Chapter 2

Literature Review

2.1 Overview of this chapter

Much has been written about quality assurance in general and its application to the field of higher education. This chapter reviews the literature with respect to quality in general (section 2.3) and the application of quality assurance to higher education (section 2.4), with particular reference to higher education in South Africa (section 2.4.4).

Guided by the three research questions in this study, the review then investigates what research exists in addressing factors and practices to promote quality web-supported learning (WSL) (section 2.5), client satisfaction with web-supported learning (section 2.6) and quality management systems for web-supported learning (section 2.7). The chapter concludes with the application of the theories of quality assurance, instructional systems design and systems thinking to produce the conceptual framework for this study.

Figure 2.1 is a diagrammatic representation of the structure of this literature review.

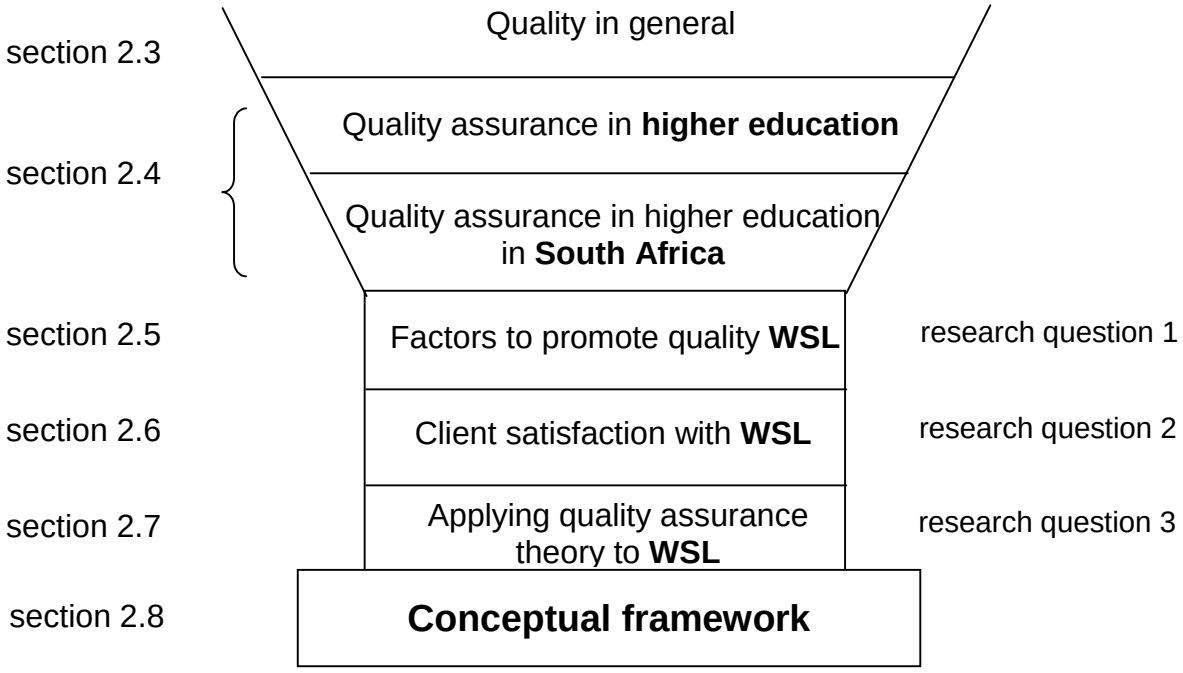


Figure 2.1: Plan for the literature review

2.2 Literature sources

An extensive literature search was undertaken, which includes a variety of reliable and up-to-date reference material. The sources include books, paper-based journals, electronic journals, relevant databases (*ERIC*, *ISAP, SACat*), conference proceedings and websites of international universities and quality assurance agencies. Peer-reviewed and/or accredited journals were sought wherever possible. The bibliographies of journal articles provided a rich source for further investigation.

I used the search phrase "web and learning and quality" to search the databases of current and completed research in South Africa (*Sabinet* and *Nexus*). Only one study close to my research problem was found: Herman (2001): *The applicability of international benchmarks to an Internet-based distance education programme at the University of Stellenbosch*. This M.Phil study attempted to apply 24 international benchmarks (Institute for Higher Education Policy (IHEP), 2000) to a full distance programme offered via WebCT. Herman (2000) concluded that the 24 benchmarks could not be

applied in the University of Stellenbosch context. He suggested that the University of Stellenbosch could develop their own benchmarks, taking international guidelines into account. My study explores such guidance in the form of factors and practices to promote quality web-supported learning in higher education institutions.

2.3 Quality in general

A brief historical overview of the *quality movement* was given in chapter 1 (section 1.7.2.1). This current section reviews the literature in terms of the common understanding of the construct *quality* and its associated philosophies. An interpretation of the meaning of quality for this study is given in the conceptual framework at the end of this chapter.

The concept *quality* lends itself to varied and ambiguous interpretations (Harvey & Green, 1993; Herselman, Hay & Fourie, 2000; Vidovich, 1999). Most sources in the literature avoid defining quality *per se* (Vidovich, 1999). "Quality" is a popular term and people tend to rely on intuitive connotations of the everyday word, for example *quality of life* or *quality products* Pirsig (1976), in his popular book *Zen and the Art of Motorcycle Maintenance*, presents a lengthy metaphysical argument that although quality exists, it cannot be defined - one intuitively *knows* what quality is. His character in the book, the scholar Phaedrus, states: "I think there is such a thing as Quality, but as soon as you try to define it, something goes haywire. You can't do it" (Pirsig, 1976, p. 209). Eventually Pirsig concludes that Quality is all-encompassing: "Quality is the IT, it is the everything, it is in anything, or it's not there at all" (Prinsloo, 2002, quoting Pirsig).

At the other extreme of practicality, the British Standards Institute (BSI) defines quality as "The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs" (BSI, 1991, cited by Sambrook, Geertshuis and Cheseldine, 2001, p. 422).

Harvey and Green (1993) identified five notions of the meaning of quality which are summarised below, drawing also on Herselman et al. (2000). The latter authors synthesized Harvey and Green's ideas with other relevant literature. I have synthesized Harvey and Green's five interpretations of quality in diagrammatic form, with guiding notes (see Appendix A).

- Quality as **exceptional**: excellence, exceptionally high standards or exceeding minimum standards.
- Quality as **perfection or consistency**: the common *zero defects* philosophy of quality based on the production line, whether it is motorcars, computers or whatever consumer items are being produced.
- Quality as **fitness for purpose**: the extent to which a product or service fits its intended purpose, is produced on time and within budget.
  In a service industry like education, this idea should be extended beyond meeting customer requirements, to offering *customer delight* (Harvey & Green, 1993; Bisschoff & Bisschoff, 2002).
- Quality as **value for money**: the concept of accountability to funders and customers. Value, affordability, efficiency and effectiveness become dominant factors in providing services and products.
- Quality as **transformation**: enhancing the performance of students, regardless of their initial level of competence – providing the conditions for a student to be transformed by a life-changing and personally enriching learning experience.

I suggest a sixth philosophy of Quality, namely:

- Quality as **innovation**: customers must be loyal and return again and again for leading-edge products and services. Ultimately management should embrace holistic initiatives to anticipate the customers' needs and wants and in so doing, "make the leap from continual improvement to continual innovation" (Gabor, 1990, p. 10).

Having considered various interpretations of the meaning of quality in general, the next section focuses on the application of quality assurance practice in the field of higher education.

2.4 Quality Assurance in higher education

This section presents an argument that the philosophy of quality assurance may be applied in a sensitive way in the field of education (section 2.4.1). An overview of the emergence of quality assurance as an issue in higher education, together with reasons for its rise to prominence, is given in section 2.4.2. Current trends in Europe, the United Kingdom, the United States of America, Australia and New Zealand are summarised in section 2.4.3.

The context of quality assurance in higher education in South Africa follows in section 2.4.4.

2.4.1 Quality Assurance and education: perspectives on the debate

Education is a dynamic and people-centered activity, with complex relationships between various roleplayers, such as quality assurance agencies, education providers and consumers. My reading of the literature has directed me to synthesize various viewpoints on a debate, which addresses two dilemmas:

- Can educators hope to implement quality assurance practice, which has its origins in the production line and automation of the industrial age?
- How do education providers reconcile internally driven self-improvement initiatives with external demands for accountability?

Each of these dilemmas is described briefly below. For ease of reference, I will refer to the first dilemma as the *industry – education* dilemma and the second one as the *internal improvement – external accountability* dilemma. After describing each dilemma, I give my personal viewpoint as to how the opposing ideas may be meaningfully interpreted in higher education.

With respect to the *industry – education* dilemma, there are various proponents on both sides of the argument. I review first some of the sceptics, followed by the views of those who are of the opinion that quality assurance practice may be meaningfully applied in the field of education.

A provocative viewpoint is expressed by James Beaton, who objects strongly to the introduction of quality assurance in the form of performance indicators in Canadian higher education:

> The rhetoric of accountability and quality is often vague and lacks substance. The built in ambiguity is likely designed to create the appearance of a strong movement around a phrase that is empty of meaning. The fact that the "quality" defining process is structured in such a way as to favour political and business interests and is largely undemocratic will lead to conflict itself. Total Quality Management and Quality Assurance has [*sic*] the potential to disrupt university traditions and culture. (Beaton, 1999, online reference)

Srikanthan and Dalrymple (2002) maintain that attempts to apply quality management models from industry have not been successful, largely because Total Quality Management (TQM), for example, addresses *service* areas of an organisation and therefore is not applicable to the core business of a university, namely education.

On the other hand, McAdam and Welsh (2000) reviewed the literature on the European Model of TQM and concluded that the business excellence model (BEM) provides an integrated map of management issues that is valued by most of the 17 further education colleges in Northern Ireland. The South African experience among the former technikons has shown that industrial models and methods may be successfully applied in the higher education sector (personal communications with Pretoria Technikon[1] – E. Genis, April 2001; Witwatersrand Technikon – B. Smit, April 2001 and Technikon SA – N. Cele, June 2004).

Newton (2002) presents six lessons learned in the area of organisational change and quality policy implementation. As a result of these lessons, he cautions that because quality is a contested issue, managers who continue to

[1] These were the names of the institutions at the time of the communication, before the mergers of 2004.

preach forms of managerialism (i.e. *Taylorism*) will not obtain commitment from their staff in terms of quality assurance policy or systems.

