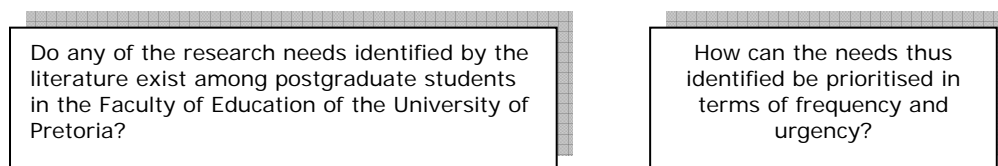# Chapter 5. Conclusions and recommendations

5.1   Introduction

This chapter provides a summary of the research that I undertook for this study. It also contains an overview of the problem statement and rationale, the research questions and the results of the research.

I shall also in this chapter discuss the lessons that may be learned from this research through reflection on the needs that I have identified, by comparing this research with other research that has been carried out in this area (see chapter 2), and by describing the scientific contribution that this research makes to the field of information and library science. I conclude the chapter with recommendations for policy and practice, and possible further research in this field of study.

I shall now use information and data from previous chapters to answer the third and fourth research questions.

Figure 14. Research questions 3 and 4

Do any of the research needs identified by the literature exist among postgraduate students in the Faculty of Education of the University of Pretoria?	How can the needs thus identified be prioritised in terms of frequency and urgency?

5.2   Summary and conclusions

The rationale for this study was to identify and better understand the electronic research needs of postgraduate students so that the Academic Information Service (Library) would be in a position to design and implement services that will address those needs in a better way than the way in which they are currently being addressed (see chapter 1). The study was guided by the following research questions in the following order:

❒ How does the literature define the specific electronic research needs of postgraduate students at higher education institutions throughout the world?

❒ What are the specific electronic research needs of postgraduate students at the University of Pretoria's Faculty of Education?

❒ Do any of the research needs identified by the literature exist among postgraduate students at the Faculty of Education of the University of Pretoria?

❒ How can the needs thus identified be prioritised in terms of frequency and urgency?

The conceptual model for this study was derived and adapted from the model by Page-Shipp et al. (2005). Their model conceptualised the various categories of postgraduate students needs. I have used the categories devised by Page-Shipp et al. (2005) to guide and organise the data that I obtained from the literature survey (see chapter 2) and to guide and determine the research methodology and the design of the questionnaire (see chapter 3). The needs identified in the literature survey are distinctly similar to the needs categories that I conceptualised in the conceptual framework for this study. The needs categories that guided this study were:

❒ Primary data sharing
❒ Transfer of data and computation
❒ E-Access
❒ E-Communication
❒ E-Training
❒ E-Publishing by postgraduate research students

The needs (described in chapter 4) that I identified through the research component of this study are also distinctly similar to the needs that I identified in the literature survey (see Research Question 3). From both the literature survey and research for this study it therefore became clear that postgraduate students in South Africa and throughout the world experience similar needs. Such needs include the following:

❒ Administrative needs: All administrative services, processes and support should (wherever possible) be made available online, and the processes involved should be designed so that they are seamless, user-friendly and automated.

❒ Access needs: Students want to have access to administrative and research support and services any time of the day or night.

❒ Database access needs: Students prefer simple user interfaces. This would preclude the use of library or other specialist jargon and acronyms on such interfaces. Students need to be trained to conduct effective searches in databases (this training is a form of student support).

❒ Internet search strategy needs: Students need to be trained to navigate the web so that they can find the best, most reliable and most authoritative web sites and scholarly publications (this training is a form of student support).

❒ The need for information literacy skills: Students need to be taught how to search for appropriate information and how to discriminate between different kinds of databases.

❒ Technological needs: Students need help and a certain amount of IT training. They need, for example, to know how to install or download software and how to use application software programs.

❒ Training needs: Training should be subject-related (i.e. contextualised) at the time when the need occurs.

❒ The need for additional support: Students often need additional information such as where they might go for statistical support or where they might find someone who offers editorial services such as text editing or proofreading for their theses or dissertations.

❒ The need for training: Students need help and training in the mechanics and methods of research reporting and thesis writing. They often need help in understanding how to write a proposal or even the text itself. They also often need to be coached on how to manage information, manipulate data, and assemble and organise the elements of a thesis.

❒ Networking needs: Students need to know how to network effectively so that they can become less isolated and vulnerable. Networking can also lead to the exchange of valuable information and know-how among researchers.

❒ Resource needs: Students still need access to print resources. They need *convenient* and ready access to the extensive collections offered by the library.

❏ Personal needs: The most obvious personal needs refer to the needs experienced by physically disabled students or students with other kinds of special needs. Other personal needs are discouragement, loneliness, and so on.

