Chapter 7

Reflections and Recommendations

7.1 Overview of this chapter

This chapter reflects on the findings of this study and on the exploratory journey of the researcher. It makes recommendations based on the findings of the three research questions. The commitment to act on findings by making recommendations in order to improve web-supported learning processes, products and services may be thought of as 'completing the feedback loop'. This quest for self-evaluation and continuous improvement is one of the basic constructs in this study (see the conceptual framework, originally in Figure 2.5 and updated with findings in Figure 7.1).

This chapter focuses on three things in particular:

- it summarises the research and the findings for each question;
- it discusses lessons learnt with respect to methodology, other related research and the contribution to the scientific body of knowledge;
- it makes recommendations with respect to policy, practice and further research.

The findings of the three research questions are summarised and related to the conceptual framework in the synthesis presented in section 7.3.

7.2 Summary of this research

The intellectual target which drives this study is the attempt to diminish the gap between the 'quality discourse' and the 'online learning discourse', which until recently have seldom converged (Reid, 2003).

Three knowledge domains provide the context for this study: quality assurance, higher education and web-supported learning. The intersection of the three knowledge domains indicates the research problem that was investigated, namely the quality assurance of web-supported learning in higher education.

This is an exploratory study, based on a case study of the Department of Telematic Learning and Education Innovation (TLEI) at the University of Pretoria, South Africa. TLEI is a service department which provides support to academic staff in terms of educational practice and e-learning projects, amongst other services. In this case study, the unit of analysis is the instructional design process. The web-supported learning opportunities produced are considered to be products. The clients of TLEI are the lecturers and students served by the e-learning team of instructional designers, project managers, education consultants, information and media specialists (see Figure 1.2: *Role players*).

The conceptual framework for this study (Figure 2.5) is based on the confluence of the existing theories: quality assurance theory, instructional systems design and systems theory (see Figure 2.3 and Appendix B). The concept of *evaluation* is central to the underlying theoretical framework, both in the sense of formative and summative evaluation of web-supported learning products, and in the sense of continuous improvement of an e-learning production unit in terms of self-evaluation and accountability.

Three research questions directed this study:

1. What factors promote quality web-supported learning?
2. What factors contribute to client satisfaction (or frustration) with web-supported learning?
3. What lessons were learnt in applying standard quality assurance theory to the instructional design process for web-supported learning?

Chapter 2 provided an in-depth literature review of the knowledge domains and the particular areas addressed by the research questions. Chapter 3

presented the research design and methodology selected in order to answer the research questions. The research strategies used were a literature survey, case analysis meetings, a student survey (see Appendix D1 for the questionnaire), lecturer interviews (see Appendix E1 for the interview schedule), expert consultation and task teaming.

The findings for the first research question were presented in chapter 4, in the form of a taxonomy of factors to promote quality web-supported learning (Tables 4.3 and 4.4; Figure 4.3). The findings for the second research question were presented in chapter 5 in terms of a student frustration index, a student satisfaction index and contributing factors to student and lecturer experiences with web-supported learning. The findings for the third research question were presented in chapter 6 in the form of artifacts produced as part of a process-based quality management system for web-supported learning, as well as eight lessons learnt in applying standard quality assurance theory to the instructional design process.

7.2.1 Research question 1:

What factors promote quality web-supported learning?

The literature review identified frequently cited studies in the literature in terms of classic benchmarks, indicators and principles (section 2.5.1) and criteria for exemplary or promising courses (section 2.5.2). A comparative analysis of the various frameworks, benchmarks and criteria produced an initial taxonomy of *critical success factors* for quality web-supported learning (Table 2.3). The taxonomy is based on the categories institutional, technology, lecturer, student, instructional design and pedagogical factors.

The taxonomy was corroborated and extended as a result of reviewing additional studies published from 2000 onwards (see Appendix C, Table C11). It was further refined and validated by critical colleagues, who are experienced instructional designers within the case study. The critical colleagues agreed that in order for the taxonomy to be as comprehensive, yet as succinct as

possible, *underlying assumptions* and *exogenous factors* should be listed separately. Examples of underlying assumptions that need to be in place for quality web-supported learning are positive attitude, commitment and motivation from lecturers; sound instructional design practice and sound teaching and learning practice. Examples of exogenous factors which are beyond the control of e-learning practitioners are class size, incentives for lecturers and work loads of lecturers and students.

The full list of underlying assumptions and exogenous factors is given in Table 4.3, which must be read in conjunction with the refined taxonomy presented in Table 4.4. The taxonomy was mapped onto Ingwersen's (1996) cognitive model of IR interaction, in order to provide a cognitive and visual interpretation of the categories in the taxonomy (Figure 4.3).

The taxonomy emphasizes the human aspects of enhancing quality, the dynamic nature of the teaching and learning process and the non-negotiable nature of staff and student training, staff and student technical support, and accessibility and reliability of the technology.

7.2.2 Research question 2:

What factors contribute to client satisfaction (or frustration) with web-supported learning?

A student feedback questionnaire was piloted, refined and improved during 2001 and 2002. In July 2003 the WebCT Experience questionnaire was completed online by 4 650 students who had at least one web-supported module. The findings are reported in chapter 5 and Appendix D.

The categories in the student questionnaire were classified as contributing to either student frustration or satisfaction with web-supported learning. The Frustration Index was calculated based on the Technical Adequacy, Educational Support and Affective Domain indices. The Satisfaction Index was calculated based on the Communication Tools and Perceived Learning

indices. The findings were that 83% of online students experience moderate to high levels of frustration in their web-supported courses and only 43% experience high levels of satisfaction.

The factors contributing to high levels of student frustration are:

- insufficient computers and printers on campus;
- the extent of technical difficulties experienced;
- inadequate student support CD-Rom;
- inadequate student training;
- sometimes slow response from classmates;
- feelings of annoyance and/or stress.

The expected frequency of technical difficulties experienced is only 1.4 times per week and the expected waiting time for a solution is 1.26 days, both of which appear to be acceptable averages[1].