A viewpoint which recognises the challenges, but is sensitive to the issue of ownership, is expressed by Fourie, van der Westhuizen, Alt and Holtzhausen (1999). They maintain that universities need to establish a quality culture and quality assurance systems in such a way as "to promote a sense of ownership among all stakeholders in the institutuion – academic, administrative and professional staff, students, and funders" (p. 37). Although the phrases used in this quotation may be typical of the rhetoric used in the first decade of education transformation in South Africa, they represent noble ideals for which it is still worth striving.

Stevens (1996) maintains that there should be no problem in applying business theory and strategies in the field of education, as long as one does not lose track of the human and personal approach. Even Taylor, the architect of the production line and division of labour, realised the importance of human interaction and relationships, before he died in 1915:

> Taylor found out, the hard way, the importance of the co-operative spirit. He was strictly the engineer at first. Only after painful experiences did he realise that the human factor, the social system and the mental attitude of people in both management and labor had to be adjusted and changed completely before greater productivity could result. (Lewis & Smith, 1994, p. 44)

My perspective on the *industry – education* dilemma is that some of the strong words expressed by the sceptics are rather one-sided and alarmist. Insensitive and undemocratic management practices will surely not gain favour with university communities. I identify strongly with the philosophy that establishing a quality culture and identifying the benefits to be gained will result in a successful application of quality assurance practice in the field of higher education.

All roleplayers need to be gently initiated into a quality culture, in the interests of continuous, meaningful improvement in web-supported learning. Quality *control* aspects should not be overemphasized at the expense of the value-added aspects of quality assurance. As quality practitioners, we must not lose sight of the social and personal nature of our service to lecturers and students. Service quality demands commitment and sensitivity on the part of those offering the service if we are to entice customers and sustain customer loyalty (Prinsloo, 2002).

Indeed, this sensitivity *has* begun to manifest itself in the field of quality assurance in higher education. There has been a perceptible shift from a focus on regulation and control, to improvement and self-evaluation (Baijnath, Maimela & Singh, 2001).

The above observation leads into the second dilemma of the debate, namely the *internal improvement - external accountability* dilemma. This dilemma is well known and frequently mentioned in the literature (Baijnath et al., 2001; Randall, 2002; Singh, 2000). In the case of this dilemma, there are not necessarily opposing views at either end of the continuum, but rather an awareness of the extremes and the need to balance both sides of the scales. Boyd and Fresen (2004) argue that internal improvement and external accountability are not mutually exclusive opposites but are both imperative, in relative proportions, for a successful institutional quality assurance system.

The *internal improvement - external accountability* dilemma is vividly described by Vroeijenstijn (1995) as the Scylla and Charybdis dilemma: approaches which concentrate on internal improvement will be doomed to be shipwrecked against the cliffs of the Scylla because of external demands for accountability. On the other hand, by overemphasizing accountability, a system will disappear in the whirlpool of the Charybdis, because internal improvement and commitment will be hindered.

To avoid thrashing about between Scylla and Charybdis, it appears to me that the sensible option is to pursue the ideal of a quality culture, which in education, refers to "the totality of the student learning environment" (Elton,

1993, p. 140). As educators, we should continually ask ourselves fundamental self-evaluation questions, such as "What am I trying to do or achieve? Why am I doing it in this way? What is the context in which I am doing it? How do I know that it is effective? Is this the best possible way of doing it?" (Singh, 2000, p. 7).

Such an awareness of the need for self-evaluation and the practice thereof, will enable education providers to be in a perpetual state of readiness to demonstrate accountability to external agencies when required to do so. This approach will obviate the reality of spending months preparing for external audits and then, after the departure of the audit panel, reverting to habitual ways of doing things.

To me, such a commitment to self-evaluation is the heart of quality assurance practice in education. It embraces all five of Harvey and Green's (1993) quality philosophies, namely quality as exceptional, perfection or consistency, fitness for purpose, value for money and transformation. It also reflects Pirsig's (1976) metaphysical interpretation of the all-encompassing nature of quality.

2.4.2 Quality Assurance as an emerging issue in universities

Traditionally, in small elite universities, academic standards and values were implicit and relied heavily on the reputation and image of the institution (Randall, 2002; Webbstock & Ngara, 1997). Harvey and Knight (1996) use the term *cloisterism* to refer to deeply embedded notions of professional autonomy and collegiality that characterised some higher education institutions. As a result, attempts at external quality assurance both nationally and internationally, were sometimes viewed with suspicion and met with resistance (Boyd & Fresen, 2004; Roberts, 2001; Stephenson, in press).

Approaches to ensuring the quality of the academic provision in higher education, both nationally and internationally, relied traditionally on the following types of review and monitoring (Smout, 2002; Ratcliff, 1997):

- comment from peers;
- attention to quality on an individual, unstructured basis;
- external review of examination question and answer papers;
- external examiners for masters and doctoral theses;
- external review by learned, professional societies.

Today however, in many countries, the public and other stakeholders such as governments, are expressing increased calls for quality and accountability, which are changing the landscape of higher education (Menges & Reyes, 1997). Harvey and Green (1993) highlight the reasons for the increased profile of *quality* within higher education: changed circumstances, increased levels of participation, widening access, pressure on human and physical resources, appraisal, audit and assessment (see section 1.7.2.2).

The notions of benchmarks, standards and reputation imply that higher education institutions seek to compare the quality of their academic provision with other such institutions on the global stage (Herrington, Herrington, Oliver, Stoney & Willis, 2001). This has resulted in a global need for higher education institutions to review their quality assurance mechanisms and protocols (Hope, 2001).

2.4.3 Quality Assurance in higher education in various countries

Most so-called 'developed' countries have progressed some way in implementing quality assurance initiatives in higher education. It was to these countries that South Africa turned in the mid-1990s, to learn from their experiences (Singh, 2001). A brief overview of the status of quality assurance in higher education in some developed countries is now given.

Europe

In Europe, there is a rich variety of quality assurance arrangements in higher education, with more than a decade of experience in the field (Van Damme, 2000; Westerheijden, 1997). The Bologna Declaration of 1999 aims to attain comprehensible and similar degree structures across all European universities, which is expected to further stimulate the

international market in higher education. In the Bologna process, quality assurance is assigned to a network of national quality assurance agencies, whose main aim is to recognise and compare the quality practices of the more than 30 member states (Jeliazkova & Westerheijden, 2002).

A recent web-based survey was carried out in five European languages, with the goal of collecting the views of European training professionals on the current quality of web-supported learning (Massy, 2002). The key findings produced a gloomy picture, with 61% of all respondents rating the overall quality of web-supported learning negatively – all the more reason for pursuing the elusive factors that would enhance the quality of such provision.

United Kingdom

In the United Kingdom, there is a long-standing history of the application of quality assurance principles to education and to higher education in particular (Brennan & Shah, 2000; Harvey & Green, 1993; Geall, Harvey & Moon, 1997). Some researchers have applied the principles of Total Quality Management to schools (Murgatroyd & Morgan, 1993). Others have applied total Quality models such as Deming's 'Plan, Do, Control, Act' model and the 'House of Total Quality' to higher education (Lewis & Smith, 1994).

The UK Quality Assurance Agency (QAA) for higher education is well established (Gosling & D'Andrea, 2001). They publish a comprehensive set of Distance Learning Guidelines on their website (QAA, 1999). It is not only in developing countries that massification and globalisation have had a profound effect on higher education. Randall (2002) reports that these were major factors in shaping the quality assurance system designed by the UK QAA.

United States of America

According to Woodhouse (2000a), "the earliest instance of the phenomenon of external quality assurance (EQA) is provided by the USA, where higher education became a big operation at an early stage" (p. 21).

The Council for Higher Education Accreditation (CHEA) is a non-profit organisation established in 1996, which co-ordinates and promotes quality and public accountability in institutions and programmes through voluntary, non-governmental self-regulation – an interesting way around the Scylla and Charybdis debate.

Most states in the USA also have regional accrediting associations to determine the quality of programmes and curricula (Ratcliff, 1997). Universities and regional associations have developed their own guidelines for best practices in distance education, which are available on the Internet (Cravener Educational Consultants, 2000). The American Federation of Teachers has published Guidelines for Good Practice in Distance Education (American Federation of Teachers, 2000).

Australia and New Zealand

Australia has been undergoing education reform for more than two decades, since the Williams report in 1979 (Candy & Maconachie, 1997). In the early 1990s they established national quality agencies and committees based on similar structures in the United Kingdom, namely the Australian Committee for Quality Assurance in Higher Education (CQAHE) and the Higher Education Council (HEC) (Jegede, 1993; Vidovich, Fourie, Van der Westhuizen, Alt & Holtzhausen, 2000).

Like South Africa, New Zealand has a Qualifications Authority, the New Zealand Qualifications Authority (NZQA), a National Qualifications Framework (NQF) and National Standards Bodies (NSBs), all of which were established in the early 1990's. The New Zealand Universities' Academic Audit Unit (AAU) takes responsibility for institutional quality audits in higher education (Hall, Woodhouse & Jermyn, 1997; Woodhouse & Hall, 1997).

Although all the above-mentioned countries have structures for the regulation or self-regulation of higher education activities in place, "there has traditionally been less regulation across frontiers and there is certainly less still in cyberspace" (Hope, 2001, p. 127).

2.4.4 Quality Assurance in higher education in South Africa

The South African scenario is sketched in this section, with particular reference to recent legislation regarding quality assurance in higher education. Quality assurance practice in South African higher education is emerging and formative. There is a "palpable urgency" (Baijnath et al., 2001, p. v) to contribute meaningfully not only to the debate, but more practically, to the formation of recognised, negotiated and acceptable mechanisms to improve the quality of teaching and learning in higher education.

e cornerstone of higher education policy development is the National Commission on Higher Education (NCHE) of 1995, which laid the foundations for the Higher Education Act of 1997 (Alt & Fourie, 2002). Various acts of parliament were passed in the mid-1990s, which represent part of our nation's attempt to standardise and legitimise our education and training system. The following Acts are relevant to the field of higher education in general and quality assurance in particular (South Africa, 2002):

- South African Qualifications Authority Act (SAQA), No. 58, 1995;
- National Education Policy Act, No 27, 1996;
- Higher Education Act, No 101, 1997;
- Further Education and Training Act, No 98, 1998;
- South African Schools Act, No. 84, 1996.

