, De Jong and Schellens 2003, p. 344), and it should be avoided wherever possible.

❑ Participants are often unsure of how to conduct a search (i.e. they need to be instructed on how to enter a search term, use dropdown windows, or start the actual search) (Van den Haak, De Jong and Schellens 2003, p. 344).

❑ From the end-user's point of view, catalogues often fail to give the necessary feedback about searches that have been conducted (Van den Haak, De Jong and Schellens 2003, p. 344).

❑ Utilising abstracting and indexing services should be encouraged amongst postgraduate students (University of Massachusetts at Amherst Library Needs Study, n.d.).

2.6.3.4   Internet search strategy needs

My investigations enabled me to identify the following needs that arise out of the necessity to navigate the World Wide Web:

❑ Postgraduate research students need to be able to navigate the web for reliable and authoritative web sites, and should be able to use effective search strategies when they do so (Robertson 2003, p. 129). In Malaysian academic libraries there is also a strong need to develop end-user programs to provide an opportunity for all potential end-users to learn basic search concepts and techniques (Majid and Mansor 1996).

❑ Middleton, McConnell and Davidson (1999, p. 221) list three general types of information needed by internal and external users of a higher education institution when using a World Wide Web site. These are:

  ▪ Promotional information
  ▪ Value-added information that is genuinely useful to people
  ▪ Utility information, services and resources "that will enable an institution to reach its strategic aims more easily, facilitate external and internal communication and enhance education". The information provided should include content and should be accessible, relevant and current (Middleton, McConnell and Davidson 1999, p. 225)

❑ Findings by Bruce (as quoted by Macauley and McKnight 1998, p. 102) indicate that "in practice, candidates appear to receive little assistance from their supervisors [in preparing their literature review]". A lack of assistance from a supervisor means that there will be a greater dependence on librarians or information specialists. Since research is a part of the learning process, students need to be assisted to conduct their own research and acquire the necessary information literacy skills to do so.

□ The study by Rowland and Rubbert (2001, p. 750) indicates that one of the main research needs identified among students is still the need for proper information resources, preferably "traditionally published material because of its mobility, flexibility, easy scanning, more comfortable reading position with less constraint on the eyes, and the option of storing texts for a long period of time".

2.6.3.5   The need to make bibliographic research requests in various ways

When it comes to bibliographic research support, postgraduates still mainly need flexible methods of submitting requests such as those made by telephone, facsimile, Internet (incl. e-mail) and ordinary post (Macauley, as quoted by Macauley and McKnight 1998, p. 99). Macauley, (quoted by Macauley and McKnight 1998, p. 99) also mentions the need for an electronic reference desk that makes chatting and e-mail facilities available 24 hours seven days a week.

2.6.3.6   The need for information literacy skills

From the literature it is clear that students need information literacy skills if they are to make sense of the vast quantity of information that is available out there. They also need to be taught how to search for *appropriate* information. "Research candidates probably have the greatest information requirements of all students; consequently they have the greatest need for information literacy skills" (Macauley and McKnight 1998, p. 100). "Normally, academics [or researchers] do not use anywhere near the number (i.e. quantity) of information services available, nor, it is argued, do academics [or researchers] normally have the necessary skills or techniques to use those resources" (Macauley and McKnight 1998, p. 101). Even then, once they have managed to conduct a successful search, they also need to be taught where to locate the physical resources (Robertson 2003, p. 129). Librarians can help to keep postgraduates updated with new services by means of individual consultation sessions (Robertson 2003, p. 129) and by showing them how to utilize electronic communication facilities more effectively.

2.6.3.7 Technological needs

My investigations enabled me to identify the following administrative needs that relate to technology and its uses:

❒ Postgraduate students need to be able to set up an e-mail account (Robertson 2003, p. 129).

❒ Postgraduate students need to be able to select an Internet Service Provider (Robertson 2003, p. 129).

❒ Postgraduate students need to be able to download and install software programs such as Adobe Acrobat Reader™.

❒ Postgraduate students need to be able to use a word processing program. Students often have doubts about their skills when it comes to word processing and application software packages (Robertson 2003, p. 129).