❏ The need for an optimal, dedicated or exclusive research environment: This means that postgraduate students not only need a dedicated virtual area on the World Wide Web, but also a physical area within the library to which only postgraduate students have access.

The most frequent and urgent needs that postgraduate students have are described in chapter 4. These needs – which contribute towards the profile of the e-researcher – may be summarised as follows (see research question 4):

❏ Electronic access: Students are becoming more and more dependent on electronic information and support that can be accessed independently of time and space. Such information and support may be either administrative or academic. Both the literature survey and the research data from this study make it plain that students need less complicated and trouble-free ways of accessing information and support.

Students in South Africa and throughout the world share the following similarities and preferences:

- Both groups prefer a user-friendly, Google-like interface that is accessed at only *one* point to gain entry to research databases.
- Postgraduate students greatly prefer to use Internet search engines rather than library databases to conduct their research.
- Most postgraduate students would prefer a separate web page that addresses only their specific needs.
- Most respondents expect to access the library web page fairly frequently (which means at least once a week).

❏ Transfer of data and data computation: Students indicated that they need to have access to certain kinds of software and tools in order to conduct their research. They are also prepared to share their data by making it available to other researchers.

- Electronic communication: Students still prefer face-to-face communication and expect feedback to be as complete as possible within the shortest possible return time. They also want to receive more communications from the library specifically in the form of e-mail newsletters.

  - Students prefer their initial training to be face to face.
  - Students want feedback within 24 hours or less.
  - Students prefer to receive full text electronic research information.

- Electronic training and support: Most students prefer to conduct their own research after they have been trained. They therefore need the kind of Internet training that will allow them to do this.
  Students would also like to have face-to-face *individual training*. The need for Internet training was also frequently expressed by students in other countries. Once students are properly trained, they will be able to access e-journals and e-databases quickly and accurately by themselves. This would mean that pressure on the library staff to conduct research on behalf of students would be greatly reduced. Once postgraduate students have been trained to carry out their own research operations, librarians (who currently work in an understaffed library) will be freed to direct their energy to whatever else might need priority in development, research and support.

- Electronic publishing (which includes primary data sharing): Most students are in favour of sharing their primary data and other research on an institutional research database. This would greatly help to position the University of Pretoria in the international research arena as a world-class research institution. It would also encourage individual researchers to compete and contribute internationally by giving them the kind of exposure and publicity that lead to the making of new contacts and to stimulating exchanges of ideas and opinions.

If they want to offer effective support services to postgraduate researchers operating in a virtual research environment, librarians will have to work hard at attaining a high degree of mastery in the following skills:

- Technological skills

- ❐ Decision making skills
- ❐ Supervisory skills
- ❐ Planning skills
- ❐ Facilitating skills
- ❐ Marketing skills
- ❐ Project management skills
- ❐ Communication skills

The research confirmed that the needs of adult learners are indeed different from those of undergraduates who have recently left school. That postgraduate students have definite preferences is plainly indicated by the data that I obtained from the survey.

5.3   The contribution that this research makes to the field of library and information science

In general, this study has contributed to a better understanding of the needs of the e-researcher and the expected responsibilities of the e-librarian.

This user study places librarians in a better position to understand how the increasing prevalence of electronic resources and technology affects library users and how current library services and approaches need to be modified for the benefit of both staff and users. This study contributes to a clearer understanding of the current electronic research needs of postgraduate students. Librarians concerned with planning will be able to use this research to make the best use of their services and resources for the benefit of their postgraduate research students working in higher education institutions. At the same time this research will enable planners to utilise their limited human resources (the library staff) and physical resources (such as computer facilities), as well as the World Wide Web in a more effective and efficient way.

The very nature of a librarian's occupation requires that a librarian be able to make allowances for the cultural, personal, occupational and generational diversity that characterises clients and staff. This same diversity is to be found among postgraduate research students. This study should enable librarians better to understand what the role or occupational profile of an e-librarian should be in a virtual research environment. It could also help academic librarians to understand the different ways in which postgraduates approach their research. Postgraduate

researchers, like all adult learners, come from different generations and therefore have learning and research styles that differ significantly from one another.

5.4   Recommendations

I make the following recommendations for research on the basis of the findings of this study.

5.4.1 Recommendations about the implementation and development of e-products, e-services and e-support

If the Academic Information Service of the University of Pretoria is to meet the electronic research needs of its postgraduate students, it will have to develop and implement certain products, tools, services and forms of support. The following items focus on what needs have to be addressed by means of formal implementation and better utilisation.