The purpose of the SAQA Act of 1995 is to provide for the development and implementation of a National Qualifications Framework (NQF) (South Africa, 1995). Two key elements of the NQF are *standards* and *quality*, which are reflected in two of its objectives, namely to create an integrated national framework for learning achievements and to enhance the *quality* of education and training (SAQA, 2001a).

One of the objectives of the Higher Education Act of 1997 is to provide for quality assurance and quality promotion in higher education (South Africa, 1997). Accordingly, it made provision for the establishment of the Council for Higher Education (CHE), a statutory body to advise the Minister of Education on all matters pertaining to higher education.

The Committee for University Principals (CUP) established a Quality Promotion Unit (QPU) in 1995 to perform external quality audits in the university sector (Hay, 2000; Smout, 2002; Vidovich et al., 2000). The QPU was closed down in 1999 as a result of a serious lack of resources, a highly politicised working environment and debate over its mandate (Smout & Stephenson (2002).

"The university sector has thus had limited experience of an external quality assurance regime in addition to manifesting a highly uneven level of internal quality assurance arrangements" (Singh, 2001, p. 142). Van der Westhuizen (2000) also mentions that the university sector had a backlog compared to technikons, in respect of quality assurance processes.

To address the need for direction, responsibility for quality assurance at universities was assigned to the Higher Education Quality Committee (HEQC), which was constituted in March 2001 (Singh, 2001). The HEQC, a permanent committee of the CHE, is concerned with strategic and conceptual issues of quality in higher education, and is responsible for programme accreditation, quality promotion and institutional auditing (Baijnath & Singh, 2001).

The CUP is now known as the South African Vice Chancellors' Association (SAUVCA), to reflect a restructured and transformed association (http://www.sauvca.org.za/about). The primary objective of SAUVCA is to provide constructive and critical perspectives on all key issues affecting higher education (Smout, 2002). SAUVCA recognised the work done by communities of interest in the field of quality assurance and formalised such activities by establishing the SAUVCA National Quality Assurance Forum (SNQAF). The work of SNQAF is intended to complement and contribute to that of the HEQC (Smout, 2002). In 2002 a definitive report was published by SAUVCA in order to assemble current quality assurance knowledge in a comprehensive resource document to assist institutions in developing their quality assurance systems (Smout, 2002).

The consequence of recent policy and legislative developments is that South African education providers are confronted with the need to implement formal quality assurance systems in order to respond effectively to the national calls for accountability (Alt & Fourie, 2002). This study responds to the call by formalising the self evaluation efforts of an e-learning support unit.

The HEQC's approach is one of capacity building and encouraging excellence (http://www.che.org.za/heqc). They make use of the well-known four stage model currently used in Europe and the United States. This model consists of the following stages (Alt & Fourie, 2002; Jeliazkova & Westerheijden, 2002):

- establishment of procedures and methods to be used by the national quality assurance agency;
- regular institutional self-evaluation;
- peer review visit by the national agency;
- published report containing the findings of the peer review visit.

The structure of, and links between, the various legislative bodies in South African higher education are summarised in Figure 2.2 (refer to the List of Acronyms in the front matter of this thesis).

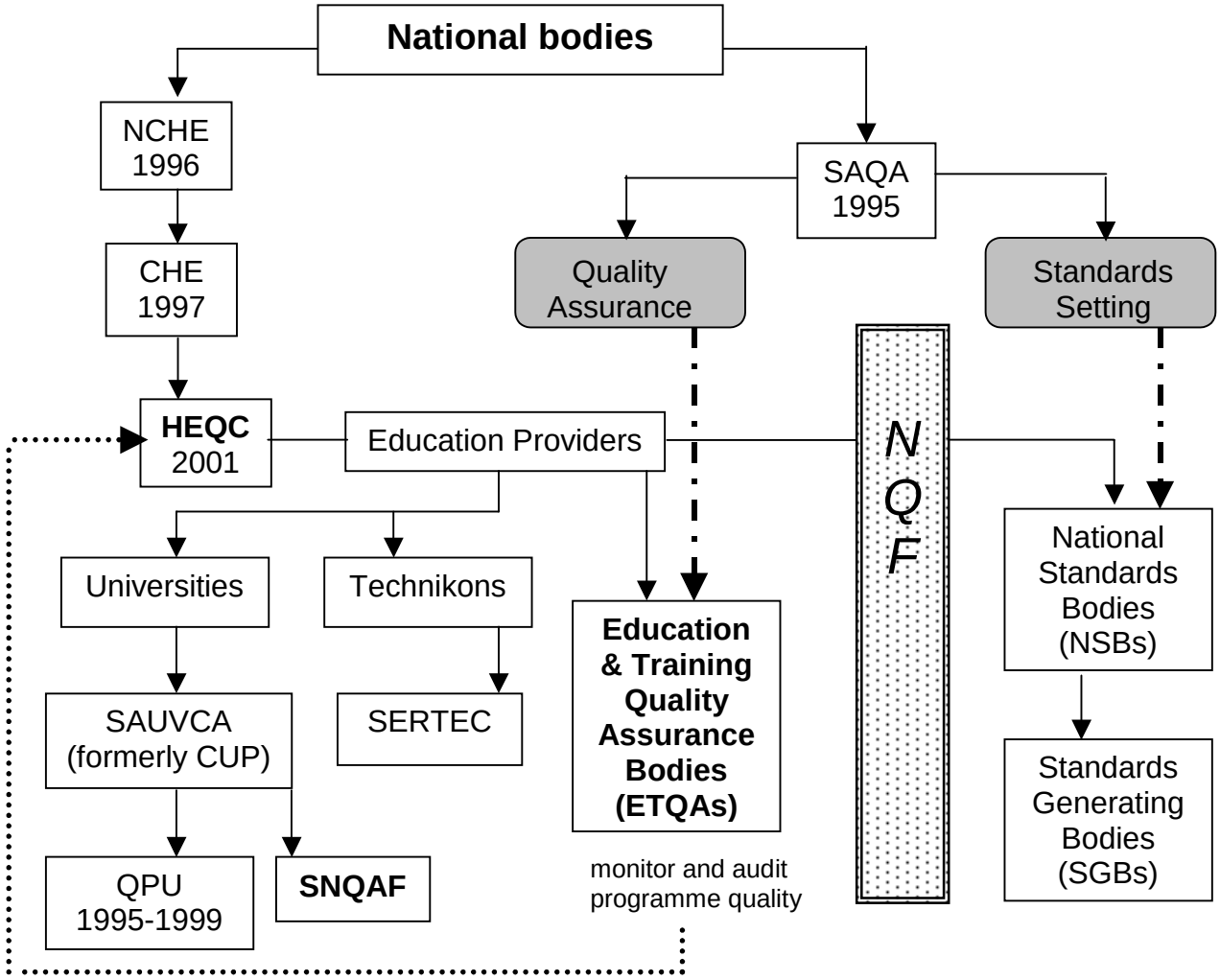


Figure 2.2: Legislative structures within South African higher education

In Figure 2.2 the bodies in **bold type** are primarily responsible for **quality assurance.** Note that the ETQA for the higher education sector is the HEQC (indicated by the dotted arrow).

There are various independent bodies which are also involved in quality assurance in higher education and/or business in South Africa. These are the Foundation of Tertiary Institutions of the Northern Metropolis (FOTIM), the South African Quality Institute (SAQI) and the South African Excellence Foundation (SAEF), which are described in turn below.

FOTIM is a voluntary foundation of member institutions, giving attention to various issues in higher education. FOTIM has a quality assurance project, which promotes improvement of quality in both the academic and

administrative sectors of member institutions. Their initial focus has been on developing models for self- and academic programme evaluation and the implementation of quality assurance procedures at member institutions (FOTIM, 2002). The first FOTIM biennial quality assurance conference was held in Johannesburg from 23-25 June 2004 and attracted international keynote speakers and workshop facilitators.

The South African Quality Institute (SAQI) is a non-profit company which offers training courses and materials and is involved in implementing quality systems in both the business and education sectors.

The South African Excellence Foundation (SAEF) assists small businesses and public sector departments to self-assess their organisations in terms of leadership, policy and strategy, customers and markets (http://www.saef.co.za/saef/mc.html). They are the custodians of the South African Excellence Model (SAEM), which was adapted from the model promoted by the European Foundation for Quality Management (EFQM).

Section 2.4 reviewed the literature with respect to quality assurance in higher education, both internationally and nationally. Relevant debates and issues which have contributed to the recent high profile of quality assurance were presented, in order to sketch the background for this study. Against this background, my case study focuses on the quality of *web-supported learning* in higher education, with particular emphasis on the *self-evaluation* initiatives of the e-learning support unit at the University of Pretoria.

The literature pertinent to the three research questions in this study is now reviewed in detail, namely factors to promote the quality of web-supported learning, client satisfaction with web-supported learning and quality management systems for web-supported learning.

2.5 Factors to promote quality web-supported learning

The first research question in this study is: *What factors promote quality web-supported learning?* This section reports on collections of guidelines available on the Internet, as well as published studies which investigate benchmarks, indicators and principles to promote the quality of web-supported (or online) learning.

There are many Internet sites that offer guidelines or best practices for distance learning, which have been developed by individual institutions, consortia of institutions or national quality assurance agencies. Some of the guidelines are for pure distance education and others are for technology-enhanced distance education (web-supported learning). A selection of such sites is listed in Appendix C, Table C1.

Although practical guidelines and standards for technology-enhanced distance education exist and are an important part of documenting best practice, they form only part of attempts to improve the quality of web-supported learning. Selected international studies which investigated the quality (and/or effectiveness) of web-supported (online)[2] courses are reviewed here. These particular studies are based on extensive research in Canada, the USA and Australia Their findings are synthesized into a taxonomy of factors contributing to the quality of web-supported learning (section 2.5.3). The studies are categorised as those that are classic studies providing benchmarks, indicators or principles (section 2.5.1), and criteria for judging online courses as promising or exemplary (section 2.5.2). More recent frameworks which corroborate and add to the synthesized taxonomy are analysed in the reflection chapter of this thesis, chapter 7.

[2] The terminology used is in accordance with that used by the respective authors of the reported studies.