❒ Postgraduate students need to be able to deal with technological problems such as trouble with the network connection, the browser or the computer that they are using (Van den Haak, De Jong and Schellens 2003, p. 344).

❒ Postgraduate students require more public workstations on which to conduct searches and research (Starkweather and Wallin 1999; University of Massachusetts at Amherst Library Needs Study, n.d.). They also need more multimedia workstations.

❒ Postgraduate students require better and more copying facilities on machines reserved for the use of postgraduates alone.

One need that is not articulated in the literature is the need that postgraduates and researchers have to access Internet hotspots (wireless Internet) from personal laptops or palmtops while they are inside the library building or on the campus.

2.6.3.8 Training needs

Postgraduate students need a specialized training that will refine their search strategies and improve their information literacy skills. One focus group participant in a study from the University of Nevada, Las Vegas, sees the library as "focusing on instruction and orientation for users so that they may do research from home" (Starkweather and Wallin 1999).

Postgraduate students need training so that they will become better able to:

- ❐ Find their way around word processing and application software packages (Robertson 2003, p. 129).

- ❐ Manipulate bibliographic software packages such as EndNote™ (Robertson 2003, p. 129; Macauley, as quoted by Macauley and McKnight 1998, p. 99).

- ❐ Conduct Internet searching (Robertson 2003, p. 129).

- ❐ Utilise search strategies (Robertson 2003, p. 129).

- ❐ Work in an online environment to access information and participate in discussion forums (Robertson 2003, p. 131).

Suggestions made by distance students include the wish for:

- ❐ Special introductory sessions that are subject-related and that focus on the information needs of part-time students (Rowland and Rubbert 2001, p. 757).

- ❐ Network end-user support and Communities-of-Practice (CoPs). This would reduce the feelings of isolation that are often experienced by postgraduate students. "Librarians must provide students with access to the information that enables them to have a broad perspective on their field of research" (Macauley and McKnight 1998, p. 97).

- ❐ Reader education (Macauley, as quoted by Macauley and McKnight 1998, p. 99).

- One-to-one tutorials (Barry, as quoted by Macauley and McKnight 1998, p. 102).

- Instruction that transcends the "how-to-use systems" approach and that incorporates advanced skills training (Barry, as quoted by Macauley and McKnight 1998, p. 102).

- Training that focuses specifically on the context of academic subjects rather than generic training (Barry, as quoted by Macauley and McKnight 1998, p. 102).

2.6.3.9   The need for additional support

My investigations enabled me to identify the following kinds of additional support required by postgraduate students:

- Information about statistics, data analysis, research funding.

- A dedicated postgraduate liaison librarian (Macauley, as quoted by Macauley and McKnight 1998, p. 99).

- A current awareness service (Macauley, as quoted by Macauley and McKnight 1998, p. 99). The study at the University of Nevada, Las Vegas, noted that the library "services mentioned most frequently were alert services from publishers and access to full text of journals" (Starkweather and Wallin 1999).

- Frequent access to or reception of a list of new publications received by the library (Macauley, as quoted by Macauley and McKnight 1998, p. 99) that would be sent to faculty (Starkweather and Wallin 1999) and to students. Most clients would prefer brief e-mail announcements that would inform them about what is new or available in the library.

2.6.3.10 The need for help when writing a proposal and thesis

Postgraduate students very often regard librarians as *de facto* co-supervisors for their studies. With this in mind, they need assistance and support for:

- ❏ Understanding the key stages and distinctive challenges of postgraduate research (Robertson 2003, p. 131)

- ❏ Understanding the requirements and elements of a thesis

- ❏ Applying bibliographic reference techniques

- ❏ Managing information (Robertson 2003, p. 129)

- ❏ Manipulating data (Robertson 2003, p. 129)

- ❏ Understanding the law of copyright and the meaning of plagiarism

The training of librarians need to be frequently reviewed if they are to keep up with changes and developments in the virtual library environment and become skilled in the use of new techniques, approaches, methods and technology. Librarians need to make an intensive study of the VRE (Virtual Research Environment) so that they can devise comprehensive and effective plans for managing library services and activities within this VRE.

