

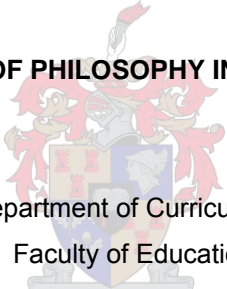
**INTEGRATING SCHOLARSHIP AND CONTINUING PROFESSIONAL DEVELOPMENT (CPD)
IN THE NATURAL SCIENCES AT A SOUTH AFRICAN UNIVERSITY**

by

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DECLARATION

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature: 

Date: 26 November 2007



ABSTRACT

The worldwide emphasis on lifelong learning, the continuous and fast pace of change and the competitive nature of practice forces professionals in all sectors to remain abreast of the latest knowledge, skills and/or innovations. This has contributed to the evolution of the term *continuing professional development* (CPD). The university lecturer in the natural sciences functions within a unique area of professional practice, as the practice requires scholarship – which contains elements of both subject-specific and educational expertise. It remains unclear how CPD within this professional arena is defined in terms of need, purpose and provision. The current quality of learning and evaluation of learning also warrants investigation. This study aimed to investigate how CPD could play a role in scholarly development from the perspective of lecturers in the Faculty of Science at Stellenbosch University (South Africa). A qualitative approach was followed. Semi-structured interviews with a purposive sample, followed by an open-ended questionnaire with a stratified random sample, were used.

The results are reported in seven chapters, of which the first provides an orientation to the conducted study. The second chapter focuses on placing CPD in the context of scholarly practice in the natural sciences at Stellenbosch University. The third chapter investigates the provision of CPD in the natural sciences that could enhance integrated scholarship. The fourth chapter investigates the quality of learning within CPD as a measure of scholarly development. The fifth chapter reports on the evaluation of scholars' learning in CPD in the natural sciences at Stellenbosch University, while the sixth chapter focuses on current issues and future trends in CPD for natural science lecturers at Stellenbosch University that will motivate an integrated and holistic approach to scholarly development – based on their own insights into their professional practice. The final chapter concludes the study with recommendations for the future practice of CPD within this sphere.

The main findings indicate a difficulty in defining CPD, as these lecturers see themselves as a diverse group not easily confined to the traditional boundaries of a professional sphere. This difficulty in defining CPD has a direct influence on the lecturers' need for CPD and the purpose of CPD within this sector of higher education. The provision of CPD for lecturers in the natural sciences does not conform to an integrated and coherent system of provision between the different stakeholders. Many initiatives are informal and are initiated according to individual needs. There is evidence of collaborative efforts within the different disciplines, although they are limited in terms of transdisciplinarity and true integration of scholarly roles. As a result of the complexities of academic practice, the quality of learning within the existing CPD initiatives is not easily determined. The progression from novice to expert is a continuous process, which is mostly self-directed and reflective in nature. Formalised government interventions, Total Quality Management systems, leadership development, mentorship and situated learning are presented as possible means of enhancing the quality of learning in CPD. The present study indicates the lack of appropriate evaluation of learning in CPD as the main shortcoming in the total process of CPD conceptualisation, provision, quality assurance and evaluation within the study population. Accountability for the monetary investment and energy spent on any CPD initiative is therefore limited. Portfolios, peer review, open-ended problems and simulations, auditing and observation of practice are presented as viable options for effective evaluation of learning in CPD that could enhance integrated scholarship. The

future trends in CPD are discussed in terms of the future context of practice; the role of and need for experts; how experts will be educated and how they will maintain their competence. This provides a holistic view of scholarly development through CPD within the context of lecturers in the natural sciences in the Stellenbosch University.



OPSOMMING

Die wêreldwye klem op lewenslange leer, die voortdurende en vinnige tempo van verandering en die mededingende aard van praktyk dwing professionele persone in alle sektore om op die voorpunt van die nuutste kennis, vaardighede en/of innovering te bly. Dit het tot die ontwikkeling van die term *voortgesette professionele ontwikkeling* (VPO) bygedra. Die universiteitsdosent in die natuurwetenskappe funksioneer binne 'n unieke gebied van professionele praktyk, aangesien die praktyk akademieskap vereis – wat elemente van beide vakspesifieke kundigheid en onderwyskundigheid vereis. Dit is steeds nie duidelik hoe VPO binne hierdie professionele terrein met betrekking tot behoefte, doel en voorsiening gedefinieer word nie. Die huidige gehalte van leer en evaluering van leer noodsaak ook ondersoek. Hierdie studie het gepoog om ondersoek in te stel na hoe VPO 'n rol kan speel in die ontwikkeling van akademieskap vanuit die perspektief van dosente aan die Fakulteit Natuurwetenskappe aan die Universiteit Stellenbosch. 'n Kwalitatiewe benadering is gevolg. Semi-gestruktureerde onderhoude met 'n doelgerigte steekproef, gevolg deur 'n vraelys met oop vrae met 'n gestratifiseerde ewekansige steekproef is gebruik.

Die resultate word gerapporteer in sewe hoofstukke, waarvan die eerste 'n oriëntering tot die voltooide studie is. Die tweede hoofstuk fokus op die plasing van VPO binne die konteks van akademiese praktyk in die natuurwetenskappe aan die Universiteit Stellenbosch. Die derde hoofstuk ondersoek die voorsiening van VPO in die natuurwetenskappe wat geïntegreerde akademieskap kan bevorder. Die vierde hoofstuk ondersoek die gehalte van leer binne VPO as 'n maatstaf van die ontwikkeling van akademieskap. Die vyfde hoofstuk rapporteer oor die evaluering van akademiese leer in VPO in die natuurwetenskappe aan die Universiteit Stellenbosch, terwyl die sesde hoofstuk op huidige kwessies en toekomstige neigings in VPO vir dosente in die natuurwetenskappe aan die Universiteit Stellenbosch fokus. Hierdie huidige kwessies en toekomstige neigings sal 'n geïntegreerde holistiese benadering tot die ontwikkeling van akademieskap motiveer – gebaseer op die dosente se eie insigte in hul professionele praktyk. Die finale hoofstuk sluit die studie af met aanbevelings vir die toekomstige praktyk van VPO binne hierdie sfeer.

Die hoofbevindinge dui op die problematiek in die definiëring van VPO, aangesien dié dosente hulself as 'n diverse groep beskou wat nie maklik beperk word tot die tradisionele grense van 'n professionele domein nie. Dit het 'n direkte invloed op hul behoefte aan VPO en die doel van VPO in hierdie sektor van hoër onderwys. Die voorsiening van VPO vir dosente in die natuurwetenskappe konformeer nie tot 'n geïntegreerde en koherente sisteem van voorsiening tussen die verskillende rolspelers nie. Vele inisiatiewe is informeel van aard en individueel inisieer hulle volgens hul eie behoeftes. Dit is duidelik dat daar 'n mate van samewerking is tussen die verskillende dissiplines, alhoewel dit beperk is wat betref transdissiplinariteit en 'n werklike integrasie van akademiese rolle. Weens die kompleksiteit van akademiese praktyk is die gehalte van leer binne die bestaande VPO inisiatiewe nie maklik om te bepaal nie. Die progressie van nuweling-na-kundige is 'n aaneenlopende proses, wat meestal selfgerig en reflektief van aard is. Geformaliseerde regeringsintervensies, Totale Gehaltebestuursisteme ('Total Quality Management systems'), leierskapontwikkeling, mentorskap en leer gesetel binne die individu se konteks word voorgestel as moontlike wyses van gehalteversekering in VPO. Die huidige studie dui op die evaluering van leer in VPO as die hooftkortkoming in die totale proses van VPO-konseptualisering, -voorsiening, -gehaltebevordering en evaluering binne die studiepopulasie. Toerekenbaarheid vir die

monetêre investering en energie bestee aan enige VPO-inisiatief is derhalwe beperk. Portefeuljes, eweknie-evaluering, 'oop' probleme en simulasies, asook oudit en waarneming van praktyk word voorgestel as lewensvatbare opsies vir die effektiewe evaluering van leer in VPO wat integreerde akademieskap kan bevorder. Die toekomsneigings in VPO word bespreek binne die toekomstige konteks van praktyk, die rol van en behoefte vir kundiges, asook hoe kundiges opgelei sal word en hul bevoegdheid sal handhaaf. Hierdie voorstelle verskaf 'n holistiese beskouing van akademieskapontwikkeling deur VPO met betrekking tot dosente in die natuurwetenskappe aan die Universiteit Stellenbosch.



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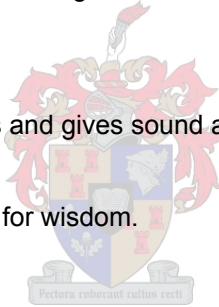
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CHAPTER 1

Orientation to the research

ABSTRACT

The emphasis on lifelong learning, especially within professional practice, is a worldwide phenomenon. Professionals are expected to remain up to date with the latest knowledge, skills and/or innovations in their field. This has led to the evolution of the term ‘continuing professional development’ (CPD). University lecturers function within a unique area of professional practice, as the practice requires elements of both discipline-specific and educational expertise – and with these forms of expertise the associated responsibility of scholarship in its various forms. However, it remains unclear how CPD within the professional arena of lecturers is defined in terms of need, purpose and provision. The current quality of learning and evaluation of learning practices also warrants investigation. This study aimed to investigate CPD in terms of these aspects from the perspective of lecturers in the Faculty of Science, Stellenbosch University (South Africa), and to relate the practice of CPD to the notion of scholarship in higher education. The results are reported in seven chapters, of which the first gives a research report on the study conducted. The second chapter focuses on defining CPD and scholarship within this context, and on determining the need and purpose thereof. The third chapter investigates the provision of CPD in this sector and its influence on scholarly development. The fourth chapter investigates the quality of learning in the CPD provided and discusses how the quality of learning has an influence on scholarship. The fifth chapter reports on evaluation of learning through CPD and how this can be applied to the notion of scholarship. The sixth chapter focuses on current and future trends in the field of CPD and scholarship that will motivate an integrated approach to CPD and scholarship in the context of lecturers in the natural sciences – based on their own insights into their professional practice. The final chapter concludes the study with recommendations for practising CPD and scholarship within the specific professional sphere.

1.1 INTRODUCTION

This chapter aims to motivate and outline a study that explored the practice of continuing professional development (CPD) and its link to the notion of scholarship in the context of professional lecturers in the Faculty of Science at a higher education institution, Stellenbosch University, South Africa. The study was aimed at determining the need, purpose and provision of CPD. A further aim was to establish the quality of the CPD that is provided, and to explore the evaluation of learning that takes place during CPD in this environment. It includes an investigation of current and future trends in CPD. How each of these aspects of CPD links to the integration of various scholarly roles in practice was investigated. The study concludes with recommendations on how the practice of CPD within the professional sphere of lecturers in the

natural sciences can enhance scholarship. The dissertation is therefore divided into seven parts, namely:

- An orientation to the research that was conducted (Chapter 1)
- Defining CPD and scholarship in the specific context of higher education, and determining the need and purpose of CPD in this context (Chapter 2)
- Discussing the provision of CPD for lecturers in the natural sciences and how it relates to the development of scholarship (Chapter 3)
- Investigating the quality of learning through the CPD provided in the specific context and how this can enhance scholarship in academic practice (Chapter 4)
- Exploring the evaluation of learning in CPD for university lecturers in the natural sciences and how this can be applied to the development of scholarship (Chapter 5)
- Determining current and future trends from the current status of CPD within this sector and its implications for scholarly development (Chapter 6)
- Offering recommendations for the practice of CPD and its integration into the various scholarly roles of lecturers in the natural sciences in future (Chapter 7).

These components are presented as chapters in the dissertation and form an integrated set of publishable papers (Chapters 2 to 6, in particular). Therefore each chapter consists of an abstract, introduction, discussion (including relevant literature and study results), conclusions and references. Overlapping does occur, but as the results will be reported as seven separate chapters, this format was considered the most appropriate alternative in reporting the study.

A theoretical framework is integrated and synthesised into each chapter. This positions the study in terms of recent relevant studies and issues. The authoritative arguments put forward in these sources of information anchor the study and show that contrasting arguments were not ignored. An overview of relevant literature helps create a logical argument and proves the significance of the study. Henning, Van Rensburg and Smit (2004) promote a critical engagement with an existing body of literature. Policy documents as sources of information were also incorporated where necessary.

This chapter includes the motivation and problem statement for the study and outlines the research design and methods, data collection, data analysis and data presentation that were used. It also briefly focuses on the main assumptions and limitations in the study, as well as on ethical considerations that were taken into account. The overview that is provided of the quantitative results of the study in terms of the target population and valid sample population creates a backdrop to the context in which the study was conducted.

1.2 MOTIVATION FOR THE STUDY

Continuing professional development (CPD) apparently gains relevance and prominence in a global society characterised by constant change. Houle (1980), as quoted in Cervero (2001) and Mott (2001) respectively, predicted that global competitiveness, higher levels of acceptable performance, rapid knowledge advancements in all professions and the need to cope successfully with larger and more complex forms of knowledge would lead to a greater need for and valuing of CPD – even to the point where it would rival pre-service professional education. Stellenbosch University (2000) clearly recognises these worldwide trends as demands, opportunities and risks presented to the university in its strategic framework.

How we understand professional practice shapes how we are treated as beneficiaries of continuous professional development, how we act as professionals and how the facilitators of continuing professional development respond to the needs and demands of professionals as learners (Wilson, 2000). Learning in continuing professional development (CPD) programmes becomes a central issue for practice development (Kabouridis & Link, 2001; Daley, 2000). This is also true for lecturers as professional academics at a university.

The higher education sector forms a unique context for the practice of CPD amidst these global changes, as lecturers are expected to integrate various forms of scholarship, which demands interrelated expertise in various fields. This includes expertise in research, teaching, and management. Lecturers need to develop their knowledge and skills in these areas continuously to function optimally in academe. Initial education is often not adequate preparation for practice (see Chapter 4) and therefore the importance of CPD in the development of scholarship is emphasised in this study.

Costley (2001) refers to professional intellectual capital as the most important factor in an organisation's success. A tremendous amount of human and financial resources is invested in the three to six years of professionals' initial education, but little systematic thought is given to what happens in the following 40 years of professional practice (Cervero, 2001; Cervero, 2000). The 1980s saw the emergence of CPD as a distinct area of practice and study, but several critical issues remain to be addressed if CPD is to fulfil its potential as change agent in the improvement of professional practice. Cervero (2001) claims that CPD lacks a unified and well-developed system of delivery. CPD is commonly characterised by programmes that merely aim to update professionals on the latest developments, in which knowledge is transmitted in an ineffective manner. These programmes are offered by a pluralistic group of providers who do not work together in a co-ordinated fashion. The major reason for this sombre picture is the transitional stage at which many professions find themselves, in which they are forced to experiment with different purposes, forms and locations for the delivery of CPD. It is unclear

where this transitional period will lead us, as CPD remains largely responsive to changes in the global market. Furthermore, individuals' learning patterns vary considerably – depending on their profession, location of their workplace and opportunities for participation in CPD (Cervero, 2001). These issues and trends are also evident in higher education institutions that act as employers of lecturers as professionals.

There seems to be a need for programmes to broaden their focus, incorporate diverse methods and formats of providing education, conduct more rigorous programme evaluations and establish new collaborative partnerships to survive in future. There also seems to be a need for more comprehensive programmes that address leadership and management skills, professionalism, professional academic skills, technological changes, organisational development and coping with change (Steinert, 2000). These proposed changes have implications for the training of lecturers as scholars in higher education. The training of lecturers previously focused mainly on the improvement of teaching skills and instructional effectiveness. O'Rourke (1997) states that an increasingly heterogeneous learner population, diversity in organisational cultures, and rapid technological changes create a demand for leaders who are democratic, have a vision, can fill multiple roles and are adaptable to changing circumstances. Competence, accountability, professionalism and lifelong learning are concepts that are currently guiding professionals to continuously improve their expertise. This accurately describes the current academic milieu where lecturers have to practise. The scholarly demands placed on lecturers require the development of multiple forms of expertise.

These aspects are directly addressed in the Stellenbosch University Strategic Framework (Stellenbosch University, 2000) where more democratic governance, participatory management and collaboration within the university and with other higher education institutions and industry are envisioned. The increase in the strategic control of central government over higher education in South Africa and the major changes in the student population have placed greater emphasis on socio-economic responsibility and responses from the higher education sector (see Chapters 2 and 6 for more detail). Stellenbosch University has chosen to see diversity as a value-adding factor and therefore chose an inclusive approach to managing its core responsibilities. This is, however, not an easy process, as it should probably be done without sacrificing the institutional autonomy and academic freedom so valued by its academic employees. CPD may not be a miracle cure for all the shortcomings and difficulties experienced by a higher education system, but it might play a significant facilitative role in ensuring the survival and prospering of its core members – the academic corps of scholars.

This study makes specific reference to a South African example in higher education and therefore provides a local insight into the general conceptualisation of CPD and scholarship in higher education in South Africa.

1.3 PROBLEM FORMULATION

Lecturers in higher education are faced with unique problems. The academic culture often places a higher value on scientific knowledge and research skills than on other forms of scholarship (Daley, 2001; McDonald, 2001). This is also evident in the emphasis placed on research-related activities in the Strategic Framework of Stellenbosch University for the turn of the century and beyond (Stellenbosch University, 2000). The segmentation of knowledge into sequential, discipline-specific credit units has made the integration of scholarship roles even more difficult. In order to adhere to the demands of this knowledge-based curriculum, these lecturers lose touch with the practice for which they are supposed to prepare prospective professionals. Lecturers in higher education are often caught between advancing their own careers within the academic sphere and preparing their clientele for professional practice (Daley, 2001; McDonald, 2001). McDonald (2001) adds that lecturers should not become estranged to the realities of practice. In academe, this means developing as a scholar in research, teaching and engagementⁱ. Lecturers as academics are therefore expected to maintain expertise within their specific field of practice, and they need to understand the pedagogy of conveying this expertise to their students and the wider community. Learning – as an essential component of scholarly development – is then envisioned as a transforming process for all concerned, rather than a mere transfer of information. This is increasingly difficult in a system that places diverse demands on its members in terms of research, teaching, engagement, integration and administrationⁱⁱ.

The development of lecturers is emerging as an essential element in the process of improving educational programmes. There is not only a need for knowledge-based educational programmes. These programmes should also consider the social function of professionalism (i.e. engagement, or community interaction, as it is known at Stellenbosch University). Increasing academic requirements in the workplace further necessitate that academics are highly qualified (McDonald, 2001; Kachingwe, 2000; Cobb, 1999).

An integrated model of academic professional practice in higher education is therefore implied, which integrates the lecturer's scholarly roles of teaching, research, engagement, integration and administration. This is in contrast to a more one-dimensional model, where the academic practitioner would focus on only one of these roles and develop linearly within the specific role. Stellenbosch University (2000:10) adheres to the integrated model of practice, where "the

University sees its research, teaching and community service as the core processes of an institution that has to be and intends to be dynamic, relevant, accessible and comprehensive".ⁱⁱⁱ

McDonald (2001), Kachingwe (2000) and Cobb (1999) point out the difficulty in developing, integrating and balancing these roles and responsibilities in practice. Can CPD be seen as a coping mechanism for modern-day lecturers in their constant quest for professional balance and excellence as scholars? This question relates to the purpose of the study, which is investigate the phenomenon of CPD within the context of lecturers in the natural sciences at Stellenbosch University in order to conceptualise CPD as an integral component of scholarly development. The study aims to provide a holistic view of the need for, purpose and provision, quality and future of CPD for lecturers, with specific reference to lecturers in the Faculty of Science at Stellenbosch University. This will give insight into the reality of CPD in academic practice, create an understanding of the scope and practice of CPD within this sphere and make suggestions on how an integrated approach to CPD and scholarship can enhance the practice of lecturers in the natural sciences.

Basic concepts identified in relevant literature need to be described before a research design can be formulated. It will give order to the study and facilitate strategic planning in this regard. The most important concepts are described below (in alphabetical order). The description of the basic concepts is focused within the context of the specific study and therefore does not suppose a broad applicability across all contexts.

1.3.1 Continuing professional development

For the purposes of this study it was consciously decided to use the term *continuing professional development* rather than related terms such as *continuing professional education* (CPE), *continuing professional learning* (CPL) or *staff development*. Continuing professional development is seen as the broadest possible concept that incorporates both the education and learning (including self-directed and informal learning experiences, as well as formalised and non-formal learning) that professionals engage in during their transition from novices to experts and beyond. Development as such goes further than education (the transfer of knowledge and/or skills through various means) and learning (incorporating education into existing knowledge and/or skill systems). Development includes incorporating and adapting all that is learnt (in whichever way) into professional practice, making it appropriate to the individual professional's context. Continuing professional development stretches beyond knowledge and skills to the values and attitudes that define an individual's professional identity as a scholar. The focus in this study was specifically on lecturers as professional practitioners in academia. Staff development could include employees of the university at all levels. It also places greater emphasis on the organisation than on the individual in terms of needs, purposes and provision

of development initiatives. Therefore continuing professional development seemed more appropriate within the scope of the specific study as it implies a holistic approach to learning, transformation and application that takes place within the total context of professional practice.

Healy and Lawler (2002) give a concise definition of CPD as an extension of preparatory learning to enhance competence and career advancement. Mott (2000) adds that CPD extends and amplifies knowledge, sensitivity or skills obtained during the initial education of a professional. Sadler-Smith, Allinson and Hayes (2000) state that it is systematic, and they stress the inherent self-directed nature of CPD activities.

Kachingwe (2000) supplies a more specific definition, but with a broad applicability. CPD is defined as any developmental activity in a formal, non-formal or informal setting that not only enhances a professional's skills and competence, but also leads to learning and personal transformation. CPD is consequently defined as the ongoing, structured or unstructured learning and developmental opportunities pursued by particular professional groups and their members (Battersby, 1999). Madden and Mitchell (1993), as quoted in Challis (1999: 373), add that CPD is the maintenance and enhancement of the knowledge, expertise and competence of professionals throughout their careers, according to a plan that takes into account the needs of the professional, the employer and society. Stellenbosch University (2000) refers to this notion as a human resources strategy that includes a focused approach to managing and leading all staff. Therefore CPD is also a form of career development that should ideally integrate individuals' aspirations and the organisation's interests. This distinguishes CPD from other kinds of adult education in that the stakeholders include not only the participants, but also clients, employers and organisations (McDonald, 2001).

Professionals seek CPD as additional developmental experiences to remind them of what they once knew and have forgotten (affirm and refresh), to acquaint them with the latest developments in knowledge (update) and to help them solve problems (reflect and apply). Continuing development is a vital instrument through which professionals can channel their creative energy, talents and skills in order to remain relevant in society and continue to be viable in the profession. The learning itself can be either incremental (refining or adding to past learning) or transformational (which is new and fundamentally different from previous learning). It is a unique combination of theory and practice (Alemna, 2001; Beatty, 2001; Daley, 2001; McDonald, 2001). A broader exposition of CPD within the context of lecturers in natural sciences will be given in the second chapter of the thesis.

Evans, Ali, Singleton, Nolan and Bahrami (2002) conclude that CPD is a lifelong learning process for all individuals and teams, which enables professionals to expand and fulfil their

potential and meets the needs of their clients. This process should ideally incorporate the principles of adult learning and there should be an evaluation of their effectiveness. Stellenbosch University (2000) specifically refers to a system of performance management of academics that evaluates their effectiveness. The effectiveness of this system itself as an evaluation tool (especially in terms of CPD) is, however, debatable and will be discussed in greater depth in the Chapter 5 of the thesis.

Continuing professional development within the context of this study can therefore be defined as any formal, non-formal or informal initiative beyond initial training, whereby the lecturer as professional practitioner obtains knowledge and/or skills that can transform professional practice and/or professional identity. CPD refers to the enhancement of professional competence and expertise to the benefit of the individual professional, the organisation, its clients and society as a whole.

1.3.2 Evaluation of learning in continuing professional development

The evaluation of learning forms an integral and essential part of the practice of CPD. The evaluation of learning in CPD can be defined through the summary presented in Table 1.1^{iv}, which is based on the work of Erasmus and Van Dyk (2003: 256), Wade (1995: 4) and Van Dyk, Nel and Loedolff (1992: 254-257). It includes the various reaction levels and corresponding evaluative questions for each level.

TABLE 1.1: An integrated approach to the evaluation of learning in continuing professional development

Evaluative questions Level	Why?	What?	Who?	How? Data collection
Reaction	Determining satisfaction	Learner attitude to learning situation	Individual learner	Smile sheets
Learning	Determining whether learning actually took place as a result of CPD	Changes in knowledge and/or skills	Individual learner	Traditional tests, to portfolios – depending on the context
Behavioural change	Determining whether learning had an effect on the learner and had long-term benefits	Actual practice of gained knowledge and/or skills	Individual learner Co-workers Superiors	Workplace observations Portfolios (self-evaluation coupled with external evaluation)
Organisational change	Determining whether CPD contributes to profitability and growth	Organisational success	Organisation as a whole	Organisational performance records

[Adapted from Erasmus and Van Dyk (2003: 256); Wade (1995: 4) and Van Dyk, Nel and Loedolff (1992: 254-257)]

Table 1.1 summarises the important aspects that will have to be taken into account when investigating the evaluation of learning in CPD. The reaction level presents the most elementary as well as the most commonly used evaluation practices. The reaction level gives an indication of the individual's satisfaction, but cannot determine whether learning or behavioural or organisational change took place. Its results are therefore of limited use. The evaluation of learning assesses impact at a deeper level than mere satisfaction, but cannot indicate whether behaviour has changed, or whether changes in the organisation have taken place as a result of the learning. Behavioural changes are often difficult to measure, but the results of such measurements are more useful in determining the true impact of CPD. Organisational change goes further than evaluation of the individual. It serves as the ultimate indicator of transformation and growth. It should not replace but rather supplement the previous individual evaluation levels. Ideally, learning should be evaluated on all four levels to ensure a comprehensive understanding of the total process of learning and its results. The evaluation of learning within CPD for university lecturers will receive more attention in the Chapter 4 of this thesis.

1.3.3 'Novice' and 'expert'

Developing as a scholar is a lifelong process, in which moving from a novice to an expert is an essential rite of passage into academic practice. Quality of practice and further learning rests not only on a substantial knowledge base, but also on expertise – the art of practice. The evolution from novice to expert has been the focus of various studies and forms an important component of an understanding of what constitutes successful CPD (Daley, 2001; McDonald, 2001; Daley, 2000; Daley, 1999).

Various forms of knowledge and skills are necessary for effective practice, but it is reflection that separates the novices from the experts. Daley (1999) identifies five stages of professional development on the continuum from novice to expert. Novices have little experience of real situations and therefore rely on rule-oriented behaviour to guide their practice. Advanced beginners start to cope with reality and differentiate between situations. Competent professionals usually have three to five years of practice experience, can organise and plan activities and can cope with unpredictable situations. The proficient professional will progress to a holistic sense of the work. Experts are able to transform information into practical knowledge, which is made meaningful by context. Intuition is a term often associated with expertise and refers to an integrated and holistic knowledge framework, which is embedded in practice and based on rapid recognition and the retrieval of familiar patterns from past experiences. The expert professional is an involved performer, not just a detached observer guided by clinical reasoning and judgement. Experts understand their own learning process within the context of their practice. They know how to search for information through self-initiated strategies and link

this to their experience. They are willing to change their practice based on the new knowledge (McDonald, 2001; Daley, 2000; Daley, 1999).

Daley (2001), Calman (2000) and Daley (1999) clearly indicate that knowledge and experience in professional practice interact in the learning process. Future research in this area needs to focus on the difference in learning practices as a professional progresses from novice to expert. It is still not clear whether this progression results from events in the professional's life or as a result of natural developmental forces. Furthermore, if we support Cervero's (1988) view that the purpose of CPD is the development of professional artistry, it is clear that the development of expertise in practice relies on the development of expertise in learning. This implies a need for more innovative facilitative and learning strategies through which knowledge will complement practice. It also necessitates research of a more critical nature concerning CPD and learning in general (Sadler-Smith, *et al.*, 2000). Action research, critical learning communities, development of portfolios and recording of life histories are emerging as new generation forms of research that incorporate reflective practice and collaborative elements (Ferraro, 2000; Castle, Holloway & Race, 1998).

These trends in research will define the future approaches to learning and training, of which CPD is no exception. It is also of importance in this study as the rate and depth of the lecturer's progression from novice to expert is greatly determined by the quality of learning, which in turn is influenced by the approaches to learning. Although novices in the academic profession often start out with substantial subject-specific expertise (as a result of their postgraduate studies), they are not necessarily well equipped for the academic professional practice as a whole (see Chapter 4). The development of expertise in academic practice demands a broader focus and alternative learning strategies. The manner in which these novel approaches are present or need to be incorporated in the development strategies of lecturers in the study population will be explored in greater depth, particularly in Chapter 3 of the thesis.

1.3.4 Profession

A profession can generally be described as an occupational group that shares specialised skills requiring extensive systematic and scholarly training, which has restricted access with rigorous entrance and exit requirements and claims high social prestige because of its importance to society. It can further be categorised as helping, entrepreneurial or technical – which are not mutually exclusive categories (McDonald, 2001; Kachingwe, 2000).

How a specific group of scholars define their profession will have a determining effect on their continuous development practices. The manner in which professionalism is perceived amongst the study population will be reported in Chapter 2 of the thesis.

1.3.5 Quality learning in continuing professional development

If CPD is to be of a high quality, the question still remains: How do professionals learn? Professional knowledge is not independent of how it is learned or used. It is important to know how professionals learn and acquire knowledge in order to provide relevant CPD of a high quality.

Daley (2000) states that CPD is still practised without a model that sufficiently explains professional learning. Previous models have relied strongly on the teaching of technical skills, the transfer of learning and the adoption of innovation. These models proposed a linear flow of knowledge to practice, with knowledge that is created in one location (usually a university setting), and that is disseminated through CPD programmes and then transferred to and adopted into practice. This resulted in CPD programmes that tried to provide up to date information rather than to cultivate lifelong learning.

Mott (2000) proposed an integrated model of learning for CPD that incorporated reflection in action, reflective theory building, constructivist knowing and problem posing. Reflection in action refers to situations where professionals are confronted with problems that cannot be immediately explained or solved within their zone of mastery – they have to search for additional information (Borduas, Gagnon, Lacoursière & Laprise, 2001; Confessore & Confessore, 1994). Reflective theory building can be summarised as the incorporation of newly learned theory into professionals' existing knowledge structures by means of reflection (Mott, 2000). Constructivist knowing was conceptualised by Daley (1999) as the development from novice to expert in which the professional's learning becomes increasingly constructivist and self-directed. This means that experts are able to construct meaning from ill-defined and complex content areas by improvising and drawing on their professional experience. Problem posing is a form of problem generation that evolves as professionals explore situations, ask questions of themselves and others, learn to reason, and experience the communication of ideas (Gonzales, 1998). It is evident that these concepts are related, that they should be integrated in learning through CPD and that they should play a role in determining the quality of learning in CPD.

The notion of scholarship, however, demands that learning takes place in various areas of expertise. Quality of learning in CPD is therefore a multi-dimensional concept that warranted investigation in the study. The third chapter in this thesis will investigate the quality of learning that enhances scholarly development in greater depth.

1.3.6 Scholarship

The meaning of scholarship and scholarly development has been at the centre of debates and studies in higher education for at least two decades. The seminal work of Boyer (1990) and later Rice (1991; 1996; 2002) and Diamond (1993; 1999) identified and described various scholarship roles, including the scholarship of discovery, teaching (and learning), application, and integration. Lynton (1995) and Lynton and Driscoll (1999) later added the scholarship of engagement. Various authors (O'Meara & Rice, 2005; Badley, 2003; Sorcinelli, 2002; Zahorski, 2002) refer to the ideal of an integrated approach to scholarship that balances the various scholarly roles. These scholarship roles need to be contextualised against the backdrop of a specific discipline (as advocated by Diamond, 2002; Rice, 2002; Paulsen, 2001 and Andresen, 2000) – the natural sciences at one South African university in the case of this study.

Boyer (1990) notes that initial notions of scholarship referred to various forms of creative work, which did not necessarily have to take place within the boundaries of academe. A scholar in these times was judged by his/her ability to think, communicate and learn. Scholarship has since taken on a much narrower definition – that of having an academic rank within higher education, being involved in research and publication and (sometimes) teaching within a specific discipline. Boyer (1990: 16) advocates a broader view:

Surely, scholarship means engaging in original research, but the work of the scholar also means stepping back from one's investigation, looking for connections, building bridges between theory and practice, and communicating one's knowledge effectively to students.

Scholarship is furthermore determined by having scholarly credentials within a specific discipline (usually by means of research), staying abreast of the latest developments in this field, maintaining the standards of integrity of the discipline (thus refraining from any unethical behaviour), and by assessment of scholarly work in whichever form (often through publication and peer review). Glassick, Huber and Maeroff (1997) translate these scholarly prerequisites into more definite criteria for scholarly practice, namely clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique. These criteria apply to all activities deemed as scholarly – be it discovery (research), teaching, engagement (service) or integration. Boyer (1990) concludes that a delicate balance exists between systematic rigour and flexibility in the assessment of scholarship.

Scholarship is therefore a multi-dimensional concept and the scholar is expected to negotiate what Barnett (2000, in Harris, 2005: 426) describes as “dynamic relationships between social and epistemological interests and structures”. Scholarly identity is a product of individual values and beliefs, as well as institutional culture and positioning of the particular discipline. Developing

a scholarly identity has become increasingly difficult in an academic environment that places multiple demands on the scholar (Harris, 2005), but where research is seen as “the strongest academic currency in higher education” (Henkel, 2005: 164). Scholarly development and identity therefore tend to focus on the scholarship of discovery in a specific discipline (Andresen, 2000).

Boyer (1990) concludes that four scholarship roles can be distinguished in academic practice:

- the scholarship of discovery (research);
- the scholarship of teaching, to which learning was later added;
- the scholarship of application, which in more recent literature is referred to as engagement; and
- the scholarship of integration.

These categories of scholarly roles will be used as a basis for the arguments posed in this study. The study will focus on how CPD can facilitate the integration of these different forms of scholarship in the academic practice of lecturers in the natural sciences.

The notion of scholarship and what it means to be a scholar and conduct scholarly work in academe will be discussed in greater depth in the following chapters.

1.3.7 University

UNIVERSITY may be considered with reference either to its Students or to its Studies; and the principle, that all Knowledge is a whole and the separate Sciences parts of one, which I have hitherto been using in behalf of its studies, is equally important when we direct our attention to its students. Now then I turn to the students, and shall consider the education which, by virtue of this principle, a University will give them; and thus I shall be introduced, Gentlemen, [sic] to the second question, which I proposed to discuss, viz., whether and in what sense its teaching, viewed relatively to the taught, carries the attribute of Utility along with it.

Newman (1852, reprinted 1996: 99)

Newman’s quote (1852, reprinted in 1996) leads us to consider what the idea of a university stands for in the twenty-first century. It is important to describe the term *university*^v in the context of this particular study, as it provides the institutional framework within which CPD takes place.

Kerr (as quoted in Newman, 2000) notes that amongst the 85 institutions established by 1520, 70 are universities. Kerr (1994) furthermore notes that higher education institutions, such as universities, have developed from elitist organisations peripheral to society and serving only the so-called learned professions to a much more central and accessible position in societies worldwide. Universities therefore have a central role to play in the health and wealth of nations through the building of human capital and accumulated knowledge.

Newman (2000) notes five fundamental characteristics that have typified universities through the ages: the gathering of a scarce and skilled academic workforce, the campus as the place of learning, the selection of students, a collection of learning material (primarily books) assembled in a library that forms the centre of learning, and face-to-face instruction in the classroom. However, there are modern-day higher education institutions that do not conform to any of these characteristics. Newman (2000) argues that despite the diversity in structures, purposes and practices of universities, the ideal of a safe space for scholarship and critical debate still exists. The notion of scholarship has remained integral to the idea of a university, and CPD has become the avenue for scholarly development in academic practice.

Universities and other higher education institutions remain one of the main providers of CPD, and offer a channel through which organisations can achieve legitimate certification and/or accreditation for their CPD programmes. Academic credit is widely recognised as a motivator for professional development. The university should not be the provider of knowledge, but rather the facilitator and referee of learning (Cervero, 2000; Knox, 2000; Hendry & Waltham, 1998).

This role of the university is reflected in the mission statement of Stellenbosch University: “The *raison d’être* of the University of Stellenbosch is to create and sustain, in commitment to the universitarian ideal of excellent scholarly and scientific practice, an environment in which knowledge can be discovered; can be shared and can be applied to the benefit of the community” (Stellenbosch University, 2000: 9). The main functions of a university can be described as providing accredited courses at the required level, initiating and supporting research and participating in community ventures aimed at improving the quality of life of the public (Stellenbosch University, 2000). Note that the scholarships of discovery, teaching and engagement are specifically implied in these statements. In essence, a university is therefore a learning organisation that promotes scholarly development and thus its members (including its employees) should be lifelong learners.

The strategic plan of the university further commits the institution to career development of its staff that takes into consideration jointly the aspirations of individuals and the needs of the organisation. This plan clearly states the need for a corps of people who are vision-driven,

motivated and competent (Stellenbosch University, 2000). CPD should play an important role in achieving these goals.

1.3.8 University lecturer in higher education (professional academic)

Naylor (1997) states that improved development for professionals will improve professional quality. It might therefore be necessary to define what constitutes a quality professional before exploring what constitutes quality in CPD. Cobb (1999) indicates a combination of attributes found in quality school teachers, which could be made applicable to lecturers at a university, including pedagogic knowledge (which could be translated into a combination of pedagogical and andragogic knowledge for the purposes of a university setting), subject area content knowledge, skills and attitudes necessary for effective learning, a strong understanding of human growth and development, effective communication skills, a strong sense of ethics and a capacity for renewal and ongoing learning. A well-trained academic force is essential in preparing learners to function competently within an increasingly technologically information-based society. Therefore, the quality of learning produced is greatly determined by the quality of the educators involved.

These attributes will influence how successful lecturers as professionals can fulfil their scholarly responsibilities. Three core responsibilities are identified in the professional practice of university lecturers, including teaching, research and community service (Stellenbosch University, 2000).

For the purposes of the study a *university lecturer in higher education* (also referred to as a professional academic) will include persons employed on a permanent basis as academic staff in the Faculty of Science at Stellenbosch University, South Africa.

1.4 RESEARCH DESIGN AND METHODOLOGY

Smit (1995) describes scientific research as a critical, purposeful and planned action with the aim of investigating existing points of reference or theories in the light of new insights.

Smit (1995) and Gay (1987) further classify scientific research as basic, applied or programme-evaluating. Gay (1987) continues to say that basic and applied research is not mutually exclusive, but rather forms a continuum. The study was basic in the sense that it aimed to ask fundamental questions about the complexities associated with scholarship and CPD in a real-life situation in order to analyse, understand and explain these phenomena in terms of both existing and new knowledge. It did not try to find a solution for or explanation of a single event, but was rather designed to address the wider phenomena of scholarship and CPD of university lecturers in general. This does, however, not imply that it has no practical utility and application

value. The research results of the study will be applied in the sense that they aim to supply data that will support theory, guide theory revision and/or suggest the development of new theory and practice within the specific context of CPD for university lecturers as scholars.

The research approach in this study was focused within the interpretive paradigm. Henning *et al.* (2004) and Babbie and Mouton (2001) refer to the interpretive research paradigm as an approach that seeks an understanding of the meanings that people give to their own social interactions – thus an interpretation of the researched issue from the point of view of the person or group that forms the focal point of the research. It aims to uncover how the interpretations and understandings of individuals or groups influence their intentions and actions through a more technical approach by means of measuring instruments. This leads to a mutual understanding and consensus between different groups and can provide practical knowledge. Therefore the interpretive paradigm places emphasis on the active and autonomous role participants play in creating meaning. It also highlights that participants' values play a determining role in the meanings they create; that any action can be explained in terms of interacting factors, events and processes; that it is difficult to attain objectivity and make broad generalisations when individual systems of meaning are involved and that reality should be studied holistically, as the world consists of multi-faceted realities.^{vi}

Since interpretive research is concerned with the descriptive analysis and understanding of knowledge systems and the way in which they are constructed to create meaning, context sensitivity is of the utmost importance within this paradigm. Therefore qualitative methodology in investigation appears to be the logical choice when working within this paradigm (Henning *et al.*, 2004).

The phenomena of scholarship and CPD were investigated within the current professional practice and specific context of lecturers in the natural sciences. It focused on the way in which individual and organisational ideologies and structures are configured and the way in which CPD is practised within this arena. This forced participants to reflect on their professional roles and responsibilities and their continuous development practices within the realm of higher education. The study gives a holistic view of the phenomenon of CPD for university lecturers in the selected setting within the specific social context and indicates how this relates to the scholarly development of this particular professional group. The research results do not lead to broad generalisations, but rather enhance an understanding of scholarship and CPD within the specific context. The research seeks an understanding of CPD from the university lecturers' point of view by means of interviews and a questionnaire. This understanding is then used to underscore the importance of CPD in integrating various forms of scholarship. Therefore the interpretive paradigm can be seen as the dominant form.

Qualitative research that focuses on data collected within a specific context, interpretation and planning for action (Tuckman, 1994) is appropriate to this study. Henning *et al.* (2004) refer to qualitative inquiry as a research form, an approach or strategy, while Landman (1988) adds that qualitative research is the study of individuals in their natural surroundings in order to find out how they attribute meanings in social situations.

The qualitative research process is inductive (Henning *et al.*, 2004; Babbie & Mouton, 2001; Tuckman, 1994) in that understanding is developed throughout the research process with the researcher as key data-collection instrument. Babbie and Mouton (2001) further point to the centrality of the researcher within this paradigm, who does not distance him-/herself from the researched, but rather gains an insider's perspective. The first-hand knowledge the researcher obtains in the process is therefore valid within the specific context. It is referred to as "credible inter-subjectivity" (Babbie & Mouton, 2001: 273). Henning *et al.* (2004) refer to the qualitative researcher as the unequivocal main instrument in the research and point out that meaning arises from direct engagement in and understanding of the empirical field in which the study takes place. The researcher is therefore reflexively the co-creator of meaning together with the participants in the study. The fact that the researcher in this study had worked within the Faculty of Science at the Stellenbosch University for approximately eight and a half years, in collaboration with the Centre for Teaching and Learning at the same university for approximately three years, and at the Faculty of Education for approximately two years, enables her to have a critical, credible and in-depth understanding of the specific context.

This type of research will not collect data to support preconceived hypotheses or theories by the manipulation of variables (as is the case in deduction), but will develop theories in the course of the research process within the specific social context. It does not 'count' experiences or occurrences, but rather tries to find discernable patterns and reasons for a specific phenomenon. The data collected is guided by theory, but not predicted or prescribed by it. Qualitative research is holistic in that it focuses on a phenomenon as a dynamic whole and does not reduce it to clearly demarcated variables and cause-and-effect relationships. Therefore the data used is detailed, the inquiry is in-depth and the results are based on respondents' personal experiences and perspectives. This lived experience of participants contributes to the conceptual richness that distinguishes qualitative research from other forms of quantitative investigation. The design is also more flexible and more responsive to changing situations and understanding. It assumes that each case is unique, although it does allow for cross-case analysis (Henning, *et al.*, 2004; Tuckman, 1994; Landman, 1988). Babbie and Mouton (2001) indicate that when qualitative methods are executed properly in research, it

enables the researcher to ensure validity, as it enables a close fit between the data and what the respondents actually say and do.

Tuckman (1994) and Landman (1988) state that qualitative research need not be totally unstructured. Therefore the questions asked and the data-collection procedures are specified in advance. Structure adds to neutrality, efficient time use and reliability. The study therefore included semi-structured interviews and questionnaires comprised of mainly open-ended questions.

Data-collection methods, data-analysis procedures and the way in which the findings are reported and meaning constructed should form a cohesive whole. The design logic behind these aspects should be clear and carefully argued. It should coincide with the research tradition in which the study is planned and conducted (Henning *et al.*, 2004).

The methodology will be discussed in terms of the research methods used, defining the target population and sampling procedures employed, and explaining how issues of validity, reliability and bias were addressed and how data collection and analysis was conducted. The methodology also refers to the data presentation format and reports on the main assumptions, limitations and ethical considerations of the study.

1.4.1 Research methods

According to Gay's (1987) research method classification, the qualitative research conducted in this study falls within the interpretive paradigm and is of a descriptive nature. The qualitative methods that were incorporated into the study included semi-structured interviews and mostly open-ended questionnaires. Babbie and Mouton (2001) propose these methods as suitable means of a qualitative descriptive investigation. The questionnaires were designed to support and check the data obtained through the interviews in order to achieve triangulation and improve the quality of the analysis. Babbie and Mouton (2001) define triangulation as making use of multiple methods in order to avoid bias and overcome shortcomings of the researcher and/or method. It is considered as one of the best ways to promote validity and reliability in a study. Henning *et al.* (2004) promote the use of a variety of methods (at least two) in qualitative research, as it gives the data gathered variety and ensures that the studied phenomenon is studied from various angles.

Scheduled, semi-structured interviews were conducted with selected persons within the university (purposive sample – see 5.2) in order to obtain baseline information and substantiate the key information gained through the literature review. Tuckman (1994) describes interviews as a direct way to investigate a phenomenon and gain insight into the perceptions of those

involved in it. Interviews may give a representative picture and provide a basis for interpretation. It also usually provides more complete data as the interviewer ensures that all questions are answered and can include his/her (the interviewer's) observations in terms of the quality of the interview and characteristics of respondents not necessarily included in the interview schedule (Babbie & Mouton, 2001). Although scheduling maximises neutrality in approach and consistency in findings, Babbie and Mouton (2001) warn that in qualitative research the researcher should guard against too much structure. The continuous nature of qualitative interviewing means that it is continually revised and flexible as themes arise from the analysis. Gay (1987) recommends that interview schedules should also be pilot tested, as in the case of questionnaires. Gay (1987) proposes the use of semi-structured questions in interviews, involving structured questions followed by the clarification of the open-ended answers that follow. This allows a combination of objectivity and depth to be obtained. Gay (1987) further proposes the use of a cassette recorder in order to simplify the transcription of interviews and make the procedure more objective and efficient. These recommendations were taken into account and both pilot testing and a recording device were used in the study.

Interviews yield in-depth data not possible through a questionnaire, and reasons for particular responses can be determined. Interviews are also more flexible than a questionnaire (Babbie & Mouton, 2001; Gay, 1987), which makes the interview an ideal medium by which to obtain qualitative data. It does, however, have its disadvantages, such as possible bias towards the interviewer, which therefore requires more communication and interpersonal skills from the interviewer. Babbie and Mouton (2001) suggest that the interviewer should be able to speak the home language of the respondent, match the ethnic grouping, age and gender categories of the respondent, and be from the same area. As there was only one interviewer in the study, not all of this was possible, but as the researcher is fluent in the dominant languages spoken by the target population, is part of and knows the dominant culture and works at the same institution as the respondents, most of these requirements were met. The sample size for interviews is usually smaller than that for questionnaires, as was the case in this study. Ten interviews were conducted and 44 respondents were sampled for the questionnaire. Therefore a combination of the two methods in the research design was incorporated to yield the best results.

A single questionnaire was developed to explore how CPD is practised by the respondents. The four major areas under investigation, including a) definition, need and purpose; b) quality of learning; c) the evaluation of learning, and d) determining current and possible future trends from the current status within this sector, were included in the questionnaire. The information obtained through the interviews and literature review served as a basis for compiling the questionnaire. The literature studied indicated the main issues that were investigated. These issues were addressed in the interview phase and then refined in the questionnaire according to

the information obtained through the interviews. The questionnaire was pilot tested before being distributed to the respondents. Babbie and Mouton (2001), Tuckman (1994) and Gay (1987) recommend pilot testing strongly, as it enables the researcher to revise a questionnaire before use. A pilot test can help to determine whether specific questions can measure and discriminate specific predetermined qualities. A pilot test should be run with a group of respondents who are part of the intended test population, but who will not be part of the sample. These respondents should be encouraged to make recommendations regarding directions, recording procedures and specific items. The questionnaire was pilot tested by three lecturers who were working within the field of natural sciences at Stellenbosch University, but who would not form part of the eventual sampling population. Their recommendations were taken into account in finalising the questionnaire.

The finalised questionnaire consisted of both open-ended and closed-ended questions (See Addendum A). The closed-ended questions were appropriate for items where categories were specified. This ensured greater uniformity and was more easily processed, but the researcher's structuring of possible responses may not have been exhaustive. These problems are, however, usually sorted out in the pilot phase of questionnaire development. An 'Other' category was always included. The open-ended questions are more suitable for obtaining qualitative data and must be coded before they can be processed. They often require the researcher to interpret the meaning of responses. This procedure holds the dangers of misinterpretation and researcher bias. Irrelevant answers may also be received (Babbie & Mouton, 2001). Interpretation and coding was therefore done with great care.

1.4.2 Defining the target population and sampling

Babbie and Mouton (2001) describe a unit of analysis as that which the researcher examines in order to construct descriptions of all such units and to explain the differences among them. The unit of analysis determines the boundaries of a study (Henning *et al.*, 2004). The unit of analysis in the study was the individual lecturer of the Faculty of Science at Stellenbosch University in terms of selected characteristics, specifically post level.

Tuckman (1994) refers to defining the target population as systematically establishing boundary conditions that specify who will be included or excluded in the study. Gay (1987) adds that this definition should include the size and major characteristics of the target population. It is the first step in the sampling process and will depend on the variables that are investigated in the specific study (Tuckman, 1994; Gay, 1987).

The total target population consisted of the 119 permanently employed academic staff members of the Faculty of Science at Stellenbosch University, South Africa – according to the list of

permanent academic staff obtained from the human resources division at Stellenbosch University. The target population can be divided into five main categories according to post level, namely junior lecturer, lecturer, senior lecturer, associate professor and professor. The distribution of the permanent academic staff amongst these categories in the Faculty of Science is presented in Figure 1.1.

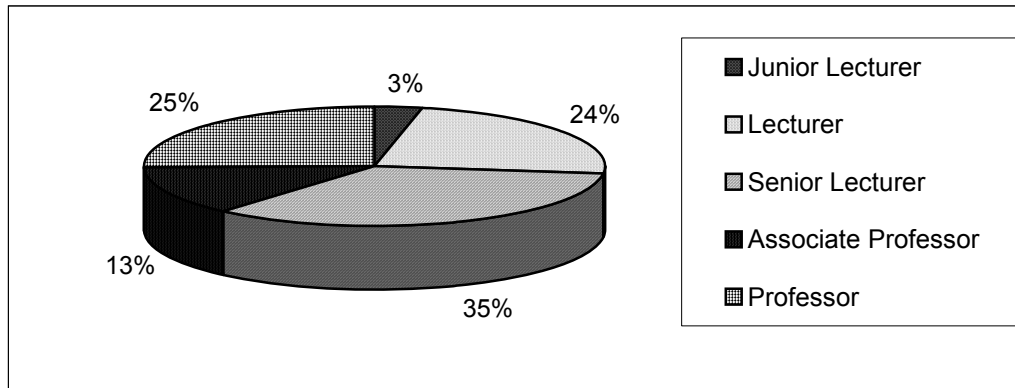


Figure 1.1: Percentage division of academic staff amongst the different post levels of the total target population

The Faculty of Science, and therefore the total target population, can further be divided into nine (9) departments, namely: Biochemistry, Botany and Zoology, Chemistry, Computer Science, Geology, Mathematics, Microbiology, Physics and Physiological Sciences. The Department of Consumer Science was not included in the study population, as it was in the process of unbundling at the time fieldwork was conducted. The distribution of permanent academic staff (total and in terms of post level) amongst these departments is given in Table 1.2.