2.5.1 Classic benchmarks, indicators and principles

The Institute for Higher Education Policy (IHEP, 2000) in the United States undertook a "first-of-its-kind study to bring reason and research data to this overheated debate" (between proponents and opponents of internet-based distance learning) "to provide more tangible measures of quality in distance learning" (p. vii). The study was commissioned and sponsored by the vendors of the learning management system Blackboard® and the National Education Association in the USA.

A comprehensive literature search was conducted, which identified a total of 45 benchmarks developed by organisations to ensure quality distance education. Six institutions in the United States were then selected and studied to ascertain the degree to which the benchmarks were used, and how important they were to the faculty, administrators and students. After consolidating and streamlining the original list of 45 benchmarks, the outcome was a list of 24 benchmarks, classified into seven categories:

1. Institutional support
2. Course development
3. Teaching and learning
4. Course structure
5. Student support
6. Faculty support
7. Course evaluation.

The 24 benchmarks are considered essential for ensuring excellence in internet-based distance learning. Emphasis is placed on items such as student interaction with faculty and other students, students engaging in higher-order thinking, timely feedback to students and access to technology and library resources. Technical training and support to students and faculty members are also recommended. The 24 benchmarks are given in detail in Appendix C, Table C2.

The report states that "in addition to the internet's profound influence on distance education, it is also important to point out that a growing number of

faculty are using the internet to complement traditional classroom-based courses" (Institute for Higher Education Policy, 2000, p. 6). The 24 benchmarks, therefore, can also be applied to what have become known as *hybrid* or *blended* learning scenarios, where the learning model incorporates a mix of delivery media. Such a learning model is in use at the University of Pretoria (see chapter 1).

A second classic and often cited study is Barker (1999), who published the results of a community project commissioned by the Canadian Association for Community Education (CACE), conducted by a consulting company by the name of *FuturEd*.

The project undertook an extensive international literature search for complete sets of guidelines and individual quality indicators for distance learning. The report summarises many resources (mainly online) to inform developers about quality education practices and the use of educational technologies.

The project defines *technology-assisted distance learning* as the learning situation where "the learner is in one location and the 'provider' of the learning is in another and technology is used to make the link" (Barker, 1999, p. 3). According to Barker (1999), a quality educational experience includes the following elements:

> … the quality of learning materials, the availability of materials, support for students through well trained staff, a well managed system, monitoring and feedback mechanisms to improve the system. Stated more succinctly, quality education is education that produces an independent learner. (p. 14)

The outcome of the project is a set of guidelines for quality indicators for technology-enhanced distance learning, which are divided into the following categories:

1. Quality **inputs and resources** for technology-assisted distance learning.
2. Quality **processes and practices** in technology-assisted distance learning.

3. Quality **outputs and outcomes** from technology-assisted distance learning.

An overview of each of these categories is given below. Full details of factors within the categories are given in Appendix C, Table C3.

1. Quality of **inputs and resources** is applicable to the teaching and learning model. It includes guidelines for learning outcomes, curriculum content, learning materials, learning technologies, instructional design and the provision of support personnel.
2. Quality of **processes and practices** includes institutional factors such as the management of students, programmes and human resources, as well as the use of technology to nurture active engagement and communication.
3. Quality of **outputs and outcomes** concentrates on the skills and knowledge of the student emerging from the learning process, as well as recognition and transferability of the qualification. This category also consider return on investment with regard to effectiveness, efficiency and customer satisfaction.

The guidelines are intended to assist consumers in making choices and in ensuring the best return on their investment (by considering categories 2 and 3 above). This consumer orientation to educational products and services is intended to assist providers of technology-assisted distance learning to develop, evaluate and continuously improve their products and services.

In 1987 Chickering and Gamson developed their now well-known *Seven Principles of Effective Instruction*, which emphasize student feedback and communication. They were motivated by the need to improve teaching and learning in higher education, as demonstrated by the quotation below:

> Apathetic students, illiterate graduates, incompetent teaching, impersonal campuses – so rolls the drumfire of criticism of higher education. … States have been quick to respond by holding out carrots and beating with sticks. There are neither enough carrots, nor

> enough sticks to improve undergraduate education without the commitment and action of students and faculty members. They are the precious resources on whom the improvement of undergraduate education depends. (Chickering & Gamson, 1987, online reference)

The seven principles (Chickering & Gamson, 1987) are based on extensive research on teaching and learning and characterise good practice in undergraduate education. Since the seven principles were proposed in 1987, new technologies have changed the face of education. Chickering and Ehrmann (1996) applied the seven principles to online learning environments.

Table 2.1 lists Chickering and Gamson's (1987) seven principles in the left column and Chickering and Ehrmann's (1996) application thereof using educational technologies, in the right column. Table C4 in Appendix C presents the same application in more detail.

Table 2.1

Seven principles of Chickering and Gamson (1987) applied by Chickering and Ehrmann (1996) to online environments

Seven Principles	Application of technology
1. Encourage contact between students and faculty	The Internet, e-mail and learning management systems.
2. Develop reciprocity and cooperation among students	Co-operative learning online.
3. Use active learning techniques	Communication tools, online activities, electronic portfolios.
4. Give prompt feedback	E-mail, online discussion fora.
5. Emphasize time on task	Asynchronous access and computer record keeping of time spent.
6. Communicate high expectations	Real life problems and scenarios, public scrutiny of work submitted.
7. Respect diverse talents and ways of learning.	Variety of learning experiences, anywhere, anytime learning.

Chickering and Gamson's (1987) strategies have been enduringly strong and widely accepted as measures for judging the effectiveness of distance learning as well as traditional classroom teaching (Johns Hopkins University,

2002; Herrington et al., 2001). De Bruyn (2003) analysed student feedback on web-supported courses at the University of Pretoria in terms of the seven principles. A summary of Chickering & Ehrmann (1996) is given by Wilkinson, Wilkinson & Nel (2001).

Ehrmann claims that although much has changed since 1996, much has remained the same (Chickering & Ehrmann, 1996). He states that "these same seven principles, and these seven kinds of technology use, seem equally important for all kinds of learners (and faculty) in all kinds of situations" (online reference).

2.5.2 Criteria for exemplary or promising courses

The learning management system WebCT was developed in British Columbia, Canada and hosts an annual user conference at which winning online courses in the WebCT Exemplary Course Project are showcased. Graf and Caines (2001) developed a scoring rubric to evaluate online courses submitted for consideration in this project. They present criteria in two categories: academic rigour (10 items) and content robustness (6 items).

Paloff and Pratt (as cited in Graf & Caines, 2001) describe academic rigour and content robustness as follows:

- academic rigour: "the degree to which a web-enhanced or asynchronous online course causes students to become immersed in the course content through the application of higher level learning objectives" (p. 1);
- content robustness: "the breadth and depth of the content included in or part of a web-enhanced or asynchronous course and the extent to which students are required to interact with that content and with each other" (p. 1).

In particular, *academic rigour* includes items such as course objectives, assignments, student participation, use of technology, course content and ancillary resources. *Content robustness* refers to the degree to which the course content is available online, how it is structured, the use of images and

graphics, the degree of interaction among students and with the lecturer and the type and quality of student assessment. The criteria in these two categories are given in full in Appendix C, Table C5.

The WebCT Exemplary Course Project supplies a scoring rubric, which for a particular WebCT course, ranks each of the above criteria in terms of *exemplary*, *accomplished*, *promising*, *incomplete* or *confusing*. Course designers are invited to nominate their own or other WebCT courses for consideration for an award (WebCT®, 2002). Winning courses enjoy international recognition and are showcased at the annual WebCT conference. This project is an international benchmark in the field of online learning, which motivated its inclusion in this literature review.

A second project to develop a framework and a set of criteria for quality in educational technology programmes is Confrey, Sabelli & Sheingold (2002). An expert panel on educational technology was established in 1998 by the US Office of Educational Research and Improvement (OERI). Educational technology was defined as "a variety of electronic tools, media, and environments that can be used to enhance learning, foster creativity, stimulate communication, encourage collaboration, and engage in the continuous development and application of knowledge and skills" (Confrey et al., 2002, p. 8).

The goal of the expert panel was to evaluate educational technology learning programmes by judging them as promising or exemplary. In order to be able to make such judgements, the panel devised a set of six criteria. The programme under review should:

1. address an important educational issue and articulate its goals and design clearly;
2. develop complex learning and thinking skills;
3. contribute to educational excellence for all (equity and diversity);
4. promote coherent organisational change;
5. have rigorous, measurable evidence of its achievements;
6. be adaptable for use in multiple contexts.

Each criterion was measured by using rubrics on five levels, ranging from Level 1 (poor or incomplete) to Level 5 (compelling or convincing). The details of the criteria and their associated rubrics are given in Appendix C, Table C6.

In elaborating the criteria, Confrey et al. (2002) discuss how the criteria need to be integrally linked, in order to strengthen the robustness and focus of the learning programme. Technology-based learning interventions that can deeply affect learning for all require organisational rethinking and renewal, significant investments in professional development of teachers, access to technology, as well as access to complex and significant learning experiences. The panel emphasized the importance of learning as an active process and the need to set high expectations for all students. These latter issues reflect some of Chickering & Ehrmann's (1996) application of the seven principles to educational technology.

Confrey et al. (2002) reported that the expert panel was sensitive to and relied on input from the field of educational technology. Even so, the resulting framework and criteria turned out to be considerably ahead of the field in its practice at that time: only five percent of programmes submitted were judged to be worthy of recognition. The expert panel gave no direct specifications of particular technologies required or how they should be optimally used: "Instead, we have defined the system into which technology is embedded and identified criteria that will signal how effective its use is by the footprints it leaves" (Confrey et al., 2002, p. 15).

In her reflection on the use of the framework, Edwards (2002) remarks that although the criteria are intended to be used to evaluate and recognise noteworthy learning programmes in a summative way, the best use of the instrument may be formative rather than summative. Confrey et al. (2002) also remarked that the framework may be used productively for self evaluation.

The studies summarised in this section approach the notion of quality in online learning from various perspectives (e.g. lecturer, student, institution and evaluation of exemplary programmes). It is clear that the context, the learning

model used, the nature of the institution and the target population all play an important role in specifying an appropriate framework for quality web-supported courses.

2.5.3 Meta-analysis: Taxonomy of factors to promote quality web-supported learning

The first research question in this study investigates factors to enhance the quality of web-supported learning. The categories and factors from the studies reviewed in the preceding sub sections are now synthesized into an overall *taxonomy* (Table 2.3), based on the frequency with which the factors were mentioned in the original works. The version of the taxonomy showing the frequencies is given in Appendix C, Table C10.