2.6.3.11 The need for networking

Librarians need to establish networks that will reduce the feelings of isolation that are often the bane of postgraduate students' lives. Increased collaborative information networking among students, academic and library staff through Communities-of-Practice would contribute towards the implementation of an institutional information system (Rowland and Rubbert 2001, p. 757; Macauley and McKnight 1998, p. 97). Meetings between subject specialists and departments to discuss new discipline-specific resources (Starkweather and Wallin 1999) could lead to better informed librarians, and that could lead to more effective services and a greater degree of client satisfaction.

2.6.3.12 Resource needs

The following items reflect the information needs of postgraduate students.

- ❏ Proper information resources. This means "traditionally published material because of its mobility, flexibility, easy scanning, more comfortable

reading position with less constraint on the eyes, and the option of storing texts for a long period of time" – regardless of what the World Wide Web may offer in this day and age (Rowland and Rubbert 2001, p. 750).

❑ Advance bookings of online material (Rowland and Rubbert 2001, p. 757).

❑ Closer liaison between subject librarians and departmental staff so that they can both monitor the availability of reading material (Rowland and Rubbert 2001, p. 757).

❑ Alternative reading lists that take the pressure off existing resources. There tends to be strong competition for resource materials because part-time and full-time students receive the same reading lists (Rowland and Rubbert 2001, p. 749). Alternative reading lists might serve to lessen the tension.

❑ The electronic delivery (where possible) of articles and chapters from books to the requestor's workstation (Macauley, as quoted by Macauley and McKnight 1998, p. 99).

❑ Access to vital sources. The service that is most important to a postgraduate researcher is convenient access to extensive collections of serials and monographs, and special collections (rare books, manuscripts and archives) (University of Massachusetts at Amherst Library Needs Study, n.d.).

2.6.3.13 Personal needs

Not only do postgraduate students have academic research needs. They also often look to the library staff to assist them with a variety of personal problems. Some of these needs are enumerated below.

❑ Personal advice. Some students ask for advice from library staff about supervision issues and even, at times, family or personal problems (Robertson 2003, p. 129).

❑ Physical needs. Students with disabilities have special physical needs which obviously need prompt, practical and sympathetic attention (Schmidt and Wilson 1998).

❑ Personal studying style needs. The library layout and services should make provision for a whole range of very different styles of study. The following list contains only some of the more obvious needs that researchers have when it comes to study environment: group study, noisy study, silent study, individual study, online or virtual study, study with coffee, study at home, study with music. Because some of these environmental styles are obviously at variance with one another, the library staff will need enormous ingenuity, tact and firmness in creating fair and just rules and adjudicating personal space among researchers who find themselves in conflict with other researchers over their personal needs and environmental study styles.

❑ Personalization of library facilities. Comfortable reading areas are needed because most postgraduate students are also working adults who spend very little time at home and who are often deprived of the comforts and amenities of domestic circumstances. Perhaps librarians can devise ways of making the library as much like a "home away from home" as the exigencies of an academic library permit. What is certain is that the more comfortable researchers are, the more easily will they be able to focus on their research to the exclusion of irritating environmental stimuli.

2.6.3.14 The need for an ideal research environment

The Researchers' Centre (the VIP lounge at the library) at the Queensland University of Technology Library seems to have arrived at the ideal solution to the needs of postgraduate students even though the services that they offer are far more than only virtual services. This library has gone out of its way to meet the information needs of their research community through a one-stop-shop arrangement that offers a combination of access to electronic products, expert in-house advice, and state-of-the-art study space that is more comfortable than the average university library (Stokker 1998).