TABLE 1.2: Distribution of permanent academic staff amongst academic departments of the total target population

Department	Total	Junior Lecturer	Lecturer	Senior Lecturer	Associate Professor	Professor
Biochemistry	12	2	2	2	2	4
Botany and Zoology	25	0	6	9	4	6
Chemistry	23	0	7	9	2	5
Computer Science	10	1	4	2	2	1
Geology	6	0	1	1	3	1
Mathematics	15	0	1	9	1	4
Microbiology	7	0	1	1	1	4
Physics	14	0	3	6	1	4
Physiological Sciences	7	1	3	2	0	1

Total	119	4	28	41	16	30
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Table 1.2 represents the total distribution of academic staff in the target population in terms of total values, as well as the division thereof amongst the different post levels. Figure 1.2 represents the total values presented in Table 1.2 as percentages and gives an overall visual image of the distribution of permanent academic staff amongst the academic departments as presented in Table 1.2.

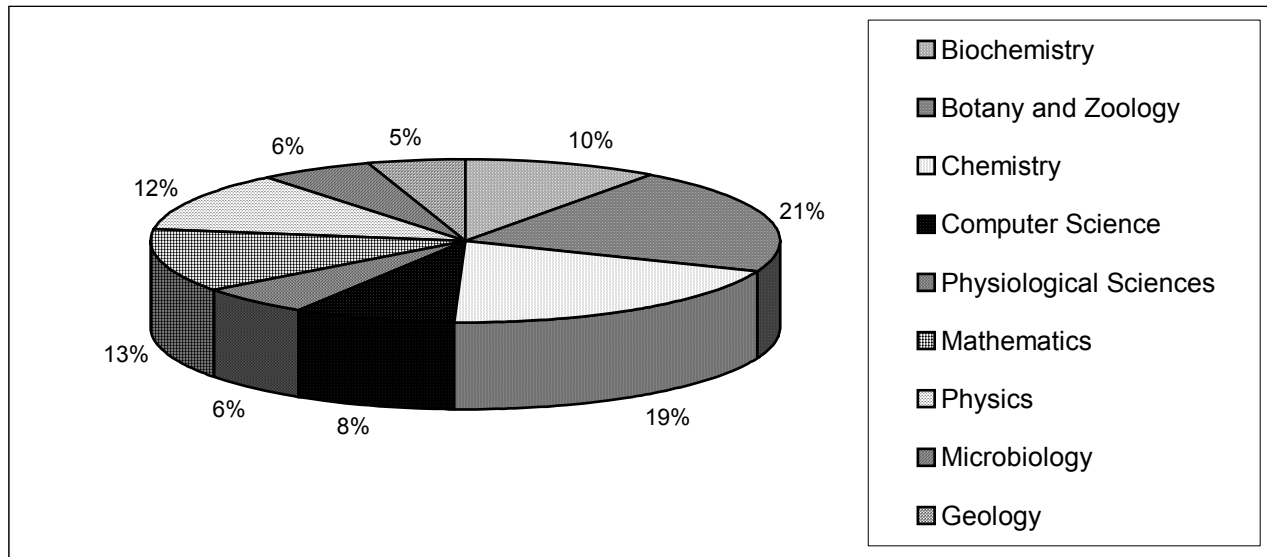


Figure 1.2: Percentage of total target population per academic department

The average years of experience in the service of Stellenbosch University of the total target population amounts to 10.75 years.

This concludes the description of the total target population from which the sample was drawn. The sampling procedure and results will now be discussed in greater depth.

Babbie and Mouton (2001) and Gay (1987) define sampling as the process of selecting a number of individuals for a study in such a manner that they represent the larger group (target population) from which they were selected. The degree to which a sample represents the total target population will determine the degree to which the results can be generalised (and therefore influence the external validity). A broadly defined sample will promote external validity, as generality is promoted. It may however, require a large sample and it may be difficult to obtain a representative sample. On the other hand, a narrowly defined sample may facilitate the selection of a suitable sample, but will restrict the conclusive generalisations that can be made (Gay, 1987). As it was not the purpose of this study to make generalisations, a smaller, more narrowly defined sample was drawn.

A purposive sample was drawn for the interviews. It consisted of 10 respondents who were chosen for their expertise relating to CPD within higher education:

- Associate professor in the Faculty of Science – Winner: Rector’s award for excellence in teaching, Faculty of Science, Stellenbosch University
- Senior lecturer in the Faculty of Science – Winner: Rector’s award for excellence in teaching, Faculty of Science, Stellenbosch University
- Research Advisor for Natural Sciences, Division for Research Development at Stellenbosch University (also emeritus professor in Chemistry)
- Director, Division for Community Interaction, Stellenbosch University – responsible for initiating partnerships with communities and facilitating and supporting processes that will strengthen community interaction
- Director: Centre for Teaching and Learning – responsible for some of the internal training programmes for academic staff at Stellenbosch University
- Senior advisor: Centre for Teaching and Learning – responsible for some of the internal training programmes for academic staff at Stellenbosch University and previously a staff member at the Faculty of Science, Stellenbosch University
- Senior Advisor: Centre for Teaching and Learning, Tygerberg Campus, Stellenbosch University – responsible for some of the internal training programmes for academic staff in the Faculty of Health Sciences, Stellenbosch University
- Contact person: Continuing Professional Development Programmes, Department of Psychology, Stellenbosch University
- Head: School for Public and Primary Health Sciences, Stellenbosch University – doctoral thesis on the evaluation of the professional skills gap and course content development for postgraduate professional skills training for medical practitioners delivering district hospital services
- Director: Centre for Student Counselling and Development, Stellenbosch University – responsible for CPD activities within the Division for Academic Counselling and Career Development.

A purposive sample was selected for the interview phase of the study. Babbie and Mouton (2001) advise that this type of sampling is suitable in conducting qualitative research, which seeks to gain the maximum amount of information within a specific context. This also enables the researcher to purposefully select respondents that differ from each other on specific variables (as described above). Henning *et al.* (2004) refer to purposive sampling as a useful approach in qualitative research as it identifies respondents that help to build and substantiate theory further and fit the criteria of desirable participants. These criteria are determined by the researcher’s knowledge of the topic and possible gaps in that knowledge that need to be filled. Babbie and Mouton (2001) provide three important criteria for the selection of appropriate

respondents for one-to-one interviews in qualitative research. Firstly, the respondent should be thoroughly encultured in the specific context of study and secondly, he or she should have a current involvement in the issue being investigated. Thirdly, the respondent should allow adequate time for the interview. A hasty interview will result in insufficient information. The respondents selected for the interview phase of the study met all these criteria. Although the sample size was not large (and therefore implied limited external validity), the interview phase was not conducted in order to make generalisations. The respondents in a purposive interview sample therefore need not be representative of a study population. The respondents in this case only represented a theoretical population that acted as spokespersons for the topic of inquiry. They were selected in terms of their expertise – in terms of the context within which the study was conducted, or their knowledge and understanding of scholarship and CPD within other sectors. Therefore a purposive sample was sufficient to obtain in-depth qualitative data that could inform and substantiate the following phase, which consisted of a questionnaire.

The predetermined boundary for the sample of the questionnaires in the study was the permanently employed lecturing staff in the Faculty of Science at the Stellenbosch University.

The sample for the questionnaire was selected according to the stratified random sampling technique. Babbie and Mouton (2001) and Gay (1987) define selecting a stratified random sample as a process of selecting a sample in such a way that identified subgroups are equally represented in the sample. Babbie and Mouton (2001) and Tuckman (1994) describe stratified random sampling as a good operational strategy for screening the study population and reducing the variability of the sample. Stratification acts as a precision measure that ensures that the sample contains the same proportional distribution of respondents on the selected parameters and is therefore representative of the selected target population, while randomisation within these strata prevents selection bias and decreases the probable sampling error. In a stratified random sample the target population is firstly defined and the desired sample size is determined. This is followed by the identification of the stratification parameters, or variables, which will represent the different strata. All the members of the population are then divided into the different strata. Within the different strata, equal numbers of respondents are selected at random (Tuckman, 1994; Gay, 1987).

Stratification in the questionnaire sample was done according to the five main academic post levels, namely junior lecturer, lecturer, senior lecturer, associate professor and professor. These strata therefore included all levels of expertise, with post level as an indication of expertise. Expertise in turn serves as an indication of the development continuum that extends from novice to expert (Chapter 4, Figure 4.3). The lecturer starts a professional academic career as a novice and progresses to an expert through gaining expertise in professional practice. This

progression would normally run concurrently with professional advancement in terms of post level. This allowed the researcher to include parameters that are of special interest to the study (i.e. expertise) and build in control for internal validity through random selection factors within the different predefined strata.

Randomisation was done within the strata with the help of the randomisation function within the *Excel* program. Ten respondents were randomly selected from each stratum, except for the first stratum (junior lecturer), where only four possible respondents were present, all of whom were selected. There were therefore 44 randomly selected respondents in total (36.97% of the total population of 119). The procedure followed in the stratified random sampling was done according to the advice of a qualified statistician (Nel, 2004). Gay (1987) recommends a minimum sample size of 10% of the total target population for a descriptive study. Babbie and Mouton (2001) regard five to 25 respondents as a sufficient number of respondents in a qualitative study. These recommendations were also taken into account when determining a sufficient sample size for the study.

A response rate of 65.91% was obtained, as 29 out of a possible 44 participants returned their questionnaires. Therefore 24.37% of the total target population participated in the study. The valid response rates within the different strata are presented as percentages in Figure 1.3 (with the valid response rate calculated as 100%).

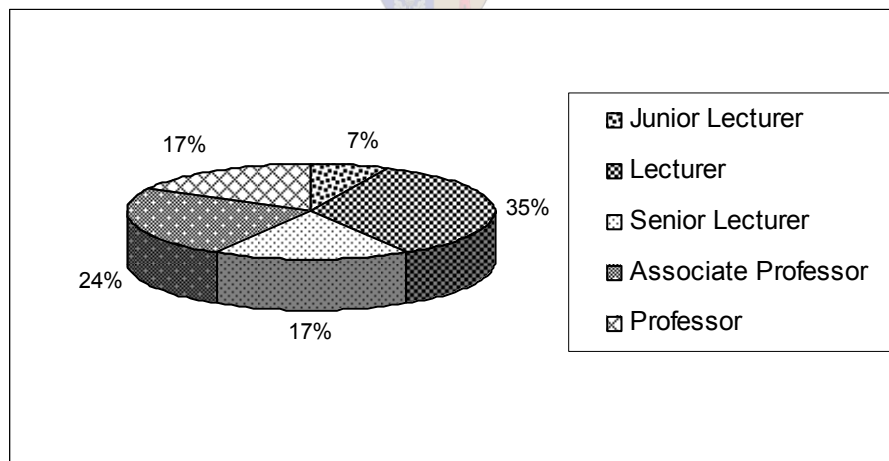


Figure 1.3: Representative percentages of different strata within the total valid response rate

The average total years of work experience of the valid sample population was 17.17 years. The average total years of service at Stellenbosch University of the valid sample population was 8.11 years (which is slightly lower than the 10.75 years of the total target population). The average years spent in the current position of the valid sample population was 4.03 years. It can therefore be assumed that upward mobility has taken place amongst the valid sample

population, as their total years of experience in service of Stellenbosch University is more than twice the years spent in their current position. This implies that they had to develop and increase their expertise in order to be promoted to a higher post level. But how, when and where does this development take place? These are questions that need to be answered by the study. They will be looked at in greater depth in the sequential chapters following the research report (Chapter 1).

1.4.3 Validity

The extent to which a measure reflects the real meaning of the concept under consideration is called validity (Babbie & Mouton, 2001). Tuckman (1994) describes two main types of validity that have to be taken into account in a study, namely internal and external validity.

Internal validity refers to the certainty with which the research results can be accepted in that the outcomes can be attributed to the approach used and not to other external variables not addressed in the study. A lack of internal validity could be a source of internal bias. Internal validity is therefore closely concerned with the research design (Tuckman, 1994).

External validity is achieved when the results can be applied in the real world to other similar approaches. It is therefore concerned with the generality of the research results, based on the research procedures used (Tuckman, 1994).

Tuckman (1994) recommends a balance between internal and external validity in the design of a study. There should be enough internal validity in order to obtain useful and conclusive results, whilst it should also try to achieve sufficient external validity within the reality of the setting to be representative and produce results that can be generalised (within the scope and approach of the study). A variety of data sources and analysis methods can ensure validity within the interpretive paradigm of research (Henning, *et al.*, 2004).

Investigation of existing case studies within formalised structures of CPD, such as those found in the fields of psychology and medicine in the planning of the study, contributed to its internal validity. A sampling strategy that clearly limited the studied population to a specific professional group of university lecturers in a specific faculty of the higher education institution, added to the certainty. Furthermore only one fieldworker conducted the research (interviews and distribution of questionnaires), which equalised the researcher effect across the sample. The qualitative nature of the study limited generalisation of the results to a wider population (other professions), but the sampling methods intended (stratified random sampling), attempted to ensure that the results would at least be applicable to the specific population of university lecturers. However, despite these limitations, it was easier to achieve external than internal validity, as the research

was to be grounded within the field setting of the lecturers' professional practice and not in a manipulated laboratory setting. The intended qualitative methods and sampling procedure therefore supported external validity within the specific population.

1.4.4 Reliability

Reliability in research refers to the consistency with which a measurement can be repeated (Babbie & Mouton, 2001; Gay, 1987).

Babbie and Mouton (2001) suggest the following measure to ensure reliability:

- Inquire only about those things your respondents are likely to know about.
- Ask relevant questions.
- Ask clear questions.

These aspects were taken into account when constructing an interview schedule and a questionnaire. The studied supporting literature, the information obtained through in-depth interviews and the pilot testing of the interview schedule and questionnaire helped to ensure relevancy and clarity. The research design and methodology presented in this report aims to make the study replicable and therefore reliable.

1.4.5 Bias

Henning *et al.* (2004) emphasise the importance of a solid theoretical foundation in qualitative research, especially in the building of coherent, convincing argument and in limiting bias. Arguments should be built on the authority of respected researchers in the field, empirical evidence and the researcher's understanding of the phenomenon. A variety of relevant research on scholarship and CPD was therefore investigated, reported and integrated into the research chapters.

The use of a well planned sampling strategy limits participant bias, which Tuckman (1994) describes as the influence of the characteristics of the people with whom the study is conducted. Even though the sample population boundaries may limit generalisation (and therefore external validity), they limit participant bias by means of stratified random sampling (in the case of the questionnaire).

Instrumentation bias is based on the manner in which the data is collected (Tuckman, 1994). The construction of the interview schedule was guided by relevant and recent literature and research on scholarship and CPD and only one field worker was used. The questionnaire was pilot tested and standardised to limit this type of bias.

The use of a stratified random sampling technique in the questionnaire phase limited the chances of sampling bias, which Gay (1987) describes as a systematic error on the part of the researcher, especially if volunteers or available groups are used.

1.5 DATA COLLECTION

Data was collected by means of interviews and questionnaires.

An interview is an important tool of qualitative inquiry, as it incorporates the individual's perspective as an important part of the knowledge and social processes that govern any society. It therefore gives insight into the subjective reality of individuals in a formatted form that is guided, managed by the interviewer and integrated into the research findings (Henning *et al.*, 2004).

Interviews can only be trustworthy and credible tools in data collection if their conceptualisation, design, implementation, recording and transcription are done according to the basic rules of sound qualitative inquiry (Henning *et al.*, 2004). A relatively standardised interview format with mostly open-ended questions was used. This enabled the researcher to remain as neutral and objective as possible and to obtain the participants' lived experiences of aspects that were of specific importance to the study. Henning *et al.* (2004) propose this as a credible data collection method in qualitative inquiry, even though interactive qualitative data collection procedures contain an element of researcher subjectivity, whether in the design of the data collection instrument or the use thereof. Standardisation, however, streamlines, systematises and sanitises the process of possible interviewer interference.

Warren (2002), as quoted in Henning *et al.* (2004), refers to three stages in collecting data through interviews. Firstly, respondents are identified and interviews are set up according to the overall research design (see 1.4.2): Defining the target population and sampling). Secondly, the interview is conducted and recorded. Lastly, the researcher reflects, analyses and interprets the data.

The interviews took place at times and venues arranged prior to the interview with each individual participant. The data was analysed and interpreted.

The respondents for the questionnaires were contacted telephonically and individually asked to participate in the study. A hard copy was then delivered by hand or an email copy sent electronically, depending on the specific respondent's preference.

1.6 DATA ANALYSIS

Data analysis was mainly done on a qualitative basis. Henning *et al.* (2004: 6) describe qualitative data analysis as the process by which the researcher makes meaning from the data by converting the “raw” information (also referred to as the “thin description”) into a bigger whole – the qualitative research findings (also referred to as the “thick description”). The work of Henning *et al.* (2004), Babbie and Mouton (2001) and Strauss and Corbin (1998) were used to inform this study in terms of grounded theory as an analytic tool used during data analysis.

Bergman (2003, as quoted in Henning *et al.*, 2004), as well as Conrad (1990, as quoted in Denzin & Lincoln, 2000) and Riessman (1990, as quoted in Denzin & Lincoln, 2000) criticises grounded theory for being post-positivist as it codes and categorises text only at the level of content and accordingly generates substantive theory. Henning *et al.* (2004), however, point out that most qualitative research has post-positivist traits, but that the challenge lies in taking the analysis beyond content as the empirical fact to more discursive complexities within the data obtained from the reality. Denzin and Lincoln (2000) describe grounded theory as a methodology that interprets a reality, as understood from the combined experiences of the researcher and the respondents. The strength of grounded theory lies in the importance of theorising and conceptualising as part of interpretive inquiry. It can feed into theory without being driven by theory. Data analysis in grounded theory requires a conceptualised understanding of the data that leads to sophisticated levels of abstraction and eventual substantive theory.

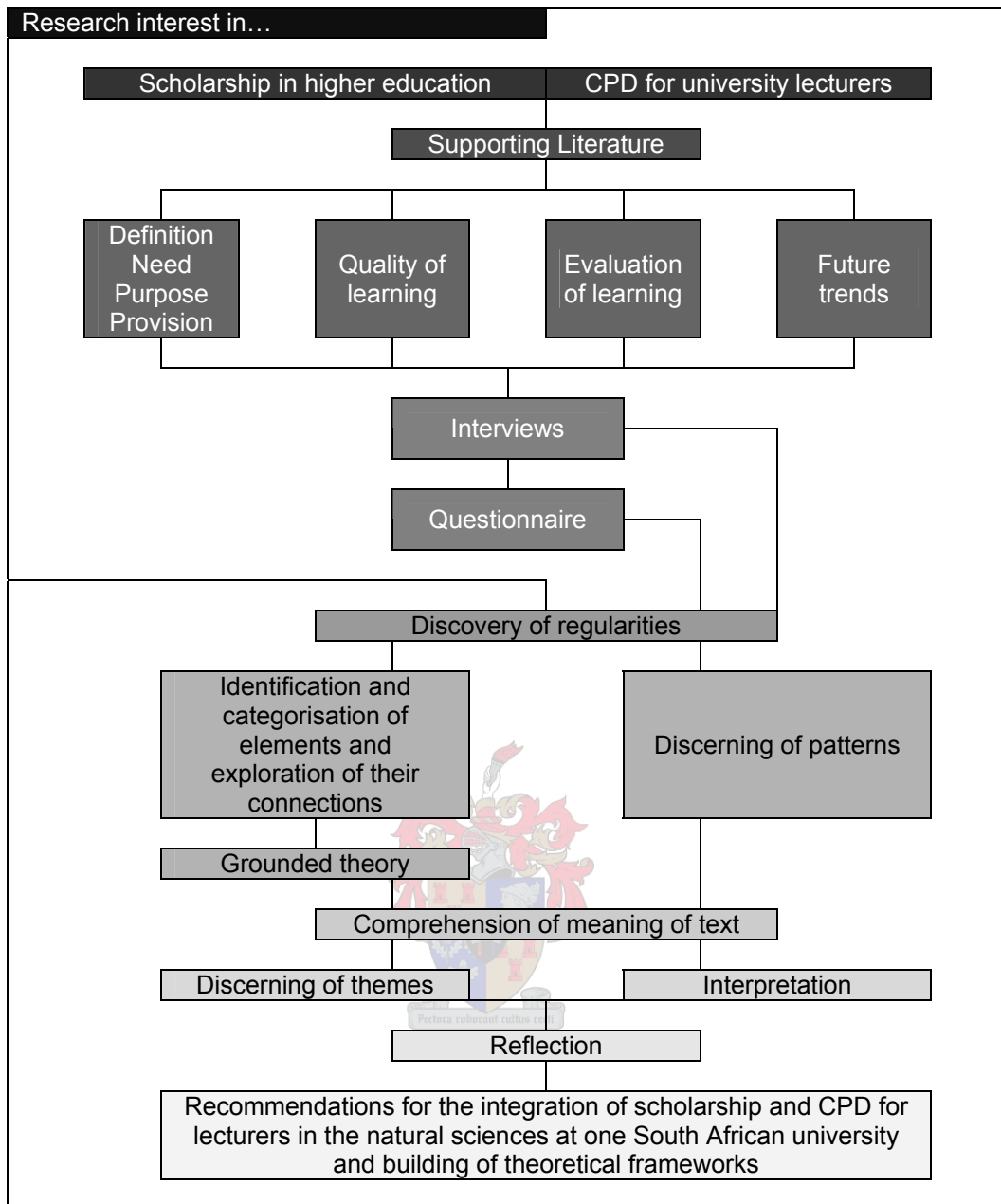
Grounded theory data analysis methods provide a flexible strategy by which the researcher can move from studying the concrete realities (thin description) to a conceptual understanding of these realities (thick description). Denzin and Lincoln (2000) describe grounded theory as an analytic strategy, not a data-collection method and note that it is an analytic strategy suited to varied data-collection methods. The main premise of grounded theory is that data is not forced into the parameters set by preconceived questions, categories, or hypotheses^{vii}, although Strauss and Corbin (1990) note that questions included in the methods used to construe data are helpful to guide the novice researcher in particular. The data obtained through both the interviews and questionnaires was used in the analysis.

There are various scholarly views and little agreement on the methodology most suited to grounded theory. The techniques and processes for developing grounded theory, as described by Henning *et al.* (2004), Denzin and Lincoln (2000) and Strauss and Corbin (1998), were used as a basis for the analysis of the data.

The interviews were transcribed and analysed for trends that were further investigated in the questionnaires. The questionnaires were analysed for categories (coding) and relationships between categories (categorising). New ways of connecting categories were investigated (axial coding). Categories were integrated and refined (selective coding). Conditions under which these relationships between categories emerged, changed or were maintained were also identified if possible. The theories that emerged from this process were therefore grounded in the researched reality. The strength of these theories depends on the type of data that is gathered and how skilfully it is analysed, as well as on the researcher's ability to conceptualise it into a coherent whole (Henning *et al.*, 2004). The researcher also tried to make connections between the categorised data and existing theories, as proposed by Henning *et al.* (2004) and Tuckman (1994). This has led to a coherent theoretical framework that explains the reality of scholarship and CPD for science lecturers in higher education, which can be challenged in further research and lead to transformation in the practice of CPD in this milieu^{viii}.

The qualitative analysis process of grounded theory that was used can be explained graphically as follows:





**Figure 1.4: Graphic representation of how qualitative research analysis was done
(Adapted from Babbie & Mouton, 2001: 490)**

The above-mentioned conceptual framework aligns the key concepts addressed in the research.

1.7 DATA PRESENTATION

The data is presented in the format of four chapters focusing specifically on (a) defining scholarship and CPD in the specific context of higher education, and determining the need, purpose and provision of CPD; (b) investigating the quality of learning in CPD provided in the specific context and how this relates to scholarly development; (c) exploring the evaluation of learning in the CPD of university lecturers and the influence thereof on their ability to develop as

scholars, and (d) determining possible current and future trends from the current reality within this sector that has implications for scholarly development through CPD.

1.8 ASSUMPTIONS AND LIMITATIONS

Gay (1987: 86) defines an assumption as “any important ‘fact’ presumed to be true but not actually verified”. In the study it is assumed that all higher education (university) lecturers included in the study population are professional adults.

Limitations are aspects of a study that affect the results and consequently also the way in which it can be generalised (Gay, 1987). Generalisation is an inherent limitation of qualitative-type studies. Other limitations in this study included time and funds – a longitudinal study that followed the participants’ professional growth and learning over time and used various research-based approaches would have been the ideal. Furthermore, a more in-depth qualitative procedure using only interviews would have yielded even qualitatively richer data.

1.9 ETHICAL CONSIDERATIONS

Henning *et al.* (2004) and Gay (1987) stress the importance of the researcher’s respect for the respondents’ privacy and right to confidentiality. As the unit of analysis in the proposed research study was individuals, this was an important consideration that the researcher had to take into account. Therefore no actual names of participants will be made public.

It was also necessary to obtain the correct and sufficient permission to conduct the study in the stated faculty of the university. Permission was obtained from university authorities (Registrar and Vice-rector: Research), as well as the dean of the faculty involved. Ethical clearance was also obtained from the Director: Division of Research Development.

1.10 CONCLUSION

The study aimed to investigate and describe the CPD reality of university lecturers in the Faculty of Science at Stellenbosch University, South Africa and to determine how this relates to their development as scholars. The different aspects that were focused on included the participants’ definition of CPD, their need for CPD, the purposes CPD serves and the current provision thereof in this specific context. It also investigated the quality of learning in CPD provided in the specific context, and explored the evaluation of learning in the CPD of university lecturers. From these findings and related literature, possible future trends were determined from the current reality of CPD within this sector. These aspects will be discussed in greater depth in Chapters 2 to 7 that follow the research report (Chapter 1).

A qualitative approach was followed, with semi-structured interviews and questionnaires with mainly open-ended questions as the methods of inquiry. The obtained data was transcribed and analysed accordingly. It will be presented in the form of five conclusive chapters. The research report presented here explained the motivation, problem statement, research design and methods, data collection, data analysis and data presentation that were used. It also summarised the main assumptions and limitations in the study, and the ethical considerations that were taken into account. It gave an overview of the context within which the study took place, with special reference to the target population and valid sample population.

The study therefore aimed to provide a realistic and holistic view of CPD within a specific context of university lecturers – lecturers in the natural sciences at Stellenbosch University. The study furthermore aimed to use the findings of the study in proposing how CPD can be used to enhance the development of scholarship in an integrated manner within the context of the target population. This provides a valuable insight into the dynamics of academic practice within the natural sciences at Stellenbosch University.



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ⁱ Literature on scholarship refers to the scholarship of engagement, whilst in the context of Stellenbosch University community interaction and sometimes community service is used in documentation to describe all policies and activities that would typically be classified under the scholarship of engagement.

ⁱⁱ Although the literature on scholarship makes no distinct mention of administration as a scholarly endeavour, this study amongst lecturers in the natural sciences indicated administration as a distinct responsibility of the target population that demands a significant amount of time and expertise (and therefore also professional development).

ⁱⁱⁱ It is interesting to note that a distinction is made between *scholarly* and *scientific* in both the mission and value statements of the university, with the Afrikaans translation of scholarship being *wetenskaplikheid* (having a scientific character) in the specific documentation.

^{iv} The evaluation of learning is discussed in greater depth in Chapter 5. The work cited here (Erasmus & Van Dyk, 2003: 256; Wade, 1995: 4 & Van Dyk, Nel & Loedolff, 1992: 254-257) corresponds closely to that of Quiñones and Ehrenstein (1997: 210) and Kirkpatrick's Four Levels of Evaluation Model (cited in Adams, 2001 and Ryan, Campbell and Brigham, 1999).

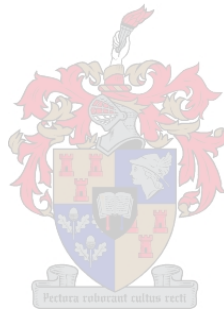
^v More detail on the idea of a university is provided in Chapter 6, where a focus on the current and future context of practice of lecturers in the natural sciences forms part of the discussion. This part of Chapter 1 only aims to provide a common definition of the term *university*.

^{vi} The choice to use the interpretive research paradigm and a mainly qualitative approach within the study was influenced by a variety of factors. Firstly, the context within which the study is situated (the Faculty of Science at Stellenbosch University) underscores a mainly positivist

notion of research in general. It would have been difficult to gain access and legitimacy as a researcher working with a more critical approach to the topic. Secondly, the researcher came from a natural sciences background – both in training and work experience – where objectivity formed the basis for scholarly endeavour. The choice to work interpretively therefore formed part of the researcher’s own development to utilise qualitative means of investigation. Thirdly, the decision to work interpretively was informed by what Babbie and Mouton (2001: 273) refers to as *intersubjectivity*. Intersubjectivity allows the researcher (in the central role of observer and interpreter) to interpret the data against his/her own contextualised understanding of the research topic, whilst retaining a distanced stance and not becoming involved as a participant in the research itself. These reasons formed the rationale for selecting to use an interpretive approach to the research problem. The researcher, however, acknowledges that other research approaches could also be utilised and provides scope for future research in this area of study.

^{vii} Glaser’s (1992) work is notable in this regard.

^{viii} Various tentative theoretical frameworks are presented in the ensuing chapters of the dissertation (see Chapter 4, Figure 4.1; Chapter 5, Figure 5.3, Chapter 6, Figures 6.1, 6.2, 6.3, and 6.4). These frameworks were built from the study data and related literature within the areas of scholarship and CPD.



CHAPTER 2

Placing continuing professional development in the context of scholarly practice in the natural sciences in higher educationⁱ

ABSTRACT

Continuing professional development (CPD) has received much attention in research and literature. It has been studied from various perspectives and within a variety of professional disciplines. Academics in the natural sciences in higher education have, however, not been the focal point in these studies and reports, as they practise on the interface of different professions. They form a unique group of scholars who practise and develop their occupation within the educational sphere, whilst their expertise lies within an (unrelated) scientific discipline. As part two of the dissertation, this chapter provides a general conceptualisation of CPD. A definition of CPD is conceptualised within the realm of scholarship. The chapter also presents arguments on the need for and purpose of CPD for scholarly development. Integrated findings, which are based on literature and a qualitative study conducted in the Faculty of Science at Stellenbosch University, South Africa, are presented. Specific reference to examples in higher education relevant to these concepts will provide a much-needed local insight into the general conceptualisation of CPD in the practice of scholarship in a specific higher education setting in Southern Africa.

2.1 INTRODUCTION

The functioning of the post-modern society is largely based on work-related activities. Identity and satisfaction are increasingly founded within the individual's profession (Mott, 2000). Yet post-modern society also places a high premium on education, with an increased emphasis on continuing professional development (CPD). Costley (2001) refers to professional intellectual capital as the most important factor in an organisation's economic success. How professionals understand professional practice shapes how they are treated as beneficiaries of continuous professional development, how they act as professionals and how the educators within continuing professional development respond to the needs and demands of professionals as learners (Wilson, 2000). Learning in continuing professional development (CPD) programmes becomes a central issue for practice development (Kabouridis & Link, 2001; Daley, 2000).

A significant amount of human and financial resources is invested in the three to six years of professionals' initial education, but little systematic thought is given to what happens in the following 40 years of professional practice (Cervero, 2001; Cervero, 2000). Lee (2001), McDonald (2001) and Medley (1999) state that it is especially the first two to three years after qualifying that are the most important formative years for novice professionals, during which they develop proficiency and a particular style of practice. Development initiatives during this

period are aimed at the orientation, mentoring and support of the novice professional (Centra, 1976), as novice professionals commonly experience a reality shock that results from a gap between academic learning and the learning that takes place in the real-life practice of a profession (Knox, 2000).

However, professional development is not only necessary at the entry level of professional practice. Developing a continuum of professional development has long been a challenge for CPD practitioners and providers (Knox, 2000). Professionals already engaged in professional practice continually seek to develop and change their practice to meet their clients' needs and expectations. The process of professional development is, however, mostly done without a clear understanding of how knowledge learned in CPD becomes meaningful in practice. A greater understanding of the connection between the context of practice and professional learning is imperative if CPD is to succeed (Daley, 2001). It may be necessary to revisit the workplace as a place of learning, where learning is directly connected to the work environment (Kabouridis & Link, 2001; McDonald, 2001; Mott, 2000).

The work environment in academic practice makes diverse demands on the lecturer as a professional practitioner. These demands can be summarised according to the various scholarship roles (discovery, teaching, engagement and integration) initially defined by Boyer (1990) and later expanded by various authors (O'Meara & Rice 2005; Badley, 2003; Sorcinelli 2002; Zahorski 2002; Rice, 2002; 1996; 1991; Diamond, 1999; 1993; Lynton & Driscoll, 1999; Schulman, 1999; Lynton; 1995 – amongst others). Lynton (1995) and Lynton and Driscoll (1999) later added the scholarship of engagement. It is therefore necessary to place the idea of CPD within the context of academic practice and the notion of scholarship for the purposes of this research.

Rowland, Byron, Furedi, Padfield and Smyth (1998) ask some fundamental questions about the nature and development of academic practice in higher education: What priority should we attach to academic freedom and autonomy versus accountability and quality control? What would stimulate lecturers to enter into dialogue across traditional disciplinary boundaries and beyond bureaucratic requirements, when they are already overloaded with academic responsibilities? How is the teaching ability of academics to be judged? To what extent are there generic teaching skills (independent of disciplinary content) that lecturers need to acquire and develop? If teaching skills are not generic (but discipline-specific), then what is the relationship between a discipline and its pedagogy? How can lecturers be encouraged to draw students into their own scholarly realm, amidst rising student numbers? In which contexts can students stimulate lecturers' scholarly creativity and how can lecturers, in turn, encourage

students to shape their own ideas and undertake their own investigations? To what extent can lecturers allow students to learn autonomously?

The debate around these questions has far-reaching implications for the evolution of continuing professional development (CPD) in the natural sciences. The questions posed by Rowland *et al.* (1998) also directly address the notion of scholarship in higher education. This chapter (Chapter 2) consequently explores the link between CPD and the notion of scholarship. The aim is (1) to open the debate around the implications of the various forms of scholarship for CPD in the natural sciences, and (2) to develop a framework for CPD in the natural sciences that would incorporate an integrated approach to scholarship. CPD as a form of lifelong learning may fill the initial education to practice gap for young lecturers starting out, and for older lecturers who seek to remain competent practitioners in an age of knowledge proliferation.

This chapter focuses on conceptualising the context of academic practice and the role of CPD within this context. The chapter starts by exploring what it means to be a professional in academic practice by providing an overview of what is generally expected of a lecturer: discovery (referring to research), teaching, engagement (which is often translated into community interaction), and integration. Academic practice therefore entails fulfilling various scholarly roles and responsibilities. In order to do so, lecturers continuously have to develop in their professional practice as scholars. CPD will then be placed within this notion of scholarship. The need for and purpose of CPD will subsequently be discussed. Research conducted amongst lecturers in the natural sciences at Stellenbosch University will be integrated into the existing literature in order to provide practice-based evidence of how CPD is integrated into the practice of scholarship in academe.

2.2 WHAT IT MEANS TO BE A PROFESSIONAL IN ACADEMIC PRACTICE

It may be sensible to explore first what a profession in general means before one can continue to define what scholarship and CPD mean within the context of a profession in higher educationⁱⁱ. A profession, in general, can be described as an occupational group that share specialised skills requiring extensive systematic and scholarly training, that have restricted access with rigorous entrance and exit requirements and that claim high social prestige because of their importance to society. It can further be categorised as helping, entrepreneurial or technical – which are not mutually exclusive categories (McDonald, 2001; Kachingwe, 2000).

Kachingwe (2000) and Medley (1999) add an ethical element of action beyond self-service to the definition of a profession. Ethics sets limits to what people can do to serve their own interests and prescribes standards of behaviour governing their interaction with others. Many professions have formal codes of conduct or standards of practice that address typical ethical

problems, but since professionals (such as lecturers) work on the interface between various professions, there may be conflicts in values. What may be appropriate in one environment may be unacceptable in another.

These formal definitions proved to be limiting within the context of the particular research. Lecturers in the natural sciences in higher education are also guided by attaining extensive systematic and scholarly training, developing and practising within a certain field of expertise, maintaining professional standards, having a sense of ethics, and professional conduct. This would, *per se*, qualify them as professionals, but they are not a group easily confined within the traditional borders of a profession. Their roles and responsibilities cover a wide variety of disciplines, tasks and obligations – including teaching (lecturing), research, community involvement and administration – that all form part of the core functions of a university.

Rowland *et al.* (1998) describe a university as a place of learning, where the learning of students, academics and society take precedence over other endeavours. The role of the university is, however, changing. This change is due to a shift from an elitist system to a mass system of education, greater influence from business and industry, and calls for public accountability. These changes have inevitable influences on the role of the academic in higher education. A re-conceptualisation of the scholarly roles and responsibilities of the academic necessitates continuous professional development in order to keep abreast of these changes.

The margins of acceptable performance in terms of research output and teaching throughput have shifted considerably as a result of accountability and funding pressures. Rowland *et al.* (1998) argue that these pressures to produce have led to an increasing separation in academics' scholarly roles of especially research, teaching and service. Boyer (1990) noted this role conflict nearly three decades ago. Boyer (1990) asks where the balance between scholarship roles should be struck – a question not easily answered if one looks at the post-1990 scholarship literature. Does the answer lie in separating the roles into different professional tracks? Rowland *et al.* (1998) refer to this separation as a false dichotomy that has placed scholarly roles at opposing ends – where the development of one is seen to be at the expense of the other. Rowland *et al.* (1998) make an important point that all the scholarly roles of an academic are about learning – learning that (supposedly) underscores the idea of a university. Learning as such is seen as a social activity that underlies all scholarly endeavours. Learning as a fundamental component of scholarship requires an enquiring mind, reflection, critique and passion.

In a critique on the work of Rowland *et al.* (1998), Andresen (2000) argues that higher education has moved beyond the teaching-research divide of the past. Lecturers as professionals and as

scholars can therefore no longer be categorised as either teachers or researchers. Evidence from the current study, however, indicates that lecturers in the natural sciences at Stellenbosch University still experience a disparity between their scholarly roles. Andresen (2000) assumes that scholars engaging primarily in teaching, and those mostly busy with research, are treated as equal scholars. This (idealistic) assumption cannot be supported in the system that has different rewards for the various scholarly activities. Andresen's (2000) further arguments that the different scholarly roles should be seen as equal and that the necessary relationship between the various professional roles should take place through the enhancement of scholarship are, however, supported – even if this may not be the reality in many institutions. This dissertation will, however, not enter into the teaching versus research debate beyond painting a realistic picture of the scholarly context in the natural sciences at Stellenbosch University. From the start a more integrated approach to scholarship will be taken, as was initially advocated by Boyer (1990: xii):

Thus, the most important obligation now confronting the nation's colleges and universities is to break out of the tired old teaching versus research debate and define, in more creative ways, what it means to be a scholar. It's time to recognize the full range of faculty talent and the great diversity of functions higher education must perform.

Boyer (1990) notes that initial notions of scholarship referred to various forms of creative work, which did not necessarily have to take place within the boundaries of academe. A scholar in these times was judged by his/her ability to think, communicate and learn. Scholarship has since taken on a much narrower definition – that of having an academic rank within higher education, being involved in research and publication and (sometimes) teaching within a specific discipline. Boyer (1990: 16) advocates a broader view:

Surely, scholarship means engaging in original research. But the work of the scholar also means stepping back from one's investigation, looking for connections, building bridges between theory and practice, and communicating one's knowledge effectively to students.

Boyer (1990) concludes that four scholarship roles can be distinguished in academic practice:

- the scholarship of discovery (research)
- the scholarship of teaching, to which learning was later added
- the scholarship of application, which is referred to as engagement in more recent literature
- the scholarship of integration.

Scholarship (and therefore by implication professionalism) is furthermore determined by having scholarly credentials within a specific discipline (usually by means of research), by staying

abreast of the latest developments in this field, by maintaining the standards of integrity of the discipline (thus refraining from any unethical behaviour), and by assessment of scholarly work in whichever form (often through publication and peer review). Glassick, Huber and Maeroff (1997) translate these scholarly prerequisites into more definite criteria for scholarly practice, namely clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique. These criteria apply to all activities deemed as scholarly – be it discovery (research), teaching, engagement (service) or integration. Boyer (1990) concludes that a delicate balance exists between systematic rigour and flexibility in the assessment of scholarship.

In higher education in South Africa there is currently no mandatory professional certification or examination that guards entry and continuing practice as an academic in the natural sciences, as is evident in other professional fields such as medicine or psychology. There is no universal professional organisation, even though the South African Council for Natural Scientific Professions (SACNASP) exists. This council strives to establish, direct, sustain and ensure a high level of professionalism and ethical conduct, that is internationally acceptable and in the broad interest of both the community as a whole and the natural sciences. Its objectives are to promote the practice of natural science professions in South Africa, exercise control over the standard of professional conduct and monitor the standard of education and training of natural scientists. It also aims to recognise education and training that forms the prerequisite for registration in terms of the Natural Scientific Professions Act no. 27 of 2003 (South African Council for Natural Scientific Professions, 2003; Republic of South Africa, 2003). This council and corresponding legislation makes provision for the practice of natural science in South Africa, but does not specifically refer to its practice within the context of higher education. Not one of the respondents directly referred to this council or their knowledge thereof. So although lecturers in the natural sciences perceive their practice as professional in most regards, it is difficult for them to define themselves as professionals.

What does it then mean to be a professional science lecturer within the context of higher education? Answering this question is no easy task, especially in the case of science lecturers in higher education. This dilemma is aptly illustrated by the following responses from participants in the study:

[To be a professional] means that I need and use my academic qualification in my work. Someone without this or a similar qualification will not be able to do my work. In some disciplines there is a council that set demands to which a person must adhere irrespective of the academic qualification before he/she may call him-/herself professional. In the academic set-up the definition of 'professional' is however very vague because a great deal of my work entails teaching and I have no recognised

qualification in teaching. I therefore do not know whether I can see myself as a professional lecturer! I can also not call myself a professional scientist or researcher because I am not registered at the relevant council. [Lecturer in Physics with 1.8 years of experience as an academic]

Many lecturers are 'perfectly professional', but have absolutely no rapport with either their students or their colleagues. In that sense, I do not think of myself as a professional. Rather an adventurer in science sharing my experiences with my students. [Professor in Microbiology and former recipient of the Rector's Award for Excellence in Teaching]

The need for increased professionalisation within education calls for a clear articulation of qualifications that includes formal education and acknowledges prior experiences or learning (Shah, 1998; Florez, 1997). Constructing a professional identity for lecturers in higher education has, however, been problematic in terms of control over the production of and access to knowledge and the establishment of formal training systems.

Constructing a professional identity in this particular sphere of practice is therefore first and foremost governed by attaining a qualification that permits practice. In the case of lecturers in the natural sciences, this seems to be a PhD (doctorate) within a specialised field (such as Chemistry, Physics, Microbiology and so forth). This qualification is mainly research-based, which would account for the professional practice in the role as researcherⁱⁱⁱ. This qualification also grants the 'qualified person' access to the other roles and responsibilities that a person in this position commonly has to fulfil, often being ill equipped to do so.

One could argue that CPD presents the ideal mechanism to fill the gap created by an emphasis on research training in the initial education of lecturers in the natural sciences. However, herein lies one of the main contradictions of the conceptualisation of CPD for lecturers in the natural sciences, as academic freedom is evidently one of the main premises on which their professional practice is built, as can be seen in the following response:

Being a professional to me means to a certain extent being my own boss. It means doing research which I wish to do; it means choosing projects serving the community which I wish to be involved with; to a certain extent choice of classes I wish to teach. [Lecturer in Chemistry with 3 years of academic experience]

This status thus exempts them (in their view) from compulsory or forced compliance to development initiatives or programmes other than those they wish to attend themselves. Brew (1995) refers to this as a *laissez-faire* attitude towards CPD, but adds that changes in

contractual terms in recent times have forced lecturers to take on a more active role in CPD. The absence of a professional body to govern professional practice and development, the diversity in these practitioners' roles and responsibilities, the diverse academic origins of practitioners and the current high value placed on research output within the academic sphere make the defining and planning of CPD for this group an unenviable task.

A professional in the natural sciences in higher education seems to include a variety of the aspects that also define professionalism in other professions, such as specialised education and training within the particular field, the development of expertise, ethical conduct, and accountability for practice decisions. The notion of scholarship is an added dimension in higher education that defines what it means to be a professional. Scholarship demands expertise in terms of discovery, teaching, engagement and integration. However, at present, lecturers in the natural sciences seem to have a relatively singular focus on the scholarship of discovery in their initial education and training as well as in their continuing professional development.

2.3 DEFINING CONTINUING PROFESSIONAL DEVELOPMENT WITHIN THE NOTION OF SCHOLARSHIP

Healey and Lawler (2002) give a concise definition of CPD as an extension of preparatory learning to enhance competence and career advancement. Mott (2000) adds that CPD extends and amplifies knowledge, sensitivity or skills obtained during the initial education of a professional. If the central argument to these definitions were applied to CPD for lecturers in the natural sciences in higher education, it would mean that they only develop their subject-specific expertise, on which their preparatory learning was focused. It is therefore necessary to widen our perspective on CPD. It should obviously include the extension of existing expertise. It should also develop aspects that might not have been addressed in the professional's initial training, but are necessary to effectively fulfil the diverse roles and responsibilities of a lecturer, as Lawler (2000) describes the core values of CPD representing the basic beliefs and goals of the profession, such as respect for learners, fair treatment of all and programme integrity. The following response attests to the contradictory approach followed within the current system:

Most lecturers at universities are trained as researchers and not as educators. We must however fulfil a huge role as educators. There is a huge gap worldwide between training and the eventual role in the career of a lecturer. [Lecturer in Biochemistry with 14 years of academic experience]

Sadler-Smith, Allinson and Hayes (2000) state that CPD is systematic. They furthermore stress the self-directed nature inherent to CPD activities. It is encouraging that the evident importance of academic freedom noted in the conducted study supports self-directed CPD initiatives amongst lecturers in the natural sciences at Stellenbosch University. The high value placed on

academic freedom and choice breeds a culture of self-motivated adult learners who assume responsibility and acknowledge the importance of self-improvement and self-development within their work environment. It is, however, still debatable whether this development takes place in a balanced manner to address all the demands a professional career in the academic field makes on the individual lecturer.

Kachingwe (2000) supplies a more specific definition of CPD, but with a broad applicability. CPD is defined as any educational activity in a formal; non-formal or informal setting that not only enhances a professional's skills and competence, but also leads to learning and personal transformation. CPD is consequently defined as the ongoing, structured or unstructured learning and educational opportunities pursued by particular professional groups and their members (Battersby, 1999). McDonald (2001) and Madden and Mitchell (1993: 12), as quoted in Challis (1999: 373), add that CPD is the maintenance and enhancement of the knowledge, expertise and competence of professionals throughout their careers, according to a plan that takes into account the needs of the professional, the employer and society. Evans, Ali, Singleton, Nolan and Bahrami (2002) and McDonald (2001) refine this definition by stating that CPD is a lifelong learning process for all individuals and teams, which enables professionals to expand and fulfil their potential and which also meets the needs of their clients. This process should ideally incorporate the principles of adult learning and there should be an evaluation of their effectiveness in practice – depending on what their practice entails^{iv}.

These definitions deal more effectively with the reality of lecturers in the natural sciences. This reality is determined by the professional (the individual lecturer), the employer (the university), society (by means of government intervention) and the clientele (the learners). The dynamic interplay of these different stakeholders in the lecturer's professional sphere demands constant transformation. This changing reality means that the goalposts are forever moving and therefore the lecturer should continuously reinvent his/her practice. The 'learned' therefore never ceases to be a learner – lifelong learning through CPD becomes the lecturer's main tool for survival in the academic race for excellence. These aspects play a determining role in their need for CPD.

CPD in the context of natural sciences in higher education therefore does not seem to have a simple definition or focus as it cannot be separated from the notion of scholarship that demands expertise in all areas of scholarly practice (including discovery, teaching, engagement and integration).

2.4 THE NEED FOR CONTINUING PROFESSIONAL DEVELOPMENT

In the current period of social development, lifelong learning has become a necessary condition for survival. Individuals, organisations and societies are at risk if they do not learn in this age of

change, uncertainty and ambiguity (Berge, De Verneil, Berge, Davis & Smith, 2002; Kabouridis & Link, 2001; Sadler-Smith *et al.*, 2000, Hake, 1999; Brew, 1995). Change is an inevitable part of the post-modern society, but should not be seen as an uncontrollable entity to which the CPD scenario merely has to adapt. Change can be managed. It means taking control and shaping direction, thus influencing the outcome of change. This is the role CPD needs to fulfil (Odini, 1999)

The changing context of professional practice has significantly contributed to the need for CPD. Changes that are influencing CPD include the rapid development of research-based knowledge, technological innovations and changes in the settings for practice (such as workplace learning). All of these have provided incentives for CPD within professions (Ramaiah & Moorthy, 2002; Kabouridis & Link, 2001; McDonald, 2001; Smith & Topping, 2001; Cervero, 2000; Kachingwe, 2000; Wilson, 2000; Sadler-Smith *et al.*, 2000; Hake, 1999; Livneh & Livneh, 1999). Organisations in this changing environment require a skilled and competent workforce to coordinate the transition from traditional to new systems and to ensure high standards of service. At the same time employees seek satisfaction and career growth. CPD should provide programmes at the appropriate level in order to enable professionals to manage their current job-related responsibilities and challenges, as well as their future careers, competently (Ramaiah & Moorthy, 2002; Livneh & Livneh, 1999; Odini, 1999).

Mapesela and Hay (2006: 715) provide an accurate description of the current pressures South African lecturers have to face:

Academics are now obliged to diversify their teaching methods, restructure the curriculum, use e-learning and parallel media of instruction, learn to cope with large classes and appreciate different cultures, handle and assist the disabled in mainstream education, as well as assess the knowledge bases of the adult learners efficiently. For academics to face all these challenges mentioned as well as the new demands for global and international participation effectively – though without receiving appropriate support and preparation (training and retraining) – is a far-fetched expectation ...

The context of academic practice that Mapesela and Hay (2006) describe is also true for lecturers in the natural sciences at Stellenbosch University. These changes in practice pose daunting challenges in terms of CPD for lecturers in the natural sciences, but indicate a definite need for development in a variety of professional practice areas. The current and predicted future job-related responsibilities and challenges encompass a variety of diverse knowledge systems and skills. These centre on the management of four main areas of practice that include

the various dimensions of scholarship discussed above, as well as administrative functions^v. Although administration is not specifically stated as a core academic responsibility or form of scholarship, lecturers perceive it as a substantial part of their professional practice. It is therefore included as a separate entity. Ideally, there should be a balance in the lecturer's training for these areas and the practice thereof. In reality they are drawn askew by the lecturer's initial training as a subject specialist and the increasing demands for innovation and research output.