In order to decide on categories for the taxonomy, the categories used by some existing collections of guidelines or best practices are shown in Table 2.2. Many of the categories shown overlap or are similar in nature (for example: student satisfaction, student services, student support). Some categories could be subsumed by others, for example ‘access’ and ‘facilities and finances’ could both be considered institutional factors.

I therefore synthesized my own categories which are given below Table 2.2.

Table 2.2

Some categories commonly used to classify guidelines or best practices

Categories used	Reference
1. Institutional Support 2. Course Development 3. Teaching and Learning 4. Course Structure 5. Student Support 6. Faculty Support 7. Course Evaluation	Institute for Higher Education Policy (2000)
1. Institutional Context and Commitment 2. Curriculum and Instruction 3. Faculty Support 4. Student Support 5. Evaluation and Assessment	Western Interstate Commission for Higher Education (2001)
1. Curriculum and Instruction 2. Evaluation and Assessment 3. Library and Learning Resources 4. Student Services 5. Facilities and Finances	North Central Association Commission on Institutions of Higher Education (1999)
1. Learning Effectiveness 2. Cost Effectiveness 3. Access 4. Faculty satisfaction 5. Student satisfaction	Sloan-C Consortium's 5 Pillars (Lorenzo & Moore, 2002)

A reasonable combination of the type of categories shown in Table 2.2 seems to be as follows:

1. Institutional Factors
2. Technology Factors
3. Lecturer Factors
4. Student Factors
5. Instructional Design Factors
6. Pedagogical Factors.

The factors for quality web-supported learning are synthesized in Table 2.3 according to the classification given above. In some of the literature studies, an item may have been mentioned in further discussion, not necessarily listed as a main benchmark. All such items *are* listed explicitly in Table 2.3.

Table 2.3 *Taxonomy of factors to promote quality web-supported learning*

Category	Factor
Institutional Factors	Technology plan
	Infrastructure / Adequate resources for online learning
	Student advice and consultation
	Institutional evaluation of programme effectiveness
	Promotes coherent organisational change
Technology Factors	Appropriate use of technology
	Reliability / robustness
	Accessibility / 24/7 availability
	Technological support available for lecturers and students
	System training available for lecturers and students
	Accurate management of student records / data
Lecturer Factors	Interaction with students / facilitation of online learning
	Frequent and constructive feedback to students
	Professional training in education - professional development
	Regular evaluation of lecturer competence
	Academic background / qualifications
Student Factors	Communication with fellow students
	Time management / time on task
	Learner control over time, place, pace of learning
	Expect efficiency and effectiveness
	Employ critical thinking strategies
	Motivation / commitment / self esteem
	Improve students' problem solving abilities
	Return on investment - customer satisfaction - cost/benefit
Instructional Design Factors	Co-operative / group learning / team work / reciprocity / collaboration
	Student engagement in higher cognitive levels / knowledge construction / challenges / complex thinking skills
	Rich learning resources / Sound learning materials
	Interactivity / Active learning / learning activities
	Design standards / guidelines / minimum requirements
	Routine review and evaluation of courses / products
	Enhanced student motivation / responsibility for own learning
	Manageable segments / modular / chunking
	Inclusivity: social, cultural, gender, disabilities
	Purposeful use of learning media
	Appropriate use of images, graphics
	Offer a complete learning package
Pedagogical Factors	Learning outcomes / objectives are clearly stated
	Communicate high expectations
	Respect diverse talents and learning styles / equity for all
	Optimal assessment strategies / authentic tasks
	Clearly stated expectations re: level of participation, assignments etc.
	Provide time for students' self reflection
	Provide a non-threatening, comfortable environment
	Students instructed in proper research methodology
	Relevance and accuracy of content
	Research and continuous improvement
	Educationally significant goals
	Programme is adaptable, sustainable and scaleable

The taxonomy given in Table 2.3 is a holistic synthesis of important factors and practices which together promote the quality of web-supported learning experiences. The taxonomy is extended and refined in chapter 4 (Tables 4.3 and 4.4; Figure 4.3)

In isolation, no category would be sufficient to guarantee quality web-supported teaching and learning. For example, Carrol (as cited by Mayes, 2001) describes the misconception of the 'Nurnberg Funnel': the assumption that the delivery of high quality learning materials is sufficient for learning to occur. The emphasis on 'good' instructional design and 'good' pedagogy confirms Clark's insistence on the benefits of sound course design, rather than the effect of the delivery medium in enhancing learning (Clark, 1994). Ragan (1999) confirms that "good teaching is good teaching" (online reference) and Oliver (2003) asserts that "the quality principles that underpin successful online teaching and learning are exactly the same as those that underpin successful face to face teaching" (p. 8).

Additional relevant studies were reviewed after this literature review was completed. The additional studies corroborate many of the factors in the taxonomy and expand it by a further ten factors that were subsequently identified (see chapter 4 and Appendix C, Table C11). The extended and refined taxonomy is given in Table 4.4.

2.6 Client satisfaction with web-supported learning

The second research question in this study is: *What factors contribute to client satisfaction (or frustration) with web-supported learning?* This section reviews reported studies on *student satisfaction* and *lecturer satisfaction* with various forms of technology-enhanced learning[3].

2.6.1 Student satisfaction

Part of evaluating the effectiveness (quality) of any learning intervention is to obtain ongoing feedback from users and monitor their use (Lowe & Hall,

[3] The terminology used is in accordance with the context of the various sources.

1999). Randall (2002) highlights the growing concerns of students, as paying customers, about the quality of the educational provision offered to them and emphasizes that delivery systems and the quality assurance thereof need to meet the needs and expectations of users. White (2000) also notes that the concept of the learner as a *customer* is becoming more prevalent.

Zhiting, Yi, Qing and Xiaoyong (2003), in a working document aimed at evaluating service quality of e-learning, specify that organisations must ensure adequate understanding of the needs and expectations of the customer and should gather customer feedback, including satisfaction with the services provided as well as with the e-learning product. Leckey and Neill (2001) claim that it is "evident that student evaluation, whether of courses, teaching quality or the overall student experience, is extremely important and has a significant role to play in the quality assurance process" (p. 19).

According to Steyn (2000), "Recent policy developments in higher education in South Africa are likely to lead to increased evaluation of teaching and courses through the use of learner evaluation" (p. 174). This means that national quality agencies (e.g. the HEQC) will require evidence from an institution about its knowledge of the student experience and the ways in which it has taken student views into account in course design, production and facilitation.

Kochtanek and Hein (2000) summarise the importance of researching the student experience with online or asynchronous learning environments:

> Many students are quite accustomed to and comfortable with sitting in a classroom at an assigned time, taking notes and following a sequence of well-developed presentations and activities created ahead of time by the instructor. They may be less comfortable communicating at a distance, using new technologies to support that communication, and actually being a partner in and contributor to the instruction, in addition to being a recipient of that instruction. (p. 284)

Kirkpatrick (1998) proposes a four-level model for evaluation, particularly in corporate training:

1. Reaction (a measure of customer satisfaction);
2. Learning (the degree of change in participants' knowledge, attitudes, skills);
3. Behaviour (the extent to which partcipants' behaviour changes as a result of training);
4. Results (achievement of objectives, impact on the organisation).

Kirkpatrick's evaluation levels should be implemented sequentially and it is a serious mistake to bypass any level (Kirkpatrick, 1998). Although evaluation at the subsequent levels may provide scope for further research, it is not easy to measure levels 3 and 4 in a higher education institution, unless one plans follow-up research involving graduates in the work place.

Clark (2000) identifies two similar levels of evaluation: reaction evaluation (participant reactions) (cf. Kirkpatrick Level 1) and achievement of learning or programme objectives (cf. Kirkpatrick Levels 2 and 4). Clark (2000) describes two advantages of reaction evaluation: it can uncover informal participant impressions and reveal unanticipated benefits and problems with the course. This is clearly useful in the sense of formative evaluation and continuous improvement and is the level of student and lecturer evaluation that is applied in this study (see sections 3.5.3, 3.5.4 and chapter 5).

This study is confined to measuring levels of client satisfaction which are based on client reactions, perceptions and experiences, i.e. Kirkpatrick's Level 1. Where perceived learning is measured, it is described as a 'Perceived Learning Index' (see chapter 5). This study does not purport to measure Kirkpatrick's higher levels, such as the degree of actual learning that took place. These are distant outcomes (see Conceptual Framework: Figure 2.5).

O'Reilly and Newton (2001) report on a joint research project between an academic school and the Teaching and Learning Centre at the Southern Cross University, Australia. They used student surveys to research student perceptions of the importance of online discussions, whether these were mandatory (for assessment purposes) or optional. Their aim was to understand

the way students are using the online medium and what processes enhance their learning, so that improvements in interactive online teaching and learning may be initiated and continued. This continuous improvement took the form of fine-tuning the design of course units (formative evaluation), implementing student support mechanisms and enabling teaching staff to improve their pedagogical strategies.

The findings of O'Reilly and Newton (2001) showed that students valued the following aspects on online communication:

- peer-to-peer interaction for social support: forming friendships, offering advice and encouragement, overcoming isolation (cf. Laurillard's (1993) conversational framework);
- peer-to-peer interaction for course-focused learning support;
- mutual help with technical issues and the use of online tools;
- a safe environment for learning through open communication;
- intrinsic motivation for engaging in online discussion;
- benchmarking individual progress within groups;
- enhanced learning due to online discussion in a social context .

The above authors concluded that learners value the human aspects of the online environment and are beginning to exhibit not only increased technical sophistication, but also social skills such as civility, conviviality, harmony and reciprocity.

Carmichael (2001) carried out an educational evaluation of WebCT at the University of Abertay Dundee, Scotland, using Laurillard's (1993) conversational framework. Laurillard's (1993) framework is based on dialogue and reciprocal actions and interactions between the student and the teacher. The case study was a small group of undergraduate students – 15 of approximately 60 students took part in the survey of student experiences using WebCT - a very small sample, compared to the sample in this study (4 650 students – see chapter 5).