The factors contributing to student satisfaction levels are:

- feeling comfortable communicating via online tools;
- feeling more freedom to express oneself than in a traditional classroom;
- perceived learning from the contributions of other students;
- promoting the ability to work as a team or group member;
- promoting the ability to plan one's own work;
- experiencing an enriching learning environment.

The second component of client satisfaction investigated was the level of *lecturer* satisfaction with web-supported learning and the service received from TLEI. Personal interviews were conducted in early 2004 with a small sample of lecturers across various faculties. The participants were identified as being experienced and active WebCT users. The Lecturer Experience and Satisfaction interview schedule was a newly developed instrument which

[1] These averages are estimates. They vary according to a student's prior experience with e-learning, as well as whether it is early or late during a semester. They should not be assumed to be constantly applicable.

emerged from the quality management system. It was piloted with a view to testing and improving it for future use in the summative evaluation of web-supported learning products. Recommendations for its refinement were given in section 5.3.4.

Strong agreement was expressed by the interviewees that web-supported learning adds value to the learning experience and supports lecturers in the facilitation and administration of learning. The use of the communication tools is confined mainly to the discussions tool and external e-mail or electronic mailing lists. Almost all the respondents had attended the basic WebCT training course, but few attended the advanced courses. This implies that they are still largely dependent on TLEI for the development and maintenance of their WebCT courses.

The open responses on the interview schedule were analysed in terms of problems experienced, benefits experienced and lessons learnt. The majority of problems were of a technical nature, experienced during the extensive IT upgrade which took place in early 2004. The message was “don’t change things that work” and “communicate with your users well in advance and frequently, otherwise they panic” (comments from lecturers).

The level of satisfaction expressed with the services offered by TLEI was extremely high. The open comments in this regard were overwhelmingly positive and appreciative. These findings provide evidence of return on investment for the university management.

The qualitative, personal nature of the interviews enabled project managers and instructional designers to renew contact with their clients and to encourage them to express sincerely their needs as well as problems and benefits experienced with respect to web-supported learning. This important summative evaluation exercise should be conducted annually.

7.2.3 Research question 3:

What lessons were learnt in applying standard quality assurance theory to the instructional design process for web-supported learning?

A formal online quality management system (QMS) for web-supported learning was designed, developed and implemented in the e-learning unit at the University of Pretoria.

The research methods used were expert consultation and task teaming. The data sources were documentation in the form of communiqués, agendas and notes, as well as archival records in the form of administrative documents. A prototyping approach was used, in which three prototypes were developed: a paper-based prototype of all procedures and supporting documents, an online prototype showing the structure and graphic interface, and the full online beta version of the system.

The QMS analyses and documents the instructional design *process* represented by the Project Timeline (Appendix F1). Each step in the project timeline is documented as a *procedure*, including an overview, its objective, procedure steps, people responsible and supporting documents such as samples, checklists and reports. Eight lessons were learnt during the task team exercises (section 6.3). Various artifacts were collected and produced in response to the lessons learnt (see Appendix F), including the online version of the quality management system itself.

The QMS was not required to be ISO 9000 compliant, but where these requirements were thought to be useful, they were implemented. The resulting QMS is evidence of a self-evaluation exercise in an academic support department, an area for which the HEQC has not yet formulated specific criteria. A voluntary external review by an international expert will take place in late 2004, for which the QMS will provide auditable evidence of a process-based quality management system for web-supported learning.

The main benefit of developing the process-based quality management system exercise was the reflection and discussion on the ways e-learning projects are executed and the identification of areas for continuous improvement. Various other benefits and an analysis of its early use were described in sections 6.4.3 and 6.4.2 respectively.

Although the system was formally launched and demonstrated to TLEI in late 2003, work is still required in the implementation phase. It is necessary to train all practitioners in the use of the system so that it becomes an automatic resource to streamline best practice. It is also necessary to maintain the documentation on an ongoing basis, in the light of the dynamic nature of instructional design.

7.3 Synthesis

This section summarises and interprets the findings from the three research questions (section 7.3.1) and maps them onto the conceptual framework (section 7.3.2).

7.3.1 Summary of findings

The three research questions in this study deal with the phenomenon of quality web-supported learning from three different perspectives, which are derived from the ISO 9001 model (Figure 2.4) and from the resulting conceptual framework (Figure 2.6).

Searching for factors to promote the quality of web-supported learning opportunities (research question 1) focuses on the *products* that are the outputs from the team approach to instructional design. Research question 2, which focuses on client satisfaction as one possible quality measure, emphasizes the *services* provided to clients by an e-learning support unit, such as training, consultation, design and development, or technical support.

Research question 3 focuses on the instructional design *process*, and applies standard quality assurance theory to develop a process-based quality management system for web-supported learning.

The three research questions and their findings are summarised in Table 7.1. Although each research question has its own focus, there are several areas in which the findings overlap and complement each other. An interpretation of the complementary findings is presented after the table.

Table 7.1: *Synthesis of research questions and their findings*

Research question 1: **What factors promote quality web-supported learning?** *[Quality of products]* (see details in Tables 4.3 and 4.4)	**Research question 2:** **What factors contribute to client satisfaction with web-supported learning?** *[Quality of services]*	**Research question 3:** **What lessons were learnt in applying standard QA theory to the instructional design process for web-supported learning?** *[Quality of processes]*
Institutional factors **Technology factors** **Lecturer factors** **Student factors** **Instructional design factors:** • usability • learning principles **Pedagogical factors** **Underlying assumptions** (see next page) **Exogenous factors** (see next page)	**Student frustration:** • insufficient computers available; • insufficient printing facilities available; • extent of technical difficulties experienced; • insufficient support from the student CD-Rom; • inadequate student training in WebCT; • an impersonal learning experience; • slow response from classmates; • feelings of annoyance and/or stress. **Student satisfaction:** • comfortable communicating online; • freedom to express oneself more than in a traditional classroom; • learning from the contributions of other students; • promoting ability to work as a team or group member; • promoting ability to plan one's own work; • an enriching learning environment.	**Lessons learnt:** • **Lesson 1:** Adopt a fundamental instructional design model to serve as the main process in the quality management system. • **Lesson 2:** Focus attention on the Analysis and Evaluation phases. • **Lesson 3:** Train e-learning practitioners in the basics of quality assurance practice. Do not allow too much time to lapse between workshops and procedure writing. • **Lesson 4**: Participants (e-learning practitioners) and managers sometimes doubt the need for a formalised quality management system or fail to realise its usefulness. • **Lesson 5:** Instructional designers and project managers in a busy production department need to make time to reflect on their own practice.
continued…	continued…	continued…