Participatory management and so-called 'flat' organisational structures envisioned by university management (Stellenbosch University, 2000) adds to the academic staff's administrative responsibilities. Brew (1995) refers to this trend as a move towards corporate management practices in higher education. It can either be attributed to universities' move to industry-like organisational structures, or to the greater demand for accountability. It forces academic staff to develop a number of management skills, including leadership, negotiation, team building, handling of disciplinary matters, staff appraisal, management of affirmative action, as well as the recruitment, selection and interviewing of prospective staff members. These are important aspects that influence institutional effectiveness, but for which staff members (especially in the natural sciences) are often not trained. As senior staff is often drawn into administrative posts (such as head of department), junior staff's lecturing loads increase. The data suggests the following distribution of senior lecturers' time spent on the identified responsibilities (Figure 2.1):

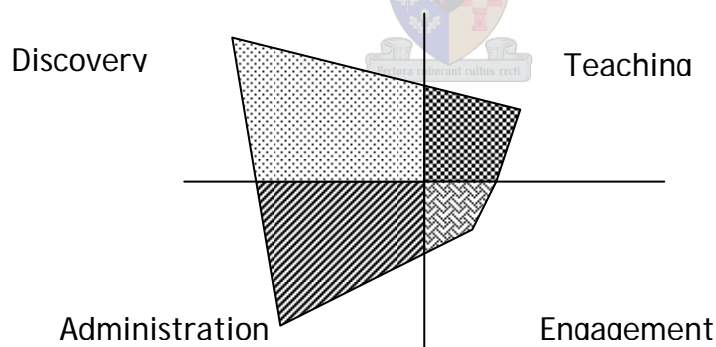


Figure 2.1: A graphic representation of the typical distribution of a senior lecturer's time amongst the different professional responsibilities

The responses in the study suggest that lecturers in more junior positions seem to engage with their various roles and responsibilities in a different manner, as Figure 2.2 suggests:

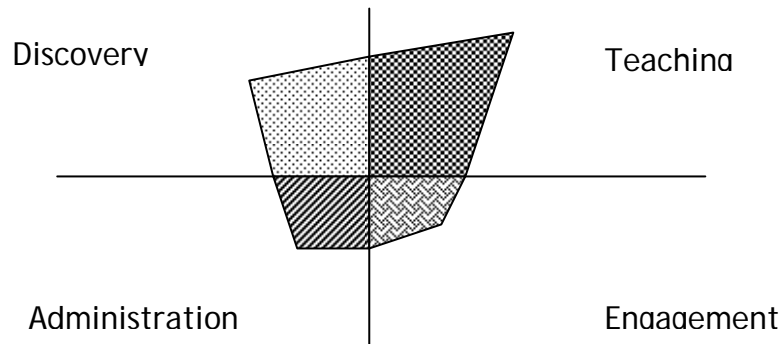


Figure 2.2: A graphic representation of the typical distribution of a junior lecturer's time amongst the different professional responsibilities

It is obvious that senior lecturers are forced to utilise a great deal of their time for either research or administration, which leaves little time for teaching and community involvement. Junior lecturers are expected to produce a satisfactory research output, whilst most of their time is taken up with lecturing responsibilities. Although a balance in the distribution would not necessarily mean an equal distribution amongst the parts, it would imply a more even distribution according to the priorities – and therefore time – awarded to the different responsibilities. The lecturers in the particular study population perceived the time used for administration as unrewarding and time-consuming. The emphasis currently placed on research output forces lecturers to devote most of the rest of their time and creative energy in this field. This is not necessarily seen as problematic, as many lecturers perceive research (including own research, supervision of research and management of research funding) as their primary task in the academic sphere. This could be attributed to the fact that lecturers in the natural sciences are primarily trained as researchers (through acquiring a PhD in a scientific discipline) and therefore feel most comfortable in this role. This trend should not necessarily be seen as negative, as research activities can inform teaching practices, as the following quote from a participant in the study illustrates:

... the ways in which we develop ourselves subject specifically, or to concentrate on the subject specific ... we do this naturally for ourselves and to understand the subject and to do research, but it always has an impact on your teaching. If your perspective is better and your knowledge is better and you just know more about certain things, then you immediately know it has an impact on your teaching and I think it improves your communication in that subject terrain with the students also, so it definitely also has an influence there. [Senior lecturer in Mathematics with 10 years of academic experience]

The fact remains that continuous development in terms of teaching is not seen as a priority by many lecturers in the natural sciences, which this quote clearly indicates:

If you look from the view of a person with a passion for teaching I think that there is a need (for teaching-related CPD). If you look from the view of the burdened academic, there may be a deeply disguised need, but often not the time. And then there is a whole lot that simply do not see such a need. So I think it (the need) lies on a few levels ... I get in touch with more and more lecturers that says that there is a greater awakening in terms of teaching and the importance thereof and the necessity of empowerment. We typically find a greater need thereof with younger academics, people that are new to the profession, than with senior academics that have years of experience behind them. [Senior advisor at CTL, previously a lecturer in Chemistry]

The demands that multiple roles make on lecturers do not seem to be limited to Stellenbosch University. Mapesela and Hay (2006) report on a case study at another South African university where the same trends are noticeable. Role changes add to lecturers' heavy workloads and take time that would usually be spent on research activities. This research time that is lost is valuable, especially in the light of national demands for higher research output (Mapesela & Hay, 2006). Again the balance between the different scholarly roles and responsibilities will determine effective practice, job fulfilment for the lecturers as employees, and ultimately their need for CPD. The scholarship of engagement in the natural sciences within the particular study seems to be centred on subject-specific communities, which means that it is closely related to the research role. Collaboration, collegial interaction and even interdisciplinary efforts transpired as important aspects where there is a definite need for CPD.

Boyer's (1990) dimensions of scholarship also provide a mandate for CPD, as the quality of scholarship is dependent upon the vigour of each academic. Academic renewal (and therefore CPD) is essential to the life of the university. Very few lecturers excel naturally and equally in all their scholarship roles (Andresen, 2000). The majority of lecturers need to continuously develop their professional skills in all areas of practice – be that discovery, teaching, or engagement.

Professionals' pre-service or formal learning will have a determining effect on their attitudes towards lifelong learning and their future need for CPD (McDonald, 2001). However, Alemna (2001) and Cervero (2000) argue that no amount of formal education is sufficient in today's fast-changing circumstances. A professional's knowledge becomes outdated at an ever increasing rate, hence the need for a continuous updating of knowledge and skills. Beatty (2001) states that, in the present context, scientific and technical information doubles every five to seven

years. This means professionals' knowledge and skills become dated at an according pace. It can be argued that professionals have been exposed to more liberal and critical thinking, through their pre-service learning, than persons in non-professional occupations. Kachingwe (2000) and Walters (1999) found that the higher a professional's educational attainment, the more likely he/she is to participate in continuing education. The research of Livneh and Livneh (1999) contradict this finding. They found that learners with lower levels of educational attainment used more time for learning activities, which supports the notion that these learners recognised the need to upgrade their education. They may also have been at the start of a professional career – a time when new professionals recognise the need for more knowledge and skills. The difference in findings might be attributed to study populations that included both professional and non-professional learners who differ in their need for and approach to lifelong learning.

This need for CPD is further highlighted by the reality that professionals do not have the luxury of predictable career paths in the post-modern organisation. Grzyb, Graham and Donaldson (1998) found that career instability was a determining factor in professionals' decisions to participate in CPD activities. O'Meara and Rice (2005) add that a new generation of academics have been moving into academe since Boyer's *Scholarship Reconsidered* appeared in 1990. Technological advances and changes in student demographics add to the changed (and still changing) academic context within which these professionals have to function. Many professions are currently moving through a transitional stage (Cervero, 2000; Kachingwe, 2000; Grzyb *et al.*, 1998). Continuous research and debate in the field of scholarship development is necessary to understand the current context of academic practice and help shape its future. The need for CPD is therefore not just to keep abreast of the latest developments, but also to improve the continuing employability of professionals (Kabouridis & Link, 2001; Kachingwe, 2000; Sadler-Smith *et al.*, 2000; Challis, 1999; Grzyb *et al.*, 1998).

Many professionals and organisations have become increasingly aware of the value of lifelong learning and its association with workplace learning. This awareness is spurred on by technological changes, the fast pace of knowledge obsolescence, the absorption of traditionally independent professionals into the corporate, organisational sphere, and the blurring of traditional boundaries between professions. Interdisciplinary, self-directed work teams are the order of the day – also in the higher education setting. There is a trend in some professions towards 'cross-skilling', as generalists are used to carrying out functions that were traditionally within the field of specialists. Equipping professionals to work toward these changes and new roles requires continuing renewal and extension of the skills, knowledge, awareness and flexibility necessary to remain effective in dynamic institutions (Smith & Topping, 2001; Finley, 2000; Kachingwe, 2000; Sadler-Smith, 2000; Wilson, 2000; Livneh & Livneh, 1999). CPD

further provides a route to improved prospects for promotion, career advancement and financial gain (Alemna, 2001).

It is evident that the fast-changing pace of knowledge and technological applications in the natural sciences has a direct influence on these lecturers and their learning. Not only does it force them to cope with change, keep up to date with the latest developments and continuously explore uncharted territory within their different areas of expertise, but it also necessitates continuous professional transformation to enable them fit into their different roles. It therefore also increases and diversifies their need for CPD.

The organisation plays a significant role in the need for CPD. Bureaucracy and managerialism influence the way in which a university approaches the continuous development of its staff in terms of scholarship (Rowland *et al.*, 1998). Evaluation and reward are the mechanisms an institution uses to ensure adherence to its underlying values. O'Meara and Rice (2005) also emphasise the influence of the institution on scholarship development. Initiatives aimed at promoting scholarship through CPD should therefore take the campus culture, university mission, and discipline context into account. Boyer (1990) emphasises the importance of clear institutional goals and fair, achievable reward systems for academic performance. But even in the 1990s higher education was driven decidedly more by external forces than by internal vision. The important point to be made is that organisations can easily stifle creativity and motivation through policies and procedures that do not reward learning, irrespective of the level of education. Creating an environment that contributes to learning remains a major challenge (McDonald, 2001). This should be founded on the learner's previous knowledge, skills, attitudes and experience.

McDonald's (2001) statements correspond with the findings of this study, as lecturers in the natural sciences expressed their distinct contempt for bureaucratic systems that invade their sense of freedom as professionals. Organisational policy determines employees' roles and responsibilities and therefore creates an unequal distribution of power, which could render so-called academic freedom^{vi} a figment of the academic's imagination. But the power relationship between the university as organisation and the lecturer as employee is not a one-sided affair. An ever changing *quid pro quo* relationship evolves whereby the university supplies infrastructure in return for the lecturer's professional services (mainly as researcher, teacher and administrator). The lecturer attains relative academic freedom within the boundaries of the academic system in return for research and student output and managing certain administrative and service responsibilities. Again it is a question of balance in this continuous power struggle. Although Stellenbosch University (2000) commits itself to academic freedom in its vision, it does

not seem as if it is the perception of the study population that an ideal balance is achieved. This is, indicated by responses such as the following:

Officially it is stated that research and education is both important at the University of Stellenbosch. But in practice the emphasis falls on nearly only research. This causes many lecturers to disregard education and only do research. This causes maybe that we lose good students. [Associate professor in Computer Science with 14 years of academic experience]

... but what about more acknowledgement regarding lecturing for example advancement to equivalent of professor? (Rector's awards and performance bonuses are only consolation prizes) as a result of this few lecturers really bother with teaching. The 'lab' is the place to be otherwise a promotion above lecturer in natural sciences is impossible. [Senior lecturer in Zoology with 35 years of academic experience]

In my opinion it (CPD) should go broader than only subject specific teaching, which is specialised research teaching, is restrictive, it is about restriction. You become a specialist in that area, but if you can function professionally in a profession is maybe another question as how much knowledge you have on a specific small facet. [Senior Advisor, CTL]

Boyer (1990) adds the importance of life phases (or seasons) of the academic to continuous development, as needs may differ in different phases and between individuals. Patterns of productivity in the various career phases of academics seem to differ between disciplines. Some disciplines (for example Mathematics) seem to produce scholars of high standing at a relatively young age. In other disciplines peak creativity seems to come at a later stage. Boyer (1990) notes that even though lecturers in the later phases of scholarly development run the risk of isolation and stagnation, lecturers in their late career stages have considerable capacity for growth and possible contributions to make within a discipline. Evaluation and reward systems need to take into account different patterns of productivity in terms of age, career and discipline. Boyer (1990) refers to creativity contracts in which a lecturer defines his/her professional goals for a three- to five-year period, where shifts in scholarly focus are possible. Such contracts make it possible for an academic to focus on a scholarly role suited to the phase in which he/she finds him/herself – for instance research at the earlier phases where it is necessary to establish a status and standing within the discipline. This view of professional development and scholarship allows continuous, broad and individualised evaluation. It is not meant as an interrupted or erratic profile of academic activity, but rather as a support structure for lifelong academic productivity (albeit in varying areas of scholarship at different times). Boyer (1990)

cites an example from Georgia University (USA) that allows five career profiles – the traditional profile that places equal emphasis on all scholarly roles, the research profile, the teaching profile, the service profile and the administrative profile (the latter four profiles placing more emphasis on the specific scholarly role identified in each profile). This type of arrangement could form the basis of a creativity contract.

Professionals seek CPD as additional educational experiences to remind them of what they once knew and have forgotten (affirm and refresh), to acquaint them with the latest developments in knowledge (update) and to help them solve problems (reflect and apply). Continuing professional development is a vital instrument through which professionals can channel their creative energy, talents and skills in order to remain relevant in society and continue to be viable in the profession. The learning in CPD can be incremental, which refines or adds to past learning, or transformational, which is new and fundamentally different from previous learning. It is therefore a unique combination of theory and practice (Alemna, 2001; Beatty, 2001; Daley, 2001; McDonald, 2001).

Kutner and Tibbetts (1997) refer specifically to the need for CPD for educators (including lecturers in higher education). Educators who are committed to improving the quality and effectiveness of their services have to participate actively in developing and improving their knowledge, skills and programmes. A comprehensive professional development approach is imperative. Up to date, however, CPD for educators has lacked coherence and continuity (Castle, Holloway & Race, 1998). Grzyb *et al.* (1998) encourage educators to address these issues and determine how they affect learning within their professions. Brew (1995) proposes a developmental model of appraisal to align individual and institutional needs. If such a model is carefully designed and implemented, it could create a climate of voluntary participation where CPD becomes an intrinsic part of professional practice. Any such system should recognise the professional integrity of the individual and the importance of CPD and create an arena for discourse where professionals can expose their problems and weaknesses without fear of penalty.

Professional lecturers in higher education form a distinct group of adults and thus have distinct educational needs for lifelong learning within their occupational sphere. Studies on the overall adult population are not always directly applicable to these professionals. They need programmes that are specifically designed to suit their professional needs. Despite common needs, resources and methods, each profession has legitimate claims to its unique expertise and distinct traditions of practice. A multi-disciplinary perspective indicates that common issues and concerns exist, which leads us to a universal definition of CPD (McDonald, 2001).

It is evident from the responses of the participants that this is also the case for lecturers in the natural sciences at Stellenbosch University. Even though provision is made for CPD programmes within the university system, it is not aimed at their specific needs. Even though the origin of these perceived needs may be generic across disciplines and faculties, lecturers in the natural sciences perceive their developmental needs to be unique to their arena of practice and want it to be addressed as such, as stated below:

I am sceptical about any CPD initiatives. It is improbable that I will spend free time on and take part in generic initiatives ... generic CPD programmes sounds like a waste of time. [Associate professor in Computer Science with 8 years of academic experience]

I must admit that most of the time I am reluctant to take part in CPD initiatives. I usually find it quicker and easier to do this on my own and just ask people a specific question when I get stuck. Often I find that although the initiatives might have aspects that I am interested in there are often many other components that I am not interested in. [Lecturer in Geology with 3.5 years of academic experience]

I don't know, I think it would be a good thing but then the course should be relevant – there are for instance some courses that I have not attended or not enjoyed because they weren't relevant for me. [Lecturer in Chemistry with 4 years of academic experience]

The requirements for each professional will also be different depending on their interests, so they would want to focus more on developing those skills that are relevant for their interest ... [Lecturer in Chemistry with 4 years of academic experience]

... there is no way how you are going to keep everyone happy, how you are going to impress everybody, that is a given. I don't think it is about a person or a division of the university, it is simply about diversity. I mean, the number of lecturers there are, the number of employees there are, so many perspectives there are on teaching. So it is not as simple as saying here is a uniform generic module as we are going to train all of you. [Head: School for Public and Primary Health Sciences, Stellenbosch University]

So it is not that you don't want to learn, I just don't think it helps to sit and listen for hours to all sorts of irrelevant stuff ... you don't want to waste the little time you have. You know when a person can really tell you something that can really help ...

and not because I think they are necessarily talking nonsense, but only because I think it is not applicable to my subject in reality. [Senior lecturer in Mathematics with 10 years of academic experience]

It would be difficult to find one/produce one (CPD programme) to suit everybody's situation they would have to be tailored to "groups". [Lecturer in Physiological Sciences with 7 years of academic experience]

... the methods that are going to work in the teaching and what is going to work and not going to work, depends terribly on the subject you lecture ... I mean there's certain methods that work excellently in certain subject areas, I would think, and then they flop miserably in others ... if you want good ideas on how to teach in Mathematics and what works and what does not work you can only talk to mathematicians. An educator will not be able to tell you anything about it. [Senior lecturer in Mathematics with 9 years of academic experience]

... computer science is for example influenced by the technology, more so than a subject such as Mathematics. [Associate professor in Computer Science with 14 years of academic experience]

It therefore becomes clear that lecturers in natural sciences do not see themselves as a homogeneous group and definitely distinguish themselves from the broader academic community, also as far as their needs within CPD are concerned. They want to be seen and approached as such.

Sadler-Smith *et al.* (2000) add that survival, maintenance and mobility are not the only reasons that drive professionals to participate in CPD. Improving a feeling of self-worth, improving competence and participating in learning for its intrinsic worth may also contribute to the need for CPD.

Lecturers in the natural sciences in this particular study underscore the views of Sadler-Smith *et al.* (2000). Self-motivation and self-improvement through self-directed initiatives are evident in their approach to CPD. This breeds an inherent culture of lifelong learning. Walters (1999) refers specifically to the need for lifelong learning in South Africa. Responses such as the following prove this point:

I am not dependent on someone else to guide me – I go with a notion of what I want to learn. In my subject, my base and intermediate levels are far more comprehensive, so it is much easier to build upon it, or branch sideways into

multidisciplinary understanding/skill, which is exciting. [Professor in Physiological Sciences with eight years of academic experience]

(I continuously develop professionally) by accepting and improving long-life learning by scientific research, by keeping abreast with progress, by searching for and keeping contacts with colleagues. (It is) part of my life ... I do not pay much attention to "organised" (or controlled) development initiatives ... I like to control the pace and ways of my professional development myself. [Professor in Botany with 25 years of academic experience]

I'm not sure that I would be able to justify the time. Also having spent so many years studying I would be reluctant to go back in to a formal course again. I much prefer doing my own professional research. [Lecturer in Geology with 3.5 years of academic experience]

It depends on each person of which 'value' he/she gains from such (formal CPD) initiatives. Many people learn skills themselves without help. [Senior lecturer in Zoology with 35 years of academic experience]

This raises issues on whether any CPD should be of a compulsory nature. The need for CPD can also be approached from other perspectives, such as legislative forces, where accreditation and certification play determining roles in the CPD sphere. McDonald (2001) and Mott (2000) specifically refer to increased public pressure and demand for re-certification and even re-licensure for professionals. Globally, governments have turned to professional credentials in ensuring professional competence, establishing standards of practice, protecting public interests and maintaining minimum levels of ethical practice. Mandatory CPD as a means of maintaining credentials remains an unresolved issue. Critics argue that it leads to higher costs to the consumer and is based on a remedial approach to education, whilst there is no evidence that mandatory CPD does in fact ensure professional competence. Current assessment or evaluation methodologies cannot ensure that CPD will lead to improved or maintained competence.

In South Africa, the institutional audit system was developed by the Higher Education Quality Committee (HEQC) for the purposes of capacity development and sustained quality improvement, which become increasingly important in a higher education system faced with multiple stakeholder demands. Stakeholders in higher education demand greater responsiveness to societal needs through student access and mobility, research and innovation that address social and economic development, as well as through engagement with

communities on a local, regional and international level. Stakeholders also require that higher education institutions be held accountable for the manner in which they maintain the quality and standards of their core academic activities and that they are able to demonstrate sustained improvement in this regard (Council on Higher Education, 2004). It therefore becomes imperative that higher education institutions are able to demonstrate that their foundation of human capital is responsive, innovative and adaptable. The continuous development of especially lecturers as professional academics in higher education will significantly contribute to a vibrant intellectual culture, the generation of knowledge and innovation and the utilisation of new modalities of provision. Provision, quality assurance and evaluation of learning will be discussed in the next two chapters as central issues in the debate around CPD. In terms of the need for CPD, the South African government and Stellenbosch University have both indicated a commitment to the continuing development of professional human capital through the national Skills Development Act of 1998 (Republic of South Africa, 1998) and the university's personnel development policy (Stellenbosch University, 1999). But whether these commitments should be translated into compulsory CPD programmes for lecturers clearly remains a contentious subject:

Forcing (attendance to CPD) just so, globally, is a very dangerous step to take, except if you have a very good reason to do so, if the HEQC says, let say, all the assessors must in effect be registered, then you don't have a choice other than to enforce it, and still I think the amount of resistance with which people will come into and continue such a programme will probably undermine rather than help any learning that could possibly take place. [Senior advisor, CTL]

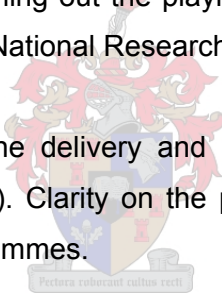
An increased demand for formal adult learning over the last 20 years is a noticeable trend in South Africa, although informal and non-formal learning opportunities have also proliferated due to the diverse needs of the adult learning population. The need for lifelong learning is driven by the re-entry into the global economy, as well as by the social and political pressures of equity and redress. Equity and redress therefore forms an integral part of the need for CPD within the South African context and is often addressed through affirmative action. Affirmative action may play a determining role in the need for and provision of CPD in the South African public and private sectors (Walters, 1999). Boylan (2002: 117) defines affirmative action as –

a policy that gives a preference to individuals based upon their belonging to designated groups who are underrepresented ... it can even be special training/education/counselling that is given to individuals from a disadvantaged group so that they might be able to compete equally with individuals from advantaged groups.

Various official documents refer to this connection between equity and/or redress and education, including the White Paper on the Transformation of the Public Service (Republic of

South Africa, 1995a), the White Paper on Education and Training (Republic of South Africa, 1995b), the White Paper on National Strategy for the development and promotion of small business in South Africa (Republic of South Africa, 1995c), the Integrated National Disability Strategy White Paper (Republic of South Africa, 1997a), the White Paper on Public Service Training and Education (Republic of South Africa, 1997b), the Input Paper: Poverty and Inequality Report – Education and Training (Republic of South Africa, 1998), the Promotion of Equality and Prevention of Unfair Discrimination Bill (Republic of South Africa, 1999), the Report on Career Management in the Public Service (Public Service Commission, 2000), South Africa's National Policy Framework for Women's Empowerment and Gender Equality (Office on the Status of Women, 2000), to name but a few. It is of specific relevance to this study that the Strategic Framework for the turn of the century and beyond of Stellenbosch University also makes specific reference to issues of redress within the institution's academic community (Stellenbosch University, 2000). The South African Council on Higher Education (2000) states specifically that higher education in South Africa needs to develop its human capital, especially in previously marginalised groups, through education and training, research and community involvement. Programmes such as the National Research Foundation's Thuthuka Programme make significant contributions to evening out the playing field for all academic professionals in the natural sciences in South Africa (National Research Foundation, 2004).

The need for CPD seems clear. The delivery and nature of some CPD programmes are, however, problematic (Medley, 1999). Clarity on the purpose(s) of CPD might help to deliver more effective and sustainable programmes.



2.5 THE PURPOSES OF CONTINUING PROFESSIONAL DEVELOPMENT

CPD is often seen as a miracle cure for professional obsolescence, especially within technically orientated professions such as engineering. Battersby (1999), Clair and Adger (1999) and Grzyb *et al.* (1998) warn that professionals should not be seen as a relatively homogeneous group. Professionals' expectations of CPD vary according to professional and personal factors, including the type of profession, the length of time in the profession, the professional role, the career stage and age. CPD planners and educators should not only rely on psychologically inspired research on the cognitive, developmental and learning characteristics of professionals alone as the basis for CPD programmes. Philosophical reflection on the importance of the purposes of CPD is too easily underscored. There is no fully developed working philosophy for CPD, although individual educators form their own philosophies within their own contexts and based on their past experiences. These educators may have no formal education in education itself (McDonald, 2001; Battersby, 1999; Challis, 1999).

Healey and Lawler (2002), Bitzer and Kapp (1998) and Cervero (1988) include the improvement of professional artistry or the professional's adaptability – the ability to operate in different practice settings – in the purpose of CPD. Houle's (1980: 75) definition of the purpose of CPD builds on the inevitable changes in society and can be summarised as: "...to convey a complex attitude made up of a readiness to use the best ideas and techniques of the moment but also to expect that they will be modified or replaced". CPD plays an important role in equipping educators to meet current professional challenges, such as effectively coping within a rapidly changing global and multi-cultural workplace (Clair & Adger, 1999; Bitzer & Kapp, 1998).

Developing expertise in their different scholarly roles, coping with change and keeping up to date (mostly in a self-directed manner) were clearly articulated purposes of CPD within this study of science lecturers:

... becoming a more 'expert' researcher gaining more insight into an aspect in Chemistry so as to become an authority. It also means keeping up to date with the latest teaching methods in chemistry and not lagging behind. [Lecturer in Chemistry with 3 years of academic experience]

... a person may not stagnate in your work and cease to learn. If you present a module for a second or third time you should ask yourself each time if there is something that you can change to make the teaching more effective. You also should read wider each time to learn something new yourself. In research the research itself is per definition continued development of your knowledge and experience in the field — but it is mostly self development ... [Lecturer in Physics with 1.8 years of academic experience]

... mastering previously unknown areas of my subject area and using these new techniques both in research and transferring it to students during lectures. [Associate professor in Computer Science with 8 years of academic experience]

... improving my capacity; taking on and learning new roles; learning new facts, techniques and research; increasing 'emotional intelligence quotient'. [Professor in Physiological Sciences with 8 years of academic experience]

The purposes of CPD are also influenced by the organisation. This leads to the central problematic question surrounding CPD: Whose interests are being served by CPD? The conflict between the self-fulfilment of the individual professional and expectations of the organisation is integral to the different purposes stated in the literature on CPD (McDonald, 2001; Wilson, 2000; Battersby, 1999). The current inherent conflict in the purpose of CPD has a direct

influence on how CPD is practised (Wilson, 2000). This is of great importance to lecturers; especially if their professional goals differ from those the organisation establishes and provides for through CPD programmes and opportunities. A possible solution to resolve the conflict is the construction of a learning organisation that serve both the purposes of the individual professional and the organisation. A learning organisation can be conceptualised as one where people continually expand their capacity to create the results they desire and where new patterns of thinking are nurtured. There is space for experimentation and reflection, which promotes self-confidence. Collective aspirations can evolve and people are continually learning to learn together (Battersby, 1999; Hake, 1999; Ritchie, 1998; Senge, 1990). The success of learning organisations is greatly determined by the vision and attitude of their leaders. Successful leaders have a vision of continuous learning, support learning initiatives in a democratic manner and create opportunities for learning (Wonacott, 2001; Lashway, 1998).

Within Stellenbosch University, the aim of personnel development is described as the empowerment of all staff to maintain high standards and continuously to improve the quality of services. Development at staff level should also aim to optimise productivity. Stellenbosch University furthermore aims to be a learning organisation that provides equal opportunities to all personnel and encourages their career promotion by exposing them to relevant development programmes in order that they may realise their full potential. Lifelong learning is a focal point in preparing personnel to efficiently meet the challenges presented by changing circumstances in higher education. The policy on personnel development proposes a system of professional development contracts between individual staff members and the institution within the context of the performance management system. This should be done in accordance with the requirements of the post that the staff member holds, or wishes to hold (Stellenbosch University, 1999). This policy places a responsibility on the university as learning organisation in terms of CPD – not only as a provider, but also in creating a supportive environment for scholarly development.

The value of CPD has been studied from various perspectives, but most of these studies have focused on the individual learner, rather than on the learner within a particular context. The decision to participate in CPD is often influenced by state- or profession-determined policies or workplace considerations (Daley, 2001; Grzyb *et al.*, 1998). Grzyb *et al.* (1998) found that organisations use subtle ways to exercise power over professionals, including power over the decisions to participate in CPD. Livneh and Livneh (1999) support the influence of external motivators, referring to organisational influences such as promotion and remuneration, in the professional's decision to pursue CPD. Internal motivation, however, remains the strongest force in the professional's quest for further education.

The role of organisational context in CPD is becoming increasingly important. Performance and learning take on multiple forms within organisations and are influenced by the context, the organisational setting and the learner's personal motivation, job satisfaction, morale and activity. Socialisation of professionals into practice tends to be founded on the organisation rather than on the profession itself, as the organisation creates the social and structural context of successful professionalisation (Hart, Clinton, Edwards, Evans, Lunney, Posner, Tooth, Weir & Ryan, 2000; Knox, 2000; Odini, 1999; Bitzer & Kapp, 1998; Grzyb *et al*, 1998).

These aspects demand reflection on the organisational culture within Stellenbosch University. The values that determine organisational culture within Stellenbosch University (according to its strategic framework) includes equity, participation, transparency, readiness to serve, tolerance and mutual respect, dedication, scholarship, responsibility and academic freedom (Stellenbosch University, 2000). To what extent do lecturers associate with these values and to what extent do these values influence the purposes of CPD at Stellenbosch University?

It is evident that the practice of CPD (even informal and self-directed variants thereof) takes place within the boundaries of the above-stated values by the lecturers in the study. It rather seems to be practical issues such as the demands of administrative tasks, lack of funding, imbalances in division of work and time management that have a negative impact on upholding these values. A supportive environment seems to be a determining factor if CPD is to achieve its purposes and uphold the values integral to the institution.

CPD is important for the maintenance of the human resources base of any organisation and should be seen as an integral part of the main organisational strategy. Cervero (2000) refers to CPD as the most important employee benefit after health insurance, which may help retain employees and lower the personnel turnover rate. Smith and Topping (2001) add that effective CPD can raise morale and improve the motivation of employees. A lack of learning leads to a lack of knowledge and skill, which will likely lead to lower productivity. This, in turn, will lead to a poor organisational image, as an organisation's success is measured to a large extent by the dedication and commitment of its workers. The use of human resources (the intellectual capital of the organisation) depends to a certain extent on how knowledge within an organisation is managed. Knowledge management within organisations refers to the way in which knowledge is developed and directed, which is unique to each organisation (Alemna, 2001; Costley, 2001). It is therefore of importance that Stellenbosch University has undertaken to engender via senior management a spirit of commitment to personnel development, spend a realistic portion of its budget on developing members' potential, create and maintain the necessary infrastructure for development, provide moral support for CPD initiatives, selectively offer opportunities for study leave to lecturers^{vii} and establish a management and remuneration system that encourages and

rewards the development of its personnel (Stellenbosch University, 1999). This approach to personnel development relates to Senge's (1990) notion that growth does not lie within the organisation itself, but rather within the individuals in the organisation.

The continuous improvement of society through professional practice has traditionally been the primary purpose of CPD (Medley, 1999). Stellenbosch University (2000) refers to engagement with the community as one of its three core processes (the other two being research and teaching). Alliances and partnerships with the greater society are therefore seen as an important catalyst for renewal within the university itself. How community engagement is defined in the professional practice and development of lecturers varies, but mainly centres on the scientific scholarly community, as is evident in the following responses that relate the purpose of CPD to lecturers' different professional roles and responsibilities:

(The role of CPD is to improve) community service if it refers to your lab community, departmental community. [Lecturer in Computer Science with 4 years of academic experience]

... my service is currently mainly within the South African Institute for Physics within the department as well as help to students or personnel of other departments that want to use our equipment. [Lecturer in Physics with 1.8 years of academic experience]

... fulfil and build out my specialist field of Mathematics to the benefit of the community. [Professor in Mathematics with 30 years of academic experience]

To use my talents, training and experience to deliver a service to the advantage of the community and science. [Senior lecturer in Biochemistry with 14 years of academic experience]

To provide support for industry challenged with scientific questions. [Associate professor in Microbiology with 6 years of academic experience]

... and community service (e.g. reviewing manuscripts, etc). [Associate professor in Chemistry with 11 years of academic experience]

Serve on editorial boards of several international journals and advisor to several grant-awarding bodies ... [Professor in Microbiology with 29 years of academic experience]

Both the individual's and the organisational definition of *community* may therefore have a determining effect on how CPD aimed at the development of the scholarship of discovery is approached in the natural sciences.

Challis (1999) summarises these different perspectives into three broad purposes of CPD: firstly, it is the updating of knowledge and skills in existing and new areas of practice; secondly, it is the preparation for a changing role in the organisation, new responsibilities and promotion; thirdly, it increases competence in a wider context with benefits to both professional and personal roles. Cervero (2000) concludes that the bottom line of CPD is to improve practice, whatever it entails.

2.6 CONCLUSION

In concluding the conceptualisation of what it means to be a professional in the academic practice within the natural sciences can partly be explained by the notion of scholarship. The added dimension of administration also needs to be taken into account, even though it is not traditionally defined as a form of scholarship. Lecturers in the specific study found that they devoted significant professional energy to this component of professional practice.

The search for a definition of CPD for science lecturers in higher education proved to be neither a simple, nor an easy endeavour. A simple explanation of the need for or purposes of CPD is also not forthcoming. It is a complex and highly context-dependent phenomenon with no clear-cut boundaries on which future practices can be built. The notion of scholarship is, however, useful in determining areas of professional practice in academe in which development can take place – even though these do not seem to be equally represented or emphasised in initial training, practice, or professional development.

Within this vagueness, however, lies the challenge – a challenge to place CPD within the notion of scholarship in this unique professional arena. The definition of, need for and purposes of CPD point to three aspects that need to be addressed: the individual (the lecturer as a scholarly learner in this case), the educational process (CPD programmes), and the organisational structure within which CPD takes place (Stellenbosch University) (Novikov, 1999). These aspects are directly involved in the provision of CPD, which will be discussed in the next chapter of the dissertation.

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ⁱⁱ The term *professor* originates from medieval times. It labelled someone as a person professing faith – a so-called *professores of science of God* (Wycliff, 1380 – according to Gould, 2006: 242), but became a more generic term and less ecclesiastical in the 18th century. The term *professor* developed to be associated with a membership within the traditional disciplines and the current ideological undercurrent still has a close affiliation to professing the knowledge

within a particular discipline. Gould (2006) notes disciplinary and institutional affiliations as the primary measure of academic professionalism and self-respect.

ⁱⁱⁱ The format of PhD programmes differs. Examples from the United States of America indicate a greater emphasis on developing the PhD candidate in both discovery and teaching. The predominant PhD format in the natural sciences in South Africa, however, seems to focus on research (and therefore development within the scholarship of discovery).

^{iv} In academic practice this would refer to effectiveness in terms of scholarship, including effectiveness in areas such as research, teaching and community interaction.

^v Even though administration does not form part of the notion of scholarship as commonly described in literature, it is included here, as respondents indicated administration as a significant professional responsibility in their daily professional practice. This finding corresponds to that of Mapesela and Hay (2006: 716), who found that lecturers have to cope with “cumbersome administrative procedures, processes and bureaucracies whilst at the same time grappling with knowledge production and other academic roles such as research, service and teaching”.

^{vi} Altbach (2001) argues that the notion of academic freedom has always been a contested terrain in academe, and that it is rarely discussed and ill-defined. However, academic freedom is a central value of higher education and at the core of many university mission statements. Academic freedom seems to be closely linked to the dominant ideology within a university, as well as to that of the society in which the university is situated. Academic freedom is described as a reciprocal relationship between the individual academic in his/her scholarly roles, and society. Altbach (2001: 208) describes this view as: “[T]hose entrusted with teaching and research in higher education, it is claimed, have a special obligation to dedicate themselves to truth and objectivity in all their scholarly work.” A more absolutist view of academic freedom (cited in Altbach, 2001: 208) contends that academics “should have the right to participate in any activities they deem appropriate”. The boundaries of academic freedom are therefore not clear, and, as a result, it remains an ill-defined concept.

^{vii} The selection criteria are mostly based on research output, and therefore the focus of study leave is commonly on the development of the scholarship of discovery.

CHAPTER 3

Providing continuing professional development that enhances scholarship in the natural sciences in higher educationⁱ

ABSTRACT

Continuing professional development (CPD) gains relevance and prominence in a global society characterised by constant change and a consumer-driven market economy. Competence, accountability, professionalism and lifelong learning are concepts currently guiding professionals to continuously improve their expertise. Lecturers as professionals in higher education are expected to perform in their scholarly roles as researchers, teachers, and in their engagement with communities. The question therefore arises whether the current provision of CPD addresses all these areas of academic practice. This chapter investigates the providers and provision of CPD within a particular professional field – that of lecturers in the natural sciences in higher education. The integrated findings are based on literature and a qualitative study conducted in the Faculty of Science at Stellenbosch University, South Africa. The influence of various role players in the CPD arena on scholarly development is discussed and the varied input of the formal, informal and commercial sectors in the provision of CPD to lecturers in the natural sciences is considered. The provision of CPD is discussed according to four paradigm shifts. The chapter concludes with general recommendations for the improvement of the provision of CPD. An investigation of the provision of CPD will give an insight into the current practice thereof within the natural sciences at Stellenbosch University, which could help to determine future initiatives.

3.1 INTRODUCTION

Continuing professional development (CPD) gains relevance and prominence in a global society characterised by constant change and a consumer-driven market economy. Competence, accountability, professionalism and lifelong learning are concepts currently guiding professionals to continuously improve their expertise. Providers of CPD play a determining role in the success thereof and therefore form an integral component of any investigation into the practice of CPD.

This chapter investigates the providers and provision of CPD within a particular professional field – that of lecturers in the natural sciences in higher education. It informs on the providers of CPD in terms of the formal, informal and commercial sectors of provision. It also discusses the provision of CPD in terms of four main paradigm shifts that currently guide its provision and its influence on the development of the various scholarship roles lecturers are commonly expected to fulfil.

The integrated findings presented in this chapter are based on literature, relevant documentation and a qualitative study conducted in the Faculty of Science at Stellenbosch University, South Africa. Mapping the provision of CPD will give an insight into the current practice thereof within this field, which could help to determine future initiatives.

3.2 PROVIDERS OF CONTINUING PROFESSIONAL DEVELOPMENT

Cervero (2001), Costley (2001), Knox (2000) and Teichler (1999) identify three main types of CPD providers, namely the formal sector (the State and higher education, including universities), the informal sector (professional associations, unions and non-profit organisations) and the commercial sector (private enterprises that provide education for profit). All of them have distinctive resources, assets and limitations. These providers and their programmes differ in their definition of an educational strategy, scientific and technological potential, clientele, sources of finance, the nature of the training and the type of certification they offer (Teichler, 1999). Mott (2000) adds the individual professional who takes responsibility for his/her own CPD needs individually or in autonomous groups, which vary in size and structure.

Kutner and Tibbetts (1997) also refer to these different providers of CPD and add that professional development does not take place in a vacuum. It therefore requires the support and involvement of the State, providers, organisations and individual professionals. Novikov (1999) adds the necessity of creating a unified educational domain in order to obtain continuity in CPD. This can only be achieved through organised co-operation between the different stakeholders in CPD. These different types of providers will now be discussed in more depth.

3.2.1 The formal sector

3.2.1.1 The State as a stakeholder in continuing professional development

Kerr (1994: 6) describes the current higher education context as –

... a world where the dominant force in human governance, and also where the worldwide advancement of learning has become the single most influential factor affecting the human condition; and the relations between them are an increasingly important aspect of society.

At the State level key decisions are made that will determine the structure and sometimes even the content of CPD activities.

Kutner and Tibbetts (1997) describe State support as the allocation of sufficient resources for professional development and monitoring of CPD programmes and their providers according to set standards. The State is therefore instrumental in developing and implementing a plan for professional development with input from the main stakeholders. The State is instrumental in

encouraging the development and evaluation of a variety of CPD programmes that will support the diverse CPD needs of individuals, organisations and the broader society. An intergovernmental infrastructure that supports professional development can contribute significantly to the overall success of CPD. It should involve stakeholders from all levels of government and from the other service delivery areas (Kutner & Tibbetts, 1997).

The State also contributes to CPD by providing an educational framework in which all academic practices have to take place. The outcomes-based approach to education and training in South Africa creates fertile soil for the cultivation of CPD in the public and private sectors. Within the South African context several legislative measures have been passed in the last decade, which have had a profound effect on education as a whole and also on CPD in particular. Mapesela and Hay (2005: 115) argue that academics have not always found it easy to deal with the policy changes in South Africa and are often ill-prepared to deal with the changes in their workplace:

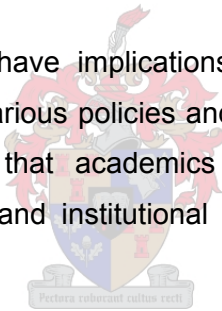
There is agreement that staff in higher education need to be equipped with skills and competencies, not only to improve the quality of higher education, but also to assist them in dealing with change. Developing the confidence and competence of staff obviously has an additional advantage that could enhance their work satisfaction.

Policy can be a source of dissatisfaction amongst academics, as policy is viewed subjectively in terms of the implications it has for the individual's scholarly practice (Mapesela & Hay, 2006). CPD could be a mechanism through which to facilitate effective change management in higher education in South Africa. This debate started in the early 1990s with the National Education Policy Investigation (NEPI). The NEPI initiative noted the importance of supporting academics to improve their qualifications and develop their skills to cope with institutional changes. The National Commission on Higher Education (NCHE) continued with the work initiated by the NEPI initiative by developing a framework for the transformation of South African higher educationⁱⁱ. The NCHE also noted the importance of developing the skills and competencies of staff in higher education (Mapesela & Hay, 2005).

A number of national policy changes and initiatives since 1994 are noted as influential in changing the South African higher education landscape (Bundy, 2006; Mapesela & Hay, 2005; Singh, 2006). Starting with the broader legislation, the education White Paper 3: A programme for the transformation of higher education (Republic of South Africa, 1997) focuses on various aspects that influence the practice of scholarship, including the improvement of teaching and learning, advancement of research, capacity-building and human resources development, the creation of a free and open academic climate, and creating institutional environments where tolerance and respect are inherent features. This legislation refers specifically to "enhancing the

responsiveness of academic programmes, research and community service to regional and national needs” (Mapesela & Hay, 2005: 116). The Council on Higher Education (CHE) was formed as a result of the Higher Education Act no. 101 of 1997 (Republic of South Africa, 1997), which focused on regulating higher education, as well as on quality assurance and promotion within higher education. The South African Qualifications Authority Act of 1995 is another noteworthy piece of legislation, as it led to the establishment of the South African Qualifications Authority (SAQA) as the governing body of the National Qualifications Framework (NQF). The NQF has had far-reaching implications for academic practice, as it introduced and required the implementation of outcomes-based education (OBE), a modular system, and an outcomes-based approach to academic programmes – which proved to be demanding in terms of pedagogic engagement and bureaucratic systems (Mapesela & Hay, 2005). The National Plan for Higher Education Transformation (Republic of South Africa, 2001) provides the blueprint for the transformation vision initially set out in the White Paper 3 by using incentives and sanctions to guide higher education transformation in South Africa (Mapesela & Hay, 2005). Bundy (2006: 15) describes this plan as “a robust version of state supervision by any international comparative perspectives”.

These national changes obviously have implications for continuously developing lecturers’ ability to meet the demands of the various policies and statutory bodies in a scholarly manner. Mapesela and Hay (2005) found that academics may perceive these changes as an infringement on academic freedom and institutional autonomy, which may have a negative effect on their job satisfaction.



Various policies since 1994 have also addressed the transformation and well-being of academic staff at higher education institutions. The Skills Development Act no. 97 of 1998 (Republic of South Africa, 1998: 2) includes the following:

To provide an institutional framework to devise and implement national, sector and workplace strategies to develop and improve the skills of the South African workforce; to integrate those strategies within the National Qualifications Framework contemplated in the South African Qualifications Authority Act, 1995; to provide for learnerships that lead to recognised occupational qualifications; to provide for the financing of skills development by means of a levy-grant scheme and a National Skills Fund; to provide for and regulate employment services; and to provide for matters connected therewith.

The purposes of this act are to develop the skills of the South African workforce (including lecturers at universities) to improve the quality of life of workers, and their prospects of work and labour mobility; to improve productivity in the workplace and the competitiveness of employers.

It also aims to increase the levels of investment in education and training in the labour market and to improve the return on that investment. The act further aims to encourage employers to use the workplace as an active learning environment (by creating a learning organisation); to provide employees with the opportunities to acquire new skills and to provide opportunities for new entrants into the labour market to gain work experience. It also aims to encourage workers to participate in these initiatives and to ensure the quality of education and training in and for the workplace. The State aimed to achieve these goals by establishing an institutional and financial framework comprising the National Skills Authority, the National Skills Fund, a skills development levy-grant scheme as contemplated in the Skills Development Levies Act of 1999, and by establishing Sector Education and Training Authorities (SETAs), labour centres and the Skills Development Planning Unit. Sector Education and Training Authorities (SETAs) were established to develop and implement a sector skills plan within the framework of the national skills development strategy, approving workplace skills plans, allocating grants to employers, education and training providers and workers and monitoring education and training in the sector. The State also encourages partnerships between the public and private sectors of the economy to provide training in and for the workplace and through co-operation with the South African Qualifications Authority (Republic of South Africa, 1998). The South African government is therefore committed to the continuous development of the South African workforce at a macro-level – including lecturers in the natural sciences at higher education institutions.

These macro-level developments have had a significant influence on academic practice at both the institutional (university) and the individual (lecturer) levels. Mapesela and Hay (2005) report that although the transformation agenda is generally supported, policy changes are also sometimes perceived as government interference that threatens institutional autonomy and individual academic freedom.

The South African Council for Natural Scientific Professions (South African Council for Natural Scientific Professions, 2003) functions at the meso-level of State involvement in CPD. The SACNSP is a statutory body supported by the Natural Scientific Professions Act no. 27 of 2003. Its powers in terms of education and training are to determine competency standards for the purpose of registration and to establish mechanisms for registered persons to gain recognition of their qualifications and professional status in other countries. It has the power to give advice or assistance to any educational institution, voluntary association or examining body with regard to educational facilities for registered persons and prospective registered persons, and the training and education of such persons. Its general powers include conducting research into matters relating to the natural scientific professions and encouraging such research. It is also responsible for the protection of the public and the environment against harmful scientific practices of registered persons and for the maintenance of the integrity, the enhancement of the

status and improvement of the standards of services rendered by registered persons (South African Council for Natural Scientific Professions, 2003; Republic of South Africa, 2003). As registration with this council does not seem to be compulsory at this stage and the implementation of the above-mentioned act only applies to registered persons, its sphere of influence in the academic sphere seems to be limited at present. This situation may change in the future.

In terms of higher education in particular, the South African Qualifications Authority Act (SAQA) no. 58 of 1995 (Republic of South Africa, 1995) resulted in the establishment of a National Qualifications Framework (NQF), which regulates all qualifications and accredits programmes and short courses. The White Paper on Higher Education (Republic of South Africa, 1997) and the National Plan for Higher Education (Republic of South Africa, 2001) both place strong emphasis on the need to develop research capacity and increase research productivity. This will ensure innovative intellectual inquiry and the application of research findings within relevant spheres of society. The Department of Education (DoE) has stated an increase in postgraduate enrolments and research outputs as a strategic goal for the South African higher education system. Strategies for the capacity development of researchers, including effective postgraduate supervision and support of new researchers and supervisors, are therefore seen as a priority (Council on Higher Education, 2004b).

There are various programmes aimed at achieving these goals. The Thuthuka Programme was initiated by the National Research Foundation (NRF) to strategically position young academics within the research, innovation and knowledge generation in the country and to ensure that they become significant players in the National System of Innovation (NSI). It is specifically aimed at women, black and young researchers in the areas of science and technology, as they remain under-represented in academic positions, especially at senior levels. The Thuthuka Programme consists of the following three sub-programmes: Researchers-in-Training (RIT), Women in Research (WIR) and the Research Development Initiative for Black Academics (REDIBA). These sub-programmes are aimed at pre-doctoral and postdoctoral levels and will eventually ideally enable participants to qualify for an NRF rating. The programme allocates funds (in the form of bursaries, scholarships, grants and contracts) for research and the promotion of multidisciplinary collaboration. The Thuthuka Programme also monitors the status and needs of research and review research proposals and results promoted by the NRF (National Research Foundation, 2004). This programme has borne some fruit within Stellenbosch University as is evident from the following responses:

I'm involved with a mentoring programme through the Thuthuka funding programme, and I'm enjoying it so much that I feel that such a mentoring programme should be

instituted for all young staff members joining the university. [Lecturer in Chemistry with 7 years of academic experience]

The Research Capacity Development (RCD) Strategy is another NRF initiative which incorporates NRF programmes through the development of people and environments that support research. It focuses on human resources development, building of research environments conducive to competitive research outputs and providing a knowledge base from which priority and strategic national research activities can be underpinned and supported. This is done through the establishment of centres of excellence. These are physical or virtual centres of research that concentrate existing capacity and resources to enable researchers to collaborate across disciplines on long-term projects that are locally relevant and internationally competitive. This strategy provides a system where leaders in a specific field can sustain and improve their expertise, whilst mentoring and developing young researchers through postgraduate study and postdoctoral support. It also creates a platform for collaborative efforts (National Research Foundation, 2004). An example of such a centre of excellence is the Centre for Invasive Biology in the Faculty of Science, Stellenbosch University. Although there was no further direct evidence among the respondents of any involvement in this initiative as such, many indicated that they were involved in NRF initiatives, or had received funding from the NRF for research projects.

Boughey (in Gravett & Geyser, 2004) and Hake (1999) claim that the influence of the State as controller of education has deteriorated in recent times in favour of market forces, individual choice and a consumerist orientation towards education. This necessitated a redefinition of the responsibilities of public authorities, the private sector and employers, as well as individuals, for the investment in education. The governmental and institutional documentation within higher education seems to indicate an increase in government control, contrary to the views of Boughey (in Gravett & Geyser, 2004) and Hake (1999)ⁱⁱⁱ. Although the above-mentioned influences are also noticeable within the South African higher education context, central government's strategic control over or influence on higher education has increased through earmarked or performance-based funding systems, reporting requirements and statutory and consultative bodies (Stellenbosch University, 2000). In South Africa, the HEQC has delegated the responsibility for the quality management of short courses, recognition of prior learning (RPL), moderation of assessment, training of assessors and certification to institutions themselves, but will do audits to evaluate the quality arrangements the higher education institutions have made (Council on Higher Education, 2004a). The HEQC has set quality criteria which serve as evaluation tools during audits, as well as broad benchmarks for quality management in higher education (Council on Higher Education, 2004b). This delegation of

State power has far-reaching implications for South African higher education institutions in terms of the provision of CPD initiatives, including CPD for their own staff.