Carmichael (2001) formed a one-to-many correspondence between the criteria of Laurillard's (1993) framework and the various tools in WebCT. She then used the student evaluation to investigate which WebCT tools were *used* and which tools were found to be *useful*, from which a usefulness percentage was calculated. This usefulness percentage for each WebCT tool was then matched with the applicable criteria from the conversational framework. This is an interesting study, although it used a very small sample and the original heuristic matching of tools to the framework appears to be rather arbitrary. The results were disappointing in that usefulness percentages for many WebCT tools were rather low, with the result that most of the criteria of the conversational framework were viewed as being not successfully implemented.

De Bruyn (2003) conducted a study at the University of Pretoria, which encompasses pedagogical aspects, as well as student experiences of web-supported learning. She used the 2002 version of the WebCT Experience survey developed by this researcher (Appendix D1 in this study contains the 2003 version of the survey). She matched questions from the survey with the Seven Principles for Good Practice in Undergraduate Education (Chickering & Gamson, 1987). (Although the survey items were not composed according to the seven principles, they fit well into that framework.) She found that WebCT is rapidly changing the way in which students and lecturers approach teaching and learning and that, in general, students perceive the web-supported courses to be efficient and interesting. She recommended that ongoing research is required, especially with respect to the adoption and integration of ICTs by lecturers.

Delport (2003) investigated the use of computer-mediated communication in undergraduate Mathematics courses at the University of Pretoria. She also used the 2002 version of the WebCT Experience and Module surveys. She found that computer-mediated communication, using all available online communication tools (e.g. discussions, e-mail, chat), was dependent on encouragement by the lecturer to interact frequently. She recommended frequent and timely feedback and encouragement to individuals and groups, in order to provide a varied and challenging learning environment, and to

promote deep learning.

McKenzie, Bennett, Mims and Davidson (2001) sought student perceptions on the value of online instruction at the University of West Georgia, during 1999 and 2000. Seven courses were evaluated, involving 161 undergraduate and graduate students. Of these students, 150 chose to make use of WebCT.

There were three aims of the McKenzie et al. (2001) study[4]:

1. to identify whether students would choose to access supplemental course materials provided on WebCT;
2. to identify whether their use of WebCT enhanced the course and if so, which tools and activities they found most useful;
3. to determine if WebCT should be continued as a supplemental resource in the future.

The findings of McKenzie et al. (2001) showed that the main reasons students used the online course components were ease of accessibility to course materials, the convenience of communicating with the instructor and other class members on a regular basis, and it saved them time. Students indicated that they liked to participate in a variety of activities on WebCT, using various online tools. The majority of participants indicated that online course support should be continued.

All the studies reviewed above evaluated student perceptions of and satisfaction with web-supported learning. Very few studies were found which surveyed the other clients of an e-learning support unit, namely lecturers, as to their level of satisfaction with web-supported learning (Fresen & Le Roux, 2003).

[4] The study quoted is from the point of view of one instructor making choices about the courses he offers, whereas this study considers the point of view of a support unit serving a whole institution. Therefore, aim 2 above is more applicable than the first or third aims. Aim 2 is also more relevant to the enhancement of quality.

2.6.2 Lecturer satisfaction

Schifter (2000) surveyed faculty members and administrators at Temple University, Pennsylvania to investigate motivating and inhibiting factors for lecturers participating in technology-enhanced distance education. Her findings list the top five motivating factors and the top five inhibiting factors for faculty members, as shown in Table 2.4.

Table 2.4

Motivating and inhibiting factors for faculty members to participate in technology-enhanced distance education (summarised from Schifter, 2000)

Top five motivating factors	Top five inhibiting factors
Personal motivation to use technology	Lack of technical support provided by the institution
Opportunity to develop new ideas	Lack of release time from academic duties
Opportunity to improve my teaching	Concern about faculty workload
Opportunity to diversify program offerings	Lack of grants for materials / expenses
Greater course flexibility for students	Concern about quality of courses

Schifter (2000) concludes that "while teaching at a distance requires new technical skills for the new teaching and learning environment, what becomes very important is how to teach concepts within this environment, i.e. pedagogy" (p. 46). This finding supports the philosophy of pedagogy before technology (see chapter 1).

The SUNY Learning Network (SLN) is the online instructional component for the 64 colleges and nearly 400, 000 students of the State University of New York. Shea, Pelz, Fredericksen and Pikett (2002) surveyed 255 online teachers from 31 of these colleges in order to investigate how the experience of teaching an online course impacts on classroom teaching. In their study, the certificate and degree programmes were offered completely at a distance.

Faculty members participating in SLN come from all academic ranks and from various types of institutions, ranging from small rural community colleges to

large urban university centres. Their areas of subject expertise include maths, science, humanities, business, art and social sciences. Faculty members undergo an intensive faculty development process, which enables them to develop and present their own online courses. Substantial incentives are offered, such as stipends and laptop computers. Support is provided, in the form of instructional design partners, trainers, help desk staff and experienced faculty mentors.

The findings of the Shea et al. (2002) study are summarised in Table 2.5.

Table 2.5

Lecturer perceptions of online learning (from Shea et al., 2002)

Outcomes	Findings
General reactions	Faculty members were asked to rate their level of satisfaction in developing and teaching an online course. Approximately 96% expressed general satisfaction and 4% expressed general dissatisfaction.
Student performance	Faculty members were asked to rate student performance in online courses, compared to similar classroom courses. Approximately 33% reported better performance from online students, 41% reported no difference in performance and 14% reported better performance from classroom students.
Interaction	The authors feel that the importance of interaction cannot be understated. Faculty members were asked about their perceptions of the levels of interaction in online courses. Approximately 61% felt that their level of interaction with online students was higher than in the classroom, 28% saw no difference and 26% rated their interaction with students in the classroom as higher than online.
Appropriateness of the online environment	Asked whether the online environment is appropriate for teaching particular course content, approximately 91% of faculty members said “yes”, 7% were undecided and 2% said “no”.

Table 2.5 (continued)

Lecturer perceptions of online learning (from Shea et al., 2002)

Outcomes	Findings
Knowledge of students / isolation	One could hypothesise that the online environment could be cold, sterile and anonymous. Asked how well they got to know their students, approximately 37% felt their knew their online students better than in the classroom, 25% felt there was no difference and 35% felt they did not know their students as well.
Alternative means of instruction and assessment	Approximately 97% of respondents reported that developing and teaching their online course offered them new opportunities to consider alternative means of instruction and assessment.
Faculty support processes	Faculty members reported that the greatest single advantage of teaching online was the emotional and technical support offered by the SLN staff. Some responded that they would not have attempted it without the support provided.

Shea et al. (2002) concluded from their results that although developing an online learning environment is not a trivial endeavour, it can be implemented in such a way that both faculty members and students report high levels of interaction, satisfaction and learning. Furthermore, faculty members found opportunities for reflection on their pedagogical practice, such as alternative means of instruction, assessment and the systematic design of instruction. They also found that teaching and online course allows them to reflect on and improve the way they teach in the classroom.

Although the various studies reviewed in section 2.6.1 acknowledged and investigated student feedback with respect to online learning, few of them specifically emphasized the theme of customer satisfaction in the light of quality assurance. Only two studies were found which investigate lecturer satisfaction with technology-enhanced distance learning (section 2.6.2). Research question 2 in this study is therefore motivated by the need to synthesize a holistic view of quality assurance of web-supported learning from the point of view of client (student and lecturer) satisfaction.

2.7 Quality management systems for web-supported learning

The third research question in this study is: *What are the components of a process-based quality management system (QMS) in a web-supported learning production unit?* This section reports on the few formal QMSs for e-learning that were found in the literature.

From an institutional perspective, many universities have Quality Assurance or Quality Promotion Units which work with national quality assurance agencies putting systems in place to assure the quality of the academic programmes they offer. Such systems are generally referred to as *quality assurance systems* and focus on institutional self-evaluation followed by external audit, based on the four step model described by Jeliazkova and Westerheijden (2002) and Alt and Fourie (2002). Some institutions may go further than this to implement auditable *internal* systems. For example, the Tshwane University of Technology (formerly Technikon Pretoria) has a well-documented formal institutional quality assurance system (not particularly for e-learning), which is easily available to staff members on their intranet (viewed during personal visit, April 2001).

With regard to electronic learning, Lowe and Hall (1999) distinguish between the *process* and the *product* in hypermedia applications. The *process model* in an e-learning support unit can be equated with the instructional design model (for example, the ADDIE model: Analyse – Design – Develop – Implement – Evaluate– see Appendix B2). This section focuses on quality management of the *process* of designing, developing, delivering and implementing web-supported learning.

Using Internet and database searches, only four formal quality management systems (QMSs) have been found which focus on web-supported learning. These four examples are discussed below. Even if the titles of papers are enticing, the depth or emphasis of the research projects is often misleading or focused in a different direction. For example, *Enhancing the quality of online higher education through measurement* (Zhao, 2003) – this paper makes various suggestions as to what may be done, but does not report on any

actual research done or systems implemented. Many papers present models, tools, or frameworks to enhance the quality of online learning (the *product*), usually referring to pedagogical effectiveness (see section 2.5).

The Distance Education Centre (DEC) at the University of Southern Queensland is the first distance education facility in the world to receive international quality accreditation to ISO 9001 (University of Southern Queensland, 2002). Their certification includes various institutional and operational aspects, such as organisational management, network design and maintenance, student support systems, multimedia development, telecommunications support, examinations preparation and production, courseware design and development and project management.

The fact that the DEC has IS0 9001 accreditation implies that they must have a formal quality management system in place, since this is an ISO requirement (L.G. Boyd, personal communication, 25 January 2004). On the Design and Development page of the DEC website, reference is made to the team approach, detailed record keeping, quality checks and ongoing evaluation and review of study packages. However, there is no direct mention on their website of a formal QMS[5].

A two-year research project in Wales, based at the University of Bangor, is reported by Sambrook, Geertshuis and Cheseldine (2001). They highlight some "theoretical issues and problems associated with establishing an online *quality assurance system* [italics added] for computer-based learning materials relevant to the needs of business and higher education" (p. 48).

Sambrook et al.'s (2001) quality assurance system consists of evaluation tools, guidance materials and a training package. As such it focuses on evaluating existing computer-based learning materials, or using the guidance in designing new materials. For producers or developers of instructional materials, it can be viewed as an 'instructional design toolkit'. For consumers (students), it is a mechanism for them to select and evaluate learning

[5] Several email messages to enquire about their research outputs remain unanswered.

materials in a given programme. Sambrook et al. (2001) conclude that their system focuses on pedagogical quality, that is, the quality of learning materials and the potential of ICT resources.