- ❑ A *federated search engine* This will offer a single-search interface that provides access to all open-access and subscription-based information resources *simultaneously*. This would function somewhat like the present Google™ interface.
- ❑ A *postgraduate web page* This would address the research needs of postgraduate students separately from those of undergraduates. The library's web page is a vital gateway to support and services that should not be underestimated by the library. It should ideally be a multi-purpose gateway or portal into a fully integrated environment in which postgraduate students can register, conduct their research, access and download full text articles, pay for services by means of a secure e-money processing system, receive e-support via e-mail or the web from an information specialist, have access to e-books, and access software such as EndNote™ through the university server.
- ❑ *An institutional research repository* This will allow postgraduate students to submit and post their research material so that it becomes available in the official repository of the University of Pretoria.
- ❑ *High-quality self-help products* Many postgraduate students continue – sometimes in isolation – to conduct their own research in the years after they have received in-house training. If the university offers unlimited online tools to postgraduates as a follow-up service that they can access in

times of need, it will be offering them an important lifelong means of support and practical assistance to graduates who might by then be physically far removed from the university's facilities. Such a service could also help to maintain a link of mutual support and loyalty between the university and its graduate staff – thus adding value to the in-house postgraduate experience long after the student has graduated.

❑ *E-newsletter* Students indicated that they want to stay in touch with the library electronically and receive updates from the library. An electronic newsletter sent by e-mail will provide ideal opportunities for the library to communicate important information to students at any time of day or night and even when the university is in recess.

❑ *Internet training* Internet training should be scheduled as part of the orientation sessions of postgraduate students. Postgraduate students should be taught how to critically evaluate the authority and authenticity of research material obtained from the World Wide Web. The library should also cater for students from previously disadvantaged communities and students who completed their undergraduate studies in the era before computers and the Internet. The library should assist students who lack computer skills and whatever other skills are needed to conduct online research, and they should collaborate with all faculties in this regard. All students need to be able to search effectively for information without assistance. This would make postgraduate students responsible for their own research. It would also relieve librarians of many hours of tediously repetitive and basically unnecessary work (helping people to conduct online searches or other procedures). It is obvious that librarians themselves need to have an in-depth understanding of Internet search strategies, Internet tools, online resources, and other tools and services that support research.

❑ *E-mail communication*   Hulshof (1999) identifies three issues that are pertinent to the use of electronic communication in the service of virtual patrons (e-researchers). These are *immediacy*, *intricacy* and *interaction*. Because it is so easy for a researcher to send a request by means of e-mail and know that it is arriving almost simultaneously at the library, some students believe that the librarian's response should be immediate (Johnson, Trabelsi and Tin 2004, p. 356). This erroneous perception (that a librarian has only the immediate task before him or her to attend to) could be challenged by the use of automated replies to e-mails that reassure e-researchers that their messages have been received and that

explain to them that what they might expect in terms of service and response (i.e. that they might have to wait in line for a reply and/or for service).

❐ ***Virtual research environment***   The library, in collaboration with the rest of the university, needs to devise an integrated approach that supports the workflow processes that are involved in scientific research. Students prefer to conduct their research in a seamless (i.e. non-interrupted) environment. They might, for example, want to cite references in EndNote™ from an electronic journal they are consulting while typing text in MSWord™. The library could investigate the feasibility of implementing open access software such as *Open Office.* Open access software (unlike proprietary software) does not need a licence.

❐ ***Expansion of the role of the librarian***   Librarians need to become better informed about the whole research process and not just about literature reviews. Once they have experienced the difficulties of the process themselves, they will be in a better position to offer informed support to students and researchers alike. Academic librarians need to have an in-depth (and preferably first-hand) understanding of all the tools, services and support that a researcher needs during the research process.

❐ ***Collaboration between faculty and library***   The literature seems to indicate that the partnership between the librarian and the academic is becoming more and more crucial. The basis for a productive working partnership between librarian and academic depends on four key elements: *shared common goals*, *commitment*, *enthusiasm* and *innovation* (Robertson 2003, p. 123). If both faculty and library were to make an equally passionate commitment to these four ideals, great progress could be made in integrating services and support to address the needs of postgraduate researchers.

5.4.2 Recommendations about further research

The research in this study has opened up the way for opportunities to research other topics. Here is a selection of research topics that could be of value to libraries and the academic research community.

❐ Research into e-research needs of students after they have completed their postgraduate studies. Such research might establish exactly how the e-research needs of postgraduate students change over time.