The influence of the State in CPD should therefore not be underestimated, especially in the South African context. Legislative developments hold far-reaching implications for institutions such as universities as employers of a professional workforce. The institution is thereby forced by law to make provision for the continuous development of its employees. No CPD initiatives within higher education can succeed if they do not take into account national authorities and current legislation. However, it may be difficult to articulate all learning that takes place into measurable output, as much of it is self-directed, self-initiated and informal. Therefore not all that is considered as CPD will be taken into account in this system.

The majority of the State initiatives also seem to be aimed at the development of research capacity and therefore act as a stimulus to the scholarship of discovery (as explained by Boyer, 1990). The development of other areas of scholarly practice seem largely left to the discretion of the institution itself, although aspects such as teaching and community engagement are taken into account during institutional audits. It is therefore sensible to also investigate CPD and its influence on scholarly development at the institutional level.

3.2.1.2 Higher education as a main provider of continuing professional development

Higher education has made significant contributions to the field of CPD, even though it previously did not have a clear strategic and proactive role in the continuing professional development of graduates. The rising need for CPD has necessitated a negotiated compatibility between the responsibilities of higher education and the demands of CPD (Mott, 2000; Teichler, 1999). However, Mapesela and Hay (2006, in reference to Holtzhausen, 1999), state that higher education in South Africa has not adequately prepared its staff for the changes currently taking place in the higher education sector.

Brew (1995) differentiates between three models of CPD provision in higher education. The first is a top-down, policy-led model. Typical examples would include CPD that concentrates on equal opportunities or the incorporation of information technology into the teaching environment. This type of CPD provision model is driven by institutional policies that form an integral part of the implementation of strategic plans and change management. The second model follows a bottom-up approach and is led by the innovation of the staff. It has a greater focus on the everyday realities of an institution's employees and captures the enthusiasm and encourages ownership of the process. The third model combines the previous two models in a sandwich approach, where both institutional policies and staff needs are taken into account in the development and provision of CPD programmes. The ideal is to combine the strengths of the

first two models, but clear and effective communication between all the stakeholders is imperative if this model is to succeed.

The current role of higher education in learning after the initial pre-service stage can be classified in the following categories: advanced academic study; advanced professional programmes; short professional training courses; public lectures and other forms of general knowledge transmission; regular degree programmes for adults; remedial and second-chance provisions; and short study programmes and in-service training for the institution's own employees. The educational provision associated with these categories is usually in the form of distance learning, part-time study, evening classes, sandwich study, single short course studies or discontinuous learning activities (Teichler, 1999).

Stellenbosch University (1999) identifies two types of CPD programmes, namely departmental (or in-house) programmes and privatised (or outside the institutional sphere), that vary in structure. Week-long courses (preferably in an island situation), one- to three-day courses, half-day sessions, lunch-hour sessions or in-service training is seen as different options for CPD initiatives. Self-development is also mentioned as a possible development alternative.

Liu and Wan (1999) state that the changing landscape of CPD in higher education has necessitated a redefinition of the purpose of higher education and a restructuring of its management. The increase in public spending in education has made it difficult for the education system to maintain the existing level of provision. These systems are required to legitimise their contribution through the value they add. Limited funding has made it necessary for higher education institutions to expand their resources. This calls for new strategic plans that integrate and legitimise CPD into the mainstream academic programmes and cultivate a more market-oriented culture that responds to environmental changes in a proactive manner. This implies that higher education institutions have to expand their marketing strategies beyond mere recruitment efforts. They have to understand and determine their competitive positioning. Contemporary higher education institutions therefore have more functions to fulfil, have to be cost-effective and must maintain the quality of education. Their target market has expanded from the 18-22-year age group to include other groups of lifelong learners. Education therefore becomes work-based, part-time, qualification-seeking and repetitive – not only a once-off investment at the onset of adulthood. Lifelong learning within this context then refers to a range of deliberate, purposeful and systematic learning that is provided in the form of CPD – also to the employees of the institution itself. One of the respondents to this study added that CPD should be quick, as well as cost- and time-efficient in order to succeed at any level^{iv}.

How does Stellenbosch University fare in this regard? In terms of policy, it has accepted a policy of personnel development which emphasises a sophisticated personnel and tuition development service. This is considered as indispensable within the highly competitive sphere of national and international higher education. The personnel development policy forms an integral part of the university's vision and mission, as well as its corporate and strategic plans (Stellenbosch University, 1999).

The procedures for personnel development stipulated in the Policy for Personnel Development (Stellenbosch University, 1999) entail a controlled and co-ordinated provision of programmes in order to prevent duplication and encourage co-operation. It also entails that developmental needs should be assessed in order to provide suitable training and development programmes. Individual members of staff can nominate themselves, or be nominated, for programmes of this nature. Performance evaluation should facilitate the identification of suitable candidates for programmes. CPD initiatives should be determined by a proper target group analysis and a needs analysis at organisational, operational and personal levels by the line management in their specific environments in co-ordination with training specialists, when necessary, according to the Personnel Development Policy of Stellenbosch University (1999). It is further stipulated that these initiatives be designed "scientifically" and be on a "professional level" (Stellenbosch University, 1999: 3). It is, however, not clearly explained what is meant by these terms in the relevant documentation, nor how they will influence the implementation of CPD initiatives within the university.

The Management According to Position (MAP) strategy may be useful in planning programmes according to the positioning of the institution. The positioning determines the relationship between suppliers and users. It also integrates mainstream education and lifelong learning in institutions' strategic planning (Liu & Wan, 1999). The Management According to Position (MAP) strategy is graphically presented in Figure 3.1.

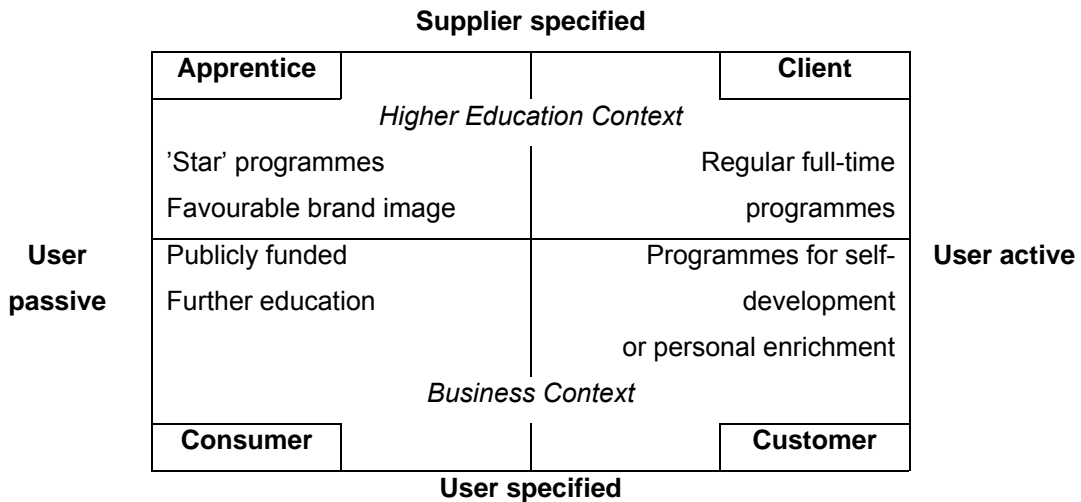


Figure 3.1: Management According to Positioning (MAP) taxonomy for higher education (Adapted from Liu & Wan, 1999: 456)

Effective strategic management will lead to integration of and collaboration between all four the quadrants within the MAP taxonomy. The challenge lies in the ability to organise the uncertainties, involving all the role players and noticing opportunities. It is important to do both external and internal marketing. This will lead to a shared value system and vision within the institution and eventually contribute to the overall organisational culture (Liu & Wan, 1999).

Administrators in higher education play a key role in the process of CPD planning and provision. They are instrumental in promoting collaboration between the different stakeholders and make crucial decisions about the provision of CPD in all settings. They are also responsible that the staff involved in CPD should receive training themselves. It is up to administrators to encourage them to be lifelong learners themselves. They should furthermore help to create an environment that contributes to learning, encourage participation in further education, create opportunities for such learning, recognise learning efforts, provide release time and substitutes for educators to become involved in further learning, encourage the sharing of learned information, and support evaluation efforts to determine its impact (National Research Foundation, 2004; Kutner & Tibbetts, 1997).

The Personnel Development Policy of Stellenbosch University (1999) clearly states the importance of senior management's commitment to personnel development. This includes spending a realistic portion of its budget^v to developing members' potential, creating and maintaining the necessary infrastructure for development, providing moral support for CPD initiatives, selectively offering opportunities for study leave to lecturers and establishing a management and remuneration system that encourages and rewards the development of its

personnel. This policy document stresses that all development programmes must be subject to some form of evaluation in order to determine their success. The Stellenbosch University Research Management Plan (Stellenbosch University, 2003) furthermore envisions the sustainable development of academic staff, specifically in the area of research, by placing a premium on appointing, promoting, retaining, supporting and rewarding academic staff for excellence. The respondents in the study among lecturers in the natural sciences at Stellenbosch University indicated that lecturers as professionals place a high value on the above-mentioned commodities:

Firstly, a working environment that supports scientific research; with top management appreciating the efforts of researchers to strive towards scientific excellence AND simultaneously providing funds for their own research including bursaries for their postgraduate students. Secondly, a greater understanding by top management that innovative thought contrasts with administrative obligations and chasing monetary goals. [Associate professor in Microbiology with 6 years of academic experience]

Education is 99% example. If any ideal is evidently supported, any CPD initiative that contributes to it will gain support. [Senior lecturer in Mathematics with 16 years of academic experience]

Professionals make meaning by moving back and forth between CPD programmes and the workplace (Daley, 2001). CPD taps into the energy that results from this movement. This includes in-house learning. It makes economic sense that resident experts (with relevant experience within the specific setting and a personal grasp of the organisational culture) facilitate learning within the organisation, rather than outside experts. This system has more speed and flexibility in terms of workplace problems and offers more opportunities for immediate application within the specific set-up (McDonald, 2001). However, Costley (2001) indicates that, as the workplace is not primarily set up as a learning environment, more pressing priorities often prevent employees from effectively learning at work. Organisational culture – as a learned and socially constructed pattern of thought that provides stability, solidarity, order and predictability and creates meaning – is therefore a determining factor in the success of CPD in organisations (Grzyb, Graham & Donaldson, 1998).

The question arises whether the organisational culture at Stellenbosch University enhances scholarly development through CPD. The developmental programmes presented by Stellenbosch University (1999) are aimed at the following main areas: induction or orientation – including the Professional Educational Development for Academics [PREDAC] programme presented by the Centre for Teaching and Learning, orientation programmes presented by the

Division for Research Development, orientation programmes to the JS Gericke Library, and introductory programmes presented by Information Technology, the service learning capacity-building programme presented by the Division for Community Engagement – all of which would fall into the apprentice quadrant of the MAP taxonomy mentioned above); task skills and subject-related capabilities (including compilation of courses, approaches to teaching and evaluation, research skills, computer literacy, use of computer packages, facilities and systems, information skills and client services, which fall into the client quadrant of the MAP taxonomy); human relationships (interpersonal skills, self-assertion and self-management, which are more aimed at self-development and self-enrichment, thus in the customer quadrant in the MAP taxonomy); managerial skills (leadership, strategic management, change management, problem solving and conflict management); specific training (such as post evaluation, labour relations, risk management, occupational safety and financial management) and organisational development (for example diagnosing organisations, strategic planning, team building and inter-group intervention). The last number of programmes falls mostly within the consumer quadrant and business context of the MAP taxonomy. Other examples of publicly funded further education include the workshops presented by the Centre for Higher and Adult Education. Stellenbosch University personnel can attend these workshops, but have to pay the required fee, just as any other participant. Stellenbosch University further encourages its employees to continue studying by exempting them from class fees. This falls within the higher education context and supplier-specified area of the MAP taxonomy. The user takes an active role, as the employee chooses to conduct these studies in a specific area determined by his/her own needs and aspirations (Stellenbosch University, 1999). The above-mentioned initiatives are aimed at developing the scholarships of discovery, teaching, and engagement. There currently seems to be limited institutional drive or support in terms of CPD to integrate these forms of scholarship at the academic practice level. Scholarly development of lecturers in the natural sciences at Stellenbosch University is driven through mainly three institutional structures: the Division for Research Development, the Centre for Teaching and Learning, and the Division for Community Engagement.

The Division for Research Development is centred within central administration at Stellenbosch University. This division reports directly to the vice-rector (research). The division primarily provides support for funding applications and administers various funding opportunities through standing subcommittees. These subcommittees are structured according to faculty aggregates (Human and Social Sciences, Science and Engineering, and Health Sciences). The research focus areas that are currently receiving substantial financial support from the institution via this division include language and culture and multicultural society, the 'knowledge economy', building a new society, competitive economy, biotechnology, sustainable biodiversity and the environment, the production and provision of food, the struggle against disease and the

promotion of health, technology for industry, fundamental theory, mathematics and complexity. These focus areas were chosen to address South Africa's national needs and priorities and to accommodate the expertise within the institution itself. It is clear that the natural sciences fit well into several of these focus areas, and that these areas also create room for transdisciplinary research collaboration (even though the institutional structures do not seem to support this in the most ideal manner). The aggregation of research expertise leaves limited room for transdisciplinary collaborative research initiatives (especially with reference to collaboration between the natural and social sciences). The Division for Research Development furthermore facilitates a research capacity-building programme that consists of various workshops aimed at honing lecturers' research knowledge, skills and attitudes. The particular division focuses on the research needs of lecturers by providing an initial orientation to newly appointed academics in terms of research funding structures. Other workshops focus on developing conference presentation skills, using the Internet for research purposes, planning and writing funding proposals, postgraduate supervision, effective mentoring, the writing of scientific articles, the development of media skills, capacity building for women in research, project management, and ethics. Specialised workshops for the natural sciences are presented in the areas of ethics and publication (Stellenbosch University, 2007b). It is clear that the division caters for a wide range of research-related needs and for a varied level of research expertise. There is a strongly developed research focus in the activities of the Division, with little evidence of support for the integration of various scholarly roles and responsibilities that lecturers have to uphold.

Stellenbosch University has created the Centre for Teaching and Learning (CTL), which forms part of Academic Support Services at Stellenbosch University, with a vision of facilitating quality teaching and learning at the institution. The Centre reports to the director of Academic Support Services, who in turn is accountable to the vice-rector (teaching). The Centre has a mission to support students, lecturers and the institution itself in order to enhance teaching and learning. The Centre therefore fulfils the roles of broker, facilitator, partner, co-ordinator, consultant and expert. Its services are guided by practice and research and it provides support in interpreting national policy, contributing to university policy and facilitating the implementation of teaching and learning policies. It facilitates excellence in teaching by creating opportunities for the continuing professional development of academic staff and an environment conducive to the principle of reflective practice. Specific support to lecturers is given in the form of the so-called PREDAC programme for newly appointed lecturers, needs-based workshops, consultations, advice on the compilation of a professional portfolio and student feedback. CTL hosts two academic days annually – called the Autumn and Spring Academies – that are focused on the development of teaching and learning practices. The Autumn Academy has recently evolved into an internal conference, where academics from across faculty boundaries gather to showcase best teaching practice. The Centre has recently launched the Fund for Innovation

and Research into Teaching and Learning (FIRLT) project that aims to support research on teaching-related matters within academics' own practices through the provision of funding for the improvement of teaching practice. This initiative offers a unique opportunity for lecturers to develop their teaching practice in a scientific and rigorous manner (Stellenbosch University, 2007a). The FIRLT initiative and the annual academic days offer some evidence of a more integrated view on scholarly development.

The Division for Community Interaction falls under the vice-rector (operations). An institutional policy for community interaction was approved by the University Council in 2004 (Stellenbosch University, 2007c: 1)^{vi}. The integration of scholarship roles is explicitly stated in this policy:

The University accepts a new paradigm for community interaction where teaching, research and community interaction are better integrated and culminate in a multidisciplinary approach. The ongoing restructuring of academic programmes to include community interaction and community-based research is therefore encouraged and reinforced.

The Division therefore focuses on the development of initiatives that lead to the application of knowledge created at the university. The university policy on community interaction acknowledges that these initiatives should be aligned with the institutional mission and its selected focus areas. A community interaction model is proposed, which is built on two main premises. Firstly, mutually beneficial partnerships between the university and community stakeholders that address local, regional and national priorities that fall within the focus areas of the institution are promoted. Secondly, social responsiveness through the integration of the various forms of scholarship (discovery, teaching and engagement) forms the basis of the proposed model.^{vii} The Division aims to strengthen interaction with the community and manage all forms of interaction in a systematic and co-ordinated manner. The Division proposes to reach these aims through encouraging civil responsibility in students by subjecting them to the realities of society as preparation for their participation in a democratic society, and by providing guidance to the implementation of community programmes through supporting the development of meaningful relationships with individuals, communities and institutions. The responsibility of the initiation and implementation of community interaction initiatives, however, remains the responsibility of the faculty:

Faculties and support service divisions make provision within their own management frameworks for putting community interaction alongside teaching and research into operation. Faculties and divisions are responsible for controlling and managing this function in accordance with the community interaction policy framework of the University. These environments themselves oversee that the prescribed ethical code is adhered to in all interactions with

the community, and that the interests of the community are served. New projects or programmes that are initiated are approved by the relevant faculty/division before being submitted to the Community Interaction Committee and registered. Representatives serving on the committee on behalf of the faculty/division are also nominated here (Stellenbosch University, 2007c: 4).

A database is maintained in which all community interaction initiatives are uniformly documented and updated for managing, monitoring and co-ordinating purposes. All initiatives of this nature are registered on the central project system of Stellenbosch University, irrespective of its relation to an academic programme. Projects overlapping with teaching and research are registered as one project but indicate the community interaction component. The initiatives that the Division currently promotes are mostly aimed at service learning as a vehicle for community interaction. The Division offers a capacity-building programme aimed at the development of service learning capacity. None of the service learning projects that are currently supported are in the natural sciences, although an invitation to participate has gone out to the natural sciences (Stellenbosch University, 2007c).

The HEQC specifically refers to these academic support services – such as the Division for Research Development, the Centre for Teaching and Learning, and the Division for Community Interaction – in its criteria for institutional auditing. These services should create an infrastructure and opportunities through which staff can enhance their expertise and keep abreast of developments in their field. Service learning is mentioned as a manner in which continuous staff development can be facilitated in terms of the scholarship of engagement. Service learning should be integrated into institutional and academic planning, and it should form part of the institutional mission and strategic goals. Adequate resources (including incentives) should support the implementation of service learning for staff capacity development and the impact and outcomes of such endeavours should be continuously monitored (Council on Higher Education, 2004b). Academic support services (such as the Centre for Teaching and Learning at Stellenbosch University) mostly provide CPD in terms of developing lecturers' teaching practices. Subject-specific development opportunities are addressed through the Division for Research Development. The respondents in this particular study, however, indicated that their developmental needs are mostly addressed through self-initiated initiatives:

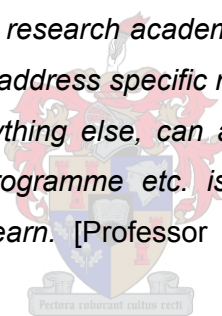
... if you are talking about structured programmes then none spring to mind (except a few workshops that the US arranges but those are not necessarily directed towards one's own area of expertise i.e. teaching workshops, supervising workshops). [Lecturer in Zoology with 5.5 years of academic experience]

I don't need CPD activities concerned about teaching or (even worse) administration. As to research, given enough time I'm quite able to take care of it alone. [Associate professor in Mathematics with 20 years of academic experience]

(Existing CPD initiatives are) aimed at improving teaching practice ... (but) not relevant to my subject [expertise] and configuration of my class. [Associate professor in Chemistry with 11 years of academic experience]

No, nothing research-specific that I don't have to organise for myself. No, teaching-related courses are not helpful relative to the amount of time away from daily work and the heap of things to catch up when return – more concise courses – to-the-point – not three full days off for this. ... Nothing subject-specific unless I go to conferences and visit international labs myself. [Professor in Physiological Sciences with 8 years of academic experience]

Very few, (mostly) self-generated ... Possibly most important is exposure to new teaching methods, for example how to teach disadvantaged students. This may not form part of the normal life of a research academic and one might require help with this ... Nothing really of help to address specific needs of disadvantaged. Have little need for outside help with anything else, can arrange it for myself e.g. if a new research, use of computer programme etc. is required, simply go and visit a laboratory or someone and learn. [Professor in Microbiology with 29 years of academic experience]



These lecturers' learning is therefore mostly of a self-directed nature and opportunistic, which means they address a learning need as it arises by consulting sources they deem as reputable – mostly colleagues and other experts within the natural sciences. This is the case not only in terms of subject-specific issues. Meaningful learning is often a consequence of work life. Problem solving and interaction with colleagues add some of the most valuable learning experiences to professionals' development. These are often unintended and incidental learning experiences. However, most of what we consider as CPD takes on the form of formal programmes. This emphasis on pre-defined formal learning results in unrecognised and unappreciated informal learning. Not all informal learning is necessarily correct or shared with others. There is, however, much scope to harness this type of learning, as it can motivate learners to become more self-directed and creative in their learning efforts. It challenges the organisation to create a learning environment that fosters productive and continuous learning – especially since more and more professionals are employed within organisational settings (Ramaiah & Moorthy, 2002; McDonald, 2001; Kachingwe, 2000; Wilson, 2000; Battersby, 1999; Castle, Holloway & Race, 1998; Grzyb *et al.*, 1998; Ritchie, 1998; Hendry & Waltham, 1998).

It is the responsibility of CPD providers to link the knowledge acquired in CPD programmes to the context of professional practice through an integrated approach. McDonald (2001) states that the majority of the persons involved in providing CPD have an academic background in the profession for which they plan and conduct CPD. A smaller group of CPD providers have no academic background in the given profession, but hold qualifications in the field of continuing education. This group gains influence and power within professional organisations as the professional groups accept their skills. The minority of CPD providers possess dual qualifications in both the specific profession and in the field of continuing education. Philosophical disagreements on the role or purpose of CPD, as well as the way in which it is conducted, result from this mixture of qualifications and perspectives within the total field of CPD. The problem that providers of general CPD initiatives in higher education commonly have to face is aptly described in the following quote:

I also think the problem that we are sitting with and which I think will be very acute in a Natural Science environment is simply the fact that qualitative research is probably so totally distant to the own framework of experience of the majority of people in that environment, that it will be extremely difficult for them to understand and interpret the research, of which there are masses, and to see what it means for their own subject area. So I think it is half of the dilemma you are stuck with in this particular work set-up, is that even though you want the people to also approach their teaching developments on a professional basis, it is for them – I don't want to talk down to people – but it is just not in their frame of reference in many cases to be able to do it. And they need very strong guidance to enter this new terrain ... but it is difficult, because you need to handle it carefully – they are experts in their own subject areas, now they are confronted by their different levels of ignorance, in a specific situation it can be very upsetting to them. It must be presented by people that have expertise, that know what is happening in the terrain, but there must also be involvement of people that have experience ... I think you are going to get the message the easiest to people, or get it most effectively to people, if it comes from people within the faculty that are involved with it. In other words that there is a person with expertise in the terrain of higher education that gives guidance of possibly the nature of presentations and so forth, but that members of the faculty are involved to share their experiences, to share in some cases years of experience, so that the message is valued by other members of the faculty, so in other words it's not this ape from Education that now comes to tell me this and that, but wow! It is one of our own people that says such things ... There is an unbelievable scepticism, people are unbelievably sceptical about somebody that is not one of us. [Senior advisor, CTL, previously lecturer in Chemistry]

The majority of the total target population for this study had a doctorate within a specific discipline in the natural sciences. The “one of us” would therefore mean somebody with a qualification on a similar level in the natural sciences and ideally within the same discipline. Small group sessions with a team of presenters, including subject specialists, would seem the most effective way of providing CPD within this professional arena. However, support services within the university remain indispensable in terms of generic knowledge and skills input. The role of these services in creating and facilitating opportunities should not be underestimated.

I have found some Uni-Ed workshops (the university department preceding the Centre for Teaching and Learning) to be useful but it is still more effective to discuss my problems with my colleagues in my department. [Senior lecturer in Mathematics with 25 years of academic experience]

At the beginning of the year I attended the Prontac [sic] course and sometimes I read something in the CTL forum's newsletter. I speak to colleagues on problems in education and on which practices work better in their experience. ... I experienced the PRONTAC course as informative and now know at least a few of the terms that are currently used in education. [Lecturer in Physics with 1.8 years of academic experience]

There are alternative provision strategies that could be considered to suit the specific CPD needs in terms of teaching development, as suggested by a participant:

I think, my feeling is, and I might be wrong, that you can put many of the subjects that fall under the humanities together and many techniques will work for them all. In natural sciences you can put together subjects such as Biology and Microbiology and Biochemistry and Botany and Zoology maybe put together and they may have many similar techniques for teaching that maybe works. And then I feel you can maybe put together Physics and Chemistry and there are techniques that work there. And then you will get to and I should think with Mathematics and Statistics and Computer Sciences and Applied Mathematics – there are many similar techniques. That is my feeling ... So I definitely think so, if you present a workshop, you must keep specificity of a subject in mind and you must put people there that know how the subject itself works. [Senior lecturer in Mathematics with 10 years of academic experience]

... Shadow work with successful researchers and lecturers ... each person has his or her own recipe for success, not all recipes work for everyone. Each person must eventually set up their own recipe but it helps "if you can page through a recipe book". [Senior lecturer in Biochemistry with 14 years of academic experience]

These are but a few of the various options that could be considered, but the bottom line remains that lecturers in the natural sciences form a unique subculture and perceive themselves as a heterogeneous group of people who play a determining role in providing CPD suitable to their unique scholarly needs. It is therefore of importance that support services remain responsive in this regard, as is evident from the following comment from a CTL staff member:

Sometimes we do find what we (CTL) might perceive as a need is not a need, a specific need, so we're also moving towards also more needs-based workshops, where departments can contact us and ask us for this and that, instead of having a tailor-made programme, that this date you do this and this date you're going to do that, and that then gets to a day ... They come back to us and say OK we want this and this and this, it's not a perceived need from outside, it's based on real needs from the lecturers' side, and even if we do not have an existing workshop we try and put something together. [Director: CTL]

Universities and other tertiary institutions remain one of the main providers of CPD, and offer a channel through which legitimate certification and/or accreditation for CPD programmes can be achieved. Academic credit is widely recognised as a motivator for professional development. It also leaves room for customised courses that are developed in conjunction with a university in order to fit a specific work context. Flexibility of programmes in terms of programme and timing and recognition of prior learning are important considerations (Costley, 2001; Kabouridis & Link, 2001; Cervero, 2000; Knox, 2000; Hendry & Waltham, 1998).

Universities are described as democratic institutions that allow their members substantial operating freedom, while providing them with a safety net of quality control. The university should not be the provider of knowledge, but rather the facilitator and referee of learning (Costley, 2001; Kabouridis & Link, 2001; Cervero, 2000; Knox, 2000; Hendry & Waltham, 1998).

3.2.2 The informal sector

CPD is often the major or primary function of professional associations (Cervero, 2000). The educational functions of these associations are complementary to initial education. Professional associations broaden the theoretical knowledge gained in the initial stages of education in order to make it applicable to daily operational problems (O'Rourke, 1997). Professional organisations offer the benefits of affiliation, an extensive support system and opportunities for networking and professional development (Florez, 1997). It is therefore important that higher education institutions strengthen their bonds with these associations in order to prepare the pre-service learners better for practice and to avoid duplication in CPD programmes for professionals seeking help from both parties (O'Rourke, 1997).

The National Research Foundation (2004) reports on the programmes initiated by the Agricultural Research Council (ARC) and the Medical Research Council (MRC) to promote research, technology development and transfer. These programmes are also aimed at developing an appropriate science and technology base and capacity to address current and future challenges, whilst creating sustainable growth. The ARC offers an Internship Programme for Early Career South African Scientists, which matches promising early career scientists from South Africa with mentors in the United States Department of Agriculture Research Service (ARS) units. Interns can obtain a master's degree or doctorate from a United States of America university located near an ARS laboratory. The Professional Development Project initiated by the ARC aims to develop young graduates through exposure to various research and development methods in a postgraduate capacity under the guidance of a mentor employed by the ARC. The MRC has implemented a research development programme to facilitate the development of research capacity in the health sciences in historically disadvantaged institutions in South Africa. Through this programme research development grants as well as grants for technical assistance and staff development can be obtained. Many professionals in the natural sciences work within the agricultural and medical fields and therefore these initiatives can also be of relevance to them.

3.2.3 The commercial sector

The commercial sector refers to private organisations either directly involved in providing CPD, or indirectly involved in continuous development through providing scope and/or funding for collaborative projects (between academia and industry), supplying jobs to newly qualified professionals, or advising academic practice from the perspective of private practice. The role of the commercial sector in CPD in higher education is multi-faceted and it has a widespread influence in the provision of CPD. Organisations play a determining role in the development and success of CPD efforts. A lack of an educational vision and funding provides some of the most important barriers to learning in the workplace. It is here that the commercial sector plays an important role (Alemna, 2001; McDonald, 2001; Daley, 2000; Hendry & Waltham, 1998)^{viii}.

Lecturers in higher education are faced with unique problems. The academic culture often places a higher value on scientific knowledge and research skills than on applied skills or practical expertise. The segmentation of knowledge into sequential, discipline-specific credit units has made the integration of knowledge and practical experience even more difficult. In order to adhere to the demands of this 'knowledge curriculum', such lecturers lose touch with the practice for which they are supposed to prepare prospective professionals. Lecturers are often caught between advancing their own careers within the academic sphere and preparing their clientele for professional practice (Daley, 2001; McDonald, 2001). This is a problem that needs to be addressed in future. Daley (2001) proposes a more creative integration of teaching

and learning strategies through the use of a constructivist perspective. McDonald (2001) adds that lecturers should therefore maintain practical expertise within their specific field of practice. Learning will then become a transforming process for all concerned, rather than a mere transfer of information. Therefore a linear professional model where academics focus on either research or teaching can be questioned. The responses of participants in the study clearly indicate that involvement outside the confines of the traditional university classroom and laboratory is essential if they want to succeed in their professional practice:

... keeping up to date with new research in my field but also trends in industry since it impacts on my students' ability to find work.... I am in constant contact with the industry. I have completed numerous projects for local companies. ... industry should play a more pro-active role ... [Lecturer in Computer Science with 4 years of academic experience]

Experience outside the university e.g. work experience at a company where a lecturer can apply and broaden his subject knowledge must be encouraged. [Associate professor in Computer Science with 8 years of academic experience]

Companies outside give more support and a supportive attitude when a trust relationship is built up. [Senior lecturer in Mathematics with 16 years of academic experience]

Industry, used as a generic term for the commercial sector, therefore provides important and practice-based opportunities for CPD that lecturers in the natural sciences are eager to exploit in their own practice.

The Technology and Human Resources for Industry Programme (THRIP) is a joint venture between industry, research and education institutions and government. It supports the development of technology and appropriately skilled people for industry in order to promote South Africa's global competitiveness. The focus falls on collaborative research in the areas of science, engineering and technology (SET). A number of private companies in South Africa invest in continuous development through higher education institutions. ESKOM, for example, is cited as one of the leading industrial organisations in terms of supporting CPD. They provide bursaries and training opportunities for individuals in disciplines such as computer science. The National Research Foundation (NRF) further supports the Innovation Fund, which was established to promote research into tangible products and services for consumption (National Research Foundation, 2004).

Developments in the South African higher education sector include the growth in private CPD providers, including foreign providers. Foreign providers also have to comply with the policies, requirements and procedures of the Higher Education Quality Committee (Council on Higher Education, 2004a). Badsha (1999), however, comments that these organisations may not have the same commitment to equity, relevance and quality as local higher education institutions. Yet they do have an influence on the South African higher education landscape irrespective of whether they operate directly or via local partners.

A number of international organisations, in collaboration with government organisations such as the NRF, have been involved in education and training in the higher education sector. These include the Tertiary Education Linkages Programme (TELP), the South African Netherlands Research Programme on Alternatives in Development (SANPAD) and the German Academic Exchange Service (DAAD). The main purpose of these projects is to increase the institutional capacity of South Africa's historically disadvantaged higher education institutions and to assist the government in implementing the national higher education policy. TELP creates Staff Development Centres where research training and staff research internships are organised to develop a culture of research. Workshops and seminars on proposal writing and development, grant management and research are also held annually. SANPAD aims to facilitate the development of personal research skills, thereby enhancing the research capacity of institutions involved in the initiative. DAAD focuses on promoting international academic relations through the exchange of teaching staff. The NRF supports these programmes through the Thuthuka Programme in order to contribute to various initiatives and to create synergy between them (National Research Foundation, 2004).

Knox (2000) states that the challenge to CPD lies in co-ordinating learning programmes and providers effectively and gaining all stakeholders' support. This will result in active contributions from all parties concerned and will promote meaningful learning for professionals.

3.3 WAYS OF PROVIDING CONTINUING PROFESSIONAL DEVELOPMENT

How CPD is provided is determined by a combination of the historical educational legacy and current educational demands. Novikov (1999) noted a need for a CPD system with flexible instruction that would provide optimal conditions for the professional to move through the educational domain.

The type of CPD offered is determined by the paradigm from which the organisation works. Firstly, the conventional paradigm focuses on the effectiveness and efficiency of professionals. This is a conservative outlook which, when translated into practice, does not empower professionals. The second paradigm has an overt political agenda through which professionals

can voice their frustration and lack of power in traditional CPD programmes that focus on techniques and skills only. The third paradigm continually challenges the rationality behind CPD programmes, while the fourth paradigm stresses the enhancement of individual autonomy, freedom and creativity within the organisational context. The fourth paradigm addresses the issues of professional power and hierarchy that often regulate professions, organisations and consequently also CPD programmes. A balance between these paradigms can lead to CPD which is emancipating and liberating, with its intention to provide a deeper awareness of content, purpose and context of professional practice (Battersby, 1999; Hake, 1999).

Enking, Harmer-Beem, Pardue and Turcato (2004) refer to content-driven or process-driven CPD. Content-driven programmes aim to give participants new ideas, information and knowledge, which can be supplied by single or multiple presenters and through a variety of methods (such as lectures, case studies, or guided questioning). This corresponds strongly with the traditional paradigm presented by Battersby (1999) and Hake (1999). The process-driven type of CPD programme contains elements of the last three paradigms proposed by Battersby (1999) and Hake (1999). The aim of a process-driven CPD programme is to develop relationships, an enhanced understanding of professional roles and improved collaborative skills. This requires active participation of facilitators and participants. It is important to decide what the focus of the programme will be in order to design a meaningful provision of learning activities (Enking *et al.*, 2004).

Cervero (2000) and Mott (2000) indicate that the amount of CPD offered in the workplace exceeds that offered by any type of provider and surpasses that of all other providers combined. It is therefore a critical question asked by McDonald (2001) whether adult education, CPD and human resources development (HRD) are different, separate entities at all. HRD has previously mainly been concerned with training, but has since expanded in depth and scope to include more facilitative types of learning. The organisation ultimately determines the goals of HRD efforts, and these are commonly founded on economically-based decisions (McDonald, 2001). Policy makers seem to be interested in a more integrated delivery system, involving new governance structures, organisational goals and programme outcomes that proactively address the issues and trends in CPD (Kutner & Tibbetts, 1997). It can therefore be said that much overlap may occur between the three mentioned fields, but that it is context specific to a large extent. An understanding of the role of context in organisational professions becomes imperative. Context shapes how professionals view new information and frame their knowledge use. It is necessary for CPD providers to understand the impact of context on knowledge construction and use in order to provide relevant educational programmes (Daley, 2000).

Lee (2001) identifies four major current paradigm shifts in CPD that have an influence on its provision. There is a change in emphasis from transmission of knowledge to experimental

learning^{ix}; from reliance on existing research findings to examining one's own practice through reflective practices; from individually focused learning to collaborative efforts; and from mimicking best practice to problem-based learning and practice. Livneh and Livneh (1999) add that CPD is becoming a cumulative, integrated process directed toward optimum performance, rather than a series of unrelated events. The provision of CPD will now be discussed according to these paradigm shifts.

3.3.1 Provision of continuing professional development that encourages experimental learning

Florez (2001) states that education as a discipline has unique difficulties in the provision of CPD. There is an extensive range of programme types, limited financial resources for CPD, and varied policies and requirements for attaining professional credentials or certification. It is a challenge to accommodate these factors and provide learning opportunities at the same time. Healey and Lawler (2002) and Kutner and Tibbetts (1997) add that CPD educators cannot only rely on the foundations of adult learning theory, but have to seek new and resourceful ways to facilitate learning programmes effectively and motivate their learners. There is no standard format for CPD programmes. The context in which it is implemented is crucial. Programme designers and facilitators must pay attention to the unique factors within each new environment. These factors include the learners, the facilitators, the physical environment, policies, resources, organisational culture and structures, the history of CPD within the specific context, and the community (Lee, 2001) – therefore the integration of scholarship roles.

Wilson (2000) and Livneh and Livneh (1999) support this integrated approach. Educators are no longer merely transmitting curricular content, but need to connect the needs of learners to the attainment of specified outcomes. This paradigm shift requires more than content knowledge, but also knowledge of how people learn and knowledge about the learners themselves.

The participants in this study obviously grasp the advantages to such an integrated approach, as they adapt it to their own practice in creating an environment that is conducive to learning:

Possibly most important is exposure to new teaching methods, for example how to teach disadvantaged students. This may not form part of the normal life of a research academic and one might require help with this. [Professor in Microbiology with 29 years of academic experience]

... to strive for excellence in teaching and research, to have a good relationship with my students, providing them with a good environment for growth. [Senior lecturer in Mathematics with 25 years of academic experience]

At first I wanted to give the 'perfect lecture'. However, I soon realised that there is far more to teaching than giving perfect lectures and testing the students in the best possible manner. Today, teaching for me is about people. It is to provide an environment in which the leaders of tomorrow can learn and develop as young scientists to their fullest potential. It is about emotions; anger, joy, excitement, sadness and all the things we experience watching our own children growing up and learning about life. [Associate professor in Microbiology with 6 years of academic experience]

The natural science lecturers in this context clearly understand that their learners are diverse in their learning needs. The same principle can be applied to their own CPD. Providers of CPD need to understand their clientele and provide for their diverse needs in terms of learning.

Sadler-Smith, Allinson and Hayes (2000) indicate that the majority of CPD participants have clear preferences for particular learning methods and activities. Preferences may vary as a function of cognitive style – the ways in which individuals prefer to organise and process information. Learners are, however, able to adjust learning strategies to the specific situation – their preferences may even vary from task to task. Analytically inclined learners will prefer a more structured approach, with systematic, sequential modes of investigation. These learners will be more comfortable with collaborative efforts and reach consensus faster. Intuitive learners prefer a global perspective and a more open-ended approach to learning. These learners require less structure, feedback and rewards from their social environment and are less influenced by peers. Sadler-Smith *et al.* (2000) propose that congruence in method and cognitive style can improve learner motivation and remove barriers to learning, but also state that a mismatch in learning activities and cognitive style may force learners to develop weak areas and improve their learning flexibility. These different types of learners will respond differently to different learning situations. Educators need to develop sensitivity for individual differences, and programme developers need to take different cognitive styles into account when designing learning experiences in CPD, as is evident from the following response:

You know subject knowledge is necessary, but there is also other knowledge, for example how to function better as a person, how to understand your students better, diversity under students, teaching styles, learning styles of students. You know, all students are not the same, it's a heterogeneous group. How to understand your clients better I would say, apart from only subject expertise, you cannot give only the one or the other to a professional person. I think there should be a balance in between. [Senior Advisor, CTL]

On the one hand experimental learning and innovation are already part and parcel of natural science lecturers' professional practice as researchers. These lecturers may, however, be resistant to innovative learning strategies in the other sectors of teaching, community service and administration, which might not be their primary interest. They might also have settled into a preferred learning pattern over time and may find it difficult to adapt to new and innovative strategies:

I have established a teaching persona and feel comfortable and competent in my style and so would not consider a postgraduate degree just yet – once I am more established I may consider a programme like this. [Lecturer in Zoology with 5.5 years of academic experience]

The challenge lies in integrating their scholarly roles and responsibilities as well as their approaches to learning in such a manner that learning in one sector informs another, as one of the participants described learning in his professional practice:

To provide the environment in which my research group (consisting of postgraduate students) can grow to a level of international competence ... To teach science to undergraduate students in such a manner that the beauty of nature is revealed to them. Simultaneously they are encouraged to critically think about scientific questions and to hone their skills needed for a future career in science. To provide support for industry challenged with scientific questions. [Associate professor in Microbiology with 6 years of academic experience]

3.3.2 Less reliance on existing research findings, more critical self-examination

Inquiry and research require professionals to reflect on questions regarding their daily practices in a systematic and intentional manner over time.

Lee (2001), Daley (2000), Kachingwe (2000), Knox (2000), and Clair and Adger (1999) report on tools that can enhance learning and reflection in order for new knowledge to become meaningful in professional practice. These tools include curriculum implementation (learning, using and refining the use of a set of instructional materials) and curriculum replacement units (implementing a unit of instruction that addresses one topic and incorporates effective facilitating and learning strategies to accomplish learning outcomes).

The new South African education dispensation has forced most lecturers who are involved in the academic profession to gain experience in terms of curriculum implementation and curriculum replacement units. Outcomes-based education has led to major changes within higher education at university level. Lecturers have been responsible for the implementation of these policies at programme and class level.

Mentoring, peer coaching and evaluation, the discussion of professional literature, analysis of practice exemplars, case studies and creating professional learning communities can be done collaboratively (Lee, 2001; Daley, 2000; Kachingwe, 2000; Knox, 2000; Clair & Adger, 1999).

The Thuthuka Programme is one of the formal mentoring initiatives mentioned previously^x. It also takes place on an informal basis within departments. Mentoring is an ideal way of providing quality CPD on demand:

Since the meetings with my mentor are on a one-to-one basis I can initiate the discussions, usually starting a meeting with "How do I deal with ...?" This means that every time I have a problem or question I can get advice almost immediately.
[Lecturer in Chemistry with 7 years of academic experience]

The participants in the study were positive about collaborative learning initiatives throughout. These initiatives include informal collegial interaction, but national and international exposure and collaboration were also stressed as important professional development opportunities:

Reading the latest journal articles on research in my field. Use of the internet to examine course development and content at other universities. Word of mouth from colleagues at other universities. [Lecturer in Geology with 3.5 years of academic experience]

I try to keep up to date with the literature and have active research collaborations with groups around the world. [Lecturer in Physiological Sciences with 7 years of academic experience]

... funding on the grounds of solving important problems so that persons from different fields can work together. Solving problems implicates learning and therefore I present it as a learning strategy. [Associate professor in Computer Science with 30 years of academic experience]

Peer evaluation is common amongst the research fraternity, as all presenting and publication of research papers are done under peer and expert scrutiny. This is, however, not the case in terms of teaching:

... through new challenges typical to your subject area in research, tackling practical application and knowledge transfer and exposing yourself to external judgement (in the case of the lecturer). [Senior lecturer in Mathematics with 32 years of academic experience]

The individual learner can use various learning activities to promote meaningful learning. McDonald (2001) indicates reading as the dominant method of purposeful learning for practising professionals. Written assignments are valued for their higher level of self-directedness. But meaningful learning will only take place if the learner receives sufficient evaluative feedback (Odini, 1999). Although the evaluation of learning will be discussed in greater depth in Chapter 5 of the dissertation, it can be said that evaluative feedback is one of the main shortcomings of the current CPD practices of the valid study population.

Reading featured as one of the main self-directed individual development strategies. However, whereas reading is centred on subject-specific information, feedback mechanisms are on an informal collegial and supervisory basis.

Self-directed learning forms an important part of CPD within any profession. CPD programmes should therefore build on, encourage and complement self-directed learning. The facilitation of self-directed learning includes clarifying the main purposes of professional education, helping learners set priorities, assisting learners in assessing their needs, identifying accessible learning resources, helping learners to reflect and evaluate their self-directed learning efforts, and supporting the study of self-directed learning (Knox, 2000; Steinert, 2000). Livneh and Livneh (1999) warn that many professionals do not have the skills to make the transition from formal other-directed CPD to more self-directed means of CPD. A preference for more dependent methods may be learned and can therefore change with the acquisition of self-directed learning skills (Sadler-Smith *et al.*, 2000). There is room for more traditional approaches, even if they contribute to the gradual development of self-directedness in CPD.

Evans, Ali, Singleton and Bahrami (2002) propose the use of personal learning plans aimed at professional development in conjunction with portfolios and mentoring as an effective means of self-directed CPD. This will contribute to effective CPD evaluation. A mentor works with the learner to assess learning needs and to devise a plan on meeting those needs. This plan is then submitted for accreditation. Once accreditation is granted in principle, the learner carries out the plan with support from the mentor and submits a report on completion of the plan to obtain the accreditation. Evans *et al.* (2002) found this method effective in terms of its flexibility and personal relevance. It leads to changes in knowledge, practice and professional development.

Reflective practice offers practical options to address professional development issues. Ferraro (2000) and Steinert (2000) advocate reflective practice as beneficial to both pre- and in-service educators for professional development. It is defined as a critical process in refining artistry in a specific discipline. It involves thoughtfully considering one's own beliefs and experiences in applying knowledge to practice, while being coached by professionals in the field. This process

forms a continuous cycle of self-observation and self-reflection. The goal is not to address a specific problem, but rather to observe and refine practice in general and on an ongoing basis. Reflective practice can lead educators to a deeper understanding of their own style and effectiveness in education. Other benefits include flexibility, immediate usefulness and sustainability. Reflective practice promotes professionalism, as it calls for the ongoing exercise of intellect and responsibility. It serves to validate the educator's ideals; it offers beneficial challenges to tradition and 'unlearning' assumptions and helps to create respect for diversity in applying theory to practice (Florez, 2001; Ferraro, 2000; Finley, 2000; Kachingwe, 2000). The following response from a respondent in the study amongst lecturers in the natural sciences at Stellenbosch University underscores the findings of these researchers:

I would say a general development programme for each member of staff is terribly important, and it must be monitored. And that person must think about it. [Director: Division for Community Engagement]

Self-directed learning and reflective practice are evident in the study population's following responses:

I hate to be bored and I hate to be stagnant – totally self-motivated. I can see for myself if I am lacking some skill or other, or could improve in some area or other

I want to know what is going on and what are the latest ideas in the field. I want to use it to do my work as a lecturer better. [Professor in Physiological Sciences with 8 years of academic experience]

... knowing that there is room for improvement and wanting to develop to my full potential. [Senior lecturer in Chemistry with years of academic experience]

I can see the changes in myself and how I handle everything. I can still learn some more things particularly financial management time management and conflict management. [Professor in Physiological Sciences with 9 years of academic experience]

... by interactively associating with students, from their reaction to my lecturing method I learn a lot. [Professor in Mathematics with 30 years of academic experience]

... the best way to learn something new is to be challenged to communicate such knowledge to a student. [Professor in Botany with 25 years of academic experience]

One's research expertise would develop in parallel with that of the student but at a higher level. [Lecturer in Chemistry with 3 years of academic experience]

... to gain knowledge, to master and transfer it sensibly to others with honesty, sincerity and total commitment. I must be proud of what I do and how I do it. [Senior lecturer in Zoology with 35 years of academic experience]

Florez (2001) describes four integrated steps in the reflective process. Firstly it starts out by collecting descriptive data from a variety of sources in order to gain a balanced picture of practice. This could include the professionals' writings on their own experiences and comments from their peers and colleagues, as well as existing theoretical literature. Secondly, the data is analysed in terms of attitudes, assumptions, beliefs, goals, power relations and the consequences it reveals. Thirdly, the professional considers how the situation or activity could have been different. This involves an examination of the alternatives, choices and beliefs behind the decisions that were made. The professional now has to envision how other professionals would handle similar situations to broaden their reflection on the data. Fourthly, the professional has to create a plan that incorporates new insights. After the professional has implemented this plan, the reflective process starts all over again. The process requires commitment and time. Professionals should be given time to experiment and master the general process, as it may be emotionally challenging.

The Centre for Teaching and Learning reportedly encourages reflective practice in their approach to CPD, as their director explained:

We find that a great deal of the process is deconstructing realities, to just let them confront, to let them look at their own practice – is it grounded on any sensible scientific ... do my assumptions rest on any sensible scientific principles? [Senior Advisor, CTL]

3.3.3 A shift from individually focused learning to collaborative efforts

Isolated reflection will not ensure that individual professionals have the support and encouragement to implement changes in practice (Hart *et al.*, 2000 & Kachingwe, 2000). Reflective dialogue enhances the opportunities for meaningful interactions and encourages professionals to provide support through observation, sharing of ideas and skills and recommending materials for study. Observation combined with feedback in the form of mentoring, peer coaching and supervision provides professionals with information regarding their performance (Lockhart, 2004; Steinert, 2000; Kutner & Tibbetts, 1997). A definite need exists for these types of initiatives in the natural sciences, as the following respondent indicates:

Ideal will be if I can attend a workshop from time to time with some of my colleagues (also senior colleagues) in the department that stimulates conversation on aspects of teaching and research. [Lecturer in Physics with 1.8 years of academic experience]

... an academic year day for natural sciences, similar to conference where personnel introduce their research through 10-minute presentations to rest of faculty. [Junior lecturer in Physiological Sciences with 5 years of academic experience]

Collaborative efforts improve the productive focus and create an environment that contributes to meaningful learning. An environment of trust and a context for reflection are prerequisites for effective reflection. Democratic forms of governance will strengthen collaborative inquiry and dialogue. Unfortunately, reflective practice is often used with a reflection on demand mentality, or as a checklist. These reflective practices have no links to conceptual frameworks, no encouragement to challenge existing practices and little sensitivity for the level of reflection the learners involved will be capable of accomplishing (Florez, 2001; Ferraro, 2000; Finley, 2000; Kachingwe, 2000; Hendry & Waltham, 1998; Lashway, 1998).

Reflection coupled with peer consultation serves as a source of validation, counsel and affiliation during periods of risk taking, conflict and role transition – which are inherent to learning and change. Hart *et al.* (2000) promote the use of the concept of accelerated professional development to develop skills in reflective practice and peer consultation. Accelerated professional development involves a group learning experience based on peer consultation. It incorporates both individual and group development, while at the same time extending the potential for learning beyond the expertise of only the mentor or supervisor. It places less emphasis on the traditional hierarchy. This type of development is not necessarily formalised, but does take place within the academic scientific community, as the following respondent commented:

Sometimes at workshops where I go to learn something, I end up realising that I am actually better than most other delegates, so in a way that is good – provides confidence rather than skill. I can see that if the attendees aren't already self-aware they will not easily learn anything – it takes insight. Yes, mainly because I know it is important to continue to learn and I am prepared to go even if I learn only one thing. [Professor in Physiological Sciences with 8 years of academic experience]

This type of development is not necessarily formalised, but does take place within the academic community in the natural sciences.