Table 7.1: *Synthesis of research questions and their findings (continued)*

Research question 1: **What factors promote quality web-supported learning?** *[Quality of products]*	**Research question 2:** **What factors contribute to client satisfaction with web-supported learning?** *[Quality of services]*	**Research question 3:** **What lessons were learnt in applying standard QA theory to the instructional design process for web-supported learning?** *[Quality of processes]*
Underlying assumptions: • positive attitude, commitment and motivation from lecturers; • commitment and motivation from students; • sound advice, support and consultation to lecturers with respect to instructional design and educational practice; • sound instructional design practice; • sound teaching and learning practice; • commitment to continuous improvement. **Exogenous factors:** • quality of the institutional learning management system; • stability of national telecommunications infrastructure; • class size; • work load of clients; • recognition and incentives for lecturers.	**Lecturer satisfaction** **Benefits:** 1. Organisation and administration 2. Communication and interaction 3. Time savings – time, money, queries 4. Good support received 5. Re-thinking, re-planning, re-structuring 6. e-learning adds value 7. Personal and professional development 8. Lecturers coming on board 9. Students gaining new experience, skills **Problems:** 1. Technical upgrades / problems 2. Encouraging student participation 3. Encouraging lecturer buy-in 4. Time required for planning and development 5. Library and copyright issues **Lessons learnt:** 1. Change management (lecturers and students) 2. Training (lecturers and students) 3. Distance learning, larger numbers of students 4. Human element 5. Discussions, growth 6. Internationalisation	• **Lesson 6**: Lecturers need guidelines in order to prepare learning materials for electronic delivery. They also need guidance on the roles and responsibilities of all role players in the design and development team, including their own. • **Lesson 7:** Lecturers often expect immediate completed web-supported learning products, even if submitted at extreme short notice. • **Lesson 8:** A formal quality management system requires at least a quality policy, document control conventions and a master document list in order to move towards ISO 9000 compliance.

Table 7.1 gives an overview of the findings of this study. These are reflected on and interpreted below.

The quest for quality web-supported learning is a complex pursuit, which may be interpreted in various ways, for example continuous improvement, self-evaluation, external accountability, or formative and summative evaluation of web-supported courses. The latter field is extremely well researched (many references are listed in Appendix B2) and is not the main focus of this study. The three research questions in this study, with their respective emphasis on products, services and processes, provide a conceptual basis for attempting to diminish the gap between quality assurance practice and web-supported learning.

The instructional design process is the unit of analysis in the case study. It features centrally in all three research questions. Sound instructional design practice is an underlying assumption for the taxonomy of factors for quality web-supported learning. Clients such as students and lecturers benefit from the added value that instructional design contributes to the production of satisfying web-supported learning experiences. The process-based quality management system demonstrated how to apply standard quality assurance practice to the instructional design process.

Since one of the knowledge domains of the study is web-supported learning, technology issues feature in the findings for two of the research questions. Technology factors are a category in the taxonomy and were highlighted in measuring the satisfaction of students and lecturers. Examples of such issues are the provision and reliability of computer technology, technical support for lecturers and students and hands-on system training for both client groups.

The human element features strongly in all the research findings. Communication and interaction between lecturers and students and between students themselves, feature among the lecturer and student factors in the taxonomy. Positive attitude, commitment and motivation are listed as underlying assumptions for the taxonomy. Working as a team member and

learning from the contributions of other students contribute to student satisfaction with web-supported learning. Lecturers experienced problems with encouraging student participation and lecturer buy-in. Making time to reflect on best practice and formalise processes and procedures in the instructional design process proved to be difficult and slow. This occurred in spite of making a conscious attempt from the start to ensure commitment and buy-in via training in quality assurance theory and direct involvement in task teams. Ultimately, the overarching, intangible aspect of the human element is the institutional factor *change management*, which cannot be neglected in the social and institutional environment of web-supported learning.

Another complementary finding is the need for support in embarking on web-supported teaching and learning – support for lecturers in terms of technical, pedagogical and instructional design factors, and support for students in terms of communication, interaction and facilitation of web-supported courses. Various artifacts in the quality management system provide supporting resources, both for lecturers (e.g. roles and responsibilities, minimum requirements) and for instructional designers (e.g. standards, guidelines, checklists and service level agreements).

Thus the findings for the three research questions complement each other and provide a strong platform for quality web-supported learning, woven from various factors, such as critical success factors, client satisfaction measures and process-based guidance for best practice.

7.3.2 Updated conceptual framework

The literature review (chapter 2) contributed to the development of the conceptual framework for this study, which was presented in Figure 2.5: *A process-based quality management system for web-supported learning.* In this section, the findings of the three research questions are mapped onto the conceptual framework.

The following narrative refers to the numbers indicated on the updated conceptual framework (Figure 7.1). The web-supported learning endeavour begins with the needs and expectations (1) of clients, namely lecturers and students. Various input factors (2) contribute to the quality of the eventual outputs, the web-supported courses (products) (4) that are designed and developed by means of the instructional design process (3). The products are evaluated (both formatively and summatively) in the course of usual instructional design practice. In terms of customer satisfaction (5), it is the summative evaluation of the products that produces measures (6) to inform the feedback loop (7), which in turn enables continuous improvement. Distant outcomes (8), such as actual learning that took place (9) (rather then student perceptions thereof) and return on investment (10), provide scope for further research.