The Sambrook et al. (2001) system does not, in fact, address the internal processes and procedures of an e-learning support unit, in the sense of a formal quality management system.

The Swiss Centre for Innovations in Learning (SCIL) is based at the Universitat St. Gallen in Switzerland. The Stanford Center for Innovations in Learning (also SCIL) collaborates with the Swiss SCIL on various teaching and learning projects.

The Swiss Centre promotes and supports quality improvement of e-learning in higher education, through a variety of activities, such as the development of quality standards, evaluation of e-learning projects and analysis of best practices. They have developed a quality management system and certification process in collaboration with the European Foundation for Management Development (EFMD) in Brussels and as part of the eLearning Quality Improvement Programme (ELIP). The EFMD includes an accreditation institute, for the accreditation of programmes at universities and corporate universities (Seufert, 2004). The same author mentions that self-assessment and external evaluation are part of ELIP and that from a customer perspective, the intention is to promote improved quality of e-learning.

The SCIL appears to use a TQM approach in that they consider the inputs, processes and outputs of quality management. They equate a quality management system with evaluation: formative and summative. In my experience of evaluating the literature in the field, this usually implies evaluation of products and not necessarily quality management of processes.

The Royal Melbourne Institute of Technology (RMIT) in Australia has developed a university-wide quality assurance system with respect to the instructional design of online courses (McNaught, 2002). The vast majority of their courses involve *mixed mode designs*, that is, a combination of face-to-

face teaching and online learning offered through a distributed learning system.

The quality assurance policy at RMIT has three primary components: educational (instructional) design, peer review and formal evaluation. All courses with an online component need to supply clear evidence of educational design and planning (which includes curriculum coherence, administrative information, planned activities and assessment opportunities). Formal peer review sessions are held in order to evaluate online courses. This provides feedback to the course designers, as well as academic development for other participants who experience strategies that they may apply in their own courses. Summative evaluation of courses after implementation directs efforts at ongoing quality improvement. This is managed by means of a formal evaluation plan, which includes a student feedback plan.

Four formal quality management (or quality assurance) systems for web-supported learning were reviewed above. Two are at universities in Australia, one at a university in Wales and one at a European corporation with links to a university in the USA. Of those which provided details of their systems, or published papers, the RMIT example appears to be a true process-based quality management system for online learning, in that it documents policy and processes with the intention of continuous improvement.

The next section synthesizes the literature review into a conceptual framework for this study. The conceptual framework links aspects of established theories and applies them to the field of web-supported learning in higher education.

2.8 Conceptual framework

Three established theories have contributed to building the conceptual framework for this study:

- *Quality assurance theory:* the body of knowledge on quality assurance (aspects include Total Quality Management and ISO 9001) that originated in the industrial era and is now being applied increasingly to the field of education (Gabor, 1990; Macdonald, 1998).
- *Instructional systems design theory*: the body of knowledge that promotes the design and development of learning environments (usually electronic) to enhance learning (Reeves & Hedberg, 2003; Smith & Ragan, 1993).
- *Systems theory*: the body of knowledge that analyses complex systems, their constituent parts and how they interact (Checkland, 1999; Senge, 1990).

Each theory, its applicability to this study and the links between the theories are presented briefly in Appendix B. Figure 2.3 shows the relationship between these three theories.

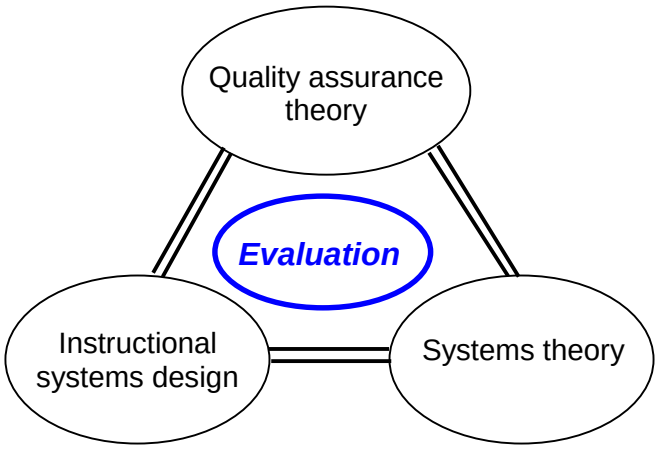


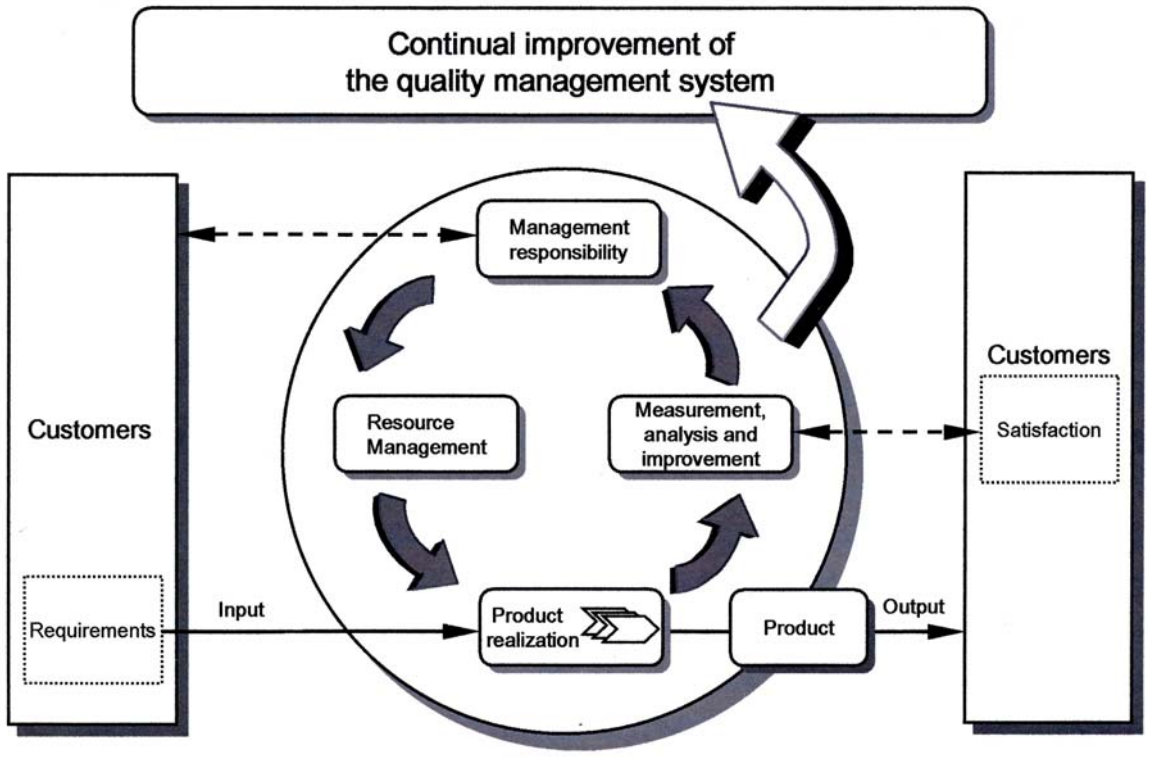
Figure 2.3:
Established theories informing the conceptual framework for this study

The common thread between all three theories is *evaluation*. Formative evaluation research and systems theory investigate human activities dedicated

to continual improvement (Bereiter, 2002; Checkland, 1999). In this case study, the term *evaluation* is interpreted in three senses:

- continuously improving processes and procedures (quality assurance);
- formatively and summatively evaluating learning products (instructional design);
- improving the way human and technical systems function and interact (systems thinking).

The ISO 9001 international standard on the requirements for quality management systems promotes a *process approach* (SABS, 2000), in conjunction with the Plan-Do-Control-Act quality improvement cycle first promoted by Deming (Gabor, 1990). The ISO 9001 model (Figure 2.4) was used as a basis for the conceptual framework for this study.



Key: ——► Value-adding activities; - - - ► Information flow

Figure 2.4

ISO 9001 model of a process-based quality management system (SABS, 2000)

Figure 2.4 illustrates the combination of a quality improvement cycle (indicated

by the circular arrows), with the process-based approach, in which *inputs* (on the left hand side of the diagram) are converted by the *process* (the central cycle) to *outputs* (on the right hand side of the diagram). During this *process*, products are designed and produced (realised). The *products* are outputs of the process: the level of their quality contributes to the level of customer satisfaction.

I adapted the ISO 9001 process-based quality management model to produce a conceptual framework for the quality management of web-supported learning (Figure 2.5).

Figure 2.5 reflects elements of *quality assurance* theory (Plan-Do-Control-Act cycle, feedback loop, inputs, processes and outputs, client satisfaction), *systems theory* (a complex, holistic system, made up of constituent parts), and *evaluation* (user evaluation of web-supported courses). It responds to the plea that "a complete solution must recognise the importance of processes, and for adequate checking of quality, we must take a balanced account of inputs, processes, outputs and outcomes (Woodhouse, 2000b, p. 107).