- ❏ Research into how non-traditional forms of training (such as e-learning or distance learning and video-conferencing) are supplementing and in some cases replacing traditional training methods.
- ❏ Research into how the e-research needs of postgraduate students might be addressed through WebCT™ as opposed to a research portal.
- ❏ Research into students who decide to end their studies. This could help to establish why some students do not complete their studies in the minimum required time of two years and why others do not complete it at all. Research is also needed to determine the extent to which the Academic Information Service might have contributed to this such non-completion. Once the Academic Information Service's shortcomings in service delivery have been identified, the Academic Information Service should be able to take steps to remedy whatever deficiencies are identified.
- ❏ An evaluation of existing tools and services (such as "Ask a librarian", the Infoportal and the current library web page) with the purpose of establishing whether they are adequately addressing the needs of postgraduate students.
- ❏ Investigations into the feasibility of providing a Virtual Research Environment (VRE) for postgraduate students. A VRE would offer postgraduates a set of integrated e-tools and e-services that support and simplify research.
- ❏ Research into how the Academic Information Service could use their knowledge of user needs and behaviour to design digital library interactions and interfaces.
- ❏ Research into how the needs of disabled postgraduate students could be addressed electronically.
- ❏ Research into the kind of support and assistance that is needed by non-South African students and how the needs of such students are different from the needs of South African students. The Academic Information Service could use the data from such research to design and establish a cultural support centre inside the library.

5.4.3 Recommendations for further development work

Since more postgraduate students who enrol in the Faculty of Education speak a mother tongue other than Afrikaans or English, the library needs to study ways and means to support and accommodate students who only understand Afrikaans or English as a second or third language – if at all. The library could, for example,

provide online tools and services such as tutorials that are supported by a text or voice-over in the language of a student's choice.

The library should also identify ways of offering support to postgraduate students during each separate *phase* of the researcher's process – beginning with the proposal and ending with the final product.

The library should provide services in conjunction with other concerned parties. What the student really needs is a customised set of products and product and service information that address the specific and varied needs of postgraduate students. The library should be regarded as but one partner in a team that offers students services and support. Other kinds of information that a student needs might include, for example, information about a statistical advisory service, information about editing, proofreading and binding, information about bursaries and other kinds of financial resources such as student loans. The library could cooperate with the Department of Telematic Learning and Education Innovation (TLEI) and other concerned faculties to develop and produce a high quality research support tool in the form of (say) a CD ROM that postgraduate students could use offline to access vital supportive and navigational information.

Librarians need to accept the existence of Google™ and Google Scholar™ as incontrovertible facts and learn from them what it can about their operational success in matters such as interface design and ease of access. The library should also not regard itself as the exclusive repository or guardian of information resources. Students should be encouraged to use whatever scholarly publications they can access on the World Wide Web to complement whatever information is available in library databases.

5.5   Conclusion

This research has made it clear that postgraduate students in the Faculty of Education have needs that are similar to those experienced by postgraduate students throughout the world. It has also made it clear that students from the Faculty of Education need better-quality services than those currently at their disposal – services that are at the same time more simplified in format and faster than those they presently enjoy. Postgraduate student support services should add definite and measurable value to any research and scholarly activity. Should this be done, one may hypothesise that *more* postgraduate students would

complete their studies *within the minimum required time* for the degree concerned, and that researchers in the university would produce *a greater research output*. Addressing such needs pro-actively before the postgraduates themselves become aware of them would demonstrate a laudable degree of commitment on the part of the library to its postgraduate users.

This study gives clear pointers for strategic planning about e-service delivery within a virtual research environment to the Academic Information Service – especially with regard to its future role as a provider of e-services for postgraduate students.

The Academic Information Service needs to make much greater use of e-services. It urgently needs to address the e-research needs of postgraduate students together with their non-electronic information needs from the point of view of *one* explanatory paradigm. What is evident from this research is that postgraduate students of the Faculty of Education are ready to function within an e-environment. Nearly all the needs that I have identified through the needs analysis can be addressed electronically and can contribute towards affirmative research experiences. (Some needs – such as that for unlimited Internet access – are currently unrealistic because of constraints within the library system itself and because of limitations in the technical evolution of the technology itself at the time of writing.)

But by utilising what technology *is* available – technology such as that which supports Internet and cellular phones – the library can even now offer support and services customised to suit the electronic research needs of postgraduate researchers. It is through such customised services that the library could improve access to its excellent information resources while at the same time creating an environment that is conducive to lifelong research experiences by researchers who have come to regard the library itself as an indispensable partner in the quest for high-quality research and academic achievement. By utilising technology to disseminate services and support outside the library walls, the library will be able to show that it really cares about its postgraduate students. This in turn should encourage them to rely on the library and its first-rate resources rather than on any short cuts (such as Google™) to which they might have become accustomed. By taking such needs into account, the library will create a virtual research environment distinguished by ease of use and access.

This will enable postgraduate students to feel that the library is their principal and most valued research partner in their pursuit of academic distinction and success.