The categories of factors reflected under the ***inputs*** part of the framework were generated from the literature review and for that reason, were kept together in a group in the original framework (Figure 2.5). However, with more knowledge gained from answering the research questions, not all those categories are *antecedents* that need to be in place before the instructional design process begins. Indeed, instructional design and pedagogical factors need to be taken into account *during* the instructional design ***process***. For this reason, as well as the fact that the *instructional design process* is the unit of analysis for the formal quality management system (research question 3), they are moved into the *process* part of the expanded framework (Figure 7.1)[2].

Figure 7.1 presents the conceptual framework with overall findings that resulted from this study, mapped onto the corresponding sections.

[2] This tactic of refining thinking in the light of findings is referred to by Miles and Huberman (1994) as *building a logical chain of evidence.*

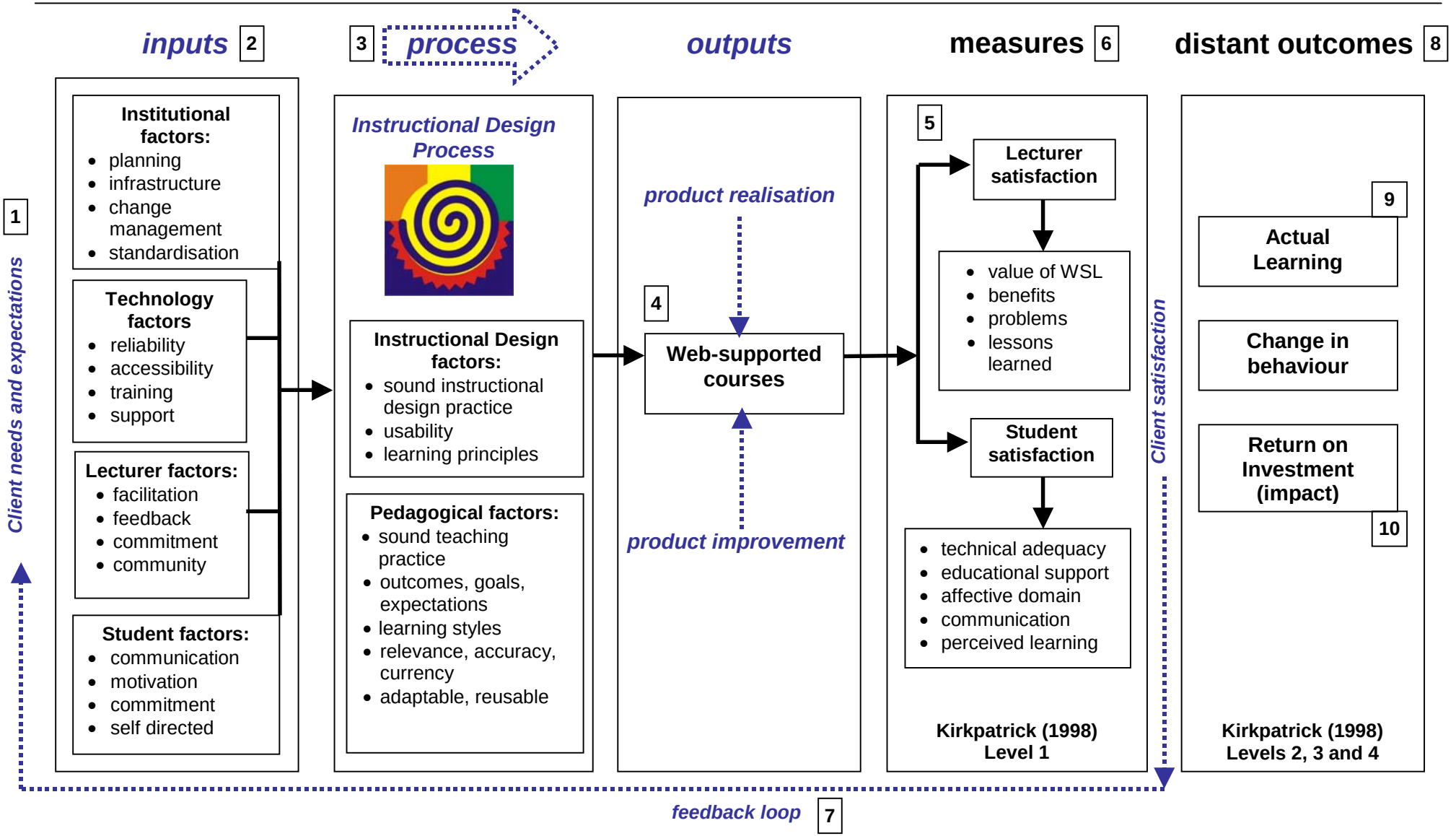

Figure 7.1:

Quality assurance of web-supported learning

The three research questions in this study correlate directly with the sections in the conceptual framework (Figure 7.1):

1. Research question 1 (factors to promote quality web-supported learning) contributes to the *inputs* section (2), which through the instructional design process (3), influences the quality of the web-supported courses (products) (4) in the *outputs* section of the framework;
2. Research question 2 (client satisfaction) (5) is reflected in the *measures* section (6) of the framework;
3. Research question 3 (standard quality assurance theory applied to the instructional design process) is reflected in the *process* section (3) of the framework, as well as client satisfaction (5) and measures (6).

Together, all sections of the conceptual framework and the findings of the research questions reflect the holistic nature of the process-based quality management system for web-supported learning that has resulted from this case study.

7.4 Discussion and reflection

This section discusses what can be learned from this research. It is a reflective section, reviewing lessons learnt in terms of methodological, substantive and scientific aspects of the study. The substantive aspects include a summary of recent findings from the literature. This section also provides a reflection on the exploratory journey that was undertaken from the start of this study (section 7.4.4).

7.4.1 Methodological reflection

This section reflects on the methodology applied, together with its appropriateness and possible limitations. Validity and reliability were discussed in chapter 3, sections 3.3.2 and 3.3.3 respectively. The detailed

justification for and limitations of the methodology were discussed in section 3.4.6.