Action research (AR), as a tool for development, and consisting of continuous feedback that targets specific problems in a particular setting, can contribute to reflective practices and effective CPD. The educator as researcher and role model encourages learners to put the theories they have learned into practice. The learners report on their field experiences and analyse their strategies with their mentors and colleagues. This forms a collaborative model of reflective practice that enriches learners' personal reflections and provides suggestions from peers on refining their practices. This type of practice also encourages self-directed learning efforts, as the learners are continuously challenged to examine their assumptions and practices (Lee, 2001; Ferraro, 2000; Brew, 1995).

It would be ideal to combine the principles of reflective practice and those of AR in the development practices of lecturers in the natural sciences. It may take some convincing and careful guidance, as these approaches are normally centred within the qualitative research paradigm, which is quite foreign to most professionals in the natural sciences.

Computer-supported collaborative learning e-learning can enable learners to pursue self-managed and independent learning through collaborative interaction. Levy (1999) describes the learning process within the computer-supported milieu in five consecutive steps: access, induction and socialisation, information seeking, interaction and finally moving to a more independent approach to meeting individual learning needs within the collaborative cyberspace.

There are various advantages to e-learning. Video and audio components can be incorporated for added visual and audio stimulation. Web-based learning is a cost-effective option and facilitates interactive and follow-up procedures (via Internet chat rooms, teleconferencing, CD-ROM, e-mail or a learning management system). Listservs offer an opportunity, via an e-mail forum, to share information with other professionals. This interactive tool creates a supportive, collaborative and experience-based learning environment. It requires highly trained facilitators to ensure optimal use and development of computer-supported CPD programmes. Traditional adult educators do not necessarily have an information technology (IT) background, while IT professionals do not have the necessary educational knowledge to ensure effective e-learning. CPD facilitators and designers of e-learning programmes should know how this learning differs from traditional delivery methods. The majority of online programmes are still instructor-led, laden with text-based reading and little interactive learning opportunities. Learners may also be resistant to e-learning, because of a lack of direct interaction, reservations about programme quality, security issues or a lack of technology skills. But as technology-based resources have become the necessary tools for conducting business, it is imperative it should also find its place

in CPD (Lorenzo, 2001; Perdue & Valentine, 2000; Steinert, 2000; Levy, 1999; Medley, 1999; Florez, 1997).

A campus-wide move to e-learning has created a scope for this type of learning at Stellenbosch University. This also applies to CPD as lecturers have been forced to develop their capabilities in this regard with a campus-wide WebCT initiative. Even though it was initially met with some resistance and although the system is not without its shortcomings, it did lead to development and innovation within this area. Examples of this will be briefly discussed.

The Centre for Teaching and Learning (CTL) at Stellenbosch University offers all academic staff that have a distinct interest in the scholarship of teaching in higher education the opportunity to receive and share relevant information via the SOLForum Listserv. The SOLForum Listserv enables staff to communicate with each other on learning and teaching issues. The goals of SOLforum are to share articles and links to information on the Internet, to stimulate insight, reflection and innovation and to share good practice in higher education.

Another interesting case in point is the continuing professional development programme for psychologists at the Centre for Student Counselling and Development at Stellenbosch University. The programme incorporates interactive multidisciplinary case discussions and forum presentations, as well as a Web-based component. The interactive presentations are divided into three parts. Firstly a problem and related theory is stated, which experts then discuss. This is followed by an interactive discussion by the experts and audience. Psychologists can access these sessions placed on the Internet in the Web-based component in the form of video clips and slides and it incorporates an evaluative system done through multiple choice questions. It is a fully operational system that could be used as a basis on which to build similar programmes for lecturers in the natural sciences, especially if the well-articulated time constraints of lecturers in the natural sciences are taken into account. It also creates opportunities for development managed by the individual in terms of time and place. It can also be a time- and cost-efficient way of reaching a larger or a more specific audience than in the case of arranged seminars and workshops, depending on the need and purpose of the programme^{xi}.

Lectures, conferences, seminars, short courses, workshops, discussion groups, in-service training facilities, exchange visits, distance learning, postgraduate studies, research, committee work, trade union activities, conversations with colleagues, experiences in professional practice and sales efforts of suppliers that also provide verbal and written information are other methods of learning that take place as part of CPD (Alemna, 2002; Daley, 2001; McDonald, 2001; Lee,

2001; Daley, 2000; Steinert, 2000; Castle *et al.*, 1998; Haycock, 1998; Hendry & Waltham, 1998).

Odini (1999) cites the lecture method as a commonly used instrument in CPD. It is criticised for its lack of interaction and the passivity it forces onto learners. Barriers in the communication process further limit comprehension. The lecture method is often used for want of a satisfactory alternative, yet it still remains one of the most efficient methods for presenting general principles to a large group in a limited amount of time. It also provides a basic outline on which the learner can build further self-directed learning efforts.

As for teaching, I nowadays use more computer technology, e.g. graphs produced by the MATHEMATICA software. But for the most part, blackboard and chalk is still the best way in mathematics; it is the best way to follow the development of ideas.

[Associate professor in Mathematics with 20 years of academic experience]

... if teaching: stay with the basic things – professional conduct in front of classes, clothing, appearance, friendliness, pronunciation, techniques (do not forget the blackboard!). [Senior lecturer in Zoology with 35 years of academic experience]

This might be true for teaching the basics at an undergraduate level, as the participant quoted in the passage above states, but it may not be the ideal for professionals involved in CPD. Interactive sessions such as workshops may be more appropriate to obtain sustained interest and active participation, input and eventually learning. But it does hold truth in terms of incorporating technological advances and distance learning elements into CPD initiatives:

We must not sit with long outdated methods. This means you must look at the available information technology methods that exist. There is a need for direct contact sessions with a certain section of these people, in other words so-called face-to-face. [Director: CTL]

Workshops, seminars and presentations are also commonly used and foster the acquisition of new skills and knowledge through participation in singular and sequential training workshops, conferences and seminars (Steinert, 2000; Kutner & Tibbetts, 1997). Evans *et al.* (2002), Challis (1999) and Odini (1999) criticise the required attendance of these events as a viable alternative to effective CPD provision. The learner continues to be dependent on participating in someone else's agenda of desirable learning. Individual experiences are not effectively incorporated into learning, which leads to limited potential for application of learning. Kachingwe (2000) contributes by making a distinction between learning and participation. Learning refers to the process by which cognitive changes occur in the mind. Participation is described as an activity that has the potential of producing learning, but does not guarantee it. Kutner and Tibbetts

(1997) further stress the importance of active participation. A participatory approach in needs assessment and the design and implementation of learning activities is essential. The Stellenbosch University Personnel Development Policy (Stellenbosch University, 1999) stresses the value and necessity of active participation in all CPD initiatives.

3.3.4 A move towards problem-based learning and practice

Castle *et al.* (1998) cite three major models in the provision of CPD in practice: the pre-technocratic or apprenticeship model, the technocratic model and the post-technocratic model. Nowlen (1988), as quoted in Mott (2000), makes a different distinction, namely the update model, the competence model and the performance model for the provision of CPD. There are various similarities between the two approaches and they are therefore discussed simultaneously in an integrated manner.

The pre-technocratic model has a predominantly instrumental focus, with restricted contributions from educational institutions. It is primarily applicable to the initial stages of professional development (Castle *et al.*, 1998). This model corresponds to the update model discussed by Mott (2000). Its central aim is to keep professionals updated, but it fails to incorporate the subjective, social aspects of knowledge in professions.

The technocratic model has become the predominant form of CPD for a wide range of professions in recent years. Its curriculum contains three main elements: a systematic knowledge base, the application of this knowledge base to professional practice and supervised practice in the workplace. This model is typical where organisations have control over the curriculum content and assessment. Fragmentation of the curriculum through the separation of theory and practice is the major limitation of this model. Practice components and problems encountered in practice are often marginalised and not integrated into the theory (Castle *et al.*, 1998).

The technocratic model shows similarities to the competence model, as discussed in Mott (2000). The goal of this model is to develop curricula built on the competencies required in specific work settings through the combination of current relevant knowledge, personal traits (such as a sense of ethics), the self-image of the professional, and self-directedness. It gives a more complete picture of what good practice entails than the update or pre-technocratic models, but fails to account for the potential of what practice might be. Its emphasis on individual competence is a benefit, but at the same time its major flaw, as it does not take the larger interdependent systems (such as social, political or organisational systems) into account. This corresponds to the fragmentation evident in the technocratic model of Castle *et al.* (1998).

The post-technocratic model developed out of the perceived weaknesses of the first two models. It emphasises professional competencies through the experience of practice and the systematic reflection on practice within the educational set-up. Competence can be described as the performance of complex, technical, specialised and professional work activities. This includes design, planning and problem solving, with a significant degree of professional accountability. Partnerships between the educational institution, the employer/organisation and the learner/professional form central components of this model. The model also emphasises assessment that is performance-based, encourages access, accredits prior learning and allows the learner greater choice of learning modes (Castle *et al.*, 1998). This model aligns closely to the performance model presented in Mott (2000). The performance model takes the individual professional, the complex networks of interdependent systems surrounding professional practice, and the interaction between these elements into account. It also emphasises the critical self-assessment through reflective practices.

These different models are all evident in different CPD initiatives. The ideal would be to progress to the post-technocratic or performance model, but this is not always possible within the aims, purposes and limitations of different CPD initiatives.

There are various approaches to the provision of CPD. Since there is no single best approach, a combination of approaches can be used. A combination enables the individual professional to select the approach best suited to his/her learning style and the knowledge and skills he/she aims to acquire. Multiple, integrated approaches that address the complex and ever-changing characteristics of a programme and the identified needs are more suited to the current educational reality (Kutner & Tibbetts, 1997). The following response from a participant in the study supports these findings:

... active participation by the participants in the development of the programme, this is very important to me ... and also relevant regarding the need and regarding the context of the people ... [Senior Advisor, CTL]

Alemna (2001), Knox (2000), Clair and Adger (1999) and Kutner and Tibbetts (1997) state that CPD should incorporate the principles of adult education, including adults' readiness to learn when they have a perceived need, and their desire to immediately apply new knowledge and skills. The importance of needs assessment in this regard is emphasised. Effective needs assessments indicate areas for improving instruction and/or a programme, individual learning preferences and preferred approaches to CPD. It can also indicate where there are gaps in CPD and it can make new members of an organisation aware of its mission. A needs assessment should only be done when there is a need for it and when a follow-up will take

place as a result of it. Needs assessments provide important data that can be used in formative and summative evaluation (Kutner & Tibbetts, 1997).

Needs assessment should be followed by a co-ordinated programme development that critically considers the goals, learning activities, providers, resources, context and negotiation procedures. These components should foster critical reflection and meaningful collaboration. It should be sustained over a long period and form a coherent whole. A comprehensive professional development plan can help to attain a balance between individual learning needs and preferences and organisational programme goals (Alemna, 2001; Knox, 2000; Clair & Adger, 1999; Kutner & Tibbetts, 1997).

CPD programmes need not always focus on specific training methods and strategies. They can also focus on professionals' attitudes that affect practice. Opportunities that explore attitudes, develop management skills, integrate theory and practice, promote professionalism, encourage creative thinking and multiple approaches to create meaning, establish a foundation for mutual respect between all participants, and reflect on the ethical implications of practice can help professionals to take a critical look at how and why they are involved in practice. Participation in a professional development institute can encourage this type of activity (Ferraro, 2000; Finley, 2000).

3.3.5 General recommendations for the effective provision of continuing professional development

Craven and DuHamel (2000) and Liu and Wan (1999) indicate that budgets and subsidies for CPD programmes have dwindled. This forces CPD educators and administrators to make strategic decisions on how to present these programmes in order to be effective providers (Craven & DuHamel, 2000; Liu & Wan, 1999). It is therefore important that the objectives of the learning are specified so that professionals and decision makers can have a clear understanding of the intended outcomes of the activities (Kutner & Tibbetts, 1997). In the South African context, each organisation (including universities) is obliged by law (the Skills Development Levies Act of 1999) to submit an annual Workplace Skills Plan. Organisations are entitled to a refund of the funds used for CPD (Greyling, 2001). Mapesela and Hay (2005) comment on the possible funding benefits that the Skills Development Levies Act of 1999 holds for academics through the Sector Education and Training Authorities (SETAs). Higher education institutions as employers need to submit workplace skills plans to their designated SETAs in order to have access to the levies that are then paid back to the benefit of the employees. Failure to submit such plans denies employees access to the funds. If SETA funds can be accessed by the institution, employee development is but one aspect that benefits. Quality assurance system reviewing, measurement, and the analysis of the quality of education and

training are also funded in this manner. Academics may therefore have limited access to SETA funds (Blumenthal, 2001). This also seems to be the case at Stellenbosch University. The Higher Education Quality Committee Institutional Audit Report (Council on Higher Education, 2007) notes that managers are responsible for the career development plans of staff and the skills plans of environments. Some environments have, however, not made funding provision for this kind of development and this may result in the failure of Stellenbosch University to comply with the South African skills development legislation. This document also comments that a training and development culture is not fully established at Stellenbosch University. Funding therefore remains a contentious issue for lecturers in the natural sciences, as is evident from the following participant's response:

Young students usually go and complete a PhD overseas and almost never come back, as there are much better opportunities in the USA and Europe. Shortage of financial support and isolation are the main problems in South Africa. [Associate professor in Computer Science with 30 years of academic experience]

Financial support for CPD programmes from organisations would enable more professionals to participate. Follow-ups are necessary to ascertain whether the transmitted information has evolved into knowledge and changed practices.

... I go to conferences and visit labs myself – this is also usually VERY expensive, thus have to plan far in advance and apply for many grants – once again time consuming. NRF has bilateral agreements with other countries and if grant is successful this can lead to exchange of skills –useful, but not widely available – also expensive. Sabbatical is very important but also very expensive to take – e.g. daily living overseas. Time consuming to set up, competes with other requirements e.g. postgraduate supervision, publishing. [Professor in Physiological Sciences with 8 years of academic experience]

Funding is a major issue in terms of CPD within the study population. Those CPD initiatives presented abroad are, in particular, often expensive and time consuming (in terms of attendance and travel). However, this type of exposure seems imperative to the sustainable development of the professional's expertise (especially within a university that aims to be competitive worldwide in terms of research) and therefore funding and workloads should be planned accordingly.

Effective marketing is often the key to survival. Craven and DuHamel (2000), Liu and Wan (1999) and Kutner and Tibbetts (1997) recommend that innovative providers should find a market niche (define a CPD mission), know their clients and communicate with them (define a target audience and do a needs assessment), analyse the competition, develop a unique brand

of CPD, and then market the right offer to the right people at the right time (develop a marketing plan). Marketing techniques should involve the five Ps: product, price, place, promotion and people. They should also explore distribution channels, test and evaluate their materials and programmes to ensure quality, provide options, and deliver on promises in order to establish credibility.

Naylor (1988) makes specific recommendations for the effective provision of CPD programmes: programmes should have personal relevance to the individual learner, confront specific problems and concerns, take place within the shortest possible time frame, indicate options and opportunities, and create a central source of help and information. Clarity on participants' roles and responsibilities, effective communication strategies and rapid responses to inquiries and complaints will further enhance CPD provision. Reward and recognition systems will also motivate participation and support effective provision, as is evident from the following participant's response:

It must be attractive to the user. Users must make use of these initiatives. There must be some sort of reward for users. [Lecturer in Chemistry with 15 years of academic experience]

Further recommendations by Alemna (2001), Lee (2001) and Clair and Adger (1999) for the effective provision of CPD include adequate publicity given in advance, which would enable professionals to make provisions for CPD programmes in their budgets and work schedules. The location and timing of CPD programmes that are convenient to participants are important features.

Cumulative CPD programmes that progress from relatively lower to advanced levels will enable professionals to progress actively from a novice to an expert through CPD. It will also provide multiple entry and exit levels for professionals with prior learning experience. Experts from other disciplines can add valuable new perspectives and needed input on issues that arise from outside the specific field of expertise (Alemna, 2001; Lee, 2001; Clair & Adger, 1999).

Cervero (2000) states that collaborative efforts among the providers of CPD (especially universities and the workplace) are increasing. This trend is enforced by the notion of CPD as part of the economic development strategy, for both the higher educational institution and the business organisation. Mott (2000) describes effective CPD as dynamic and reflective of the changing environment evident in professional practice. It should also be a collaborative effort, be practice-based and use the complexities of practice as a foundation for learning. Effective CPD is further described as authentic, especially in terms of evaluative procedures. Finally, effective CPD demands a future-oriented attitude to meet the demands of the present and the

future. These are the parameters for effective provision and quality development of CPD. The provision of CPD plays a determining role in its quality. Cervero (2000) proposes a repositioning of training from a developmental tool for individuals to a strategic tool for the entire organisation in order to raise quality.

The NRF recommends the following for successful implementation and provision of collaborative continuous professional development programmes, especially for novices (National Research Foundation, 2004):

- Institutional ownership of its capacity development effort, also in terms of the nature and extent to which it is determined to develop its human capacity;
- A financial commitment from both parties – the NRF (for instance) and the institution. This includes funding for CPD in terms of running costs of projects, conference attendance, study visits, sabbaticals, visiting scientists, professors or mentors, or in terms of research equipment;
- A long-term commitment of at least five years of all stakeholders in the programme;
- Sustained pressure to produce appropriate and quality outputs;
- Flexibility and responsiveness to new ideas and directions;
- Co-ordination of research activities within the department, faculty and/or institution;
- A lecture relief or replacement component and flexible leave arrangements for participants in recognition of their participation, especially when lecturers are working towards doctoral degrees or postdoctoral experience. This could also be in the form of research or technical assistance;
- Translation of capacity development beyond the individual and his/her attainment of a qualification to further involvement in research and capacity building.

Effective practice is linked to inquiry, reflection, collaboration and continuous growth. If we want to improve CPD, we need to understand and promote the continuous development of these elements (Ferraro, 2000; Short & Echevarria, 1999).

3.4 CONCLUSION

The value of CPD in the current post-modern work reality is evident. How to provide CPD that fulfils these needs and meets these purposes is a complex and often elusive enterprise. The formal, informal and commercial sectors were identified as the main providers of CPD. The provision of CPD was characterised by four major paradigm shifts, including a change in emphasis from transmission of knowledge to experimental learning; from reliance on existing research findings to examining your own practice through reflective practices; from individually focused learning to collaborative efforts and from mimicking best practice to problem-based learning and practice.

An investigation of the provision of CPD in the context of the natural sciences in the particular university provided some interesting insights in terms of the above-mentioned aspects. Although it is difficult to formulate CPD in the context of these professionals in higher education regarding its provision in exact and all-encompassing terms, it is a necessary exercise. It proves that CPD does not take place in a social vacuum. The structures that are put in place to enhance the development of various scholarly roles function well in terms of their specific focus areas. However, there seems to be limited evidence of support for the integration of scholarship in individuals' practice. The current general approach to CPD also seems to be relatively generic, which does not address the need of lecturers in the natural sciences to be acknowledged as a unique area of academic practice. It leads us to question the issues related to the quality of learning and quality development within CPD, which will be discussed in greater depth in Chapter 4 of this dissertation.



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FRICK, BL & KAPP, CA 2006. Mapping the provision of continuing professional development in the natural sciences in higher education. *Acta Academica*, 38(2): 229-253.

ⁱⁱ The principles upon which this framework was built include equity and redress, diversity, quality, effectiveness and efficiency, academic freedom and institutional autonomy, and public accountability. The framework set the scene for transformation in South African higher education.

ⁱⁱⁱ Kerr (1994) provides a useful explanation for this seemingly contradictory view of government control. Governments worldwide seem to exercise less micro-managed bureaucratic control over higher education institutions, opting for a more macro-management approach that exercises influence on higher education institutions through policies and formulae. Newman (2000) adds that governments around the world exercise less control over higher education in favour of market-driven decision making.

^{iv} Whether this is always attainable is a debatable point.

^v The amount or proportion to which a realistic portion of the budget amounts is not specified.

^{vi} Stellenbosch University prefers the term *community interaction* to describe in the broadest sense the interaction between the University and communities in society. The term includes the more limited notion of service learning, while at the same time taking other service-oriented academic and non-academic community interactions into account. It also allows the University to give expression to alternative forms of social responsiveness. The term *community* signifies the social grouping (qualified segment) involved in the interaction at any given moment. The recent institutional audit report of the Council on Higher Education (2007:99), however, criticises such a broad definition of community ([the broad definition of community] *makes the concept of community almost boundless and raises issues about the usefulness of such a notion of community*) and recommends institution-wide debate about the meanings of its notion of community, as well as the nature and purposes of the interactions with different communities and the ways in which this conceptualisation of community addresses the institutional objectives of self-renewal and commitment to redress in the wider South Africa. The critique within the report highlights issues that have implications for the practice of the scholarship of engagement in the natural sciences: *The Panel is of the view that SU's [Stellenbosch University's] understanding of community interaction could provide a point of departure for the institution to give effect to its intention of becoming more outward-looking and contributing to the social development of South Africa. However, in order for this to take place, SU needs to engage with what it means by 'community' and what are the purposes of the different type of interactions which the University is proposing to have with different sectors in the Western Cape* (Council on Higher Education, 2007: 100).

^{vii} No further details of this model are provided in the policy.

^{viii} Newman (2000) refers to 662 for-profit institutions that are awarding degrees. The particular article does not state whether this number refers to a specific geographical area, or a worldwide distribution.

^{ix} Experimental learning (as promoted by Lee, 2001:2) should not be confused with experiential learning (as defined by Kolb, 1984). Although these concepts are similar in some aspects, experimental learning refers specifically to an active learning process where the learner (a lecturer in this instance) is free to experiment, innovate and reflect upon the outcome of the (learning) experiment in the activity in which he/she engages. Such an approach to learning reminds of Schön's (1983) notion of reflection-in-action. Experiential learning builds on total experience of the learner (which could be gained through experimentation, but is not limited to a specific experiment). Schön's (1983) notions of reflection-in-action and reflection-on-action could both apply to experiential learning, but reflection-on-action would be more appropriate if learning is built on past experiences.

^x The Thuthuka Programme, initiated and funded by the National Research Foundation (NRF), aims to develop young academics within the research, innovation and knowledge generation through organised mentoring. It is specifically aimed at women, black researchers and young researchers in the areas of science and technology, as they remain under-represented in academic positions in South Africa, especially at senior levels (National Research Foundation, 2004).

^{xi} Newman (2000) notes 971 higher education institutions that are presenting virtual programmes. The article does not specify whether this number is limited to a specific geographical area, or refers to a worldwide sample.

CHAPTER 4

Quality of learning in continuing professional development as an indication of scholarly developmentⁱ

ABSTRACT

Continuing professional development (CPD) is often seen as a miracle cure to ensure competence, accountability, professionalism and lifelong learning in professions. However, critics warn that, unless a high quality of learning in CPD can be ensured, it will not live up to expectations. In academic practice this means that CPD has to lead to scholarly development. This chapter focuses on quality development in CPD as it presents CPD of a high quality as a viable option to promote professional excellence. The chapter provides an overview of what constitutes scholarly quality in academic work. The discussion extends to how academic expertise is developed by the progression from a novice to an expert. Various developmental options are considered and discussed that could enhance the scholarly development of expert lecturers in higher education. A study amongst lecturers in the natural sciences at Stellenbosch University is used to underscore the main principles presented in this chapter.

4.1 INTRODUCTION

An educated populace is a vital resource for national growth in a global economy. An increase in the number of professions and professionals, the increased obsolescence of knowledge and skills and an acknowledgement of the importance of lifelong learning have led to an increase in CPD programmes (Kachingwe, 2000; Cobb, 1999; Hake, 1999). This leads to opportunities, but also to an obligation to examine the quality of learning within these programmes.

An overview is provided of quality in terms of the educator (lecturer) as a scholar, the learning process and the progression from novice to expert as a result of learningⁱⁱ. The article concludes with ways through which quality can be facilitatedⁱⁱⁱ. Various management-related options are considered, including national policy and programme accreditation, and Total Quality Management. Leadership development, mentoring, and situated learning are presented as options for the development of scholarly expertise in higher education.

4.2 QUALITY DEVELOPMENT AS PROFESSIONAL ACADEMICS

The development of professional quality involved in education is emerging as an essential element in CPD programmes. Increasing academic requirements in the workplace necessitate more qualified educators (McDonald, 2001; Kachingwe, 2000; Cobb, 1999) – which also applies to lecturers in the natural sciences in the higher education context. Winter, Taylor and Sarros (2000) argue that quality in a higher education institution depends upon the performance of the

academic staff as professionals within an institution, which influences the quality of higher education worldwide. Naylor (1997) states that improved education for professionals will improve academic quality. Mapesela and Hay (2006), however, argue that more attention is paid to student issues in higher education in the South African context than to issues related to higher education staff. Singh (2006: 73) argues that all stakeholders in higher education should be involved in issues of academic professional quality:

The active role of academics, researchers and students in engaging with quality issues as something that is valuable for the academic enterprise and for their own academic and career goals is critical in preventing a total lapse into quality compliance.

It is necessary first to define what constitutes a quality professional in higher education before what constitutes quality in CPD can be investigated. What does it mean to be a professional academic of high quality in higher education? It is necessary to look at the role a university is expected to fulfil in order to answer this question. The Stellenbosch University Strategic Framework for the Turn of the Century and Beyond (Stellenbosch University, 2000) describes the responsibility of a university as being threefold: to create knowledge (research), to transfer knowledge (teaching), and to apply knowledge (community interaction). An educator of quality will therefore excel in these areas of practice.

The literature provides a somewhat broader view on the subject of educator quality (which includes lecturers as professional academics). Knowledge of pedagogy (and andragogy), subject area content knowledge, skills and attitudes necessary for effective learning, a strong understanding of human growth and development, effective communication skills, a strong sense of ethics and a capacity for renewal and ongoing learning are attributes commonly associated with quality educators (Cobb, 1999). Lankard (1996) adds the dimension of self-knowledge as a competency that educators should possess and develop. It forms an integral part of experience and enables the educator to know and understand how he/she will relate to various situations and roles. These aspects can be translated into the various scholarly roles initially described by Boyer (1990) and expanded upon by O'Meara and Rice (2005), Badley (2003), Sorcinelli (2002), Zahorski (2002), Rice (2002; 1996; 1991), Diamond (1999; 1993), Lynton and Driscoll (1999) and Lynton (1995). These roles include discovery, teaching, and engagement, which should ideally be integrated. The correspondence to the central tasks of a university espoused in the Stellenbosch University Strategic Framework for the Turn of the Century and Beyond (Stellenbosch University, 2000) is obvious.

4.2.1 Continuing professional development and the scholarship of discovery

Boyer (1990) linked the scholarship of discovery to research in academe. The discovery of knowledge for its own sake in a disciplined (but free) manner lies at the root of such scholarly endeavours. Andresen (2000: 25) describes research as:

...characterised by ongoing active investigation accompanied by publication of the outcomes, and by membership in the network of an 'invisible college' of investigators who share similar driving curiosity, operating methods, conceptual armoury, values and critical perspectives (and who consequently contribute to a common literature, of course).

The scholarship of discovery provides the stimulating intellectual environment which lies at the heart of academe. Not only the outcomes of scholarly discovery, but also the processes involved in it, cultivate passion and provide meaning to scholarly work. Boyer (1990) sees the scholarship of discovery as an inextricable part of and asset to academic life.

Boyer (1990) notes that the scholarship of discovery (research) is perceived as the predominant measure for productivity and scholarly success. Lecturers are expected to achieve credibility within their disciplines through research, after which they are expected to keep up to date with new developments in their field through continuous research. Kerr (1994: 4) indicates that the emphasis on research productivity has led to an increase in specialisation – to the detriment of scholarship in general:

Specialization, particularly in research, and by extension into teaching, is intensified. Larger worldwide communities of specialists mean that specialists write increasingly for each other and less and less for the wide readership within their disciplines and related fields of knowledge. More and more specialities have a critical mass of scholars that subsist within their own confines. They have their own vast literature to read and large numbers of colleagues to know, and are driven to seek smaller and smaller topics to explore in the effort to gain recognition. Internationalization of learning means also the fractionalization of knowledge – it is specialization that becomes more universal.

O'Meara and Rice (2005) report that research expectations at universities have since increased – even if multiple forms of scholarship are expected and valued. The scholarship of discovery is still perceived as the most legitimate and preferred way of proving professional expertise in academe – even though the work of Boyer (1990) has done much to broaden the general view of scholarship.

Rowland, Byron, Furedi, Padfield and Smyth (1998) argue that a major component of all research is not made accessible to students. Engaging students in dialogue about current research not only enhances their understanding and love for the discipline, but their (naïve) insights may actually contribute to new questions on the specific topic. Furedi (in Rowland *et al.*, 1998) emphasises the value of including students in the lecturer's work environment beyond the classroom – which is seen to be a mutually beneficial experience.

How can CPD enable lecturers to incorporate their research into other scholarly activities? The “symbiotic relationship” (Andresen, 2000: 29) between scholarly roles and scholars demands collegial interdependence and ongoing dialogue and debate. Rowland *et al.* (1998) recommend interdisciplinary discussion groups where ideas can be articulated, challenged and questioned by others not necessarily in the same discipline. Byron (in Rowland *et al.*, 1998), however, warns that this type of group discussion may not be well received by lecturers, who often see such initiatives as just another burden in their already full programme. Brief, problem-based, one-to-one peer interaction when necessary is deemed more sustainable.

4.2.2 Continuing professional development and the scholarship of teaching

The specialisation of science is an inevitable accompaniment of progress; yet it is full of dangers, and it is cruelly wasteful, since so much that is beautiful and enlightening is cut off from most of the world. Thus it is proper to the role of the scientist that he not merely find the truth and communicate it to his fellows, but that he teach, that he try to bring the most honest and the most intelligible account of new knowledge to all who will try to learn.

Robert Oppenheimer, physicist (1954, as quoted in Boyer, 1990: 24)

Andresen (2000) refers to teaching as mediating the connection between research findings and students' learning needs. Understanding is created when a teacher makes the content knowledge of a discipline accessible, intelligible and fascinating to students at their level of development. Boyer (1990) adds that teaching as a scholarship^{iv} starts with what the teacher knows, but becomes consequential only when this is understood by others (students) through connecting the teacher's understanding to the student's learning. Åkerlind (2007: 27) identifies five qualitatively different approaches in the development of lecturers' teaching abilities:

- familiarity with what to teach, through the gathering of content knowledge;
- knowing how to teach, by gaining practical teaching experience;
- becoming a skilled teacher, through building a so-called repertoire of teaching strategies;
- developing into an effective teacher, by experiencing which strategies are effective and which are not; and

- becoming an effective facilitator of student learning, through an increased understanding of what works (and what does not work) for students to learn.

Åkerlind's (2007) findings relate to Kolb's (1984) cycle of experiential learning, where the learner (in this case the lecturer) moves from actor to observer and from specific involvement to general analytic detachment. This process leads to a new form of experience that feeds into the next cycle of learning.

Andresen (2000) argues that this notion of the scholarship of teaching is not the same as the scholarship of research, but that they are integrally related as the teacher needs to have a substantial knowledge of a discipline and what constitutes knowledge within the specific discipline. Boyer's (1990) vision of teaching as scholarship is that it stimulates active learning, encourages critical thinking, provides room for creativity and motivates lifelong learning. In this view, teaching leads to learning that transforms and extends the current boundaries through reading, classroom discussions and opportunities for students to pose questions and explore the boundaries of the discipline.

Teaching is furthermore envisioned as a caring relationship between the teacher and student – demonstrated by the teacher's passion for the discipline and encouragement of students' intellectual growth and development (Andresen, 2000). Unfortunately teaching is sometimes seen as a mere routine and necessary task, characterised by a transmit-memorise-recall process. In this view teaching is not seen as evoking the passion and understanding of future scholars in the field – keeping the continuity of knowledge development flowing.

Specialised study (research) enables a lecturer to communicate with postgraduate students busy with advanced study within the specific discipline, but it does not prepare the lecturer to necessarily communicate knowledge effectively to undergraduate classes where more pedagogical procedures are required (Boyer, 1990). Becher and Trowler (2001) add that demographic changes result in diverse undergraduate students entering the higher education system who are often not well prepared for academic success. Curricula therefore need to be adapted, and better support services need to be established. The current worldwide emphasis on quality and accountability in higher education has been criticised from various perspectives, but it has also contributed to academics' awareness of the changes in views on teaching and learning.

Boyer (1990) notes that the necessary professional development of lecturers to cope with these changes is often overlooked in universities. He therefore advocates such development processes for all academics, but especially for doctoral students and/or newly appointed young

academic staff. Boyer (1990) suggests that development of this kind be a collaborative effort between a pedagogical specialist and a discipline specialist that can relate to the field of study. Teaching assistants and mentoring programmes for postgraduate students and young academics may also be useful in preparing the teachers of tomorrow. Learning how to teach in a discipline teaches the teacher about the discipline itself. Boyer (1990) envisions a broadened view of postgraduate studies that guide future scholars to explore scholarship beyond discovery.

Rowland *et al.* (1998) argue that lecturers are not seen as learners, just as students are not seen as researchers. The concept of the teacher as learner is also emphasised by Boyer (1990). Padfield (in Rowland *et al.*, 1998) describes teaching and learning as a two-way process. Academics that are merely trained to teach find it difficult to bridge the gap between their different scholarly roles. Rowland *et al.* (1998) warn that teaching without enquiry, reflection and passion is a mere technical service to customers in a competitive information industry, without the critical and moral purposes that engage both academics and students in true learning. Furedi (in Rowland *et al.*, 1998) add that learning encompasses more than merely reaching predetermined outcomes and the attainment of required skills. Academic learning includes aspects such as abstract reasoning, the ability to conceptualise, and problem solving. These (necessary) aspects of learning are not easily captured in traditional assessment procedures. Furedi (in Rowland *et al.*, 1998: 136) articulates this problem as follows:

Such inquiry [intellectual inquiry] is driven by a willingness to embark on the unknown. It implies openness to experimentation and to engagement with problems not yet anticipated. The obsession with outcomes short circuits this process. Routine predictability takes precedence over intellectual discovery. Such teaching is also intellectually less demanding on students than a more open-ended reflection of the subject matter.

In referring to the role of the lecturer in such a milieu, Cross (in Boyer, 1990) calls the lecturer a classroom researcher.

Boyer (1990) states that universities cannot afford not to support teaching, as a significant percentage of students are at the undergraduate level and deserve teaching that is of a high quality. A university borders on the unethical if it does not fulfil this obligation. Both undergraduate and postgraduate students require scholarly guidance if they are to be well prepared as the scholars of tomorrow. Education as such forms a “seamless web” where the quality of scholarship is formed throughout a person’s educational career (Boyer, 1990: 67). Education can therefore not be seen as a series of isolated learning incidences. On the contrary, education at university is aimed at shaping professional attitudes and values –

otherwise graduates will end up as specialised technicians lacking insight and perspective. The heart of higher education is therefore disciplined inquiry and critical thought, incorporating useful knowledge and a sense of social responsibility. Boyer (1990: 65) refers to this as liberal education, where the future scholars are able to “think creatively, communicate effectively, and have the capacity and inclination to place ideas in a larger context”.

Rowland *et al.* (1998) make a strong case for changes in teaching, including teaching methods and assessment practices. The innovative use of new technologies to assist in the teaching of large numbers of students in particular, is also advocated. Theories of learning, curriculum development, new technologies, and action research can, however, not take place in isolation from the specific discipline and curricula. Teaching strategies and technologies provide important alternative routes for the lecturer to guide his/her students to a deeper understanding of the subject matter, but it is not an end in itself. Students need to contextualise their learning to the actual discipline – as Rowland *et al.* (1998: 135) aptly explain: “It is a lack of this awareness, rather than an ignorance of teaching methods as such, which leads to science students doing experiments designed to replicate dead knowledge rather than to discover anything about the world ...” Clark (as quoted by Andresen, 2000) argues that the disparity lies not between research and teaching as such, but is created when teaching removes itself from the research realm and tries to convey codified knowledge (content knowledge) without conveying the necessary background of the discipline.

Smyth (in Rowland *et al.*, 1998) argues that the development and assessment of teaching and learning need to move beyond the generic and the traditional lecture approach. Furedi (in Rowland *et al.*, 1998) adds that the lecturer’s academic freedom and autonomy is compromised when external standards that are unrelated to the discipline are used to determine his/her performance.

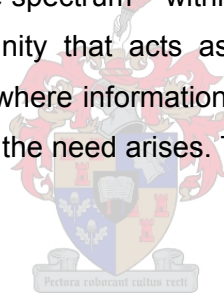
4.2.3 Continuing professional development and the scholarship of engagement

Boyer (1990) initially worked with the concept of application as a form of scholarship. The application of knowledge to problems and the use of problems to guide inquiry form the undercurrent of this form of scholarship. Boyer (1990) noted a gap between academic values and societal needs. The central question arose: how can knowledge be useful to individuals in the wider society?

Boyer (1990) sees the relationship between the service and society as reciprocal, as new understanding can come from applying knowledge to everyday situations.

The scholarship of engagement unfortunately receives the least of all attention both in literature and in practice – as Boyer (1990: 22) states: “[S]ervice is routinely praised, but accorded little attention.” Boyer (1990) provides reasons for this trend. The meaning of service is often vague and not seen as directly connected to serious intellectual work. Boyer (1990) draws a clear distinction between citizenship activities and service related to scholarly work. In the latter case, activities need to be related to one’s discipline and flow from professional activities. Such activities need to be awarded the same rigour and accountability present in research activities. But Boyer, Altbach and Whitelaw (1994) found that academics’ service activities are not regularly evaluated in the majority of the countries included in their study.

The Stellenbosch University Strategic Framework (Stellenbosch University, 2000) specifically refers to the social function of professionalism as community interaction, and advocates a more comprehensive and inclusive definition of community, which includes trade and industry, potential employers and disadvantaged groups. The scientific society can be added to this division. This interaction should ideally be characterised by a vibrant interaction between the institution and the society at large to the advantage of both. The interaction should lead to constant renewal on both sides of the spectrum – within the university as facilitator of innovation and growth, and within the community that acts as the catalyst for renewal. This can be described as a process of osmosis, where information and the application thereof continuously flow between the different sectors as the need arises. This process is graphically represented in Figure 4.1.



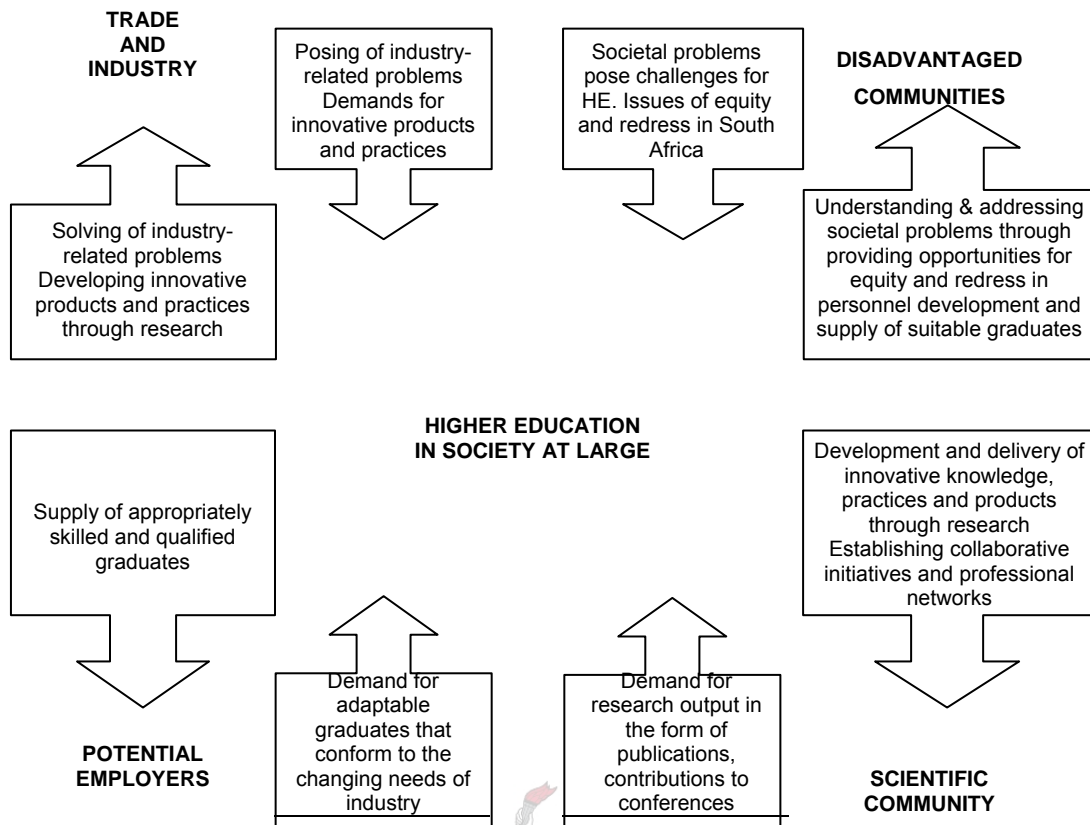


Figure 4.1: The osmotic process between higher education and the community that defines the social functions of professions within higher education

Similar frameworks could be stated for the other roles and responsibilities of lecturers in the natural sciences, but this example suffices to illustrate the complexities of academic practice in the specific sphere of community interaction as it is practised within Stellenbosch University. It clearly indicates that lecturers are not only expected to keep up to date in their subject-specific areas of practice, but also to develop a variety of other skills, such as reflective practice, problem-solving skills, constructivist knowing, communication skills and managing diversity. Lockhart (2004) found that the most effective CPD took place in safe learning environments, where reflective practice and collaboration with partners inside and outside the department were encouraged.

In order for an activity to count as service, it needs to be related directly to the scholarly work of the academic in his/her discipline. Boyer (1990) cites the following as examples of the scholarly service in practice: consultation, technical assistance, policy analysis, and programme evaluation. External parties are usually involved in service-related projects and their review of the process and outcome(s) are therefore essential in assessing these activities. External experts may be asked to participate in review committees. In Boyer's (1990: 77) words:

The conclusion is clear. We need scholars who not only skilfully explore the frontiers of knowledge, but also integrate ideas, connect thought to action, and

inspire students. The very complexity of modern life requires more, not less, information; more, not less, participation. If the nation's colleges and universities cannot help students see beyond themselves and better understand the interdependent nature of our world, each new generation's capacity to live responsibly will be dangerously diminished.

4.2.4 Continuing professional development and the scholarship of integration

The scholarship of integration puts isolated facts into perspective and forms understandable intellectual patterns. Making the connection between facts explicit ultimately makes research authentic, an aspect to which Boyer (1990: 19) refers as "serious, disciplined work that seeks to interpret, draw together, and bring new insight to bear on original research". Integration also refers to an interdisciplinary understanding of current knowledge in a broader context, which becomes increasingly important in a globalised world where the traditional boundaries between disciplines are often blurred (Boyer, 1990). Becher and Trowler (2001) note a move from so-called Mode 1 knowledge (based within specific disciplinary boundaries), to Mode 2 knowledge (which refers to trans-disciplinary and problem-based forms of knowledge).

Boyer (1990) recommends that a broader view of scholarly writing should be taken – where articles or books may be aimed at an audience beyond the discipline. This view will advance the scholarship of integration and give credit to the difficulty of making subject knowledge more broadly understandable and accessible. Such writing requires scholarly knowledge and its integration into a broader field of knowledge. Writing for integration may also contribute significantly to the scholarship of teaching. Boyer (1990) also refers to the development of technology (such as computer software or audio-visual resources) as valuable forms of integrating scholarly knowledge in creative ways to reach both specialists and non-specialists^v. The scholarship of integration may be expanded even further to educate non-specialists (Boyer, 1990). Boyer (1990) includes the design of new modules and participation in curriculum innovations as examples of the application of the scholarship of integration. The design and presentation of cross-disciplinary seminars also serve as examples of integrated scholarly endeavour.

Becher and Trowler (2001) note an inherent resistance to change, to which Merton (1973, as quoted in Becher & Trowler, 2001: 97) refers as "organised scepticism". Academics' reactions to change differ, but in reaction to the above-mentioned changes most academics seem to place greater emphasis on their disciplines than on belonging to a particular institution of higher learning. This disciplinary emphasis is evident in the professionalisation of the academic world – where a doctorate has become the minimum entry requirement. Academic professionalism and the idea of scholarship therefore become closely linked to a particular discipline (Becher &

Trowler, 2001). Kogan (2000, in Becher & Trowler, 2001), however, argue that intellectual exchange will sustain the academic community as a whole amidst disciplinary fragmentation.

These debates have important implications for the development of integrated scholarship through CPD. The work of Becher and Trowler (2001) on academic tribes and territories may be useful to explain academics' search for a scholarly identity in the rapidly changing higher education environment. Becher and Trowler (2001) argue that academic communities are characterised by distinctive cultures^{vi}. The tribal territories of academic disciplines vary in terms of boundary permeability. Disciplines that have relatively established ideologies, values, and judgements of uniqueness, quality and content, tend to have more well-defined boundaries and to be more ethnocentric. Becher and Trowler (2001: 36) refer to the natural sciences as the "pure sciences", where knowledge is seen as being cumulative, and concerned with universals and quantities.

Knowledge is also seen as impersonal and value-free. Clear criteria for knowledge obsolescence and verification exist within the academic tribes of the so-called pure sciences. Even though clear delineations of tribal territories seem to exist along the boundaries of Mode 1 knowledge, temporary alliances may be forged for mutual benefit in the Mode 2 knowledge realm. Some alliances have had long-term effects on the initial disciplines, as sub-disciplinary specialisations have grown and eventually split from their disciplinary origins. These sub-disciplines, however, tend to uphold the inherent ideologies characteristic of the disciplinary grouping (such as pure sciences or humanities). An academic tribe provides its members with an identity and a particular frame of reference. The characteristic identity of a particular academic tribe is developed from an early age – usually already at the undergraduate level, where patterns of thought are imprinted (Becher & Trowler, 2001). Academics build their practice around this identity, to which Becher and Trowler (2001: 75) refer as "the desire to develop a reputation in the field and to contribute significantly to it".

The reported study in the natural sciences concurs with the findings of Henkel (2000) that emphasise research output as a central aspect in the ideal science career and a critical component of the academic's identity. This emphasis on the scholarship of discovery provides an explanation as to why lecturers in the natural sciences would be less enthusiastic to venture into the relatively unknown territory of teaching and engagement as it affords them little if any recognition within their own tribe. Scientists use rational thought and theory in their research endeavours, but often fall back on their intuition and their own experiences as students in their scholarly roles as teachers and in their engagement with communities. Discovery (or forms of research) that are integrated into scholarly practice (such as action research) may be regarded

with some scepticism, as it is perceived to lack credibility within the notion of research promoted by the specific academic tribe (Greenbank, 2007).

The work of Cetina (1982, as quoted in Becher & Trowler, 2001: 76) on the scientist as an economic reasoner is valuable in taking this argument further. Cetina argues that academics are preoccupied with value – where the value of the product or output is perceived to be related to the value of the academic him-/herself. Professional achievement is therefore measured in terms of the contribution to the discipline through research (not teaching or service). In the natural sciences the intricacies of pedagogy remain foreign uncharted territory for many academics. Few natural scientists will be enticed to attempt this journey from content knowledge to pedagogical content knowledge (as initially explained by Schulman, 1987) without the necessary map in the form of training and/or collaboration. When promoting non-positivist forms of research in a context such as the natural sciences, one needs to be conscious of lecturers' ontological, epistemological and methodological stances towards different aspects of scholarship – including research, teaching, engagement and integration.

Becher and Trowler (2001) emphasise the advantages of collaboration to productivity, an important consideration in the current highly audited higher education environment. Collaboration allows the academics to retain their expertise in their disciplines of origin, while expanding their horizons to other fields of inquiry. The importance of continuing to work and publish in the discipline of origin (and therefore retain an identity and standing in this discipline) is underscored by Becher and Trowler (2001).

Many academics go through career transitions, but these transitions are mostly from an academic role to a management role – not a shift in academic discipline. Becher and Trowler (2001) found this transition to occur most commonly in the late 30s or early 40s when administrative loads increase or in their 50s when many established academics become more interested in their teaching role. Established researchers may also become more interested in theoretical aspects of their field, as opposed to empirically based research. Others may prefer to take up permanent positions in professional associations. Few, however, choose to leave academe altogether. Becher and Trowler (2001) report that these voluntary career changes are often met with ambivalence from other academics in the specific tribe. These findings have implications for the timing and content of CPD initiatives, as well as the way in which scholarly integration takes place throughout an academic career.

4.2.5 Scholarly development as an indicator of lecturer quality in the natural sciences

Lecturers in the natural sciences focus primarily on subject-specific knowledge and practice, in which they have extensive expertise and are on the whole highly qualified. The National Research and Technology Audit found that in 1996, 40% of academic staff at universities in South Africa had doctorates as highest qualifications, 34% were at master's level, while 26% of these academics had either a bachelor's degree (including honours), or a higher diploma (National Research Foundation, 2004).

At Stellenbosch University, only 11.16% of the total target population (14 of a total of 119) did not have at least a doctorate in the natural sciences at the time of the study^{vii}. This group of professionals is also expected to teach, provide research supervision, manage people and act as administrators, and therefore they cannot ignore the skills and attitudes necessary to effectively fulfil these “non-scientific” roles and responsibilities. These academics often do not have the necessary training or conscious need to develop the capacities noted by Cobb (1999), as is evident from some participants' responses, also from their own experiences as learners:

There are a number of lecturers (in my day as a student) who are brilliant scientists, but who just are completely disorganised when it comes to teaching they were also incapable of transferring information to us as students. [Lecturer in Chemistry with 15 years of academic experience]

... some of the lecturers that I had when I was a student were not 'people people' who clearly didn't like lecturing and didn't really teach us that well. [Lecturer in Chemistry with 7 years of academic experience]

Many lecturers are 'perfectly professional', but have absolutely no rapport with either their students or their colleagues. [Associate professor in Microbiology with 6 years of academic experience]

The fact that teaching is based on scientific principles, with a background, with research and a whole heap of facts and knowledge, theories et cetera, I think passes by the most people in the natural sciences environment, maybe just as a result of a lack of interest. [Senior advisor, CTL and previously a lecturer in Chemistry]

This demands an integrated professional practice, such as the following research participants' reactions display:

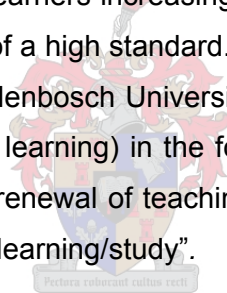
To use my talents, training and experience to deliver a service to the advantage of the community and science. This service must at all times be of the highest ethical

and academic standard. [Senior lecturer in Biochemistry with 14 years of academic experience]

... to gain knowledge, to master and transfer it sensibly to others with honesty, sincerity and total commitment. I must be proud of what I do and how I do it. [Senior lecturer in Zoology with 35 years of academic experience]

Self-knowledge can be achieved in various ways. Inventories (such as the Six Holland Personality Environment Types, the Strong Interest Inventory, the Career Assessment Inventory and the Myers-Briggs Type Indicator) can be helpful in gaining self-knowledge on personality, learning style and preferences in die workplace (Lankard, 1996).