This library offers a dedicated area in which research students can study, meet one another and consult library staff. Refreshment facilities are available, as are a

meeting room, a consultation room, and 14 screened ergonomic workstations, each of which is equipped with a fully networked PC. At the time of the writing of this article (Stokker 1998), the consultation room contained a single workstation with modem access to specialist geographical information system products and other information resources. This library also offers full access to the Internet, more than 100 bibliographic databases, indexes, full content databases, and general purpose software including word processing packages. At the time of the writing of the article, the library staff were also considered installing bibliographic management databases such as EndNote™. All workstations have access to networked laser printing. Guaranteed expert assistance is available during business hours from the assigned reference librarian. Clients may visit the library or request a librarian to visit the faculty or school. Other "nice-to-haves" in this library include a whiteboard for library staff to post messages and for clients to leave messages for each other, a mail tray in which clients may deposit requests and other documents for circulation within the internal mail system, and a small supply of stationery for the unprepared client.

2.6.4 Demographic factors

According to New Jersey's *Plan for Higher Education* (1999, p. 1) there are "significant challenges facing higher education as it plans for the future, including the changing mix of students and student needs driven by shifting demographics".

The Academic Orientation Program for International Students (AOPIPS) at the University of Melbourne was established in 1999 because of the various kinds of help that international students needed to adjust to the strange and in many ways alien (to them) local cultural environment. "The program has become an integral part of the academic support skills programs and is designed to assist students with their studies, and to improve their communication skills and their transition to learning at an Australian university. Library staff also plays a role in supporting the program" (Robertson 2003, p. 129).

Since the University of Pretoria, and specifically the Faculty of Education, is attracting more and more interest from African countries in particular, this will definitely impact on service delivery by the library. Students are no longer limited by location – in a virtual world they can study, access web-sites and catalogues and conduct research from libraries outside their home country, regardless of

time and space. The Academic Information Service might contemplate offering (limited) special services to foreign students – and to foreign African students in particular - similar to the Academic Orientation Program for International Students offered by the University of Melbourne. Coming from foreign countries these students offer suffer from various kinds of cultural shock, which also need to be considered when addressing the needs of postgraduate students.

2.7   The conceptual model on which the literature survey was based

I have used the model by Page-Shipp et al. (2005) which I adapted and applied as the theoretical framework of this study to guide and determine the design of the conceptual framework for this study, and that in turn guided and determined the literature review for this chapter.

I identified two components of electronic research from the model by Page-Shipp et al. (2005). These two components are *eScience* and *Access to eInformation*. In order to develop a Virtual Research Environment that contains these components, it is necessary first to identify the specific electronic research needs of postgraduate students and researchers. Once these needs have been identified, the specific tools and applications required for a Virtual Research Environment can be designed, developed and implemented. If these steps are followed, the research needs of postgraduate students and researchers can be optimally addressed.

The conceptual model for this study derived and adapted from the model by Page-Shipp et al. (2005), conceptualises various categories of needs that postgraduate students have. I used these categories to guide and organise the data obtained from the literature survey and to guide and determine the design of the questionnaire.

2.8   Summary

This literature review constructed a firm conceptual foundation from which I could conduct a needs analysis among postgraduate students at the University of Pretoria. The literature makes it clear that the needs experienced by postgraduate students are different from these of other user groups. It also makes it clear that the library needs to accommodate this special category of users by addressing those needs if it hopes to remain relevant in the modern

academic world by refining and perfecting the virtual research environment that it sets aside for postgraduate students. The modern academic librarian needs to have an understanding of adult learning principles, of the critical differences in the characteristics and assumptions of different generations, of learning styles and personality types, and of continuous changes in technology in order to remain competitive in a rapidly modernizing world. The strain of keeping up to date with all important new developments makes huge demands of librarians. But these are demands that will have to be met by any librarian who wishes to provide a world-class service that complies with the best international standards and who desires to give the best possible service to research clients in an increasingly virtual research environment (VRE).

I identified various needs categories in the conceptual framework for this study and these guided the literature survey. The needs identified from the literature survey show definite similarities to the needs conceptualised in the conceptual framework for this study. The categories of need identified in the literature survey are:

- ❏ Administrative needs
- ❏ Access needs (which include database access needs)
- ❏ Internet search strategy needs
- ❏ Bibliographic research requests
- ❏ Information literacy skills
- ❏ Technological needs
- ❏ Training needs
- ❏ Needs relating to writing a thesis or proposal
- ❏ Resource needs
- ❏ Need for networking
- ❏ Personal needs