With respect to the literature review of factors to promote the quality of web-supported learning, my interpretation of the factors considered to be important by the authors, influenced the resulting synthesis of critical success factors. Furthermore, there may be many other important factors – the fact that some things such as *class size* were not specifically mentioned by the experts, does not mean that they are insignificant in the effectiveness of the online environment. An attempt to cover such factors was made by specifying underlying assumptions, without which quality web-supported learning cannot materialise, as well as exogenous factors which are beyond the control of e-learning practitioners (Table 4.3).

The collection, analysis and interpretation of the student feedback used quantitative techniques such as frequency counts, expected values, cross tabulations and graphical representations of distributions. My interpretation of which items imply student frustration and which items imply student satisfaction rested on intuition and judgment, both of which play an important part in the scientific method (Reid, 2000). The distinction between frustration and satisfaction items is acknowledged as one of the assumptions on which the statistical analysis is based.

The self-selecting sample was not representative of all students taking web-supported courses. This issue is mitigated by the fact that it was not the intention to fully describe or analyse the distribution of all such students. It is acknowledged that only certain types of students may have participated in the optional survey, for example those with strong opinions to express. Nevertheless, useful demographic and usage data, as well as satisfaction and frustration data, was obtained from those students who chose to complete the questionnaire.

The fact that the self-selecting sample is not replicable from year to year due to the shifting student population does not prevent longitudinal studies to monitor the trends in the satisfaction and frustration indices over time.

The responses to the open items on the student questionnaire provided a rich source of qualitative data. The extent of open responses analysed was demarcated by the point at which data saturation was reached. There is the possibility that further analysis of the open responses will yield additional findings in respect of positive aspects, negative aspects and suggestions for improvement of web-supported courses. This rich qualitative data may at any time be scanned visually by interested parties, in order to report any powerful statements anecdotally for the purposes of management information. The full data set in html format was forwarded to relevant academic departments for their own further use.

The lecturer feedback survey was a pilot study with a small sample of lecturers known to be active in WebCT. A limitation is acknowledged, in the sense that the sample was neither comprehensive nor representative of all lecturers using WebCT. However, the sample was adequate to test the first application of the instrument, which yielded useful findings (see chapter 5).

The design and development of the process-based quality management system made use of expert consultation and task teaming. The research took place in an actual work situation by investigating and documenting the instructional design process and its constituent procedures. The participant researcher strategy was realistic and practical, although it is acknowledged that it may have caused inadvertent distortions in my deductions (Guba & Lincoln, 1981). As the project progressed, various needs of the participants emerged and were immediately addressed, for example the sanity checks ("Why are we doing this?"). Consensus and validation were sought from the participants in the task teams and the QMS Steering Team meetings.

7.4.2 Substantive reflection

Substantive reflection provides the opportunity to compare the results of this study with other related research, as well as to discuss relevant literature that emerged after having closed the literature review in chapter 2 (T. Plomp, personal communication, 27 November 2002).

It appears that both 'e-learning' (web-supported learning) and 'quality' are constructs that tend to be misunderstood and misrepresented. Parker (2004) refers to the fact that both terms are "so burdened with assumptions as to create their own problematic" (p. 386). Both constructs have their zealous promoters and equally vehement detractors. Both domains are briefly reflected on in this section, in the light of the findings of this study.

Perspectives on web-supported learning

Just as with other technologies and media before it, such as radio, television and computer-based education, questions have arisen as to whether web-supported learning can deliver on its promises. Globalisation and market trends which pressurise higher education providers into offering more programmes online, mean that fraudulent operators emerge and students need to become critical consumers. The 'increased access argument' originally claimed as a major advantage of web-based systems (Parker, 2004) has backfired by the simple fact that *lack* of access to computer technology is a reality (as shown in this study – chapter 5).

The integrity of online teaching and learning environments is currently being questioned in the light of various philosophical, professional and change management issues. The buy-in of academic staff is vital in building high quality, online, interactive courses. "The importance of the degree to which faculty feel that they are receiving encouragement and solid support in all areas of online development should not be underestimated" (Caplan, 2004, p. 179). This study found that lecturers are appreciative of and dependent on the support and services provided by the e-learning support unit at the

University of Pretoria (see chapter 5), even though they acknowledge the difficulty in encouraging colleagues to embrace web-supported learning.

The importance of engagement and communication between student-student, student-lecturer and student-content is corroborated by Anderson (2004a) and Parker (2004): "… the online environment begins to take shape. Until students and instructors engage, however, it is still just a shell" (Parker, 2004, p. 389).

The implication is that the basic qualities of a good teacher provide the foundation for a good *e-teacher*. Anderson (2004b) identifies three vital qualities of an e-teacher: the first is that an e-teacher is an excellent teacher: "They like dealing with learners; they have sufficient knowledge of the subject domain; they can convey enthusiasm both for the subject and for their task as a learning motivator; and they are equipped with a pedagogical (or androgogical) understanding of the learning process" (p. 290). Anderson's (2004b) other two qualities of an e-teacher are a set of technical skills ("internet efficacy") and that "an effective online teacher must have the type of resilience, innovativeness, and perseverance typical of all pioneers in unfamiliar terrain" (p. 290). These comments reflect the full meaning of the term *facilitation* of web-supported learning, one of the critical success factors identified in the taxonomy of factors to promote the quality of web-supported learning.

Perspectives on the quality debate

The widespread and emotive quality debate has political, social, technical and philosophical implications (Parker, 2004; McLoughlin & Luca, 2001). The quality debate in terms of the *internal improvement - external accountability* and *industry - education* aspects was engaged in section 2.4.1.