These are typically elements that science lecturers are not necessarily exposed to in their subject-specific continuous development, but which forms an essential part of successfully fulfilling their roles and responsibilities in higher education. This is especially important in the changing landscape of higher education, where the nature of the learner corps has changed considerably over the last decade. Learners increasingly see themselves as clients who expect and insist on education and training of a high standard. This is underscored by the Stellenbosch University Strategic Framework (Stellenbosch University, 2000), which describes the institution (and by implication, its teaching and learning) in the following way: “A university characterized by quality teaching, by the constant renewal of teaching and learning programmes, and by the creation of effective opportunities for learning/study”.



This student-centred ethos and demands for the innovative facilitation of learning place a responsibility on lecturers to practise within the parameters of a system that expects quality output in all its diverse facets.

A well developed educator force is essential in preparing learners to function competently within an increasingly technologically information-based society. This requires that the educators continuously learn and develop as well (through CPD) and that this learning and development is of a high quality. The next section will therefore investigate the theory and practice of the quality of learning that takes in CPD.

4.3 QUALITY OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

If CPD for lecturers in the natural sciences is to add value to academic practice, the question still remains: how do these professionals learn? Professional knowledge is not independent of how it is learned or used. It is important to know how professionals learn and acquire knowledge in order to provide relevant CPD of a high quality.

Daley (2000) argues that CPD is still practised without a model that sufficiently explains professional learning. Previous models have relied strongly on the teaching of technical skills, the transfer of learning and the adoption of innovation. These models proposed a linear flow of knowledge to practice, with knowledge created in one location (usually a university setting), which is disseminated through CPD programmes and then transferred and adopted into practice. This has resulted in CPD programmes that have tried to provide up-to-date information, rather than cultivating lifelong learning. There is not only a need for knowledge-based educational programmes – CPD should also consider the social function of professionalism (McDonald, 2001; Kachingwe, 2000; Cobb, 1999).

Mott (2000) calls for the development of an integrated model of learning for CPD. The envisioned model should integrate reflection in action, reflective theory building, constructivist knowing and problem posing. Reflection in action refers to situations where professionals are confronted with problems that cannot be immediately explained or solved within their zone of mastery – they have to search for additional information (Borduas, Gagnon, Lacoursière & Laprise, 2001; Confessore & Confessore, 1994). Reflective theory building can be summarised as the incorporation of newly learned theory into professionals' existing knowledge structures by means of reflection (Mott, 2000). Constructivist knowing is conceptualised by Daley (1999) as the development from novice to expert in which the professional's learning becomes increasingly constructivist and self-directed. This means that experts are able to construct meaning from ill-defined and complex content areas by improvising and drawing on their professional experience. Problem posing is a form of problem generation that evolves as professionals explore situations, ask questions of themselves and others, learn to reason, and experience the communication of ideas (Lockhart, 2004; Gonzales, 1998). It is evident that these concepts are related and should be integrated in learning through CPD.

Daley (2000) proposes integration through the Expanded Model of Learning in Continuing Professional Education^{viii} to build on the model proposed by Cervero (1988). The latter model has expanded our understanding of the multiple forms of knowledge needed in professional practice, but has failed to integrate both the professional practice and the context into a holistic understanding of professional learning.

The model depicted in Figure 4.2 (from Daley, 2000: 35) presents knowledge as a social construction of information that incorporates both constructivist and transformative learning. Professionals' knowledge base is constructed within the context of their practice. New knowledge concepts are linked to practice experiences. This is an active learning process through which new knowledge is incorporated into practice, based on the professional's

interpretation of the environment. Context and professional practice are therefore linked to knowledge development to complete the learning process.

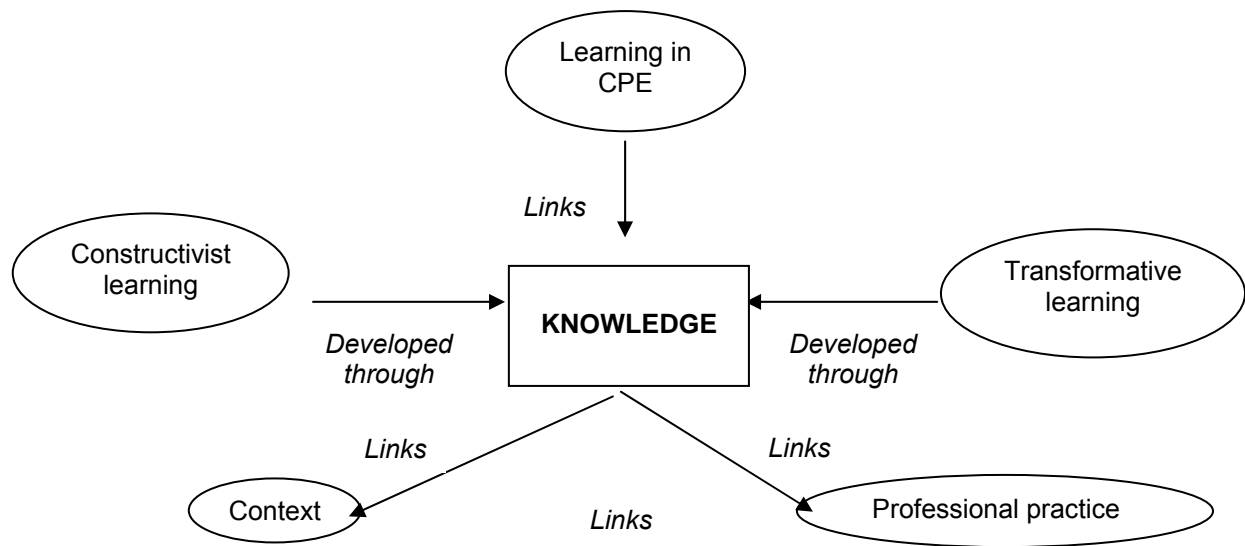


Figure 4.2: The Expanded Model of Learning in Continuing Professional Education
(Adapted from Daley, 2000: 35)

Daley (2001), Daley (2000), Levy (1999) and Naylor (1997) argue that information evolves into meaningful knowledge through constructivist learning. The principles of constructivist learning theory state that knowledge and beliefs are formed within the learner. Therefore learners themselves add meaning to experiences. These principles further suggest that learning activities should encourage learners to connect their experiences, knowledge and beliefs and that learning is a social activity which is enhanced by shared inquiry. Finally, reflection is seen as an essential aspect by which the learner constructs a personal meaning by linking knowledge and experience through reflection. Learning therefore becomes an active process. The constructivist learning theory explains how professionals acquire knowledge, how they make use of their experiences and how they learn through their practice. Learning environments should consequently be structured around the identification and achievement of personal goals and encourage personal responsibility and initiative, rather than focus on specified topics. This will develop learners' questioning skills, critical reflection, self-management and self-monitoring. Programme design and facilitation should relate to learners' experiences, interests and needs, and encourage a self-directed approach to learning.

The academic freedom noted in the core values of Stellenbosch University (2000) is therefore of importance if lecturers are to develop as self-directed and reflective practitioners. The organisationally directed goals and responsibilities have to be balanced with those of the individual practitioner through dual negotiation. Self-direction, reflection and learning through

experience are already evident in the valid study population's learning practices, even if they are not articulated in these precise terms:

I like to control the pace and ways of my professional development myself.
[Professor in Botany with 25 years of academic experience]

It depends on each person of which 'value' he/she gains from such (CPD) initiatives. Many people learn skills themselves / without help? [Senior lecturer in Zoology with 35 years of academic experience]

I think the (CPD) facility should be there when a need is expressed, but have reservations about putting all academic staff through such a programme. As an academic, I show resistance to being over-managed where not necessary.
[Professor in Microbiology with 29 years of academic experience]

Also having spent so many years studying I would be reluctant to go back into a formal course again. I much prefer doing my own professional research. [Lecturer in Geology with 3.5 years of academic experience]

These comments do not mean that professionals do not want to learn or develop. It only indicates that they have a context-specific and needs-based approach to learning and want to feel in control of their own development paths.

Daley (2001) found that the construction of meaning from knowledge gained through CPD programmes was influenced by the nature of the professional's work. All professions have a unique view of their work, which should be integrated into the CPD process in order for meaningful learning to take place. In the case of lecturers, the sharing of knowledge and learning was found to be an important part of constructing meaning. Lecturers often see themselves as a resource into which others may tap. This orientation can form an important part of the structuring of learning for this group of professionals. It is therefore important to incorporate transformative learning into the model.

Collaborative efforts and the need for collaboration in continuous professional development are important aspects in the practices of the valid study population. This means that lecturers are a resource for others, whilst they also develop themselves in the process. This supports the nature of their work (primarily research, lecturing and community interaction) and provides room for both constructivist and transformative learning. The participants in this study see the benefits of collaboration, as the following response indicates:

The more techniques, ideas one encounters interacting with other people and gaining of experience can only make one more of an expert. [Lecturer in Zoology with 5.5 years of academic experience]

Transformative learning adds to our understanding of the construction of knowledge and defines learning as a critically reflective process (Costley, 2001; Daley, 2001; Daley, 2000). Reflection involves a retrospective perception and revaluation of experience. This results in new perspectives on experience, a change in behaviour and a readiness for application and commitment to action (Challis, 1999). A reflective learner sees learning as an ongoing process, with interaction between theory and based on factors related to the specific context and more global (macro-) factors. Education then becomes more than an instructional plan and programme. The knowledge becomes meaningful in practice; it forms a two-way relationship between the lecturer and learner, and it builds on both knowledge and experience. Meaning learned in educational settings is often challenged, modified and/or changed in the context of practice. Client situations often challenge a professional's knowledge, beliefs and assumptions, which triggers a reflective process and results in a re-examination of established knowledge and practice. These situations are referred to as paradigm cases, through which professionals develop networks that inform their knowledge, understanding and actual practice (Costley, 2001; Daley, 2001; Daley, 2000). Transformative learning is evident in the learning practices of some participants, as the following response indicates:

... being able to attract research students at honours and master's level eventually at PhD level too by interacting effectively with these students. One's research expertise would develop in parallel with that of the student but at a higher level.

[Lecturer in Chemistry with 15 years of academic experience]

The Expanded Model of Learning in Continuing Professional Education (see Figure 4.2) links the theoretical perspectives of constructivist and transformative learning to form a holistic and integrated view of knowledge development. This explains how professionals initially acquire knowledge and then how their understanding is changed, based on experience. The model combines learning, professional development and context. These factors should form core components of an integrated CPD programme. The model places the provider of CPD in a facilitative role rather than only in the role of developer of a specific programme. This type of approach encourages these facilitators to work with professionals/participants in creating tools that foster knowledge construction in the context of practice. Such an approach to learning will enhance the application of CPD learning in practice (Daley, 2000; Hendry & Waltham, 1998). The Expanded Model of Learning in Continuing Professional Education (Daley, 2000) meets the requirements set out by Mott (2000) for an integrated model of learning for CPD.

It is evident that the participants in the study already employ many of the concepts included in the Expanded Model of Learning in Continuing Professional Education (Daley, 2000). They have achieved these insights mostly through trial and error, not through being experts in educational strategies. Practical ways should be sought to help lecturers in the natural sciences reflect on, construct, and transform their knowledge and learning. In order to do this, they need to understand the context in which learning and professional practice take place. Only then will they be able to develop optimally as professionals. Models such as the Expanded Model of Learning in Continuing Professional Education (Daley, 2000) are valuable in explaining and understanding the quality of learning in CPD, but are relatively useless if they are not put into practice. Lecturers in the natural sciences, in particular, are often not interested in the theory of education. Therefore such models need to be translated into practical, applicable and suitable CPD practices for this particular audience.

4.3.1 Scholarly development as a continuous endeavour: Moving from novice to expert

CPD programmes are mostly still focused on updating professionals' knowledge and the dissemination of information in a formalised manner. This knowledge is seldom directly or immediately, if ever, transferred to practice. Furthermore, there are a multitude of providers and a lack of coherent strategy or long-term vision for CPD. There is usually a narrow focus on a specific professional domain and with no or little links to previous professional or pre-service education. This leads to elementary, sporadic and reactive systems, with information-intensive, short-course updates and little integration into a lifelong learning plan. The quality of the outcome of the learning is crucially affected by the way in which the individuals approach their learning. Surface approaches, such as rote learning of facts and their regurgitation through formal examinations, do not lead to a deeper understanding of the underlying principles, ideas and concepts and the meaningful interpretation thereof. This type of educational practice might still suffice for novice practitioners, but certainly falls short of the CPD needs of the expert professional (McDonald, 2001; Cervero, 2000; Daley, 2000; Challis, 1999). Quality of practice and further learning rests not only on a substantial knowledge base, but also on expertise – the art of practice. The evolution from novice to expert has been the focus of various studies and forms an important component of an understanding of what constitutes successful CPD (Daley, 2001; McDonald, 2001; Daley, 2000; Daley, 1999).

It is difficult to attach a time frame to this type of progressive process, as professionals develop in different ways and a multitude of factors influence this development. The time frame would therefore differ for each individual professional. Subject-related knowledge and technical and practical skills are all necessary for effective practice, but it is reflection that separates the novices from the experts. Daley (1999) identifies five stages of professional development on the continuum from novice to expert. They are summarised in Table 4.1.

TABLE 4.1: The professional practice implications of the five levels of expertise (Adapted from Daley, 2001; McDonald, 2001; Daley, 2000; Daley, 1999)

Practice implications Level of expertise	Situational awareness	General practice application	Application in higher education
Novice	Little experience with real situations	Relies on rule-oriented behaviour to guide practice	Junior lecturer. Has acquired a doctorate, but at least a master's degree. Draws on own experiences as student, but has little experience of teaching or supervising research. Will need induction and mentoring.
Advanced beginner	Able to differentiate between situations	Can cope with reality	Lecturer. Experience in all fields of practice, but is not considered an expert. Can still benefit from mentoring, but is able to give input in collaborative initiatives. Teaching persona is established and starts to build a research team. Understands basic administrative systems.
Competent professional	Usually has three to five years of practice experience in specific field of practice	Can organise and plan activities and can cope with unpredictable situations	Senior lecturer. Competent teacher and researcher. Has built up professional networks. Can initiate and lead research. Is involved in various aspects of community service.
Proficient professional	Understands complex practice-related situations	Progresses to a holistic sense of the work	Associate professor. An established teacher and researcher, who is also respected within the scientific community and as a mentor.
Expert	Transforms information into practical knowledge, made meaningful by context. Intuition often associated with expertise. It refers to an integrated and holistic knowledge framework, embedded in practice, based on rapid recognition and the retrieval of familiar patterns from past experiences.	An involved performer, not just a detached observer, guided by clinical reasoning and judgement. Understands own learning process within the context of practice. Knows how to search for information through self-initiated strategies and link this to experience. Willing to change practice based on the new knowledge	A professor in the academic field is usually considered an expert. Is respected for competence and expertise by colleagues, mentees, learners and others in the discipline. Involved in policy formulation and implementation.

At the stage where a person becomes a lecturer in the natural sciences, he/she has already acquired extensive expertise in a specific discipline through postgraduate studies – usually a doctorate within a specific discipline, but at the least a master's degree. There are those that are still hesitant to call themselves experts, sometimes based on their lack of experience in their scholarly roles other than discovery (research):

Neither. I think that I am somewhere in the middle. Although I have only one year of teaching experience (the previous years were as a postdoc) I have tried to involve myself in different aspects of academic life to give myself the experience. [Lecturer in Physics with 1.8 years of academic experience]

I am neither a novice nor an expert. I am still getting used to teaching large first-year classes. I don't think I am an expert in my current area of research. [Senior lecturer in Mathematics with 25 years of academic experience]

Definitely NOT an expert but not a novice either. I think that with 15 years' experience I am definitely NOT a novice but then again people just starting out have some great ideas and could also be at the same level as myself in certain aspects. [Lecturer in Chemistry with 15 years of academic experience]

Intermediate I still have a lot to learn, but have gained a lot of experience. [Lecturer in Chemistry with 7 years of academic experience]

Somewhere in between not a novice or I would not be where I am now but a way off being an expert. [Lecturer in Physiological Sciences with 7 years of academic experience]

Those that did see themselves as experts did so mostly in terms of their years of experience^{ix} and subject-related expertise gained through research experience:

I am involved in my research field for 17 years and is currently the only person in SA that can give training in the field of ... [Senior lecturer in Biochemistry with 14 years of academic experience]

I have 19 years' experience as a researcher in science. I have about 50 peer-reviewed publications including book chapters and articles in scientific journals as well as a few patents. In addition, a number of M.Sc. and Ph.D. students have successfully completed their studies under my supervision. During the past few years, my pre-graduate students also scored me above average on my lecturing

abilities. I am not a novice. [Associate professor in Microbiology with 6 years of academic experience]

... already involved with technology transfer to industry for 15 years. Supply study supervision to 20 M.Sc. students up to present. [Associate professor in Computer Science with 14 years of academic experience]

25 years of experience in science. International acclaimed expertise. 3 doctorates. 180 publications. Experience in Univ teaching at 14 different institutions etc. [Professor in Botany with 25 years of academic experience]

After 35 years I am as knowledgeable as my assignments/circumstances/personality and abilities allow me. [Senior lecturer in Zoology with 35 years of academic experience]

The traditional emphasis on knowledge and skills may have marginalised the aspects that truly cultivate experts. Different educational strategies are therefore appropriate at different skills levels to ensure optimal learning. More structure is needed at the novice level, which includes concept formulation and assimilation, such as the PREDAC programme for newly appointed lecturers presented by the Centre for Teaching and Learning at Stellenbosch University. More informal mechanisms are appropriate at the expert level, such as constructivist, reflective and self-directed initiatives grounded within individual practice contexts. It does not mean that learning suited to expert professionals is totally without structure, but the methodology and approach differ. Understanding the differences in novice and expert learning can enhance the quality of CPD programmes and help both novices and experts to reach learning outcomes (Costley, 2001; Daley, 2001; McDonald, 2001; Daley, 2000; Hart *et al.*, 2000; Steinert, 2000; Challis, 1999; Daley, 1999). The following participant concretely describes these differences between novices and experts:

Novices are in general more forgiving in terms of what they receive (in CPD). They take in more information, they are more accepting, it is more an aptitude, while experts are more critical ... The experts I think are more disposed to self-directed learning, to take initiative and they are probably also the people that will not have such a pressing need for interventions such as workshops and programmes. Novices may have a greater need for mentorship, someone to hold their hands, someone that can unlock it. [Senior Advisor, CTL]

The lecturers that participated in the study indicated that they saw differences in their own learning strategies as novices and as (more) expert practitioners over time. They indicated that

it took time for novices to build up professional networks and gain exposure. In this instance support and encouragement from senior personnel are indispensable in novices' learning through CPD, as the following participants in the study indicated:

I only think novices should be actively encouraged by their senior colleagues or departmental heads to attend these things (CPD initiatives) and then the person that attends such things must get recognition that he/she develops him-/herself professionally. If a person gets no recognition for it, it is easily seen as a waste of time. You are then also not encouraged to go by senior colleagues and the opportunity is not used. [Lecturer in Physics with 1.8 years of academic experience]

When I started lecturing. I felt I had to show that I could work independently, but now I realise that no academic can truly be independent: Communication and exchange of ideas are very important for the growth process both as a lecturer and researcher. So now I learn better than I did when I was trying to read and do everything on my own, and so inevitably reinventing the wheel. [Lecturer in Chemistry with 7 years of academic experience]

Furthermore, the more expertise a professional in this sphere gained, the more independent (but also interdependent) the person became. Experience enables the professional to distinguish between important and unimportant information, to easily grasp the essence of information (and not waste time on irrelevant details), to rapidly recognise and retrieve familiar patterns and to disseminate in an understandable manner. Quiñones and Ehrenstein (1997) refer to this skill as “adaptive expertise”. Adaptive expertise is evident in the following responses from participants in the study:

Before I started working I was a student then I learnt to understand things myself now I learn so that I can transfer and/or apply knowledge. I now distinguish much more between information that is useful to me (e.g. a short applicable summary of the language policy in the class) and information for which I have no use or that I cannot apply (e.g. thick policy documents). [Lecturer in Physics with 1.8 years of academic experience]

I am not dependent on someone else to guide me – I go with a notion of what I want to learn. In my subject, my base and intermediate levels are far more comprehensive, so it is much easier to build upon it, or branch sideways into multidisciplinary understanding/skill, which is exciting. [Professor in Physiological Sciences with 8 years of academic experience]

I've got a lot more experience, you can ask informed questions, you actually know what you want to know. [Senior lecturer in Mathematics with 10 years of academic experience]

I do not bother with detail. I concentrate on tendencies/principles and concepts I also transfer it to students as such. [Senior lecturer in Zoology with 35 years of academic experience]

I approach things from a more fundamental perspective ... [Senior lecturer in Chemistry with 9 years of academic experience]

What is different is having a better feel for what is important and not important. Also increased recognition and credibility built over the years makes it easier to get things done. [Professor in Microbiology with 29 years of academic experience]

It 'forced' me to broaden my scope of interest. The best way to learn something new is to be challenged to communicate such knowledge to a student. [Professor in Botany with 25 years of academic experience]

Novices do not develop into experts overnight; it is an ongoing and mostly self-directed and reflective process. The building of national and international networks of colleagues – that contributes to collegial interaction and development in a meaningful way – takes time and effort. Knowing how to distinguish important information from the unimportant masses takes time, experience and insight. Developing an effective personal style of teaching and disseminating information comes through making mistakes, learning from other lecturers' examples, obtaining feedback and being challenged by one's learners.

But how can we ensure that these processes do take place and how can we optimise their benefits in order to ensure quality learning and eventually quality professional practice?

4.4 ENHANCING THE QUALITY OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

Boyer (1990) argues that scholarship cannot take place in isolation – a shared vision of intellectual and social possibilities that integrate the various scholarship dimensions is necessary. A community of scholars adds more value to the expansion of our current knowledge boundaries than an individual ever could. However, Boyer *et al.* (1994) found that relatively few lecturers perceive an integrated vision of scholarship that is shared by academics and administrators on campuses around the world. Watty (2006) argues that various

stakeholders in the academic context need to be involved in enhancing quality, as they may have different perspectives of quality that are all legitimate given their point of reference. Harvey and Green (1993, in Watty, 2006) therefore refer to a variety of possible conceptions of quality, including exceptionalism, perfection (or consistency), fitness for purpose, value for money, or transformation.

These different conceptions of quality can easily lead to divergent ideas on what constitutes quality learning and how scholarly development can (and should) be facilitated through CPD. Boyer *et al.* (1994) found that academics place a high value on broadening their scholarly horizons through scholarly networks and exchanges across institutions and national boundaries. This trend has led to what Boyer *et al.* (1994: 11) describe as “academy [that] is more cosmopolitan than local: *professional* loyalty [that] is stronger than *campus* loyalty”. Boyer *et al.* (1994) attribute this trend to hierarchical and bureaucratic structures of governance that have removed academics from issues that affect the institution as a whole and that have even created a climate of distrust between academics and administrators. The managerial drive for economy, efficiency and effectiveness (Becher & Trowler, 2001) may have reduced communication and collegiality (Boyer, 1990). It may have decreased academics’ control over curriculum (Becher & Trowler, 2001). Becher and Trowler (2001) add various other changes in higher education that have contributed to a differentiated and permeable system, including changes in the internal characteristics of higher education institutions, rapid technological changes, an emphasis on market-friendly applied research, and external pressures for vocationally oriented curricula. Clark (1996, in Becher & Trowler, 2001) notes the growth in academic disciplines and their fragmentation into sub-disciplines as the most significant change factor in higher education for its determining effect on the massification and market-driven ethos of the system. The roles and responsibilities of academics have also diversified, which has intensified the need to cope effectively with changes in higher education. Becher and Trowler (2001) argue that Boyer’s (1990) initial classification of scholarly roles may need to be expanded to include leadership, management, administration, and entrepreneurship, as these all form part of current expected academic practice.

Even if it is perceived that academic freedom exists, the respondents in the study amongst lecturers in the natural sciences did not feel supported by academic governance in their scholarly endeavours. However, a lack of administrative/governance support for the development and integration of scholarship does not seem to prevent these scholars from establishing international scholarly communities.

There is a wealth of experience from which to tap when we investigate how to enhance the quality of learning in CPD, both formally and informally. This part of the chapter narrows it down

to five main areas within which and through which quality can be enhanced. These areas focus on the input from various stakeholders in enhancing quality. Firstly, the focus falls on the macro-level, with formalised governmental interventions in CPD quality assurance through national policy and programme accreditation. Secondly, the role of management input at the institutional (meso-) level is considered. The Total Quality Management system is discussed as an effective manner through which CPD quality can be improved and maintained. Thirdly, a connection is made between management, the learner, and learning itself through leadership development. The fourth aspect, namely mentorship, supports quality development at a more micro-level. Different models of mentorship are integrated with practical experience thereof to obtain a holistic perspective on the issue at hand. Finally, situated learning is presented as an individual and collaborative strategy to enhance the quality of learning in CPD and therefore also scholarly growth.

4.4.1 National policy and programme accreditation

Mapesela and Hay (2006) note that policy implementation may pose a threat to academics who have to adapt to changes brought about by the transformation in South African government and consequently by the policy environment. Higher education in South Africa has faced a myriad of changes in post-1994 policy, which includes an increased drive towards quality assurance.

The Higher Education Act (Republic of South Africa, 1997) assigned the responsibility for quality assurance in higher education in South Africa to the Council on Higher Education (CHE). Quality assurance is currently handled by the Higher Education Quality Committee (HEQC), which is the permanent sub-committee of the CHE. Quality assurance by the HEQC takes place within the framework of the Regulations for Education and Training Quality Assurers (ETQAs) of the South African Qualifications Authority (SAQA), which has the responsibility to oversee standard setting and quality assurance in support of the National Qualifications Framework (NQF). This committee's main functions centre on quality promotion, institutional audits and programme accreditation. Its activities also focus on capacity development and training as a critical component (Council on Higher Education, 2004a & b). These documents further refer specifically to the availability of opportunities for the scholarly and professional development of academic staff as a criterion for success in terms of delivering quality outputs in the higher education sector. This is of specific relevance to CPD in higher education as a whole. Quality assurance by the HEQC institutional audit mechanism can play a central role in ensuring the quality of CPD initiatives in higher education.

The HEQC aims to investigate the policies, systems, strategies and resources that will enhance quality assurance (meeting of requirements and standards), quality support (sustaining existing levels of quality), quality development and enhancement, and quality monitoring (reviewing,

monitoring and acting on quality issues). The first audit cycle (2004-2009) is focusing primarily on institutional arrangements for assuring quality in the core areas of teaching and learning, research, and community engagement. However, it is stressed that the primary responsibility for managing and sustaining quality rests with higher education institutions themselves. The HEQC therefore serves to monitor and validate institutional information through a system of peer and expert review (Council on Higher Education, 2004a).

The HEQC specifically refers to academic support services in its criteria for institutional auditing. These services should create an infrastructure and opportunities through which staff can enhance their expertise and keep abreast of developments in their field. Service learning is mentioned as a manner in which continuous staff development can be facilitated. It should be integrated into institutional and academic planning, and form part of the institution's mission and strategic goals. Adequate resources (including incentives) should support the implementation of service learning for staff capacity development, and the impact and outcomes of such endeavours should be continuously monitored (Council on Higher Education, 2004b).

It is debatable whether academic support services (such as the Division for Research Development, the Centre for Teaching and Learning (CTL) and the Division for Community Engagement at Stellenbosch University) should provide and monitor subject-specific development opportunities, which are mostly addressed by subject-specific organisations or self-directed initiatives. These organisations and initiatives have long established monitoring systems, such as peer review of articles published in reputable journals, and question-and-answer sessions following conference presentations. The support services within the university are indispensable in terms of generic knowledge and skills input and in creating and facilitating opportunities for CPD-aimed scholarly development of lecturers at Stellenbosch University. The support services have evidently taken note of the latest HEQC audit report and are in the process of developing and presenting training initiatives aimed at informing and enhancing scholarly practice at Stellenbosch University in the light of the HEQC's first audit cycle.

Programme quality may hold implications for the quality of learning and should therefore also be considered by both institutions and individual scholars. Knox (2000) mentions 14 goals of CPD against which the quality of CPD programmes can be measured. These goals include clarifying the defining function of the profession and the mastery of relevant theoretical knowledge. A measurement of the quality of CPD programmes should further investigate participants' capacity to solve problems, the use of practical knowledge, and their self-enhancement beyond the professional speciality. It should indicate to what extent the programme supports formal training, the creation of a sub-culture, ethical practice, penalties, legal reinforcement, and to what extent

the programme provides participants with credentials. The programme's public acceptance and its connection to other vocations and to clients must also serve as indicators of quality.

Although it is compulsory for all formal programmes presented at undergraduate and postgraduate level at universities to be accredited by the South African Qualifications Authority (SAQA), many CPD initiatives are informal in nature. Differences in opinion exist as to whether these initiatives should be accredited at all. Those in favour of accreditation see it as valid quality control and a way through which industry and academia will be able to judge the abilities and skills of an individual. Furthermore, it would possibly be easier to receive recognition and reward for attendance and completion if these initiatives were accredited, which would make it worth the while. Those against accreditation see it as another form of bureaucratic control and added administrative load, which lecturers already perceive as overbearing. They also fear that participants would end up only participating in CPD initiatives for the credits awarded (should a credit system be implemented simultaneously), rather than for inherent self-improvement. Another perceived negative aspect of accreditation as a quality assurance mechanism is that it could inhibit academic freedom in that such initiatives could become compulsory^x. This is the negative side of reward and recognition – that only the accredited initiatives will bear any weight when it comes to promotion and professional advancement. Accreditation as such will not ensure the quality of outcomes. The proof is in the pudding, so to speak – as is evident from the following respondent's comment:

Not all [CPD programmes should be accredited]. Lots of little certificates can become rather silly. If accreditation is needed, they should be packaged into programmes of substantial impact. From the PEK/PAK committee, I know this is also the DoE approach, it does not wish to give accreditation for small courses, it must fit into one or other already established level and be of a reasonable number of credits, otherwise the system will become unmanageable. However, completion of a programme, even with a good pass, does not indicate that you have become a better professional. Doing the job well is better evidence. [Professor in Mathematics with 30 years of academic experience]

In terms of Recognition of Prior Learning (RPL) and the increasing demands for accountability, competence and quality it is inevitable that there will be increasing pressure on CPD providers for accreditation. This will serve as an indication of quality CPD programmes (at least) and as such will increase the chances for appropriate and quality learning, although it can never serve as a guarantee.

Total Quality Management, leadership development and mentoring are ways in which quality learning through CPD can be reached.

4.4.2 Total Quality Management

Managerial structures also have a role to play in scholarly development through CPD. Kabouridis and Link (2001) and Brew (1995) propose the Total Quality Management (TQM) system as a means to achieve quality learning in CPD. It is defined as a management approach that is centred on quality, based on participation and aims at long-term success. The four main elements of the system are a client focus, continuous improvement, a process orientation and societal learning. The client focus depends on the specific client's needs, which will differ between professions. In the case of higher education, these needs will be centred on education, research and community involvement. Continuous improvement and total participation, or teamwork, requires improvement as a natural part of everyday tasks. Societal learning refers to learning on the individual and team levels. All learning has its origin in the individual, but it is the joint efforts of teams that often create extraordinary results.

Problem solving within this system takes place through a plan-do-check-act cycle, similar to the action learning cycle (Zuber-Skerritt, 1991). Ziegler (2001), as quoted in Mott (2001), makes a strong case that the elements inherent to action learning and research make it an ideal means of improving practice and therefore a powerful tool in improving the quality of CPD as a whole. During the planning phase a process that needs improvement is selected. The selected process is documented through the analysis of data. The doing phase consists of the implementation of the proposed plan and monitoring its progress. The check phase follows, in which the data collected is analysed and compared to the goals set out in the planning phase. If the results are positive, the revised process is documented and becomes the standard procedure. This constitutes the acting phase (Kabouridis & Link, 2001). Figure 4.3 provides a schematic representation of the TQM system.

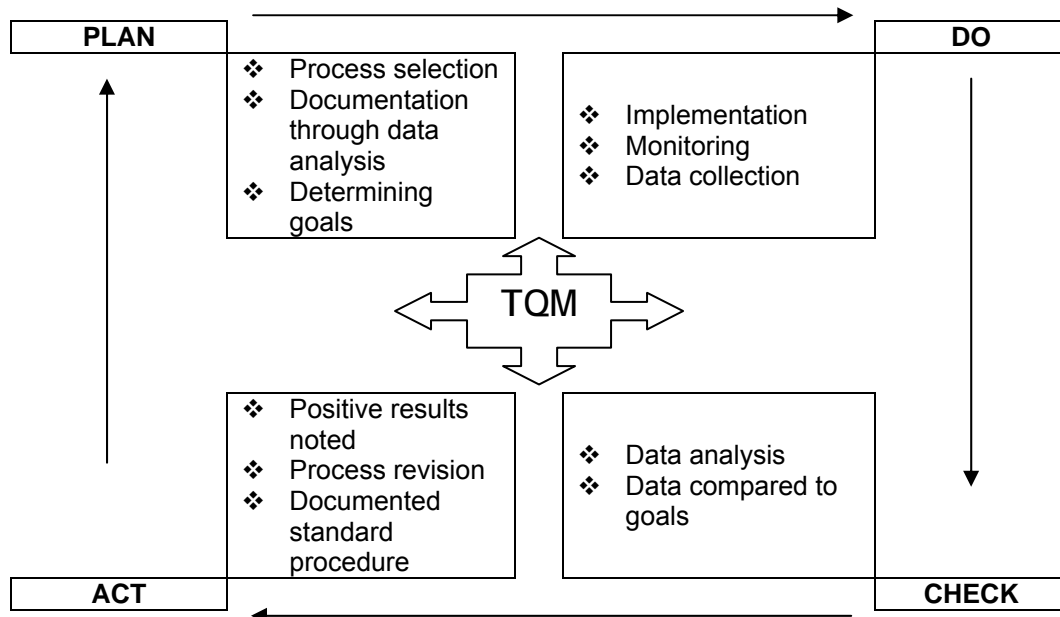


Figure 4.3: A schematic representation of the Total Quality Management System
 (Adapted from Kabouridis & Link, 2001: 104)

The TQM system is built on the principles of adult education and collaborative teamwork (Kabouridis & Link, 2001). Steinert (2000) also supports this type of approach, as it is integrated, longitudinal and encourages collaborative efforts. Quality in the TQM system adheres to the notion of flawless consistency of a product or service (Watty, 2006).

The TQM system should not be accepted without critical appraisal. Various authors provide a critique of the application of such an industry-shaped system in a higher education context. Houston (2007), Lomas (2007) and Watty (2006) argue that the TQM conception of quality as a framework of zero defects may lead to a narrow-minded notion that higher education is aimed at producing a homogeneous population of graduates. The TQM system also promotes the notion of the student as customer or client, which implies a mere contractual relationship between the student and the education provider (the lecturer). This view detracts from transformative notions inherent to higher education. Houston (2007) warns that the continued uncritical acceptance of TQM as a quality assurance measure in a context such as higher education may over-simplify the notion of quality as a whole and lead to privileging the views of certain stakeholders. Educational processes, educational theories, educational values (such as academic freedom, professionalism, and collegiality) and student learning find little room within such a managerial system that often strengthens external control on the shape and output of the organisation. TQM therefore has limited transferability from industry to higher education, according to Houston (2007). Watty (2006), however, also argues that managerial systems such as the TQM does have a place in higher education if it can accommodate a wider notion of quality than mere

fitness for purpose. Houston (2007) adds that certain university functions (such as administrative and service functions) may indeed fit comfortably into the quality structure provided by TQM, but it may require a different language, concepts and methods than those used in industry.

Total Quality Management could evolve into an appropriate and successful participatory CPD management strategy in the natural sciences. Even though natural scientists may initially be sceptical of the qualitative elements incorporated into the system, it presents a relatively simple, yet effective mechanism through which individual lecturers can plan, execute, evaluate and defend their continuing development strategies. It is also suitable as a management strategy in collaborative initiatives and leaves room for the unique practice setting in which lecturers in the natural sciences find themselves. It will ensure that development does not take place in a haphazard fashion, but is properly planned and executed. Documentation phases will enable these professionals to learn effectively from their experiences, to strategise future initiatives according to what they have learnt and to document examples of good practice as repeat use and standard procedures. It will also make it easier for these professionals to document their career paths and therefore make it easier to comply with institutional demands such as professional profiling, because they have already organised the relevant documentation through the TQM system.

4.4.3 Leadership development

Leadership development is another important aspect in ensuring and improving the quality of learning through CPD. The leader in higher education has a paradoxical role to fulfil. Lecturers value their autonomy and academic freedom, but also have a high regard for their shared responsibility. This calls for leaders who can facilitate the work and development of their colleagues without imposing structures that stifle creativity and innovation (Murray, 1995). Brew (1995) states that the lecturer as lone innovator has much less impact than the leader (such as a head of department or mentor) who stimulates and co-ordinates a collaborative effort to learn, change and develop co-operatively. Students will then also receive a coherent message about the way in which they, in turn, are encouraged to learn and develop. Leaders have the power to truly cultivate lifelong learning and transformation.

The demands placed on leaders within the CPD field have changed considerably. There is a need for a new model of transformational leadership that will re-direct CPD. Leaders should influence the significant stakeholders to continuously debate the issues surrounding CPD. Transformational leadership encourages proactive change, as well as goal setting and attainment through non-coercive means. These leaders intellectually stimulate, facilitate, develop and inspire team members to work toward a collective purpose, mission and vision.

Individual attention, respect and equality are central features in this leadership style (Wonacott, 2001).

A leader in higher education (such as a dean or a head of department) is expected to be a change agent in the transformation higher education is experiencing worldwide. They often lack the knowledge and skills to empower and motivate other staff members to cope effectively with change and transformation. Leadership development at departmental level is an aspect that should be taken more seriously by institutional management. Training in terms of team building, empowerment, creating a climate of supportive communication, cultivating participative decision making to ensure commitment, encouraging scholarship, performance assessment, the use of rewards and recognition in motivating staff, and conflict management are aspects that need consideration. Gillespie, Hilsen and Wadsworth (2002) suggest leadership development workshops or study groups as possible ways to initiate this type of training.

Current literature on leadership development in higher education tends to focus on transformation within the teaching role of the lecturer. University leaders are not only expected to provide and plan an environment that is conducive to continuing professional development in terms of the scholarship of teaching and supplying adequate infrastructure. Although these aspects are important, the leadership role in terms of CPD stretches much further. Leaders are expected to consult, initiate, participate, support and lead by example in all fields of practice, including all the scholarly roles. Gentile (2002: 97) describes a leader in the academic context as:

... a key individual ... articulating divisional needs and perspectives to senior administrators at the institution, as well as helping faculty gain insight on issues facing the institution as a whole.

Gentile (2002: 97, 99) continues to define the leadership role of the dean in a faculty of science as follows:

It is the responsibility of the dean of natural sciences to work with departmental chairpersons to sharpen individual programmatic goals and objectives and, more important, provide overarching direction within the division ... The dean helps to form and frame a sense of community and an agenda for action for the division. This focus on direction influences how we hire faculty, socialize faculty into our community, and pay attention to faculty at all career stages ... The responsibility of the dean is to know the needs and dreams of each individual faculty member and to work with him or her, together with other divisional leaders, to ensure that the greatest potential is achieved from each of the scholars within our division.

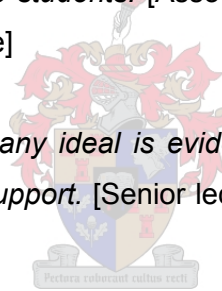
The Faculty of Science at Stellenbosch University seems to be no exception to this notion of leadership, as the following respondents reveal their perceptions of leadership development:

... learning mostly comes from doing projects, being involved in a managerial position. [Lecturer in Computer Science with 4 years of academic experience]

... short workshop, no longer than two days, that gives simple guidelines for success in the sciences and academia. Here planning strategies regarding time, projects, curricula and your professional goals can be discussed, further budgets, applications for bursaries and awards, leadership and applicable topics can be handled by experts. [Senior lecturer in Biochemistry with 14 years of academic experience]

Firstly, a working environment that supports scientific research; with top management appreciating the efforts of researchers to strive towards scientific excellence AND simultaneously providing funds for their own research including bursaries for their postgraduate students. [Associate professor in Microbiology with 6 years of academic experience]

Education is 99% example, if any ideal is evidently supported, any CPD initiative that contributes to it will gain support. [Senior lecturer in Mathematics with 32 years of academic experience]



Improving leadership depends on the available opportunities for potential leaders to develop their skills through reflection, self-assessment, challenging situations and support from positive role models and mentors. This calls for a multidisciplinary approach and the construction of a cognitive leadership model (Wonacott, 2001). Moss (1994: 26), as quoted in Wonacott (2001), describes this as “improving those attributes – characteristics, knowledge, skills, and values – that predispose individuals to perceive opportunities to behave as leaders, to grasp those opportunities, and to succeed in influencing group behaviours in a wide variety of situations”. Successful leadership in this context is further described as taking on a primarily facilitative role in group processes and empowering group members.

The Cape Higher Education Consortium (CHEC) is a collaborative project of five tertiary education institutions in the Western Cape Province of South Africa. It is mainly involved with educational policy development, collaboration and capacity development within the Western Cape and South Africa. On behalf of the collaborating institutions, the CHEC initiates and administers regional collaboration in higher education through projects and a management

development programme called Creating the Leading Edge. This programme is a regional management development programme for middle management staff working in higher education in the Western Cape. The programme is open to all staff, including academic and support staff in management roles. The target group is middle management, defined as a graduate equivalent, over five years' total work experience, a new manager or experienced manager (Cape Higher Education Consortium, 2004).

The Creating the Leading Edge programme was developed to promote the view that middle managers, as an essential resource in higher education (HE), should be valued. To meet the challenges of the complex and changing HE environment in South Africa, these managers need continuing professional development. Many of these needs are generic and meeting these needs through regional collaboration in the provision of training events forms the foundation for the development of a strong HE region in a restructured national system. This yearly programme is presented in modular form, with the core modules constituting a comprehensive management development programme. It focuses on competencies (skills, knowledge, attitudes and behaviours) in an interactive and participative forum. Completion of the programme is recognised by all the higher education institutions in the region. A CHEC certificate will be presented to those who successfully complete all of the core modules. However, managers who do not wish to attend all the core modules may enrol for any number of modules. The programme aims to provide a foundation for the development of leaders that is open to accommodate emerging needs of higher education and build on the existing expertise of middle management and thus to further develop leaders in middle management who initiate, embrace and facilitate change (Cape Higher Education Consortium, 2004).

The CHEC has furthermore initiated the HERS-SA initiative, which is a managed network to improve the status of women in higher education in South Africa and to contribute to leadership development in this way. The initiative works towards empowering participants for leadership roles in academia through offering accessible education, training and development programmes. Despite the fact that women constitute over 50% of the higher education workforce, only 9% of the Vice-Chancellors and Deputy Vice-Chancellors are women. The highest proportion of women are in the lowest academic positions and the lowest pay classes in support departments, this despite employment equity legislation and the articulated priorities of the department of education. HERS-SA aims to challenge institutional culture and facilitate workplace change, thereby addressing gender inequity and enabling women to participate fully in the workforce. The initiative consists of an annual HERS-SA Academy for women already in, or aspiring to, senior leadership positions, professional development workshops and programmes. The initiative creates networks through its website and listserv. It manages the Mellon Funded programme to send women to HERS Mid-America for professional development

and it promotes research into gender equity in higher education in South Africa (HERS-SA, 2004).

Stellenbosch University (2000: 5) has committed itself to a system of participatory management and 'flat' organisational structures. Leadership therefore not only resides with top management, but is reverted to departments and academics themselves. This is positive in the sense that it empowers academic environments to plan and conduct CPD according to their own needs. It gives them more negotiating power to set and achieve their own CPD goals.

Leadership development is an important tool in improving quality in CPD. The highly competitive arena of higher education demands leaders that can initiate and adapt to change. Leaders who are empowered lifelong learners in their profession will motivate others to follow their example of continuing professional development.

4.4.4 Mentoring


Mentoring could be an effective human resource for quality development in CPD. It can be described as guiding the development of an individual in a non-judgemental way towards professional excellence. It does not impose a rigid structure on the professional as learner and can be described as a relationship rather than an activity (Oliver & Aggleton, 2002; Ritchie & Genoni, 2002; Ferraro, 2000). Steinert (2000) describes mentorship according to three concepts: support, challenge and vision. Support includes activities that reduce uncertainty and reaffirm the value of the professional as a learner. Mentors should also challenge the mentees to reflect critically on their own assumptions, values and competencies. A mentor helps the mentee to build a vision through guiding discussions and acting as a role model. Lecturers in the natural sciences see themselves as role models, especially in their supervision of postgraduate students, but also at an undergraduate level – as the following response indicates:

To provide the environment in which my research group (consisting of postgraduate students) can grow to a level of international competence. To teach science to undergraduate students in such a manner that the beauty of nature is revealed to them. Simultaneously they are encouraged to critically think about scientific questions and to hone their skills needed for a future career in science. [Associate professor in Microbiology with 6 years of academic experience]

However, lecturers also need role models to improve their own professional practice. Mentoring programmes such as the Thuthuka Programme, initiated and funded by the National Research Foundation (NRF), aims to develop young academics within the research, innovation and knowledge generation through organised mentoring. It is specifically aimed at women, black researchers and young researchers in the areas of science and technology, as they remain

under-represented in academic positions, especially at senior levels. The Thuthuka Programme consists of the following three sub-programmes: Researchers-in-Training (RIT), Women in Research (WIR) and the Research Development Initiative for Black Academics (REDIBA). These sub-programmes are aimed at pre-doctoral and postdoctoral levels and, ideally, will eventually enable participants to qualify for an NRF rating. The programme allocates funds (in the form of bursaries, scholarships, grants and contracts) for research and the promotion of multidisciplinary collaboration. Monitoring structures within these programmes determine the status of and needs for research, and serve to review research proposals and results promoted by the NRF (National Research Foundation, 2004).

Ritchie and Genoni (2002) indicate three main functions of mentoring. It can have a career-enhancing function that develops skills that are necessary for satisfactory work performance and promotion. Mentoring can also have a psychosocial function, which supports the mentee's sense of self-worth and belief in his/her capacity to work effectively in the specific profession. The third aspect of mentoring addresses professionalism. Mentoring in this case helps the individual to establish a professional identity and gain entrance into professional networks, reinforces an understanding of the standards of practice, and facilitates the individual's continuing professional development in general. Bitzer and Kapp (1998) give a concise and useful mentoring checklist that also indicates the functions of both the mentor and the mentee (Figure 4.4):



MENTEE	MENTOR
<ul style="list-style-type: none"> • Develops expertise in a structured manner • Encourages and assists in career planning • Improves professional and personal networks • Helps to understand the organisation • Increases confidence through monitoring and demonstrating personal progress • Assists in change management 	<ul style="list-style-type: none"> • Provides new insights into the organisation • Broadens application and skills of the mentor • Helps mentor to learn and demonstrate additional skills • Provides an opportunity to actively enhance the personal and professional skills of colleagues • Assists in change management

Figure 4.4: The relationship between mentor and mentee in continuing professional development (Adapted from Bitzer & Kapp, 1998)

There are various models of mentorship, as reported in Oliver and Aggleton (2002) and Daley (1999). Table 4.2 summarises the functions, the role of the mentor and the defining characteristics of these different models.

TABLE 4.2: Summary and application of the mentorship models presented in Oliver and Aggleton (2002) and Daley (1999)

Models Criteria	Apprenticeship	Competency	Reflective practice	Integrative
Functions	Moving from novice to expert through imitation of expert practice	Gaining competency through demonstrating effective practice	Enables mentees to place their professional practice within the wider social and moral context.	Building a progressive relationship that may eventually benefit both mentor and mentee
Role of the mentor	Mentor leads novice by setting an example of good professional practice.	Mentor takes on the role of a coach who observes practice and provides feedback on an agreed list of pre-defined behaviours.	Mentor encourages open communication and reflection on and in practice.	Mentor gives support in the learning of basic competencies to a more equal relationship as the learner gains experience.
Characteristics	Learner watches and emulates an experienced professional in the workplace.	Learning by doing and receiving feedback on tasks completed	Encourages learners to engage in dialogue with a more experienced professional	A relationship between mentor and mentee that changes over time as the mentee develops in professional practice
Stage of professional development	Novice practitioner	Advanced beginner	Competent professional	Proficient professional and Expert professional
Practical application	Shadow work is beneficial, especially applicable to novices in the natural sciences still learning and practising methods, techniques and skills in a specific discipline. Applicable to graduates busy with postgraduate studies	Novice lecturers in the natural sciences, such as those involved in the NRF Thuthuka Programme, are prime examples. Postdoctoral students also fall within this category. They have expertise, but are new to professional practice in the academic sphere.	Mentee has experience in all aspects of professional practice within the academic sphere, but may not be the most knowledgeable or experienced professional in the specific environment.	Related to collaborative efforts, where all parties may already have expertise in the discipline, but can supplement and gain from each others' knowledge and experience. There is a more equal relationship between all concerned.
Examples from practice	<i>Shadow work with successful researchers and lecturers</i> <i>The most useful is to have a system of mentors, this was also the way I learned most in the beginning, not through formal programmes.</i>	<i>There are too many lecturers here that do not have a clue how to act in front of a class. I myself had to learn the hard way luckily I had two good MENTORS.</i> <i>My mentor assists me with a variety of problems as they arise.</i>	<i>I would use my failures of the past and taught colleagues not to copy them.</i> <i>'MENTORING' programmes that allow one to have access to ones peers for help and advice</i>	<i>Developing others has become more important and is an important part of my job as HOD (Head of Department)</i> <i>To serve as grand priest of education and teaching (is my aim)</i>

The model that is adopted is highly dependent on the professional culture and the extent to which it is externally regulated. Creative work settings often adopt a more informal mode and regulated professions may implement a more formal apprenticeship or competence-mentoring model. Legislative, organisational and professional contexts are therefore important in shaping mentoring within a profession. These models show that mentoring can indeed be effective at all levels of learning – from novice to expert.

This type of support can be offered in various ways. Timetabled mentoring takes place in agreed time slots and ensures mutual commitment to the process. Corridor meetings are more informal. Mutual or peer mentoring entails self-help pairs or small groups that meet to support each other. Telephone mentoring is possible in cases where the parties are geographically separated. Modern information technology (distance learning, e-mail) can also be mentioned under this category (Challis, 1999). Ritchie and Genoni (2002) add that mentoring need not only be a relationship between two individuals, but can be applied in a group format. This can be done through professional associations (a professional group that facilitates career development by exertion of social norms and roles), support groups (small group meetings facilitated by a mentor), or co-mentoring groups (a small group led by a peer mentor). Professional associations can provide mentoring via their special interest groups as well as via platforms for junior researchers. An example of the functioning of a support group could be the writing of an article by a group of experts and some novices. These specialised skills may include computer skills, statistical skills and/or writing skills. This collaborative effort by a support group enables a synergistic approach where everybody benefits and the novice can learn a great deal. Co-mentoring groups can occur when research projects for capacity building are formed and several novice researchers are co-mentored in proposal writing skills, literature reviews, doing field or laboratory work, developing data-collection instruments, analysing and interpreting data and writing up the findings.