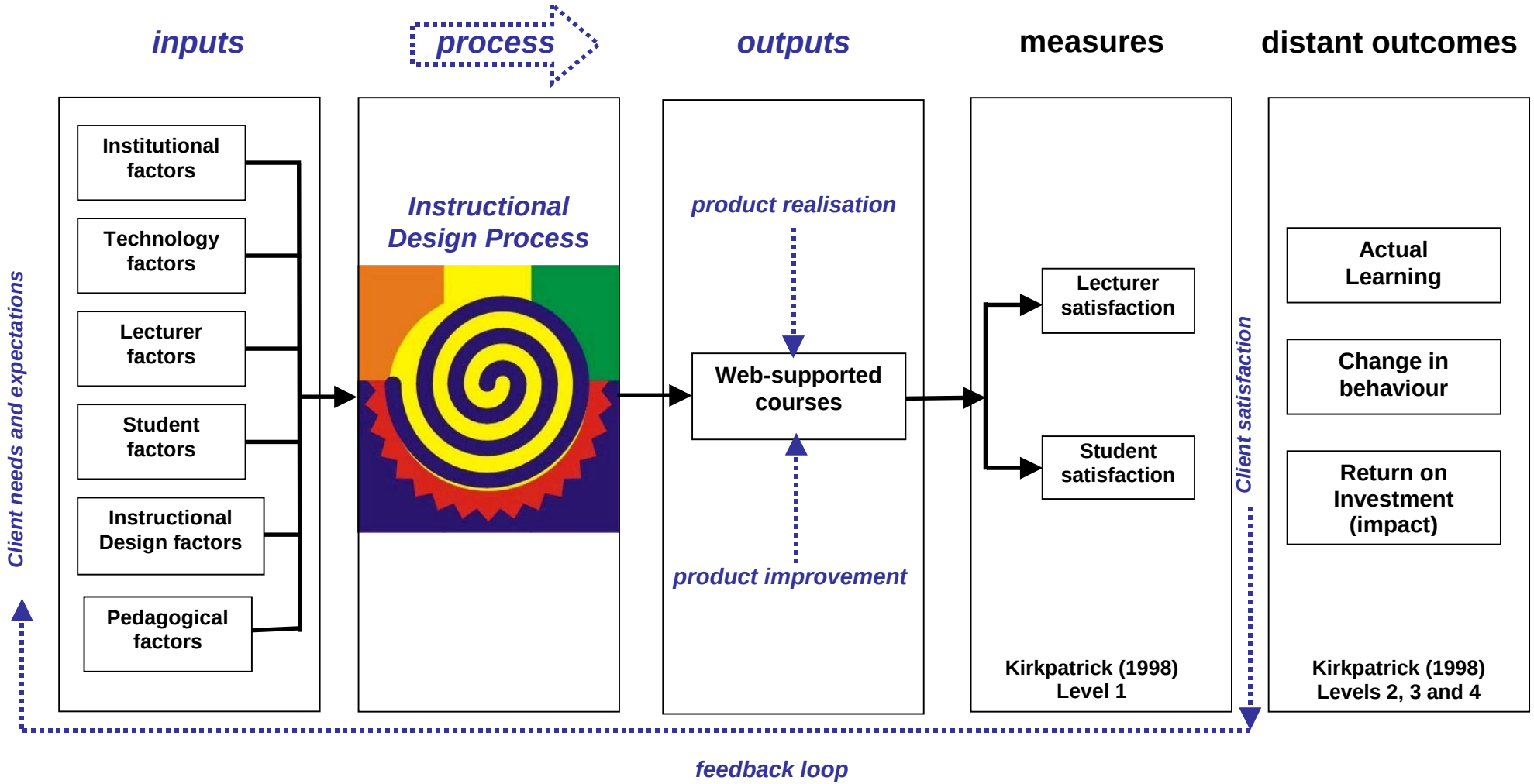


Figure 2.5:

Conceptual framework: A process-based quality management system for web-supported learning

The inputs into the system include factors identified from the literature review, which contribute to the quality of web-supported courses, in the categories institutional, technology, lecturer, student, instructional design and pedagogical factors (see Table 2.2 for details of the factors in each category).

In the context of this case study, certain unique factors within these categories are briefly described here. With respect to institutional factors, TLEI enjoys commitment and funding from top management, including the provision of human resources (TLEI practitioners), computer laboratories on campus and a campus-wide licence for a learning management system. Technology factors which directly influence the quality of web-supported learning and the extent of customer satisfaction include the support received from the campus IT division, the provision and maintenance of technology and human resources in the computer laboratories and the availability of a help service for lecturers and students.

Some of the lecturer and student factors in this case study tend to be universal rather than unique, for example, varied backgrounds, learning styles, levels of commitment and motivation, and differing positions on the adoption curve (Moore, 1999) for web-supported learning. What is unique about the South African learner population is the extent of cultural and language diversity that needs to be catered for in designing any learning opportunity, as well as the fact that only half[6] the student population has access to computers in their homes (see chapter 4). Increasingly, the needs of students with disabilities are now being recognised, both nationally and internationally.

Instructional design and pedagogical factors tend to be universal, i.e. approaches in which promote constructivist learning principles and practices to encourage deep and meaningful learning. What is unique to web-supported learning is the challenge to optimise the use of the medium, without simply converting existing learning materials into electronic format. Complementing this need is the challenge to encourage lecturers to enhance their facilitation of

[6] In the sample in this study, 56.2% of students have computers in their homes.

web-supported learning.

In Figure 2.5, the instructional design *process* is represented by the stylized image. The ISO 9001 quality cycle was adapted to form a spiral, implying continuous improvement, striped ribbons implying excellence, such as an award or medal, and a 'stamp of approval' indicating accountability and accreditation[7]. These interpretations of the meaning of quality were adopted by the E-Education Unit in this case study to generate a *quality policy*.
A quality policy is an ISO 9001 requirement (SABS, 2000). The written policy embraces the philosophies of fitness for purpose, client satisfaction and continuous improvement (see Appendix F10).

In Figure 2.5, the iterative flow (indicated by dashed arrows and italic text) represents the feedback loop, an integral part of the Plan-Do-Control-Act cycle. Customer needs and expectations (the antecedents) are categorised in terms of the taxonomy of factors required (inputs). These inputs are transformed via the instructional design *process*, in order to realise quality web-supported learning *products* (outputs). *Product realisation* refers to the production and formative evaluation of web-supported learning opportunities. *Product improvement* refers to the summative evaluation and improvement of the completed products.

Improvement decisions need to be based on *measurements* which provide management information and inform the quality cycle. Measurements can take many and varied forms. The measurements investigated in this study are participant reactions according to Kirkpatrick's (1998) Level 1, namely levels of student and lecturer satisfaction. These client feedback measures need to be acted upon (for example, via a summative evaluation procedure), with the aim of ongoing process and product improvement.

Other possible measures of quality include actual learning that took place (for example comparing scores on pre- and post tests), changes in behaviour as a

[7] The image was designed by the graphic design section of TLEI.

result of learning, and return on investment (impact on the organisation) after learning has taken place. These additional measures, which are Kirkpatrick's (1998) Levels 2, 3 and 4, provide scope for further research and are included in Figure 2.5 as *distant outcomes*.

In order to measure the distant outcomes, in particular return on investment, financial inputs will need to be quantified and cost effectiveness investigated. The cost issues are not part of the present study, although the provision of infrastructure and adequate resources are included as required institutional factors.

2.9 Summary

This chapter reviewed the literature in terms of quality in general, quality assurance in higher education and quality assurance in higher education in developed countries and in South Africa. It investigated the literature in respect of each of the three research questions in this study: factors to promote quality web-supported learning (section 2.5), client satisfaction with web-supported learning (section 2.6) and quality management systems for web-supported learning (section 2.7).

The construct *quality* includes the perspectives of quality as *exceptional*, quality as *perfection or consistency*, quality as *fitness for purpose*, quality as *value for money* and quality as *transformation*. Quality as *innovation,* with an emphasis on *client satisfaction* (anticipating customer wants and needs) prompted research question 2 in this study.

Two aspects of the quality debate were engaged in this chapter, namely the merits of introducing quality assurance practices into higher education, and the dilemma of internal improvement versus external accountability (the Scylla and Charybdis dilemma). It was concluded that a meaningful approach to self- and continuous improvement in higher education is possible, taking into account the sensitivities and commitment of participants, the dynamic nature

of education and basic good management practice. In so doing, it is possible to avoid the threats of Taylorism, cloisterism and conformance to specifications.

An overview of the current international status of quality assurance in higher education was given. Europe, United Kingdom, United States of America, Australia and New Zealand are prominent in the field, with well established national agencies and histories of applying quality assurance principles to education.

National transformation initiatives and the current legislative framework in South Africa were summarised. Quality assurance in South African technikons is further advanced than it is in universities, where there is an uneven level of internal and external quality assurance mechanisms. The HEQC initiated pilot audits of higher education institutions in 2003, which included the University of Pretoria as the first university to contribute to the practice of institutional audits and to the specification of relevant criteria.

In considering the first research question, prominent international studies were reported and analysed. The analysis was presented in two categories: classic benchmarks, indicators or principles and criteria for exemplary or promising technology-enhanced courses. In the former category, classic studies that are often cited in the literature were analysed. In the latter category, studies by recognised agencies such as the vendors of WebCT (Canada) and the Office of Educational Research and Improvement (OERI) in the United States were analysed. Details of the findings of all these studies are given in Appendix C. A taxonomy of factors to promote quality web-supported learning was synthesized: institutional factors, technology factors, lecturer factors, student factors, instructional design factors and pedagogical factors. The critical factors in each category of the taxonomy were given in Table 2.3. The extended and refined taxonomy is given in Tables 4.3 and 4.4, together with a graphic interpretation (Figure 4.3), in answer to the first research question.

With respect to research question 2 (satisfaction of students and lecturers), client satisfaction is a vital component of quality assurance and is reflected in Kirkpatrick's (1998) first level of evaluation: Reaction. The clients of an e-learning support unit in higher education are lecturers and students. Several specific studies were found which collected student feedback information on courses supported by online materials and activities, but not on an institution-wide basis. Only one study was found which investigated motivating and inhibiting factors for faculty members who embark on technology-supported learning.

With respect to research question 3 (applying quality assurance theory to the instructional design process), only two higher education institutions were found (University of Southern Queensland and RMIT, both in Australia), which have implemented formal processes and procedures for distance education supported by technology. Other research projects, although they may refer to 'quality assurance systems', generally tend to concentrate on the pedagogical effectiveness of online learning, or alternatively on institutional quality assurance measures to improve teaching and learning in general.

There is therefore a lack of guidance in the literature for e-learning practitioners or government quality assurance agencies attempting to document critical success factors to standardise and improve the quality of web-supported learning, from both the process and product perspectives.

The theoretical basis for this study embraces the established theories of quality assurance, instructional systems design and systems theory. Instructional design models traditionally include phases of formative and summative evaluation. Systems thinking has been applied to quality management by various authors (Senge, Kleiner, Roberts, Ross & Smith, 1994; Fourie, 2000). It may be applied to complex systems such as instruction systems design and formal systems such as quality management systems.

The chapter ended by presenting the conceptual framework for this study, based on elements of quality assurance theory (for example Plan-Do-Control-

Act cycle, feedback loop, client satisfaction, inputs, processes and outputs), instructional systems design (for example, formative and summative evaluation of web-supported courses) and systems thinking (complex, holistic human activity systems, made up of constituent parts)

The conceptual framework is represented diagrammatically in Figure 2.5, which incorporates all three theories and adapts them to the instructional design process for web-supported learning products.