The extremes of the argument may be described as the "tension between externally driven compliance and internally driven improvements" (Parker, 2004, p. 387). Political emphasis on efficiency and accountability has meant that national quality assurance agencies have proliferated worldwide, as have

various standards, guidelines and best practices in higher education (see Appendix C1). A balance between internal needs and external demands needs to be sought (Boyd & Fresen, in press). The process-based quality management system in this case study and the artifacts it produced, is a contribution to quality assurance practice and criteria that will assist the HEQC in evaluating academic support units, with particular reference to web-supported learning.

The commercial, corporate flavour of the quality movement (for example, Total Quality Management) has made it difficult for autonomous academic institutions to accept its recommendations. Parker (2004) states "The engineering (or re-engineering) of systems designed to guarantee that manufacturing processes would meet technical specification might seem to imply a uniformity that may not be possible, or even desirable, in the dynamic and heterogeneous environment of higher education" (p. 388). The need to address the human aspects of quality management in higher education was considered throughout this study.

Examples of sensitivity towards participants are described below:

- the progress of the task teams took second place to the demands and pressures of a busy e-learning production unit;
- student sensitivities were considered in the application of the student questionnaire, in the form of the message of invitation and the assurance that their feedback was confidential and would be acted upon;
- lecturer sensitivities were considered by not burdening overworked lecturers with the completion of yet another paper-based or e-mail questionnaire;
- personal thank you letters were sent to the lecturers who participated in the Lecturer Experience and Satisfaction interviews, to assure them of appreciation of their time and involvement.

Whether or not the student is called the 'client' or the lecturer is seen as the 'supplier' or 'provider', a balance is recommended. This balance should be

based on institutions providing solid support to students and the committed educator striving continuously to improve the academic experience for the student, as shown in the complementary findings of this study (section 7.3.1).

Other points for reflection raised in the literature

What about the student voice in the evaluation of online courses? Heterick and Twigg (2001) recommend student evaluation of courses and claim that students *are* in a position to judge what they need and want. They suggest a student rating system: "Rather than asking students whether or not they 'liked' the course, we should ask them specific, pre-structured questions designed to take into account those factors that experts believe are necessary to ensure high quality. Responses to these questions would generate an overall 'satisfaction index' similar to the star rating systems used on dot-com sites such as amazon.com and eBay.com" (Heterick & Twigg, online reference).

The questions suggested by Heterick and Twigg (2001) are remarkably similar to some of the items in the student WebCT experience questionnaire in this study. For example:

- How reliable was the technology?
- How challenging was the course?
- Was there sufficient interaction with other students?
- Was there sufficient interaction with the instructor?
- Did you receive adequate technical assistance?

Arbaugh (2000) refers to the fact that prior studies of internet-based courses have been criticised for focusing on individual courses. This study has constructed and calculated not only a satisfaction index, but also a frustration index across a campus-wide spectrum of students participating in web-supported courses.

Parker (2004) reviews and compares standards from four jurisdictions, including two of the classic studies which contributed to the taxonomy produced by this study: Barker (1999) and Institute for Higher Education Policy (2000). The other two standards cited by Parker (2004) are listed in

Appendix C1. The same source also discusses one of the corroborating studies in my later literature review (Herrington et al., 2001; section 4.2.3). Fahy (2004) compares another of the classic studies (Chickering & Gamson, 1987) with the well-known Bloom's taxonomy. Other authors refer to some of the studies reported in chapter 4 (Herrington et al., 2001; Zhao, 2003; Collis & Moonen, 2001).

Anderson (2004a) expands on the themes of student-student, student-teacher and student-content interaction, some of the interactions that were promoted by Chickering and Gamson (1987). Pelz (2004) presents three principles of effective online pedagogy, namely allow the students to do (most of) the work (active learning), interactivity is the heart and soul of effective asynchronous learning and a facilitator should strive for 'presence'. These principles corroborate some of the pedagogical and instructional design factors in the taxonomy synthesized in this study, namely engagement, interactivity and facilitation.

A new initiative to promote and standardise approaches to the quality enhancement of e-learning is the European Quality Observatory (EQO, http://www.eqo.info) (Manouselis & Sampson, 2004). The EQO aims to develop a common conceptual framework for the analysis, description and comparison of quality approaches (QAs) in education, particularly in e-learning. The project has built a web-based respository of metadata to capture and describe specific experiences of the application of various quality approaches and how these may be re-used by other organisations in similar contexts (Hildebrandt & Teschler, 2004).

This research study, together with its context, has been recorded as a user in the EQO web portal. In this way learning from a specific case study contributes to the generalisation and usability of the recommendations made (Ehlers & Pawlowski, 2004).

The studies mentioned in this section, some of which were identified after closing the literature review, corroborate many of the findings of this study.

7.4.3 Scientific reflection

Scientific reflection focuses on what this research has contributed to the scientific body of knowledge and what has been learned during the course of this study.

This research has contributed to the body of knowledge of three intersecting knowledge domains: quality assurance of web-supported learning in higher education. Until now, the field suffered from a distinct gap in knowledge and best practice (see the national and international calls for relevant research – section 1.4).

Although this study is based on a bounded case study of the e-learning support unit at the University of Pretoria, South Africa, various methods and findings are generalisable to other e-learning scenarios. These are:

- The taxonomy of critical success factors is a contribution to the theory of quality web-supported learning and does not rest on the case study alone.
- The techniques for measuring student and lecturer frustration and satisfaction are practical examples of how measures of client satisfaction may be used to 'close the feedback loop' of Deming's PDCA cycle (Gabor, 1990). These measures provide quantitative and qualitative management information for continuous improvement as well as evidence of return on investment.
- The approach used in the design and development of the online QMS and its artifacts may be adopted and customised for similar e-learning situations in higher education. In particular, it contributes to providing a precedent and criteria for the HEQC in South Africa.
- The submission of the exploratory journey and recommendations of this study to the European Quality Observatory provides a practical vehicle for the adaptation of this study to more scenarios than the one it was originally designed for (Hildebrandt & Teschler, 2004).