It is evident from participants' feedback that there is a need for collaborative mentoring. This may take on the form of informal individual arrangements, or more structured peer- and group-mentoring sessions. Interdepartmental collaboration within the faculty may also hold interesting possibilities for cross-pollination and multi-disciplinary teamwork, as is evident from the following response:

Greater consciousness of research areas within faculty so that interdepartmental collaboration is possible. ... an academic year day for natural sciences similar to conference where personnel introduce their research through 10 minute presentations to rest of faculty. [Junior lecturer in Physiological Sciences with 5 years of academic experience]

Collaborative efforts will strengthen a system of collegial peer review, limit the chances of academic duplication, and improve the integration of research, teaching and engagement with the community.

Mentoring can also be a learning experience for the mentor, as it encourages the use of cognitive skills such as listening, questioning, providing feedback, reflection and motivation to grow. Mentors can develop their leadership skills and become recognised for their expertise. The mentor becomes an experienced co-worker and co-learner. The success of a mentor programme is dependent upon the quality of training given to the mentor (Huling & Resta, 2001; Ferraro, 2000; Weiss & Weiss, 1999). Disadvantages of mentoring include its demands on time and resources and a lack of suitable mentors within certain professions (Evans, Ali, Singleton, Nolan & Bahrami, 2002; Oliver & Aggleton, 2002; Challis, 1999).

Mentoring is only effective when certain individual, organisational and professional factors are in place. All the stakeholders should have clarity on the definition of mentoring within the specific context and the expected outcomes. A policy framework will help to clarify the aims and expectations. The proper resources, administration, the support of senior management, clear arrangements for recruitment, the training and support of mentors, the careful matching of mentors and mentees and the establishment of ground rules (such as confidentiality) for the mentoring relationship are necessary for mentoring to succeed. The chosen model of mentoring should be suitable to the specific context. A workable framework for the evaluation of mentoring schemes within a specific context is the final prerequisite for effective mentoring (Oliver & Aggleton, 2002).

Although a campus-wide mentoring programme for undergraduate (specifically first-year) learners exists, as well as the Thuthuka Programme for young researchers, much can still be done in terms of developing a mentoring initiative for academic staff. The relevant literature indicates that mentoring is not only effective and should not only be aimed at novice professionals, but that persons at all levels of expertise can gain from such initiatives. The study indicates that the perception of mentoring is positive and that there is a need for more such initiatives within Stellenbosch University, as is evident from the examples from practice quoted in Table 1. Mentoring, individually or collaboratively, has the potential to contribute significantly to the academic culture and growth within the Faculty of Science. The exchange of ideas and knowledge and the sharing and solving of similar problems falls within the realm of context-specific academic freedom and scholarship. The idea should not be to formalise such initiatives to the point of accredited programmes since its flexibility and informality is what appeals to overburdened academics. A general policy or at least an obvious encouragement, recognition

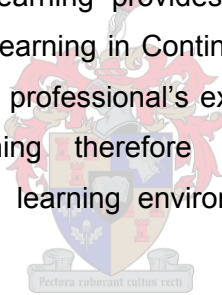
and reward of such initiatives can lead to much growth in these professionals' continuing development.

4.4.5 Situated learning

Section 3 in this chapter explored the enhancement of the quality of learning in CPD. A situated learning approach is a possible approach to enhancing the quality of learning in CPD in the professional sphere of natural science lecturers in higher education.

To situate learning means to place thought and action in a specific place and time. A situated learning approach focuses on the knowledge and skills that make experts successful in a particular setting. This contextualised approach involves other professionals as learners, the environment, and activities that create meaning. Co-operative and participative methods of learning are emphasised. Content is learnt through activities, rather than through instructional pre-organised learning packages. Situated learning integrates content, context, community and participation (Stein, 1998).

This conceptualisation of situated learning provides a practical approach to implementing Daley's (2000) Expanded Model of Learning in Continuing Professional Education (see Figure 2), as situated learning builds on the professional's existing experience and expertise within a particular context. Situated learning therefore incorporates both constructivist and transformative learning in an active learning environment and as such new knowledge is created.



Stein (1998) mentions four critical tasks when designing a situated learning experience. Firstly, situations that are complex, realistic and problem-centred, as well as those that support the desired knowledge, are best suited to situated learning activities. Secondly, scaffolding is necessary for novices. Facilitators must therefore know the type and intensity of guidance necessary for different learners to master new situations. Thirdly, facilitators move from mere content transmitters to tracking the learning process, assessing outcomes of learning, building collaborative learning environments, encouraging reflection and creating contextual awareness. Lastly, facilitators should continuously assess learners' intellectual growth. Stein (1998) refers to cognitive apprenticeships, which involve discussion, reflection, evaluation and validation of different perspectives. In this manner learners can observe experts in practice and develop their own unique approaches to practice.

Situated learning is the culmination of all the aspects that enhance quality in CPD. It places learning within the boundaries set by national and general management policies. It is an ideal way to incorporate the mechanisms suggested by the TQM system. It enables academic

leaders to ensure that professional development takes place in a progressive, innovative, but also orderly and realistic manner. It furthermore ensures that real problems within the practice context are addressed. It gives structure to mentorship.

An example of situated learning that co-ordinates all of these facets is the Habilitation degree commonly found in academic practice in European countries such as Germany, Switzerland and Austria (also known as the *Indonita* in Italy). This qualification provides a universal teaching licence to teach at any level of education. It serves as a reflection of a high value of academic freedom. In this model aspirant academics have to follow senior scientists (mostly within the European Union) for an extended period of time (sometimes up to 10 years) after completing their doctorates in order to get their qualification as an independent scientist in the academic sphere (International Academy of Philosophy, 2004; Koenig, 1999). Formal Habilitation programmes, such as the one offered at the International Academy of Philosophy, require an examination of the candidate's general suitability for the Habilitation degree, an examination of the candidate's Habilitation thesis, an examination of the candidate's pedagogical abilities and a discussion of the candidate's thesis and other publications in the form of a colloquium. These initiatives form part of the Socrates Programme's ERASMUS component within the European Union, aimed at contributing to collaboration, exchange and development in higher education (International Academy of Philosophy, 2004). There is, however, much criticism on the system of Habilitation, as it takes aspiring academics a long time to achieve credibility to become qualified, independent practitioners in the natural sciences. Especially younger scientists (in particular those who want to complete their postdoctoral scholarships outside of Europe) are adamant that a more streamlined system is long overdue. Academic fellowships are proposed as a means of attaining academic tenure much more quickly (Koenig, 1999). Even though the criticism of the Habilitation system may be valid, this system does provide an example where quality in CPD is enhanced through thorough situated learning for an extended period of time. The participants in the study who had obtained this qualification were positive about its effect on their professional practice.

Lockhart (2004: 116) refers to a short-term approach to situated learning called the "knotty problem warranty", where a lecturer would briefly describe a problem experienced in practice to colleagues within an organised session. Individually brainstormed responses to each problem that follow a structured format give feedback to the lecturer. This type of peer learning set-up adds to the quality of learning through CPD since it creates a safe, non-judgemental learning environment where free discussion is allowed and where a common understanding of the practice context exists.

Situated learning can therefore be regarded as an appropriate approach to learning for educators in higher education as it integrates their different scholarly responsibilities (including research, teaching, engagement and integration) into one learning experience. It also emphasises the role of the expert in professional practice and draws on this resource of knowledge and/or skill. Science educators at a higher education level are specialists within their specific fields of expertise and emphasise research as a primary means of continuous development. This makes it difficult for them to buy into broader initiatives that address the other responsibilities. Situated learning may be an effective means to achieve this, as learning becomes inherent in practice and is congruent with the different roles the educator has to fulfil. Situated learning requires expert facilitators that are respected within the profession. It accentuates the importance of facilitators that have a solid grasp of the practice settings and the inherent complexities and demands thereof (Stein, 1998).

CPD initiatives aimed at lecturers in the natural sciences that incorporate elements of situated learning will require input from competent practitioners within the field of practice. This accentuates the role of the expert professional in the development and implementation of CPD that is of a high quality.

4.5 CONCLUSION

The results of the study conducted amongst lecturers in the natural sciences at Stellenbosch University create a picture of the complexity of not only academic practice, but also of the learning that takes place throughout the life of an academic. There are no clear-cut rules that can ensure that the learning in continuous professional learning that takes place is of a high quality. There are, however, some learning guidelines that can be derived from the study that can be used to develop CPD opportunities that can enhance learning in professional academic practice.

These guidelines can be summarised as follows:

- Lecturers' experience and existing knowledge should form the foundation for further learning. Experiential, contextualised learning is an important key to success in this regard.
- Existing theoretical models are useful in the development and implementation of CPD initiatives, but need to be translated into contextualised practice. This emphasises the necessity of experiential learning and immediacy of application, relevance and practicality.
- Learning takes place when CPD opportunities are needs-based and self-directed. Therefore generic CPD programmes may have limited success as they do not always meet the needs of different groups and do not address different adult learning preferences and levels of professional development.

- The power of collaboration must not be underestimated. Lecturers often see themselves as a resource for other persons' learning, but continue to learn in the process themselves.
- The nature of academic work and institutional context must be understood in order to achieve a balance between individual needs and institutional demands. CPD can build on existing systems and capitalise on their elements to promote learning.

The maintenance and development of professional excellence becomes a function of systematic, innovative design, implementation and evaluation of CPD initiatives when these principles are incorporated into CPD practice. The reported research provides evidence that the six above-mentioned principles can enhance the learning of lecturers in the natural sciences through CPD. The next chapter in this dissertation (Chapter 5) will therefore critically investigate evaluation within CPD.



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ⁱ This chapter was adapted and accepted as a conference paper:

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The above-mentioned paper was adapted on the grounds of the feedback received and then accepted for publication in the following journal:

FRICK, BL & KAPP, CA 2006. Continuing professional development (CPD) of lecturers in the natural sciences: Enhancing the quality of learning. *Education as Change*, 10(2): 81-96.

ⁱⁱ Learning in this sense draws on the work of Knowles and associates (1984) who refer to andragogy as the way in which adults (including professionals) learn. The andragogical model of adult learning sees the adult learner as self-directed, having valuable prior experiential learning to draw upon in new learning situations, needs-driven and problem-oriented, and internally motivated to learn (although external motivators can also play a role in the adult's motivation to learn). The notion of lifelong learning (as explained by Longworth and Davies, 1996) is also central to understanding learning as a continuous developmental process that stimulates and empowers individuals to acquire knowledge, values, skills and

understanding throughout their lifetimes. Knox (1977: 9) refers to development as “the orderly and sequential changes in characteristics and attitudes that adults experience over time. Earlier, or antecedent, characteristics help shape subsequent, or consequent, characteristics.” The work of Brookfield (1986) on understanding and facilitating adult learning also needs to be noted, especially in terms of the importance placed on voluntary participation, mutual respect, collaborative spirit, action and reflection, and self-direction within adult learning. The theories of adult learning therefore have a determining influence on how CPD is conceptualised within this study.

ⁱⁱⁱ Quality can be interpreted in various ways. Lagrosen, Seyyed-Hashemi and Leitner (2004) note five different (but interrelated) ways of thinking about quality: firstly, quality as exceptional (the notion of excellence in terms of exceeding high standards), secondly, quality as perfection or consistency (where standards are met and excellence refers to zero defects), thirdly, quality as fitness for purpose (a customer-oriented notion in which the student is seen as the client), fourthly, quality as value for money (therefore directly related to income and expenditure), and fifthly, quality as transformation (a more qualitative and fundamental change is implied in the form of enhancement and empowerment). This variety of interpretations serves as the main underlying indicators driving quality. The Stellenbosch University documentation (including its vision and mission (Stellenbosch University, 2000) seems to focus on excellence as a quality indicator, although the other indicators mentioned above also feature in these documents. The South African national policy imperatives (as reported in Badsha, 1999 and Mapesela and Hay, 2005) have a more transformational slant to the understanding of quality included in these documents. Singh (2006) reports that the South African quality assurance system for higher education was built on the fitness-for-purpose principle, although the other notions of quality also played a role in its development. Mapesela and Hay (2005) note that this lack of consensus may be an area of concern for academics who are pressured to perform in terms of quality and quality assurance and who have to remain accountable to the various stakeholders in higher education. A holistic view of quality is taken in this dissertation, encompassing all the above-mentioned indicators. A singular focus on one of these quality indicators would detract from the complexity inherent to the scholarly practice of lecturers in the natural sciences at Stellenbosch University. Mapesela and Hay (2006) refer to various authors (Shippey, 1995; Lategan, 1996; Meade, 1997) who support a multi-faceted view of quality.

^{iv} Later works use the notion of the scholarship of teaching *and learning*. This notion is problematic, as it implies that learning only takes place within the so-called scholarship of teaching and learning, whilst learning is implicit in all scholarly activities. The scholarship of teaching will therefore be used throughout this study.

^v Think of David Attenborough’s well-known work for the BBC in the fields of botany, zoology and ecology.

^{vi} A culture is defined by Becher and Trowler (2001: 23) as a set of values, attitudes and behaviours that are taken for granted, and are perpetuated by repetitive practices within a specific group of people in a specific context, and with specific ideas, which can be translated into the notion of academic tribes with territories which they inhabit. These cultures and ideas are socially constructed and reconstructed through discipline-specific language, literature and symbolism that exclude the uninitiated in the field of specialisation. An academic tribe stakes its territory around a particular body of knowledge. The epistemology and phenomenology of the knowledge of a particular academic tribe determine the organisation of their professional roles and responsibilities – and consequently how scholarship and CPD is defined and practiced.

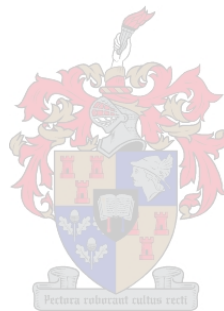
^{vii} For more detail on doctoral students at the Faculty of Science (Stellenbosch University), please see Chapter 6, Section 4.3.5.

^{viii} Cervero (1998) and Daley (2000) use the term *continuing professional education*, whereas in this study it was decided to use *continuing professional development*, as it encompasses a more holistic notion of the professional growth (development) of lecturers as scholars. For the purposes of the argument these two terms is used synonymously at this point.

^{ix} This notion of years of practice as a determinant of expertise is contradictory to Knox’s (1977: 9) view of continuous development that “(d)evelopmental changes occur over time, but few occur as a result of time”.

^x Kerr (1994) describes universities as international institutions because of their quest in advancing universal knowledge, but add that national imperatives have increasingly moulded university functions to suit the purposes of the State. Learning (which forms an essential part of CPD) is, however, an individual

matter governed by the individual (lecturer). Kerr (1994: 6) describes the interplay between these forces in higher education as follows: "Learning relies on thought and persuasion, while national purposes rely more on pressures and on controls. Learning is mostly for its own sake, while national purposes want learning for the sake of its uses. Confrontations might seem inevitable. At least, these two undertakings are not fully compatible."



CHAPTER 5

The evaluation of scholars' learning in continuing professional development in the natural sciences at one South African university

ABSTRACT

Continuing professional development (CPD) is often seen as a miracle tool to ensure professional competence, accountability, professionalism and lifelong learning. It is, however, difficult to prove that CPD leads to these end results (or that it does not). Evaluation of learning in CPD is becoming increasingly important in a rapidly changing professional world where timeliness, cost and productivity govern the work environment. Higher education is not exempt from these trends, but poses a unique and complex context as professional academics as scholars (lecturers) are expected to fulfil and integrate multiple scholarly roles. Scholars' learning is therefore not easily measured. This chapter critically discusses the evaluation of learning in CPD. It integrates relevant literature and a study from the South African higher education context to illustrate the underlying principles and practices of evaluation within CPD.

5.1 INTRODUCTION

Evaluation of learning through continuing professional development (CPD) is a much debated and contentious subject, because it is difficult to demonstrate that a specific educational initiative has the expected influence (Beatty, 2001; McDonald, 2001). However, the evaluation of learning is an aspect of CPD that cannot be ignored, as it serves as proof of quality (which was discussed in greater depth in Chapter 4).

Continuing professional development (CPD) programmes are often seen as a panacea to all the problems of maintaining competence within practice. Its purpose is to reassure the public of professional competency, but there is no evidence that this is actually the case. Attendance at CPD programmes does not lead to learning and a change of practice (Evans, Ali, Singleton, Nolan & Bahrami, 2002, McDonald, 2001; Daley, 2000).

There are other factors besides CPD that may contribute to a change in practice. A particular professional's motivation, past experiences, zest for learning, age and career stage may also influence the outcome (McDonald, 2001). The nature of the proposed change and the social context in which the professional practices occur are factors worth considering in determining outcomes. A single variable, such as a specific CPD programme, is therefore too simplistic to fully explain the relationship between continuing education and performance. It is therefore difficult for providers of CPD to prove the value of their contributions and to claim results in

terms of the influence of CPD. This limits their ability to advocate and promote outcomes they are not certain they can deliver (McDonald, 2001).

Current evaluation criteria fall short of proving a significant link between CPD and improved performance and competence. Most of these efforts are based on a remedial approach to education (Evans *et al.*, 2002, McDonald, 2001; Daley, 2000).

Higher education provides an interesting context in which to study the evaluation of learning through CPD, as lecturers are expected to fulfil multiple scholarly roles in their capacities as researchers, teachers and facilitators of community interactions. Their ability to integrate these roles successfully adds to the complexity. CPD – and by implication learning – needs to address the various components of practice. Learning can be formal, informal, or non-formal in nature, which complicates any attempt to evaluate the learning that takes place through CPD in this context.

A sound theoretical background may be useful in attempting the complex task of evaluating learning through CPD in a higher education context such as the natural sciences. This chapter provides an overview of the evaluation of learning in CPD. The information provided is based on relevant literature and a study conducted amongst lecturers in the Faculty of Science at Stellenbosch University. It focuses firstly on the reasons for evaluating CPD. Secondly, it summarises evaluation theories relevant to CPD. Thirdly, aspects to be evaluated are discussed. Portfolios, peer review, open-ended problems and simulations, auditing, and observation of practice are investigated as possible evaluative approaches and instrumentation. Where to place the responsibility for evaluation of learning in CPD is also considered. Finally, an integration of these aspects might provide a holistic view of evaluation of learning in CPD and place evaluation within the total context of scholarly practice.

5.2 RATIONALE FOR THE EVALUATION OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

Evaluation in general is important for two reasons. Firstly, diminishing and limited resources make unfocused and unexamined professional development a luxury that can ill be afforded in current times. Increased participation and financial support from non-educational collaborators are placing new demands for accountability on CPD providers. Secondly, rapidly changing technological and social structures force higher education to respond in an equally rapid fashion. CPD becomes the vehicle for meeting these challenges and therefore it requires sound information to make sensible changes. Evaluation provides information on the impact of a programme and provides data for the refining and adjustment of learning activities. Evaluation should therefore be built into CPD activities, with appropriate questions asked to determine the

effectiveness of learning activities and to identify how learning efforts can be improved (Evans *et al.*, 2002; Adams, 2001; Kutner & Tibbetts, 1997). The outcome of evaluation provides facilitators with feedback on how effective their promotion of learning is and it provides information for internal and external agencies (Challis, 1999).

Changes in academe include increased diversity in higher education and a greater demand for accountability within teaching and research in terms of the economic and social realities of South Africa. Mapesela and Hay (2005) note various national policy initiatives in South Africa that include demands for accountability within all forms of scholarly practice as part of the drive to assure quality and cope with national and global changes. These changes challenge not only novice academics, but also more experienced practitioners. Academics are forced to operate in different modes of practice and therefore traditional assessment procedures are not always suitable.

Evaluation of CPD is important to individual professionals for various reasons. The artistry of professional practice lies in mastering knowledge and gaining competence in its application. Only then can a person claim scholarly academic status. This status demands integrity and a commitment to the values of the profession (Parsons, 1968 in Bitzer, 2004). Therefore scholarly quality is not only determined by professional attributes, but personal qualities also play a determining role. Booth (1989, in Bitzer, 2004) includes courage, persistence, humility and honesty, among others, in the virtues that separate true academic scholars from mere staff members. Should these qualities be an indication of academic quality, they are clearly difficult to measure or evaluate.

The described multi-dimensionality of scholarly quality creates the need to understand what is meant by learning. Chapter 4 provided an overview of quality in learning and therefore only a brief overview is provided here (also see 3.5 in Chapter 1 for more detail). Learning in the context of CPD for lecturers in the natural sciences is seen against the background of Knowles's (1984) theory on andragogy. Andragogy, in short, refers to the way in which adults (including professionals) learn. Longworth and Davies (1996) add that this type of learning refers to all continuous development related to the acquisition and improvement of knowledge, values, skills and understanding. Evaluation of individuals' learning includes assessment procedures that provide feedback to learners so that they can learn from their mistakes and build on their accomplishments. It enables learners to correct errors and deficiencies. It motivates learners, it provides focus, it grades learner achievement and it helps to consolidate learning. It helps learners to apply abstract principles to practical contexts, thus connecting theory and practice. Learners can estimate their potential to progress to other levels or courses with the help of evaluation measures and feedback. It also serves as a guide to career choices (Challis, 1999).

On a national level, the South African Higher Education Quality Committee (HEQC) has delegated the responsibility for the quality management of short courses, recognition of prior learning (RPL), moderation of assessment, training of assessors and certification to institutions themselves, but undertakes audits and national programme reviews to evaluate the quality arrangements the higher education institutions have made (Council on Higher Education, 2004a). The existence of any form or level of quality has to be determined through evaluation. The White Paper on Higher Education (Republic of South Africa, 1997: 6) states that context-specific evaluation of academic standards is pursued:

The pursuit of the principle of quality means maintaining and applying academic and educational standards, both in the sense of specific expectations and requirements that should be complied with, and in the sense of ideals of excellence that should be aimed at. These expectations and ideals may differ from context to context, partly depending on the purposes pursued. Applying the principle of quality entails evaluating services and products against set standards, with a view to improvement, renewal and progress.

The HEQC has set quality criteria, which serve as evaluation tools during audits and programme reviews, and as broad benchmarks for quality management in higher education. Increased and broadened participation, responsiveness to societal interests and needs, and co-operation and partnerships in governance serve as some of the main quality criteria used in evaluative procedures. Efficiency and effectiveness, accountability for the expenditure of public funds, and the adherence to market principles are also mentioned as criteria by which quality is measured (Badsha, 1999). The Council on Higher Education (CHE) (2004b) describes benchmarking as a useful source of information for organisations in setting goals as well as for continuous self-improvement. The national benchmarks set by the higher education branch of the Department of Education (DoE) for institutional efficiency and excellence form the foundation for CPD as a need in higher education. The benchmarks include questions on how the institution enriches and adds excellence to the higher education sector, what the institution does to produce a vibrant intellectual culture and create cutting-edge knowledge and technologies through innovation. It also monitors continuous efforts by higher education institutions to improve quality (Council on Higher Education, 2004b). The success of any institution in these areas can (at least partly) be attributed to the quality of its human capital. Lecturers themselves are primarily responsible for ensuring quality in this regard. They will be unable to meet these criteria if they do not continuously develop in order to revitalise their professional capacity, as described in the CHE document on criteria for institutional audits (2004b: 8):

The arrangements for the quality assurance of and support for teaching and learning enhance quality and allow for its continuous monitoring (through) staff development policies and strategies which promote the professional competence of academic staff and give particular attention to the development needs of new personnel.

Badsha (1999) notes that the establishment of national structures – such as the National Qualifications Framework (NQF) – were specifically aimed at improving the development of human resources at all levels of education through promoting coherence between education and training, and improving access to and progression through recognised qualifications. This approach has been criticised for an over-emphasis on outcomes and a move towards vocationalism and standardisation, which may inhibit the ideals of academic freedom and development inherent to higher education. The increased coherence and responsiveness to societal needs are, however, advantageous to all levels of education (Badsha, 1999).

Stellenbosch University pursues learning and quality through using trained and/or accredited trainers and/or facilitators for staff development. Development programmes must be subjected to some form of evaluation in order to determine whether learning and improvement have taken place. Furthermore, they should be subjected to formative and summative feedback from participants and to a proper follow-up six months to a year after presentation (Stellenbosch University, 1999). However, no mention is made of how the quality of learning resulting from development initiatives will be monitored or evaluated. The Higher Education Quality Committee Institutional Audit Report for Stellenbosch University (Council on Higher Education, 2007: 83) also addresses this issue explicitly:

[A]lthough many interesting ideas and practices are in evidence, it is not clear how productive it is for the institution to leave entirely voluntary the attendance of courses or workshops. The improvement of teaching and learning at the institution cannot be exclusively based on a voluntary approach to staff development, given the institution's own priorities in relation to teaching and learning. The Panel was also concerned about the absence of a monitoring or tracking system to ascertain the impact that staff development has on improving the quality of teaching and learning at the institution.

The report also noted that promotion opportunities for lecturers based on their performance in teaching were limited (Council on Higher Education, 2007).

This study conducted amongst lecturers in the natural sciences at Stellenbosch University clearly indicates evaluation of learning in CPD as the main shortcoming in the total process of

CPD conceptualisation, provision, quality assurance and evaluation within the institution. Accountability for the monetary investment and energy spent on any CPD initiative within the institution is therefore limited.

5.3 EVALUATION THEORY: WORKING TOWARDS A CONTINUING PROFESSIONAL DEVELOPMENT EVALUATION MODEL

Objectives that explain the evaluation process dominate the focus of CPD evaluation (Ottoson, 2000). Although objectives are necessary components of CPD evaluation process, Evans *et al.* (2002) caution that control of the process itself does not necessarily ensure the desired outcomes in terms of changes in learners and subsequent improvements to practice. Previous research tended to focus on the process of CPD activity, including programme content, teaching strategies and learning experiences, rather than on the influence, outcomes and benefits of the programme on its participants (Smith & Topping, 2001; Steinert, 2000). Ottoson (2000) proposes a re-investigation of evaluation theory, which can be useful to construct further knowledge on evaluation.

It is necessary to place evaluation within the total programme context. The Model of Learning in CPE (continuing professional education) proposed by Ottoson (2000) gives a useful indication of evaluation within the total context of CPD. This model focuses more specifically on evaluation as part of the CPD process than Daley's (2000) Expanded Model of Learning in Continuing Professional Education. The latter model (mentioned in Chapter 4) aimed to explain how learning takes place in CPD in an integrated manner, but did not move beyond the learning process to evaluation.

The Model of Learning in Continuing Professional Education (CPE) presented in Figure 5.1 (Ottoson, 2000: 45) situates learner and knowledge assessment at the interface of the CPD educational context, the learner's practice context and the evaluation context.

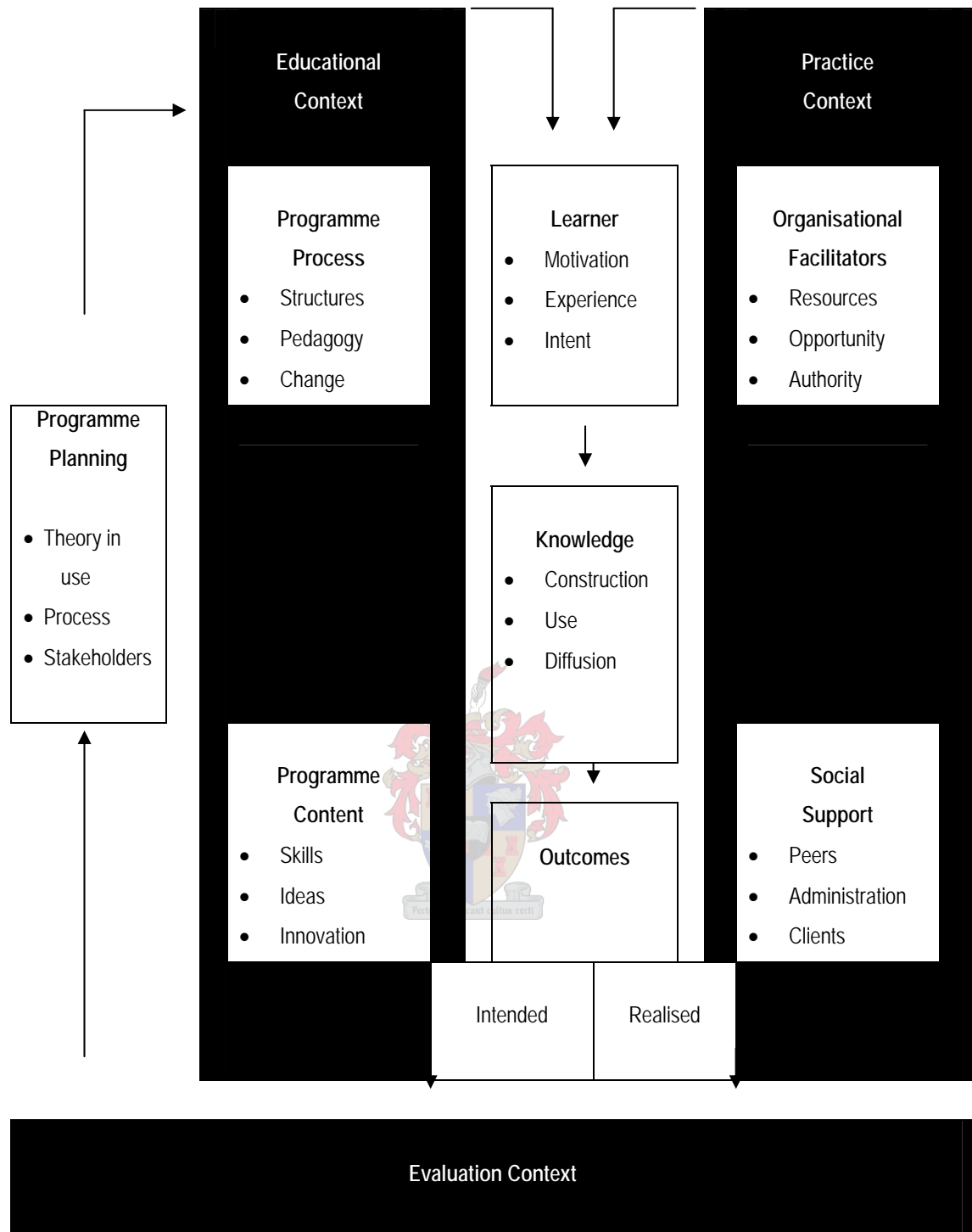


Figure 5.1: Model of Learning in Continuing Professional Education (Adapted from Ottoson, 2000: 45)

The Model of Learning in Continuing Professional Education (CPE) presented in Figure 5.1 (Ottoson, 2000: 45) places the learner's knowledge processing between the educational and practice contexts. The educational context has an influence on the learner through programme process, content and planning. The influence of practice context takes place through organisational facilitators and social support. How knowledge is understood and assessed

depends on the nature of the influencing contexts, learner characteristics and the theories in use. The assessment of knowledge may focus on its construction, use, diffusion, or a combination thereof, depending on what evaluation aims to achieve. Evaluation enters the educational context through programme planning. Data for evaluation comes from both the educational and the practice contexts to assess the realised CPD outcomes, which can be intended and/or unintended. These outcomes influence CPD programme planning. This model is useful in placing learning and evaluation within the total context of professional practice. It takes the individual, the programme and the organisation into account and therefore gives a clear indication of where evaluation of learning should fit in. It does not, however, explain the 'how', 'what' or 'who' questions surrounding the evaluation of learning. Adams (2001) and Kutner and Tibbetts (1997) indicate that present evaluation models fail to consider the changes within organisations and of learners as they try to adapt to constantly changing world trends.

There are various existing models aimed specifically at the evaluation of CPD (in some cases referred to as continuing professional education, or CPE). The six main impact evaluation models that were used to date include Kirkpatrick's Four Levels of Evaluation Model (1959-1960, as reported in 1994), Grotelueschen's Evaluation Model (1986), Cervero's Model for CPE (1984-1986), the Training for Impact Model by Robinson and Robinson (1989), Jackson's Results-Oriented Training Model (1989) and Abruzzese's Continuing Education Model (1996), as discussed in Adams (2001) and Ryan, Campbell and Brigham (1999). All of these models identified behaviour change and improved performance as desired outcomes for participants and organisations. They all have basic constructs that are still applicable, but they seem outdated and sluggish in a rapidly changing world because no single model had all of the features needed for an effective evaluation of learning and the influence thereof on scholarly practice in higher education. Therefore Adams (2001) developed the Behaviourally Based Impact Evaluation Model (BBIEM) as a modern adaptation of the above-mentioned evaluation classics.

Table 5.1 provides a brief comparison between the different evaluation models used in CPD. It is by no means exhaustive, but it does give an overview of the different models in terms of the basic conceptualisation and the utility of each model, as well as a brief critique on its limitations.

TABLE 5.1: Comparison of existing models for the evaluation of continuing professional education, as discussed in Adams (2001), Clair and Adger (1999), Ryan, Campbell and Brigham (1999) and Kutner and Tibbetts (1997)

Models	Comparison	Basic conceptualisation	Utility	Critique
Kirkpatrick's Four Levels of Evaluation Model (1959-1960)	<p>Consists of four levels of programme evaluation:</p> <ul style="list-style-type: none"> ▪ Reaction shows participants' satisfaction with the programme by means of a questionnaire. ▪ Learning measures the learning of principles, facts and techniques, which is determined by paper-and-pencil tests. ▪ Behaviour measures changes in behaviour and job performance. It takes place in the work setting. It is more difficult to measure, as changes in behaviour are not always visible or in a measurable form. ▪ Results relate the results of the CPD programme to organisational objectives. This is the most difficult to measure, especially if the organisational goals are not specific and results-oriented. 	<p>The model contributes to evaluation theory, as it provides answers to questions associated with CPD that organisations commonly ask.</p>	<p>Kirkpatrick's model has been well used, but mostly only on the first two levels (reaction and learning).</p>	
Grotelueschen's Evaluation Model (1986)	<p>The reasons for evaluation are divided into three main categories:</p> <ul style="list-style-type: none"> ▪ Past activities or outcomes (summative evaluation) ▪ Current programme activities (formative evaluation) ▪ Possible future actions for alternative evaluation that will influence programme planning decisions <p>The model uses a classification scheme that combines the dimensions of programme evaluation, namely the evaluation purpose, programme elements and programme characteristics. The original purpose determines the evaluation questions put to participants and facilitators about the programme features through questionnaires. The purposes of the end-user of the evaluation determine the questions that are asked.</p>	<p>It provides a conceptual framework through which educators can analyse evaluation situations in the planning and conducting of an evaluation. The model stresses the importance of clarity on evaluation purposes and the intended audience for the evaluation.</p> <p>This model presents a process by which judgements related to programme justification, accountability, programme improvement and/or planning can be made. The model provides justification of preferring one approach over other approaches by using a series of questions about the nature of the evaluation.</p>	<p>The model is externally focused on the programme level (rather than on the individual professional's learning), which limits its use.</p>	

TABLE 5.1: (continued)

Cervero's Model for CPE
(1984-1986)

Variations in four sets of independent variables explain differences in improved job performance, which include

- **Characteristics of the CPE programme**

- The **individual professional** (including demographic data, motivation to change and preferred learning style)

- The **nature of the proposed change**

(referring to the ability to apply the change in practice)

- The **social system** (including peer support) in which the professional works.

Improved job performance is the dependent variable.

Robinson and Robinson's Training for Impact Model
(1989)

A 12-step approach to results-oriented training.

It links training courses directly to business needs, problems and opportunities.

Needs assessments are used to determine future participants' desired knowledge and skills, which are then linked to business needs, problems or opportunities before implementing the CPE programme.

The model depends on a partnership between facilitators and line managers, as managers will eventually have to support the professionals' learning and its application in the workplace.

This can easily be illustrated through the formula:

Learning experience x work environment = business results.

Zero learning experience or zero support from the work environment will result in zero business results.

The link between objectives and results serves as an indication of impact. This emphasis on partnerships, accountability and results indicates that facilitators will need to expand their skills consultation, organisational assessment and the measurement of results.

It links CPE and job performance through a multi-dimensional approach.

Its use lies in the identification of key variables that have an effect on job performance. This model can be adapted across professions for the evaluation of CPE impact. It highlights that professionals possess a body of specialised knowledge and skills that can be broadened by CPE.

It places even greater emphasis on the importance of individual choice than Cervero's model for CPE.

The significance of the model lies in the consultative and collaborative approach between the learner, the facilitator and the organisation, thereby incorporating organisational needs into evaluation.

The adoption of new ideas and methods lie within the individual professional and therefore the inclusion of the individual (as an independent variable) is significant.

Medley (1999) supports this approach to evaluation, as context is a major determinant of effectiveness. Any evaluation procedure that does not take the learning and practice contexts into account will be incomplete.

TABLE 5.1: (continued)

Jackson's Results-oriented Training Model (1989)

It focuses on the translation of monetary investment in training into concrete business results. The first step is to determine the gap between actual and desired performance, from which performance standards are derived. This indicates the individual's performance requirements to meet organisational objectives. The performance results or outcomes are then defined in terms of cost/benefit analysis or financial terms. Performance can be determined in two ways, namely by the assessment of skilled performance, or by counting the number of completed items. The first measure is more appropriate to professional work, where it is not always possible to count results. The model then proposes seven steps for the evaluation process:

- identification of needs
- needs analysis
- writing of training objectives
- developing the programme
- conducting the programme
- evaluating the programme
- communicating the results.

Interventions are possible at any point.



It is a bottom-line approach that forces educators to be held accountable for the education they present. Furthermore, the model provides a framework for impact evaluation.

The model is significant as current developments emphasise the connection between specific performance evaluation and organisational objectives. The facilitator becomes the strategic planner that has to define skilled performance. It is a good operational model for impact evaluation and its strength lies in the pre-assessment phases prior to the development of a CPE programme.

The model aims to show a cost justification of CPE programmes for business purposes, which is its main contribution to evaluation theory.

It seeks an effective way to demonstrate the value of staff development and to identify evaluation methods that could increase the quality of professional services and decrease the cost of those services.

It does not take into account the broad perspective of the whole organisation, which includes culture, employee abilities and employees' past performances.

Abruzzese's Continuing Education Model (1996)

It focuses on impact evaluation strategies and depicts evaluation as a hierarchy ascending from simple to complex levels of evaluation. The different levels are related to the frequency of implementation and the time and cost involved in the measures.

- **Process** forms evaluate satisfaction with learning experiences.
- **Content** evaluation determines whether learners achieved the educational objectives of the CPE programme.
- **Outcome** evaluation focuses on change in performance that continues after completion of the CPE programme.
- **Impact** evaluation is the operational result on the institution.

This model's advantage lies in the fact that it addresses cost, time and frequency issues, as well as different levels of evaluation.

TABLE 5.1: (continued)**Behaviourally Based Impact Evaluation Model (BBIEM) (2001)**

It is a means of evaluating CPE outcomes within an organisational setting. Programme outcomes form the point of departure.

The CPE planner/facilitator consults with the target population, after which decisions on the desired evaluation level are made.

It leaves room for both pre- and post-evaluative measures. The pre-evaluative measures determine the organisational needs before the CPE programme is developed. The resulting desired behaviour change and learning are described as outcomes (or impacts) of programme participation.

Surveys based on behaviourally stated questions, which are directed to both the organisation and the participants, are the data collection tools.

It is designed to justify a CPE programme through an impact evaluation study.

This model is flexible and stable and can be used at any point in the evaluation process, depending on the type of evaluation information required.

It links the organisation, the CPE programme and the participants in a broad evaluation process that assesses an organisation's learning needs, develops an appropriate CPE programme and involves participants and management in the whole process. Participants help to identify behaviour necessary for successful performance and determine whether the learning was understandable and transferable. Management has the responsibility to state organisational objectives clearly and to assess the value of the CPE programme in meeting the stated objectives.

It is management's responsibility to afford sufficient time and resources for effective CPE to take hold. The BBIEM works towards a shared commitment of all the primary stakeholders and the establishment of a learning organisation. The model has combined the strengths of the previously available models into one integrated and versatile concept. It aligns behavioural aspects of expected performance to programme objectives in the development of learning opportunities.

All of these models contribute to our understanding of evaluation of learning in CPD. The type of model selected will depend on the specific context and the purposes of evaluation. For instance, if we need to evaluate learning in the teaching role of a lecturer, the Behaviourally Based Impact Evaluation Model (BBIEM) (Adams, 2001) may be the most appropriate point of departure as it is a participatory evaluation process that assesses learning needs, identifies behaviour necessary for successful performance, and determines whether learning was understandable and transferable. When we consider the evaluation of the learning of the lecturer as researcher in higher education, the Training for Impact Model (Robinson & Robinson, 1989) would be a probable choice. It links learning to business needs, problems and opportunities, all of which are important in justifying research. This model emphasises the importance of individual choice – the academic freedom valued greatly in any research environment. It also stresses the importance of consultation and collaboration, which are important elements in modern-day research environments. In terms of engagement (community interaction), Abruzzese's Continuing Education Model (1996) could be useful as it seeks an effective way to demonstrate the value of staff development and to identify evaluation methods that could increase the quality of professional services and decrease the cost of those services. Administration as an academic responsibility also demands learning and output within the university as an organisation. Jackson's Results-Oriented Training Model (1989) emphasises the connection between specific performance evaluation and organisational objectives. The model aims to show a cost justification of CPD programmes for business purposes.

Different theoretical models could therefore be useful depending on the evaluative focus. An evaluation model that successfully engages with all scholarly roles is still lacking. This lack of integration leaves room for future research focused on the evaluation of learning.

5.4 WHAT TO EVALUATE IN CONTINUING PROFESSIONAL DEVELOPMENT

Evaluation is closely linked to programme development, and the type of evaluation should depend on the purpose of the programme. It is important to note that there is a difference between evaluating a professional's performance and evaluating a CPD programme as such. This distinction will determine what to evaluate and how (McDonald, 2001; Kutner & Tibbetts, 1997).

The way in which a university as learning organisation approaches academics will play a determining role in the evaluation of these academics' learning, development and work. Bitzer (2004) refers to two approaches within this debate: Universities can approach academic staff as professionals who determine their own work agendas and involve them in determining the direction and purpose of the institution. On the other hand, universities can treat academic staff

as employees who are held accountable for their work through structured evaluative systems. It is important to determine where the focal point within a specific institution lies before one can determine what constitutes quality in the specific context and what would be the most appropriate evaluation thereof. Evaluative procedures and the broader ethos of practice within an institution should ideally be compatible. Ottoson (2000) argues that appropriate evaluation of CPD will depend on the adult learning theory used, the process and content of learning, and the support provided. Evaluation procedures used to assess these criteria need to be transparent and inclusive of all the relevant stakeholders, although it does not necessarily mean that all stakeholders are directly involved in the evaluation process itself. It only means clarifying the criteria and deciding who participates in the evaluation (Ottoson, 2000).

It follows naturally that scholarship forms the basis of evaluation of learning – including knowledge, values, skills and understanding – in the context of lecturers in the natural sciences. A brief discussion of the evaluation of learning within the various forms of scholarship will provide a background to further discussions.

5.4.1 Evaluation within the context of the scholarship of discovery

The evaluation of the scholarship of discovery is most commonly done through publication and peer review (Boyer, 1990). Boice (1991) found that young academics in particular were uncertain whether quantity or quality of research output awarded them a high standing, while more established academics tended to focus more on quality issues of their research output. The latter can be explained by what Mulkay (1977, in Becher & Trowler, 2001: 85) refers to as:

... judgements of the highest quality [that] can only be made by men [sic] who are already eminent, those at the top of the various informal scientific hierarchies exercise great influence over the standards operating within their fields. And those scientists who wish to advance their careers and to produce results which are accepted as significant contributions to knowledge must comply with the standards set by these leaders.

The leaders to whom Mulkay (1977, in Becher & Trowler, 2001: 85) refers are journal editors and referees that perform a gate-keeping function and have obtained their privileged peer position as a result of their academic training and development. This form of peer review is argued to maintain standards within a discipline and to recognise individual expertise and excellence. Becher and Trowler (2001) criticise the notion of a peer group as it is not clearly defined, has strong undercurrents of differential power relations within a discipline, and cannot always adequately address issues of validity and reliability in the review process. Peer review, however, continues to be the basic measure by which new contributions to the disciplinary body of knowledge are evaluated.

Published articles form a relatively easy quantitative measure of the scholarship of discovery. In most disciplines (also those in the natural sciences) an established system of publication and peer review exist through a hierarchy of academic journals, or (in some cases) through the publication of books. This system seems easy enough, but Boyer (1990) notes that quite often publications are only counted as an assessment measure, without their quality being determined. At the same time, all lecturers are expected to perform in the same scholarly roles, even though research support varies across disciplines. This is an output-based, rather than a process-driven approach (Boyer, 1990). These findings hold implications for the CPD of academics – both at the novice and the more experienced levels of development. Becher and Trowler (2001) note that research development has become more institutionalised as a result of the national and international emphasis on quality assessment. This has led to a managerialist approach to academic development within the scholarship of discovery.

The evaluation of the scholarship of discovery at Stellenbosch University seems to concur with the above-mentioned literature. Management structures have been put in place to govern research development and output. The institution has a Research Development Plan (Stellenbosch University, 2003), which is managed by the Division for Research Development (Stellenbosch University, 2007b). These managerial structures serve as the link between national research imperatives (such as National Research Foundation scientist rating, research funding, and accredited of scientific journals) and the individual lecturer as a scholar of discovery. The Division for Research Development is responsible for the annual research report of the institution, which reports on the research output per faculty and department within the whole institution. Evaluation in this form is mostly in terms of quantifiable research output (for example the number of peer-reviewed articles published, the number of conference papers delivered, the number of books or chapters in books produced). The quality of the research output – and by implication the learning that took place in the process – is supposedly determined at the peer review level.

5.4.2 Evaluation within the context of the scholarship of teaching

How is the scholarship of teaching to be judged? Boyer (1990) states that teaching of a high quality is expected – and even assumed – but rarely adequately assessed or rewarded. Penalties only apply when research funding and output (such as student throughput) are not satisfactory. Excellent teaching is rarely valued for its worth. Boyer (1990) goes further to say that teaching will only receive the same acknowledgement as research if it is assessed on the same basis as research – an agreed-upon basis in the wider academe, not only within a specific institution. Rowland, Byron, Furedi, Padfield and Smyth (1998) ask how teaching that creates a passion for knowledge can be acknowledged without falling into the trap of a so-called

competence model that merely assesses technical, generic skills. Discipline-specific professional development and assessment measures need to be developed that encourage lecturers to develop teaching skills that will enhance the integration of all the scholarship roles and create a so-called “passionate and lively educational ethos” (Smyth *in* Rowland *et al.*, 1998: 137). Implied in this type of approach is a balance between discipline (content) knowledge and pedagogical knowledge. Padfield (in Rowland *et al.*, 1998) adds that individual differences and preferences of lecturers also need to be taken into account.

Boyer (1990) notes various practical examples through which teaching may be evaluated, such as self-assessment, peer assessment and student assessment of the lecturer and module. Self-assessment may be achieved through reflective statements, structured reflective forms and self-assessment of a portfolio. Peer assessments include various forms ranging from classroom observations (with carefully developed criteria and specified data-gathering procedures) to peer-reviewed papers, posters, or articles. Student assessment can consist of formal forms completed by students (summatively, or formatively), or MIPs (Most Important Points) done in class (which may contribute to a lecturer’s self-assessment). Boyer (1990) notes that academics are often resistant to such measures, as the evaluation of teaching is perceived as invasive and subjective.

The Centre for Teaching and Learning (CTL) emphasises the importance of monitoring professional development in the scholarship of teaching (Stellenbosch University, 2007a) that corresponds to a variety of the levels identified by Boyer (1990). Self-reflection is emphasised as a form of scholarly evaluation of learning in the activities of the CTL. Professional portfolios, research-based investigation of practice and evidence of best practice form part of the process of self-reflection that is encouraged. Training initiatives, such as the module on assessment, contain various self-reflective and practice-based assignments. The module is structured to end with the compilation of these assignments into a professional portfolio on assessment. The annual rector’s award for excellence in teaching also requires nominees to compile a structured teaching portfolio. The recently introduced annual internal Teaching Conference hosted by the CTL provided the opportunity for lecturers to showcase best practices and engage in peer dialogue on the topic of teaching. The relatively new Fund for Innovation and Research into Teaching and Learning (FIRLT) project feeds into this process. The fund aims to support research on teaching-related matters within academics’ own practices through the provision of funding for the improvement of teaching practice. Student feedback via structured forms is encouraged. This format includes a structured self-reflective form that the lecturer can complete and add to the eventual report, which is sent to the lecturer, the departmental chairperson and the dean of the relevant faculty. Lately, student throughput has also gained importance as a measure of scholarly competence in teaching. This may be a controversial measure, as

throughput rates may be influenced by other factors than teaching alone and it has limited scope in determining whether the lecturer has learnt more about the scholarship of teaching. However, such measures do provide an impetus for debate on teaching. Although these evaluative initiatives focus on the various evaluative aspects identified by Boyer (1990), they still seem to be quite fragmented as a result of a focus on a specific aspect of teaching. This lack of coherence may make it difficult for the individual lecturer to integrate the learning into all areas of scholarly practice.

Various formal qualifications exist wherein learning in terms of the scholarship of teaching is assessed at a formal level. An example of such a qualification at Stellenbosch University is the MPhil in Higher Education.

The MPhil in Higher Education is presented by the Centre for Higher and Adult Education (Faculty of Education, Stellenbosch University). This programme has a specific higher education focus and leads to a doctoral degree in education. Assessment and recognition of prior learning is an option for prospective students who lack formal education qualifications, but can prove prior learning in the area of teaching in higher education. Learning is assessed in various ways. Assignments for each of the 10 modules¹ are based within the institutional context and assessed accordingly. Group activities and tasks for each of the 10 modules are formatively assessed during the two-week residential period at the beginning of each of the two years of study. Participants in the programme are expected to complete self-reflective study portfolios throughout their study period. The final assessment is twofold: firstly, a demonstration of the integration of the acquired knowledge at the start of the third semester of study, and secondly, a thesis on a chosen topic within the area of higher education. The thesis is examined both in written format and orally by appointed examiners in the field of expertise (usually one independent internal and one external examiner). The student has the option to replace the thesis with a research portfolio consisting of advanced assignments, case studies and research reports – all of which have to comply with the scientific standard required for an academic article. A research portfolio is examined orally.

5.4.3 Evaluation within the context of the scholarship of engagement

The scholarship of engagement applies to all activities, projects or work that academics undertake to make their expertise more accessible to the communityⁱⁱ. The central questions in evaluating the practice of scholarly engagement include:

- How does the work relate to the lecturer's academic expertise?
- Were the goals of the project/activity well defined?
- Were the procedures well planned?
- Were the actions rigorously noted?
- In which ways did the process enrich the lives of the participants as well as the understanding of the academic of his/her own field?

These questions necessitate reflection as an essential component of recording scholarly engagement activities (Boyer, 1990).