Several overall lessons were learnt during the course of this study. Notwithstanding the debates against the corporate flavour of Total Quality Management, it was found that by taking a pragmatic approach in the interests of continuous improvement, such principles may be modified and successfully applied to an e-learning support unit. It became clear that client satisfaction needs to be researched and addressed in the interests of service quality. Summative evaluation of web-supported learning by students and lecturers needs to be enabled on a regular basis. In terms of lecturers, the qualitative approach yielded more valuable and meaningful data than a campus-wide e-mail questionnaire would have done. Lecturers are keen and willing to share their sincere experiences and needs. The human element in terms of both lecturer buy-in and student utilisation of web-supported learning determines the ultimate success of using technology to enhance teaching and learning.

7.4.4 Reflection on the exploratory journey

This research study has been a path of continual reflection, self-appraisal and growth. The intellectual ideals, or objectives, of the exploratory journey of discovery were described in section 3.3.1 and are reflected on here.

The first objective was to understand how quality assurance theory may be applied to the instructional design process for web-supported learning. The findings in this case study, with respect to a formal process-based quality management system for web-supported learning (see Figure 7.1), show that standard quality assurance practice may be adapted and applied in this field. The case study has provided a precedent that contributes to institutional and national quality assurance practice with respect to web-supported learning.

It became clear that it was not so much the design and development of the formal quality management system that was unique, but the process, the path taken, the collaboration of the team, the possibilities for studying the impact of our practice and investigating appropriate measures for quality web-supported

learning products. This realisation confirmed the *evaluation* aspect within this study: a realisation that I am not only putting artifacts on the table, but evaluating the instructional design process and contributing to best practice in an e-learning support unit.

The second objective was to understand the interplay between the quality of processes and the quality of products in the context of this case study. These concepts were crystallised by the three research questions, which essentially partitioned and zoomed in on these notions. The interpretation of the quality of products, services and processes was discussed in section 7.3.1: *Summary of findings*. This is another example of the application of standard quality assurance terminology to the field of web-supported learning. It contributes to the holistic picture reflected by the updated conceptual framework (Figure 7.1).

The third objective was to interpret client satisfaction in terms of summative evaluation of web-supported products in the quest for continuous improvement. This objective brings together the evaluation aspect of the case (the usual formative and summative evaluation inherent within instructional systems design) and the evaluation aspect of this study (the self-evaluation aspect of the process-based quality management system).

No formal summative evaluation was in place in the e-learning unit until the QMS was implemented. A summative evaluation procedure was written and a summative evaluation checklist was one of the artifacts produced. This provides a match between summative evaluation and the measurement of lecturer satisfaction with web-supported learning. Student feedback data is also a measure of client satisfaction. This is now regularly collected and analysed, also as part of the summative evaluation procedure.

The above reflection illustrates that the objectives set at the beginning of this exploratory study were realised.

7.5 Recommendations

This section presents recommendations that have emerged from the findings of this study. Recommendations in terms of *policy and practice* are given in section 7.5.1 and recommendations for *further research* are given in section 7.5.2, together with suggestions for possible new research questions.

7.5.1 Recommendations for policy and practice

The following recommendations for policy and the practice of improved web-supported learning may be made as a result of this study.
These recommendations have emerged from within the bounds of this specific case study. However they may be translated to similar e-learning situations in other higher education institutions.

Recommendation 1:

A need expressed in the student questionnaire was for lecturers to make better use of the online environment and to facilitate web-supported courses more actively. Being a competent e-teacher includes keeping the learning material up to date, posting student marks frequently, giving timely feedback to students as individuals and in groups, and encouraging more interaction and discussion online. Skills such as summarizing, weaving and grading online discussions need to be enhanced. A new training course for academic staff was introduced in March 2004 - *Facilitation of e-learning* - which attempts to meet this need. The course is a combination of pre- and post-course online components, plus a two-day face-to-face workshop. In this way lecturers are able to experience what it is like to be a student in a web-supported course.

Recommendation 2:

Students expressed the opinion that current training in WebCT did not equip them sufficiently to engage in their web-supported modules. It is recommended that student training in WebCT should be hands-on and customised for the particular module being implemented. All students should feel comfortable and competent in accessing and using the online

environment before they leave the training session. Another suggestion is that follow-up training sessions could be arranged, as students progress through the course and experience specific difficulties with respect to the medium.

Recommendation 3:

The QMS was designed and launched during 2003. Its early use was reported in section 6.4.2. However, for various reasons, it is currently not yet incorporated into the daily practice of instructional designers and project managers in the e-learning support unit. Although it was considered a good idea at the time to develop the QMS in WebCT itself, this means that it is not readily accessible for practitioners who do not normally access WebCT (e.g. education consultants). Therefore it is recommended that the location of and access to the online QMS be re-considered. One possible alternative location is on the TLEI intranet, with one co-ordinator authorised to maintain the documentation. Re-training and re-acquaintance with the updated system would be required.

Recommendation 4:

Summative evaluation is an opportunity not only to evaluate the effectiveness of a web-supported course, but also to collect data on the institution's return on investment. It is therefore recommended that the Lecturer Experience and Satisfaction interview schedule be modified according to the suggestions given in section 5.3.4 and perhaps shortened further. It should be administered at the end of each year in order to measure:

- effectiveness of implemented web-supported courses (e.g. whether they add value to the learning experience);
- lecturer satisfaction with web-supported learning.

It is further recommended that the name of the schedule revert to the *Summative Evaluation Checklist*, as it was named in the QMS. Departmental discussions will need to take place to decide on the format of and distribution channel for the checklist.

7.5.2 Recommendations for further research

In investigating and answering the three research questions in this study, additional issues emerged, which provide scope for further research. For each of the recommendations listed in this section, possible research questions for further investigation are suggested.

Recommendation 5:

The taxonomy of factors to promote the quality of web-supported teaching and learning emerged from the literature review. Although it was extended and refined by additional research papers, as well as by critical colleagues in the case study, it still needs to be tested empirically. Depending on the outcome of such an experiment, the taxonomy could be incorporated into academic staff training courses.

Possible research questions:

Possible research questions to implement this recommendation are:

1. How effective is the taxonomy of factors in promoting the quality of web-supported learning courses?
2. What modifications or improvements to the taxonomy emerge from its use in practice?

Recommendation 6:

In this study, the student feedback data from July 2003 was analysed in detail. An ongoing longitudinal study should investigate the trends in levels of student frustration and satisfaction. Although the findings will not be replicable due to the self-selecting sample and the fact that the student population shifts each year, trends in the frustration and satisfaction indices will provide evidence of continuous improvement as well as areas causing concern.

Possible research questions:

Possible research questions to implement this recommendation are:

1. What trends in student levels of frustration and satisfaction are visible from semester to semester and from year to year?

2. What steps can be taken to reduce levels of student frustration and increase levels of student satisfaction?
3. What is the impact of and return on investment provided by web-supported learning support units at higher education institutions?

Recommendation 7:

The student WebCT experience survey measured client satisfaction at Level 1 of Kirkpatrick's (1998) 4-Level evaluation model: *Reaction*. This implies that student perceptions of their web-supported learning experience were measured. A research project needs to be initiated to investigate and measure *actual* student learning in web-supported courses. Additional in-depth quantitative analysis of the student feedback data could be done, for example, correlations of perceptions of web-supported learning with final results, both at the end of a course and in later job performance of graduates (Kirkpatrick's (1998) Levels 2, 3 and 4).

Possible research questions:

Possible research questions to implement this recommendation are:

1. How can the extent of actual student learning in online courses be evaluated (measured)?
2. Do students successfully achieve specific learning outcomes via web-supported courses?

Arbaugh (2000) makes the same recommendation: "although satisfaction initially may be an important factor in determining whether students continue with Internet-based programs, the viability and credibility of these courses and programs ultimately will hinge on whether they can generate effective learning outcomes" (p. 48).

A paper at a recent conference implied that student learning in one Master's course was evaluated according to all four levels of Kirkpatrick (1998) (Zhang & Van der Westhuizen, 2004). However, those preliminary findings were still based on student *perceptions*, and only one student was of the opinion that

she had effectively learnt at level 4 (*Results*: achievement of objectives and impact on the organisation).

Recommendation 8:

Recommendation 3 indicated that the online QMS should be relocated and updated and that re-training and re-acquaintance with the system are required. After that has taken place, the updated QMS should be incorporated into the daily practice of instructional designers and project managers in the e-learning support unit.

Possible research questions:

Possible research questions to implement this recommendation are:

1. What implementation and training strategies will promote the use of the online quality management system for web-supported learning, so as to ensure its adoption and effectiveness?
2. How is the online quality management system used in practice by instructional designers, project managers and education consultants?
3. What suggestions do users have to improve or extend the system? (summative evaluation of the QMS itself).
4. Is the process-based quality management system for web-supported learning translating into specific improvements in client satisfaction measures?

Additional research topics have been mentioned throughout this thesis as being beyond the scope of this study. These include:

- extension of the quality management system to include other delivery media, besides web-supported projects;
- modification of the student feedback questionnaire, in conjunction with Ramsden's Course Evaluation Questionnaire (CEQ) (Ramsden[3], 1991), and the adaptation thereof for distance

[3] Paul Ramsden is well known for developing the Course Experience Questionnaire (CEQ) as an indicator of the quality of teaching in contact learning programmes. This instrument is now officially used by all higher education institutions in Australia (Lawless & Richardson, 2002).

education (Lawless & Richardson, 2002) and web-based courses (Richardson, 2003);

- further field testing, rigorous factor analyses and reliability and validity testing on the modified student feedback questionnaire;
- institutional issues, such as the provision of ubiquitous computing on campus (Smith, 2003);
- the investigation of the Six Sigma methodology with respect to higher education.

These questions indicate that research projects need to be undertaken and in some cases, longitudinal studies and empirical testing are required.

7.6 Conclusion

This study investigated the application of quality assurance practice to web-supported learning in higher education. The rationale presented in chapter 1 motivated this study in terms of six national and international calls, which illustrate the need for research in this field.

The metaphor for this research is the image depicting the instructional design process, shown in the conceptual framework (Figures 2.5 and 7.1). The metaphor incorporates the notions of continuous improvement, awards for excellence, accreditation and meeting criteria or requirements. These constructs are at the heart of the natural human inclination to offer our best, especially in the field of education, where dedicated educators should have the best interests of their students at heart.

The holistic approach in this study applies quality assurance practice to the field of web-supported learning, by integrating the continuous improvement of products, services and processes with respect to web-supported learning. The taxonomy of critical success factors for web-supported products includes underlying assumptions, exogenous factors, institutional, technical, lecturer, student, instructional design and pedagogical factors. Client satisfaction in terms of student and lecturer experiences with web-supported learning was

measured. This is one possible measure to inform the feedback loop of continuous improvement. The self-evaluation exercise in an academic support unit provides a precedent and contributes to criteria that will be useful for the HEQC.

In conclusion, lecturers need to be encouraged and supported in embracing new technologies. It is a team effort. Overburdened academics cannot be expected to facilitate learning via new technologies, nor to comply with the demands of external quality assurance agencies, without additional support and incentives. A balance needs to be sought between education innovation, professional development and continuous quality improvement on the one hand and the realities of massification, globalisation, diversity, performance enhancement and accountability on the other. I believe that it is possible to harmonise the debates of managerialism, cloisterism, self-evaluation and external accountablility.

In the seventeenth century, the mathematician Fermat declared: " I have found a very great number of exceedingly beautiful theorems!" (Bell, 1965, p. 56). I have been on a personal voyage of discovery into unchartered topics and enticing territories. I have found gems which contribute to the field of quality web-supported learning in higher education. I have learned a great deal, both personally and that which may be adopted and applied by other practitioners in the field. This epic is testimony to the never-ending desire of educators to improve our practice, our offerings to students and our own professional development.

"What you find in any quest depends mostly on what you set out to find, and where you choose to look for it" (Miles & Huberman, 1994, p. 155)