The monitoring and evaluation of the scholarship of engagement are documented in the institutional Community Interaction Policy (Stellenbosch University, 2007c: 5):

All community projects or programmes under the auspices of the University are monitored and evaluated both before and after registration of the project/programme. Self-evaluation at faculty and division level constitutes the most important part of the evaluation process, which rests on community interaction criteria that is developed by each department as part of quality assurance protocol. Annual progress, outcomes and financial management reports must be submitted in the prescribed format in respect of all projects/programmes. The registered project/programme leaders will assume responsibility for submitting these reports in the prescribed format. The evaluation of projects/programmes shall be done in accordance with the directives of the Higher Education Quality Committee. The integration of community interaction with teaching and research, and inter-disciplinary co-operation between faculties/divisions are encouraged and promoted, also with regard to the evaluation process. Project/programme selection shall be judged against national priorities and in accordance with identified needs. Communities will be given the opportunity to evaluate the University's community interaction output and to judge the results thereof.

The policy (Stellenbosch University, 2007c: 5) furthermore supports the inclusion of community interaction in the appraisal of lecturers, and the introduction of incentives for lecturers who actively facilitate the implementation of the community interaction policy and strategy. This stance is in accordance with the criteria set by the HEQC for community interaction by higher education institutions that stipulate community interaction as a factor in departmental quality

assessment. However, the policy acknowledges community interaction as a voluntary activity for individual lecturers.

The Council on Higher Education (2007: 100), however, criticises Stellenbosch University for a lack of effective monitoring and evaluation as far as community interaction is concerned:

Given the extent and variety of these activities, the Panel concurs with the institution that an audit of community interaction activities is urgently needed and that the development of monitoring systems to enable the institution to evaluate the impact of its activities is also urgently needed. The Panel is concerned that no evidence could be found of specific attempts at developing mechanisms for the quality assurance of community interaction activities. If, as the CI policy suggests, this function is conceptualised in the context of teaching and learning and research, a number of criteria and procedures would have to be developed for the existing quality assurance structures (which are focused on teaching and learning and research) in order to encompass community interaction.

The community interaction policy is a relatively new document at Stellenbosch University (it was accepted by the University Council in 2004) and the initiatives that have since been supported by the Division for Community Interaction have focused on the integration of service learning into undergraduate curricula. None of these initiatives have taken place within the Faculty of Science. The Division is presently seeking to establish partnerships within the so-called 'hard sciences' (including natural sciences), but is doing so on a voluntary basis.

This does not mean that the Faculty of Science has not previously been involved in community interaction. A number of projects within the Faculty of Science at Stellenbosch University engage academic staff with various communities. These projects include:

- The ESKOM Expo for Young Scientists is presented in conjunction with the Institute for Mathematics and Science Teaching (IMSTUS) at the Stellenbosch University Faculty of Education.
- The Imbovane Outreach Programme is aimed at introducing school learners to the biodiversity and changing landscapes within South Africa. The programme is a joint initiative of the Centre of Excellence for Invasive Biology (Faculty of Science, Stellenbosch University), the Darwin Initiative, the University of Sheffield (United Kingdom) and the Western Cape Department of Education.
- The Stellenbosch Mathematics Camp is held for school learners who performed well in the Mathematics Olympiad of the previous year. Lecturers in Mathematics provide guidance on

solving various forms of mathematical problems and help to prepare learners for future Mathematics Olympiads and further studies.

- An annual Mathematics Olympiad is hosted by the Faculty of Science at Stellenbosch University. The Olympiad gives learners in the Further Education and Training (FET) band of school education the opportunity to compete nationally and internationally in the field of Mathematics.
- The Stellenbosch University annual Science Winter Week aims to introduce learners who are interested in a career in the natural sciences to the various programmes and subject disciplines at the university and career possibilities within natural sciences.
- The South African Environmental Observation Network (SAEON) Project is a collaborative initiative between SAEON and the Faculty of Science at Stellenbosch University. It promotes longitudinal environmental and ecological research, data exchange and monitoring on changes in the natural environment. The results obtained within the project are distributed to institutions such as CapeNature and the South African Institute for Biodiversity where, in turn, they are made accessible to the general public.
- The Faculty of Science at Stellenbosch University is affiliated to the African Institute for Mathematical Studies (AIMS) that promotes mathematics and science in Africa, recruits and trains students and teachers in these areas, and builds capacity for African initiatives in education, research and technology.
- The Sunzone project forms part of the Stellenbosch University Schools' Technology in Electronics Programme (SUNSTEP). The Faculties of Science and Engineering are involved in the project, run in conjunction with the South African Department of Science and Technology. The project is involved in the development of learning materials and the training of teachers in basic electronics. School outreach programmes and workshops are facilitated to encourage learners to further their studies in the areas of science and technology.

It can be argued that these initiatives create opportunities for CPD for the lecturers involved. Evaluation of lecturers' learning is not mentioned in any of these initiatives. The reflective questions posed by Boyer (1990) in terms of evaluating the learning that takes place during engagement activities have therefore not been answerable in the context of the natural sciences.

5.4.4 Evaluation within the context of the scholarship of integration

In the evaluation of scholarly activities Boyer (1990) notes certain key questions:

- Did the learning that took place have well defined goals?
- Was relevant and recent literature cited and integrated into the learning experience?
- Were key aspects covered and were the relationships between these aspects evident?

These questions have implications for the integration of scholarly practices, including discovery, teaching and engagement. There is a widespread belief that lecturers must prove that CPD makes a difference to their professional practice and outcomes reached by their students. This might not be appropriate as the presence, satisfaction and/or participation of learners do not automatically indicate effective learning, or guarantee a change in professional practice (McDonald, 2001; Daley, 2000; Kutner & Tibbetts, 1997). The same argument could be formulated for the other forms of scholarship.

A differentiation of impact at three levels is therefore necessary. Firstly, reaction to CPD experiences, secondly, the acquisition of knowledge and skills gained from the experience, and thirdly, changes in instructional behaviour resulting from the experience can be determined as different impact levels (McDonald, 2001; Daley, 2000; Kutner & Tibbetts, 1997).

Competence evaluations, in practice, are mostly limited to probes of knowledge and in some cases practical skill, which fail to acknowledge qualitative features. Evaluation practices need a broader conception of professional work, and therefore assessment methods that have a wider scope than one-best-answer items are necessary (McDonald, 2001). Documentation of learning experiences becomes increasingly important, as it serves as evidence of acquiring new knowledge and skills and a consequent adaptation of professional practice (Calman, 2000).

The study amongst lecturers in the natural sciences at Stellenbosch University indicates the nature of learning as one of the major problems in evaluating learning in CPD of science lecturers. The majority of the CPD initiatives undertaken by the lecturing staff are self-initiated and on a non-formal or informal basis, which makes the evaluation of learning through formal structures difficult, inappropriate, or downright impossible. It is clear that the need exists for an evaluative process that integrates the strengths of various methods. It should incorporate the different levels of learning in combination with basic evaluative questions. The combination of levels of evaluation with critical evaluative questions will give an integrated and holistic view of evaluation in CPD. Table 5.2 presents such an integrated approach to evaluating learning in CPD.

TABLE 5.2: An integrated approach to the evaluation of learning in continuing professional development (Adapted from Quiñones & Ehrenstein, 1997: 210)ⁱⁱⁱ

Evaluative questions Level	Why?	What?	Who?	How? Data collection
Reaction	Determining satisfaction	Learner attitude to learning situation	Individual learner	Smile sheets
Learning	Determining whether learning actually took place as a result of CPD	Changes in knowledge and/or skills	Individual learner	Traditional tests, to portfolios – depending on the context
Behavioural change	Determining whether learning had an effect on the learner and had long-term benefits	Actual practice of gained knowledge and/or skills	Individual learner Co-workers Superiors	Workplace observations
Organisational change	Determining whether CPD contributes to profitability and growth	Organisational success	Organisation as a whole	Organisational performance records

From Table 5.2 it is obvious that as the level of evaluation increases, so it becomes more difficult to determine its effect. There are various methods that can be used in the evaluation process. A selection of these methods will be discussed next, in order to illustrate their possible beneficial contribution to the evaluation of learning in CPD. Some of these methods have been suggested in the discussion on what to evaluate, but will be discussed in greater depth henceforth.

5.5 POSSIBILITIES FOR EVALUATING LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

The enhancement of scholarly competence beyond research output is an important factor in developing and evaluating human capital in higher education in South Africa. How should this evaluation of quality take place in practical terms? According to Bitzer (2004) there are no clear and easy answers to this question.

There are various methods of evaluation that can be used to determine whether learning has taken place. They range from formal, written examinations to observation in real-life practice. The selection of an evaluation method should be guided by the purpose of the evaluation. This will ensure that the right things are evaluated, and not merely those easiest to evaluate (Challis, 1999; Kutner & Tibbetts, 1997). Professionals may also use the gained knowledge in ways that

are totally different from what the CPD planners had intended. How a specific CPD initiative affects a professional's practice or competency is difficult to prove (McDonald, 2001; Daley, 2000). Lankard (1996) therefore advises that the evaluation of learning should be authentic – it should evaluate active learning, relate to realistic practice contexts and be based on clearly defined standards. Evaluation thus goes beyond the methods used, but also considers what will count as real evidence of the intended or realised outcomes and how this evidence can be justified as accurate, valid and reliable. The intended use and users of the evaluative findings also play a determining role in the decisions made about evaluation procedures. In the end, all evaluation schemes need to be measured against the standards of accuracy, feasibility, propriety and usefulness (Ottoson, 2000).

Central questions in the selection of an appropriate evaluation method are: Has behaviour changed and learning been enhanced as a result of the CPD opportunities provided? How is CPD related to competence, proficiency and performance? How are the eventual clients influenced by CPD? Kutner and Tibbetts (1997) recommend the development of an evaluation plan that will enhance effective evaluation, provide answers to these questions and give direction to the evaluation procedures. The components of such a plan include determining evaluation objectives, target audiences and evaluation questions; identifying the evaluation strategies to be used; determining evaluation methodologies; determining the necessary human and fiscal resources; and finally, establishing a time frame for collecting and reporting data.

The number of possible evaluation methods is legion. However, there are a few methods that have proved and continue to prove their worth in the evaluation of learning in CPD. Portfolios, peer review, open-ended problems and simulations, auditing, and observation of practice will be discussed in terms of their contributions to the evaluation of learning in CPD.

5.5.1 Portfolios as an evaluative method

Bitzer (2004), Killen (*in* Gravett & Geyser, 2004), Evans *et al.* (2002), Ferraro (2000), Challis (1999), Clair and Adger (1999) and Murray (1995) propose portfolio-based learning development as a method of evaluation that is consistent with current adult learning theory in an age where there is an increased call for revalidation and accountability. It is the view of Lester and Perry (1995: 1) that “[t]hrough portfolios, students compose a portrait of themselves as able learners, selecting and presenting evidence that they have met the learning standards ...”.

A professional development portfolio is a collection of material, made by the professional. It records and reflects on key events and processes in the professional's career. It is usually paper-based, but may include anything that provides appropriate evidence of learning. This collection of evidence is then presented for review with a particular purpose in mind. This

purpose should be clear to both the professional as learner and the reviewer. Portfolios are directly related to a personal professional learning plan, which forms the framework within which portfolio development takes place. It also provides the outcomes that the portfolio aims to demonstrate. The portfolio is the practical and intellectual property of the professional who developed it and therefore its creation, maintenance and appropriateness are also this person's responsibility (Killen *in* Gravett & Geysler, 2004; Evans *et al.*, 2002; Ferraro, 2000; Challis, 1999; Clair & Adger, 1999; Murray, 1995).

There are various benefits to a portfolio: it recognises and encourages reflective learning and autonomy; it is based on real practice and therefore bridges the gap between practice and theory; it makes allowance for individual style and preference; it enables assessment within a transparent framework, stated criteria and clear learning objectives; it allows for both formative and summative evaluation; it can accommodate evidence of learning from a variety of contexts; it provides a model for lifelong learning and CPD. Portfolios are, however, not suitable in situations where learners are expected to recall information and apply it in a specific, time-limited context (Challis, 1999).

The very personal nature of a portfolio makes it difficult to pinpoint precisely what constitutes a typical portfolio. Aspects that are usually recorded in a portfolio include the experience (that which has been done), the learning (that which has significance for change in the future), the evidence (a demonstration of how learning is applied in an appropriate context), an indication of learning needs (which indicates where the learner wants to go) and learning opportunities (an action plan which indicates how learning needs can be met). The choice of what is included rests with the learner, but its source and purpose should be clear (Bitzer, 2004; Challis, 1999).

Learning can be documented in a variety of ways, but it should include rich and varied information assembled over time. Some scholarly activities are easier to document than others and care should be taken that this does not lead to a skewed assessment. Therefore it is important that a mutual agreement be negotiated between the staff member and the assessor/assessment agency on what the priority areas are, how it will be evaluated and what types of documentation are deemed sufficient in this regard (Bitzer, 2004).

Castle, Holloway and Race (1998) found that writing and compiling a portfolio is a daunting experience for professionals that have been ill prepared for this task. Challis (1999) recommends that professionals as learners are supported during portfolio development. The nature of the support will vary according to the needs of the professional as learner and the purpose of the portfolio. Oliver and Aggleton (2002) and Challis (1999) recommend that when

evaluative procedures are involved, the person supporting the professional as learner and the evaluator should not be the same person.

Bitzer (2004) refers to scepticism about this quality assessment measure amongst academics and management, as it is often not seen as 'hard evidence' of performance and output. This is especially true for environments such as the natural sciences, where the research focus lies mainly within the positivist research paradigm using quantitative methodologies. These are the approaches to scientific measurement that natural scientists are used to and within which they are comfortable. They may find it difficult to accept alternative practices. One needs to be conscious of lecturers' ontological, epistemological and methodological stances towards different aspects of scholarship (including discovery, teaching and engagement) when promoting non-positivist forms of research in a context such as the natural sciences. Greenbank (2007), for instance, promotes collaborative action research as a way in which to promote behavioural changes in teaching practice, but adds the view of Carr and Kemmis (1986, *in* Greenbank, 2007) that teachers tend to use implicit theories based on their perceptions of effective practice. The natural sciences community may not consider alternative forms of investigation (or evaluation) as 'scientific' and may therefore perceive their results as less than credible. Greenbank (2007) furthermore argues that reflection is a complex process not easily grasped. Ensuring that reflection takes place through structured procedures does not guarantee its effectiveness.

There was little evidence of experience in compiling a portfolio in the data from the study amongst lecturers in the natural sciences at Stellenbosch University. One respondent, however, explained that initial scepticism is often grounded in ignorance. Compiling a portfolio can be converted into a positive experience by going through the motions:

I had no knowledge of it (a portfolio), we do not do such things ... I had to write a motivational essay and the main aspect of it was to write a piece on your perspectives, philosophies and your approach to teaching. ... And I did my best with that thing, even if I was a bit sceptical initially. But funnily enough now I find that I refer back to it I wonder about certain aspects of my teaching. For example, then it helps to read that thing, because then I know I put it on paper and these are my points of view and then I measure myself to it – am I doing it correctly? I find, and I did not anticipate this, that it helps me afterwards. But I find that it helps a person. So I think, maybe it boils down to that a person must go and sit and write down your views on things. About teaching and also about research and that which you want to achieve, how you want to, what you believe in, what you want to get done and so forth. Also your plans, you must be realistic, but you have something there that you want to do, but it places a bit of pressure on you to at least try getting it done.

[Senior lecturer in Mathematics with 9 years of academic experience, and previous receiver of the rector's award for excellence in teaching]

A portfolio policy for newly appointed academic staff is in the drafting phase at Stellenbosch University. Evidence of work done in the total task field of research, as well as teaching and community interaction (engagement) during the initial two years of probation appointment, will be evaluated before a permanent appointment will be made. The portfolio will also be used for purposes of advancement. Although the evaluation of learning through CPD does not seem to be a focal point in this draft policy, reflective practice is emphasised and evidence of continuing professional development will obviously be to the advantage of the applicant. A portfolio offers a way in which to evaluate the learning of novices and experts differently, but still in a fair manner. Weighing items included within the portfolio can lead to system that does not discriminate against novices. Negativity can, however, be expected:

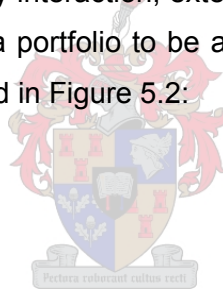
... I have seen such preliminary documents of how the portfolio must be and I thought oh! If I have to do it, I'm not going to do it! I don't have time for this! I will be worried if there is a structured very extensive manner on how you must keep a portfolio. An easier way would probably be to say you must write something once a week and then somewhere you must have a mentor or someone that you can discuss it with after a month or so and then maybe after two years write up all the stuff in a formal format that can then be evaluated. But if it is from the start, you know I didn't read the stuff properly, but it seemed to me if they tell me I must fill in that thing, I mean even for me that is positive, I don't want to do it. [Head: School for Public and Primary Health Sciences, Stellenbosch University, who formed part of the portfolio policy planning committee]

The evaluation of portfolios is essential to strengthen the quality of CPD. Self-assessment forms an integral part of the reflective and autonomous process that is fostered through portfolios. It forms the basis for identifying further learning needs and setting goals for continuing learning (Ferraro, 2000; Challis, 1999). This type of evaluation will only be useful if the reported perception of acquired knowledge is valid when compared to objective assessments of the same knowledge. Khan, Awonuga, Dwarakanath and Taylor (2001) found that learners were not able to assess their learning accurately, which leads to fundamentally flawed evaluations. This necessitates the use of well-developed assessment instruments that validate evaluative measures. Khan *et al.* (2001) clearly state that there is still an unmet need for valid self-assessment tools that can be used in the evaluation of CPD efforts.

External evaluation is therefore necessary in order to evaluate the quality and value of the learning that has taken place. Murray (1995) stresses the importance of selecting reliable and

adequately trained evaluators. The evaluator should be fair, consistent and preferably not so close to the candidate that it might influence his/her judgment. Evaluation may be formative, which provides feedback for the professional's development, or summative, which indicates a specific end point to the current learning. Evaluation of portfolios is best carried out within a set of principles and criteria, which enables the evaluator to judge the validity, authenticity and sufficiency of the evidence presented. These benchmarks should be known to the evaluator and the professional as learner and mutually understood by them. The expected outcomes should be attainable and their assessment should be possible. A reflective statement by the professional will further clarify the use of specific evidence. Grading of portfolios is not often done, as it is counter-productive to the learner-centred philosophy underlying the use of portfolios. Portfolios are hard work, requiring consistency and commitment. However, portfolios present a valuable alternative to traditional evaluative measures commonly found in CPD (Ferraro, 2000; Challis, 1999).

Bitzer (2004) provides broad quality indicators at the professional academic level by which lecturers can be assessed in this manner. These include qualifications, study record, teaching, research and publications, community interaction, external examining, professional associations and scholarly standing. In order for a portfolio to be a useful assessment instrument, it should include the five main phases indicated in Figure 5.2:



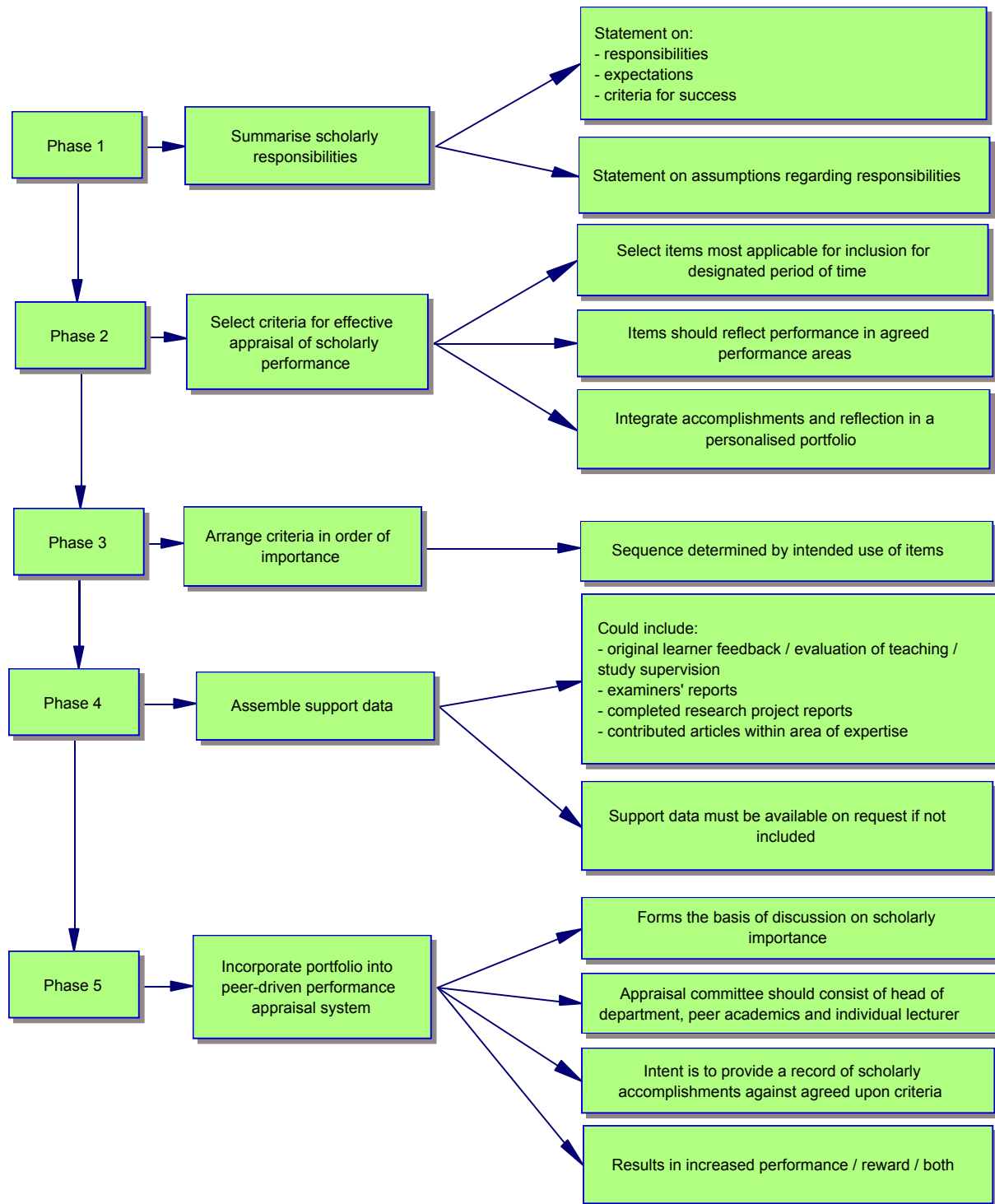


Figure 5.2: Phases in scholarly profiling (Adapted from Bitzer, 2004: 33-34)

Bitzer (2004) warns that portfolios should not be seen as an easy option to determine quality of learning through CPD. Compiling a portfolio is a complex and evolving process where no single view of what constitutes quality is sufficient. The input of learners, colleagues, peers, administrators and the person him/herself is necessary to provide reliable and valid judgements. Murray (1995) adds that portfolio development should be an obvious institutional priority. Review points must be included in order to eliminate inappropriate or biased information.

Assessment can only be fair if the criteria, standards and evidence used by the institution are stated clearly, fully and in writing for all concerned parties. It must furthermore be administratively manageable, as well as cost and time efficient. Active support must be given to improve staff performance, and training is essential if academics new to the system are to succeed. Many academics fear that the information disclosed in a scholarly profile will be used in terms of tenure, promotion and retention decisions. If the system is to succeed staff have to have confidence in the integrity of the system. Active participation in the development of the system will further facilitate and establish trust and commitment. Profiling should be seen as both a process and a result. It helps to determine goals, to appraise the processes for reaching them and to assess to what extent they have been reached (Bitzer, 2004).

Institutional documents and policies suggest that portfolio development as an evaluative measure will form part of academic practice in future at Stellenbosch University. Response data, however, suggest that there is still some way to go before portfolios are effectively integrated into practice at the institution as a whole and in the Faculty of Science in particular.

5.5.2 Peer review as an evaluative method

Hertling (1999) refers to peer review as an alternative evaluation method. Consulting professional peers conduct formal evaluations and make recommendations according to the outcome of the evaluation. Peer review does not usually take place without some form of peer assistance, which usually has the same broad functions as mentoring. Hertling (1999) found that peers on the same level impose higher standards than superiors, as they directly suffer the consequences of incompetent colleagues. It is a way to involve professionals actively in the growth and development of their own discipline and practice. The notion that many professionals lack adequate training to evaluate their peers competently has the potential to present problems within this method. It is a method that requires a high level of management, trust and co-operation.

In South Africa, the HEQC promotes the use of peer review findings not only in the evaluation of academic programmes, but also in staff development. The HEQC's Criteria for Institutional Audit refers to supervisors and mentors as contributors to the assessment of work-based learning. Reviewers should, however, be trained to ensure consistency of the review process and to improve and professionalise assessment practices (Council on Higher Education, 2004b).

Peer review is an example of an evaluation system already in place within the academic sphere (National Research Foundation, 2004). Any academic work aimed at publication in a reputable journal will be subject to peer review. This is a widely accepted practice in lecturers' research,

but not as much in the other areas of scholarly practice such as teaching or engagement. The following response attests to this notion:

... it happens to an extent at a conference, if you give a lecture yourself and people react to it and you get feedback. But I think the greater test is eventually getting your articles published, that is where the actual exam takes place ... publications are the most concrete measuring instrument that I can think of – research. [Professor in Microbiology and former recipient of the Rector’s Award for Excellence in Teaching]

Lockhart (2004: 116) refers to the “Teaching Innovation Program Partnerships” and Bitzer and Kapp (1998: 109) refer to the “buddy system” in which lecturers work in teams of two where the one acts as a regular observer of the other’s class practices and vice versa. Each team negotiates the aspects of interest in their specific context. Class observations and student interviews form part of this peer evaluation, which leads to regular conversations between the two lecturers. All the teams regularly convene to discuss their experiences and ideas. This has implications in terms of time. Reviewers will also need training to ensure the reliability and validity of their observation practices. It is, however, a viable option for implementing peer review of teaching and engagement in higher education.

5.5.3 Open-ended problems and simulations as evaluative methods

Open-ended problems and simulations pose more realistic situations for relevant evaluation, but require expert evaluators to score the responses, especially since it is likely that there will be more than one correct action, reaction or solution to the stated problem (McDonald, 2001). The consequences of wrong decisions in simulated circumstances are less damaging than mistakes made in real situations (Bitzer & Kapp, 1998). Problem-based learning demands engagement, inquiry, solution building, debriefing and reflection and presentation of findings as components of the learning process. This type of learning is suited to teamwork exercises (Lankard, 1996).

Open-ended problems and simulations are already being applied practically in the research setting through experimentation and are evaluated as such, but they could also be applied within the teaching setting of natural science lecturers’ modern-day practice. Technological advances, as well as an increasingly diverse learner population as clientele, demand a myriad of teaching strategies. Learning and development that take place in teaching practices could be evaluated by posing open-ended problems and simulations to lecturers. This could take place in an individual or group setting (Lankard, 1996).

CTL incorporates simulated teaching experiences in the Professional Educational Development for Academics [PREDAC] induction programme for newly appointed academics. Lecturers attending the programme are expected to lecture to a small group of their peers whilst being

video-recorded. The recorded lecture is later viewed amongst the small group of peers and constructive feedback given on how the lecture could be improved. This form of simulation is reported as helpful in developing lecturers' communication skills and self-reflection (Blom & Poole, 2004; Roter *et al.*, 2004; Wang & Hartley, 2003; Banville & Rikard, 2001).

5.5.4 Auditing as an evaluative method

A regular audit according to a statement of guidelines or standards may be possible in some professions. Organisation and attendance of conferences and sharing of professional experience at these meetings may contribute to a learning record. Facilitation at different knowledge and skill levels, and evidence of team working and research publications and output can be seen as participation in learning experiences. Rapid developments in information technology can facilitate this process of record keeping and monitoring, which may lead to more innovative ways of assuring quality (Calman, 2000).

Another form of auditing and evaluating expertise (and therefore implicitly learning over time) is by means of the National Research Foundation research rating system, whereby researchers with proven track records receive a certain rating which serves as an indication of their expertise and excellent credentials within a certain research field (National Research Foundation, 2004). Research output – albeit in a highly quantitative manner – is also audited at the institutional level by the Division for Research Development that publishes an annual research report. In addition, a regular annual study on the impact of the research done at the university is conducted by Centre for Research on Science and Technology (CREST).

The Council on Higher Education (2004b) uses student satisfaction surveys, graduate tracking surveys, employer satisfaction surveys, as well as impact studies that assess the effectiveness of quality assurance and quality enhancement systems, for the core functions of a higher education institution as sources of evaluative information in institutional audits. These measures imply an auditing of teaching practices in higher education. The specificity of these national measures is not clearly stated in the relevant documentation and therefore its usefulness to specific disciplines and individual lecturers may be limited. Stellenbosch University uses a series of regular user and customer satisfaction surveys (Council on Higher Education, 2007).

These are conducted through the following means:

- student feedback: implemented in 1988; since 2002, final-year students have provided feedback on their study programme as a whole;
- sporadic follow-up studies amongst graduates;
- electronic employment surveys (Omega questionnaire);
- employer satisfaction surveys conducted by some faculties (for example in the Agricultural and Forestry Sciences, Education, Engineering)^{iv};

- Stellenbosch University brand surveys conducted by CREST in 1999 and 2005.

The recent Institutional Audit Report (Council on Higher Education, 2007: 66-67) on Stellenbosch University comments that:

... progress so far has been variable across units with respect to impact and cost-effectiveness studies, as well as with systems to obtain client feedback, but there is awareness that these aspects need to be addressed. SU [Stellenbosch University] also notes that existing processes do not allow for systematic information on client satisfaction, and envisages this as a priority for the Community Interaction Division, once it is established ... Overall, the Panel had the impression that the institution is making a decisive effort to harness information on its performance at different levels in order to be able to monitor its progress and to position itself within the higher education system ... The Panel would like to encourage the institution to construct a set of indicators which is simple and manageable enough to be used by the academic units for their own internal planning and monitoring purposes, and which hopefully will not be regarded only as an external "management" tool.

CTL administers the student feedback procedure. Although the system is useful from an auditing perspective, it has limited use as an evaluative measure of learning in professional academic practice. The Higher Education Quality Committee Institutional Audit Report (Council on Higher Education, 2007: 27) makes specific mention of shortcomings in the system regarding the use of student feedback as an auditing mechanism:

The Panel also heard that departmental chairs do not always make students' evaluations available to faculty. The Panel encourages the institution to investigate this matter and to make sure that student feedback of teaching are widely distributed and acted upon by the relevant units.

Although the auditing systems such as those mentioned above are in place, auditing should not be considered an exhaustive evaluative measure. Auditing mostly does not take the qualitative aspects of learning into account and therefore it should be used in conjunction with other measures, such as those mentioned in the rest of this section.

5.5.5 Observation of practice as an evaluative method

The observation of behaviour in practice may add to a more comprehensive evaluation, but there are problems in terms of the reliability of observations, as well as of evaluators who may not be qualified to do a sufficient and accurate evaluation. Validity, according to McDonald (2001), is an important consideration: Is the evaluation measuring what it is supposed to measure? How can these problems be overcome? The above-mentioned literature suggests a variety of methodological options that can be used as tools in observing practice, including open-ended problems and simulations (McDonald, 2001), regular audits according to a statement of guidelines or standards (Calman, 2000), self-assessment (Ferraro, 2000; Challis, 1999), peer review (Hertling, 1999), mentoring (Challis, 1999) and/or portfolios (Ferraro, 2000; Challis, 1999).

The PREDAC induction programme presented by CTL to newly appointed lecturers at Stellenbosch University uses simulated peer observation – as explained earlier. The programme encourages participants to participate in a voluntary system of class observation conducted by the facilitators of the programme. This system is a once-off observation following the PREDAC programme, but sequential observations can be arranged per request. CTL staff focus on recent PREDAC participants for this purpose and requests for observation of other lecturers' classes are reportedly limited.

It therefore becomes clear that a combination of a selection of these different methods appropriate to the specific situation may be the most suitable option to yield reliable and valid evaluative evidence to support findings.

5.6 PLACING THE RESPONSIBILITY FOR THE EVALUATION OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

Self-reports have limited value to research that aims to determine the impact of CPD. Regular self-assessment forms part of reflection in learning, but more formal processes are called for where credit is at stake (Smith & Topping, 2001). The majority of self-assessment evaluations have focused on participant satisfaction. Self-assessment usually takes the form of end-of-session evaluations, follow-up surveys or pre- and post-assessments that determine cognitive or attitudinal change. This type of feedback does not give conclusive evidence of a positive relationship between CPD and changes in cognitive learning and/or practice and it fails to account for external variables in a systematic manner. The objectivity of these measures is debatable. Evaluation by experts in a specific field, generalists, peers, representatives of other disciplines or members of the public may be involved in more extensive evaluation. However, experience in assessment is a prerequisite for all these possible evaluators (Smith & Topping,

2001; Calman, 2000; Steinert, 2000). This does not only mean subject-specific expertise – as would be the case with line managers (such as departmental chairpersons) within the natural sciences. A participant within the study describes the problems associated with this type of practice in the following words:

Again I think it depends on the available resources, because ideally it should include all of the above [self, peers, facilitators of CPD programmes, line managers and central organisational evaluation were previously mentioned] I think there must be elements of self-evaluation and if it is a professional programme, it should be an inherent characteristic of the programme. That there is constant reflection on what is done, how it is done? But self-reflection can only bring you up to a point and I think then the next step is to get peers to give input ... So I think a combination according to the resources that are available. Often there aren't going to be resources to do external evaluations, external peer evaluation. I think, if I may be so bold, it is the least preferable for everyone that supervisors, or their line managers, must do it, because with all respect in many cases those people are just not going to have the knowledge to know what they are evaluating. The typical example is of a very innovative lecturer that does all the right things, but because it happens in isolation regarding the rest of the stuff that happens in the faculty, the person gets tremendous negative student feedback. And then that person is nailed for the negative student feedback, regardless of the fact that what they do is right and well planned and well executed and of utter value for student learning. But at the end of the day because it is so different, they do not like it (the learners), the guy gets a lot of negative student feedback, the module gets a lot of negative student feedback. Now I am afraid the reaction I have seen in some cases with line managers was that the person is told now pull yourself together, while the response actually should be to tell the rest of the faculty to pull themselves together. But because people do not always have the insight to realise what is happening from an educational point of view, correct action is not always taken. [Senior advisor, CTL]

Sarnoff, Welch, Gradin and Sandell (2004) report the same challenges in implementing and evaluating active learning techniques in higher education. Active learning techniques are most effective when used in adult learning, as adults are usually motivated by unique, personal reasons for learning. Students (especially at an undergraduate level) mostly have only their primary and secondary schooling experiences to build upon, and they expect a familiar approach. Anything foreign to these limited experiences will initially result in negativity. Sarnoff *et al.* (2004) found that lecturers face major challenges if colleagues and management do not support them in their innovative efforts. It is therefore important that sufficient resources be made available for development of innovative practices, that innovation be rewarded and that

brief periods in which evaluation results are less than positive be understood and accepted as an expected result of such innovation.

Lecturers' sense of academic freedom and the value they place on this freedom makes evaluation of learning a contentious topic, as it easily encroaches on their sense of autonomy. In the end, however, heads of department remain the designated drivers of evaluation in CPD. They therefore need training and support to fulfil this role adequately. Mentors could be a possible solution to the problem, but this aspect raises questions on the desirability of tainting the mentor-mentee relationship with evaluation issues. Mentors can, however, give important input when considering the mentee's professional competence, as the mentor possibly has a closer professional relationship with the person than a line manager has. In the assessment of portfolios mentors are therefore an important resource.

It could be argued that external professional bodies should drive the evaluation of learning in CPD. However, currently the university demands a certain extent of autonomy as an institution and therefore evaluation issues are deemed part of internal affairs. The South African Council for Natural Scientific Professions (2003) therefore serves higher education institutions in an advisory capacity only and not as a determining body in this case. Organisations such as the National Research Foundation (2004) serve as external brokers of the evaluation process (by using peers from the wider academic environment), but only in terms of research and only to a certain extent.

Hendry and Waltham (1998) suggest CPD should work towards a "Master of Best Practice" system. This system indicates the fulfilment of an internally negotiated development plan for each professional as learner. It provides professionals at all levels with a framework for setting targets, prioritising development needs and identifying learning opportunities. Achievement in this system means that the professional is capable of functioning autonomously and reflectively, transferring knowledge between contexts. A Master of Best Practice will be aware of and use opportunities for professional development, benchmark practices to the best practice standards, work in a flexible and multidisciplinary manner, be aware of organisational values, strategies and objectives and understand their impact, and finally, continuously develop practice to respond to new circumstances. There need to be clear criteria to judge a Master of Best Practice and competencies need to be mutually negotiated and defined by the individual and the facilitator. An example of such a system is the Habilitation qualification (a form of academic apprenticeship) that used to be common practice in European countries such as Germany. Although there is much criticism (Enders, 2001; Haug & Tauch, 1999; Kwiek, 2003; Musselin, 2005; Pechar, 2002 – amongst others) of this practice, it does provide a universal national teaching licence with a strong research base within these countries and serves as a reflection of

professional artistry. Those qualified within this system are awarded high esteem and academic freedom in academia. Although not without flaws, the system served to evaluate professional practice over a long period of time. The inherent qualities of such a system could be useful in implementing a Master of Best Practice system, driven by a peer review system, in an environment such as the natural sciences.

5.7 TOWARDS AN INTEGRATED APPROACH OF EVALUATIVE PRACTICE OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

Although there are many theories and debates surrounding the evaluation of learning in CPD, they are evidently not effectively put into practice within the Faculty of Science at Stellenbosch University. The informality, individually driven and self-directed nature of many CPD initiatives may be a contributing factor. The fear of an even heavier administrative load as a result of more policies and procedures that have to be implemented may make these academics sceptical of any initiative that aims to monitor or assess professional learning and development. Academic freedom (which is highly valued in this environment) further removes any inclination to support evaluative initiatives, as these academics perceive themselves beyond the level where their professional practices are to be constantly monitored. The reality is, however, that society, government and the institution itself demand greater accountability and proof of investment. It is therefore important that we understand the context of practice and devise ways through which we can determine whether learning and development do indeed take place.

Figure 5.3^v illustrates a holistic approach to the evaluation of learning within the academic context of lecturers in natural sciences. It incorporates the different roles and responsibilities commonly expected of lecturers in this context and it builds an evaluative scheme for each of these sectors^{vi}. First of all it focuses on the reasons for evaluation, to determine why evaluation is deemed necessary within this area of practice. It then progresses to what should ideally be evaluated and then how it can be done. Finally, it refers to who should take responsibility for evaluation in the specific sector of practice. It aims to give a holistic view of academic practice and of how evaluation of learning can take place in this practice arena. It points to similarities and differences in terms of evaluation of learning in the different areas of practice. It therefore becomes clear where overlap occurs and where differentiation is necessary.

Integration with the scholarships of teaching and engagement through making research findings accessible to students and the general public, and through applied research	Integration with the scholarship of discovery through action research
Who? Self-evaluation Peer review Line manager National Research Foundation <i>facilitated by: Division for Research Development</i>	Who? Self-evaluation Peer review Line manager <i>facilitated by: Centre for Teaching and Learning</i>
How? Portfolio Auditing Peer review Open-ended problems and simulations <i>through: Publications</i> <i>Conference attendance and presentations</i> <i>Supervision of research</i> <i>Mentoring</i>	How? Student feedback Portfolio Observation of practice Peer review Open-ended problems and simulations <i>through: Teaching-based research</i> <i>Reflection in and on action</i> <i>Practical application of knowledge and skills</i> <i>Mentoring</i>
What? Knowledge (Learning) Behavioural change	What? Reaction Knowledge (Learning) Behavioural change
Why? Accountability to sponsors, government and society Global competitiveness in innovation and technological advances Obtaining funding for continuing research	Why? Serving diverse learner clientele Incorporating technological advancements into class situation Outcomes-based education demands re-circulation
RESEARCH	TEACHING
EVALUATING LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT OF THE INDIVIDUAL NATURAL SCIENCE LECTURER	
ADMINISTRATION	COMMUNITY INTERACTION
Why? Organisational effectiveness Optimal productivity Financial control Managing other personnel	Why? Responsiveness to societal problems and issues Application of research Promoting growth in profession
What? Behavioural change Organisational change	What? Reaction Behavioural change Organisational change
How? Audit Observation of practice <i>through: Output in terms of administrative duties expected</i>	How? Community feedback Audit Observation of practice Portfolio <i>through: Membership of professional organisations</i> <i>Record of consultation</i>
Who? Self-evaluation Line manager <i>facilitated by: Dean: Faculty of Science</i>	Who? Community stakeholders Self-evaluation Peer review <i>facilitated by: Division for Community Interaction</i>
	Integration with the scholarship of research through the generation of research problems, and with the scholarship of teaching through service learning

Figure 5.3: An integrated approach to the evaluation of learning in continuing professional development of lecturers in the natural sciences

Scholarly development of professional academic practice lies at the heart of the evaluation of learning. Figure 5.3^{vii} provides a graphic outline of the evaluation of learning in various areas of practice, including research, teaching, community interaction and administration. It indicates that there are a variety of similarities in terms of the 'why', 'what', 'how' and 'who' questions surrounding the evaluation of learning in the various forms of scholarship. The similarities could be used to facilitate the integration of scholarship – and the evaluation of learning that takes place in these spheres of practice. Such integration could also serve to lessen the administrative burden often associated with evaluative practices.

Institutional documents suggest that many of these evaluative measures are either already in place, or envisioned for the future. However, the implementation of such practices seems to be fragmented at present. The lack of integration could be attributed to the lack of coherence between the various reporting structures. Increased collaboration and consultation between national and institutional structures, as well as within the institution itself in terms of CPD, and the consequent evaluation of learning, may be necessary. The nature of learning practices may also contribute to the lack of evaluation of lecturers' learning through CPD. The response data indicated that the evaluation of learning through CPD does not take place effectively as a result of non-formal and informal ways of learning that are not monitored, reported, or noted as forms of learning. These aspects were not investigated in depth, but provide scope for future research.

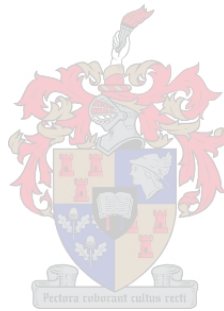
5.8 CONCLUSION

A critical re-investigation of the underlying theories, concepts, principles and practice of the evaluation of learning process within CPD can significantly contribute to our understanding of professional lifelong learners. Only through consistent, critical and appropriate CPD evaluation will we be able to monitor the quality and resulting worth of CPD as a valuable contributor to lifelong learning within the professional sphere.

There are a variety of approaches and options to consider when devising a plan for the effective evaluation of learning in CPD. The specific context will play a determining role in the why, what, how and who of evaluation practice. Within the context of lecturers in natural sciences at university level, this study indicated a lack of evaluation of learning in terms of its conceptualisation and application in professional practice. Further studies in this regard are necessary to define, plan and implement the evaluation of learning in an integrated manner in this professional sphere.

In the present study, the data that serves as evidence of the evaluation of learning in the context of lecturers in the natural sciences is limited. The lack of data clearly showing an integrated evaluation approach has led to the development of a suggested approach that

concludes this chapter. The use of such an integrated approach remains to be proved through implementation. This chapter only touched the tip of the iceberg in this regard. It only gave a broad overview of evaluation of learning within the total practice of CPD within a specific professional sector, but does serve as a basis on which to build further theories and studies^{viii}.



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ⁱ The MPhil in Higher Education follows a modular structure consisting of eight compulsory modules and two elective modules, followed by a thesis component. The 10 modules referred to in the text include all the above-mentioned modules, excluding the thesis.

ⁱⁱ The definition of community does not seem to be fixed. It varies between a relatively narrow definition of community as the discipline-specific scholarly community (academic tribe, as

described by Becher and Trowler, 2001) and the community including groups of people outside the boundaries of academe.

iii It is evident that the approach put forth by Quiñones and Ehrenstein (1997) corresponds closely to Kirkpatrick's Four Levels of Evaluation Model (1959-1960, as reported in Adams, 2001).

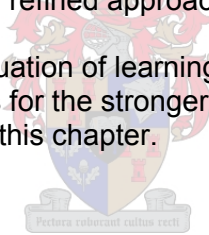
iv The Faculty of Science was not mentioned as one of these faculties.

v The suggested integrated approach to the evaluation of learning in CPD presented in Figure 5.3 was developed with lecturers in the natural sciences in mind. Many aspects of the approach are, however, of a generic nature and therefore apply to the wider higher education community of academics.

vi Even though administration is not described as one of the basic forms of scholarship, it is included in Figure 5.3, as the data in this study amongst lecturers in the natural sciences suggested that administrative responsibilities form an integral part of their academic practice and therefore the study population may have professional development needs in this regard. The learning that takes place as a result needs to be monitored and evaluated as part of a holistic process. Administration was therefore included in Figure 5.3.

vii Figure 3 provides a relatively generic approach to the evaluation of learning in CPD, which could easily apply to areas other than the natural sciences. The lack of data on the evaluation of learning through CPD in this specific context contributed to the decision to take a more generic approach at this stage. However, it is recommended that future research on this topic focus on developing a more contextualised and refined approach.

viii The evidence pertaining to the evaluation of learning that could be sourced from the data in this study was limited, which accounts for the stronger emphasis on literature and the development of a conceptual basis in this chapter.



CHAPTER 6

Current issues and future trends

in continuing professional development

for lecturers in the natural sciences at one South African university –

a question of integrating various forms of scholarshipⁱ

ABSTRACT

The contribution of CPD to the enhancement of scholarly practice has been investigated from a variety of perspectives in this dissertation. The first five chapters were divided into a description of the research context (Chapter 1), a conceptualisation of the definition, the need for and purpose of CPD (Chapter 2), and the provision of CPD (Chapter 3). The development of the quality of learning (Chapter 4) and the evaluation of learning (Chapter 5) in CPD were discussed. All the arguments were based on relevant literature and a study conducted amongst lecturers in the Faculty of Science, Stellenbosch University. This chapter (Chapter 6) gives a critical perspective on current issues and future trends in CPD and its influence on the development of scholarship within the natural sciences at Stellenbosch University. Specific attention is given to the future context of practice, the role of the expert in scholarly practice, how scholarly experts will be educated, and how their levels of competence will be maintained within the realm of CPD. Again the information is based on literature and examples from the study amongst lecturers in the natural sciences will highlight the trends that can be expected in the future. A number of recommendations are made in terms of expanding research on the topic.

6.1 INTRODUCTION

The 1980s saw the emergence of continuing professional development (CPD) as a distinct area of practice and study. Houle (1980), as quoted in Cervero (2001) and Mott (2001) respectively, predicted that global competitiveness, higher levels of acceptable performance, rapid knowledge advancements in all professions and the need to cope successfully with larger and more complex forms of knowledge would lead to a greater need for and valuing of CPD – even to the point where it would rival pre-service professional educationⁱⁱ. Altbach and Davis (1999) promote a more seamless transition between education and work activities – especially since the links and transition points between initial education and work are currently weakly articulated.

CPD in general still lacks a unified and well-developed system of delivery (Cervero, 2001). It is commonly characterised by programmes that merely aim to update professionals on the latest developments, in which knowledge is transmitted in an ineffective manner and is offered by a

pluralistic group of providers that do not work together in a co-ordinated fashion. The major reason for this sombre picture is the transitional stage at which many professions find themselves, in which they are forced to experiment with different purposes, forms and locations for the delivery of CPD. It is unclear where this transitional period will lead us, as CPD remains largely responsive to changes in the global market. Furthermore, individuals' learning patterns vary considerably – depending on their profession, location of their workplace and opportunities for participation in CPD (Cervero, 2001). These critical issues remain to be addressed if CPD is to fulfil its potential as change agent in the improvement of professional practice.

In the specific study an investigation of the conceptualisation, need for, provision, quality and evaluation of learning in CPD within the natural sciences in higher education proved to be a complex endeavour. Lecturers in the natural sciences are expected to develop as scholars. Scholarship makes diverse demands on the individual academic, as it requires expertise in discovery, teaching and engagement. The South African society presents further complicated dynamics in terms of future trends in an already complex professional environment such as higher education in South Africa. Global trends, coupled with local experience and research, do, however, guide us in this quest. The 20th century was marked by the professionalisation of workforces and therefore the debate around professionalism in higher education is not new. Professional accreditation in higher education is, however, a relatively novel idea (Anon, 2003). This might have a direct impact on the direction CPD in this sector will take in the 21st century.

In order to determine future trends, Calman (2000) suggests that the following questions be asked:

- What will be the future context of practice in higher education?
- What is the role of experts and will we need them?
- How will experts be educated?
- How will their level of competence be maintained?

These questions direct the discussion that will follow.

6.2 THE FUTURE CONTEXT OF PRACTICE IN HIGHER EDUCATION

Brew (1995) states that CPD is highly context dependent. The context defines what is legitimate in terms of CPD. What will be the future context of practice in higher education, as this will have a determining effect on the development of scholarship through CPD within natural sciences in higher education? All that is certain about the future within higher education is that nothing is certain. It can, however, be expected that scholarly practice will not become less complex or less demanding of the professional.

The development of scholarly practice has been at the centre of various debates and studies in higher education. The majority of views presented on the issue of scholarship tend to advocate an increased emphasis on the scholarship of teaching and learning, or to call for the integration of the various components of scholarship as initially identified by Boyer (1990). This component focuses on what current literature and practice tell us about CPD within the future context of practice in higher education. The author here takes a step back from these 'scholarly' debates to ask whether one should not first consider what the common understanding and practice of a university is, before determining to what extent and form scholarship is possible within a specific setting. Andresen's (2000: 148) view is used as a basis for this argument:

The function of the university, far from being the preservation and passing down of knowledge, becomes reframed as the imaginative engagement of students with teachers in a manner that achieves a rebirth of knowledge for each new generation.

Scholarship has been at the centre of debates and studies in higher education for at least two decades. The seminal work of Boyer (1990) and later Rice (1991; 1996; 2002) and Diamond (1993; 1999) has identified and described various scholarship roles, including the scholarship of discovery, teaching (and learning), application and integration. Lynton (1995) and Lynton and Driscoll (1999) later added the scholarship of engagement. Various authors (O'Meara & Rice, 2005; Badley, 2003; Sorcinelli, 2002; Zahorski, 2002) refer to the ideal of an integrated approach to scholarship that balances the various components of scholarship.

These scholarship roles do not only need to be contextualised against the backdrop of a specific discipline (as advocated by Diamond, 2002; Rice, 2002; Paulsen, 2001 and Andresen, 2000), but also need to be placed within the broader context of what it means to be a university in a specific setting. South African national higher education structures and policy framework, as well as Stellenbosch University as a specific institutional setting, are used to illustrate the limitations these factors place on the ideal of integrated scholarship in the natural sciences.

The two central questions addressed in this section are:

- How does the idea of a university in the South African higher education context influence the concept of scholarship?
- Is integrated scholarship possible within the context of South African higher education?

The example of the Faculty of Science at Stellenbosch University is used to illustrate that a managerial approach to a higher education system limits the possibility for the integration of all forms of scholarship in academic practice. An alternative view on the integration of scholarship is presented.

6.2.1 The idea of a (South African) university

The landscape of South African higher education after 1994 is characterised by a move towards a single national system of education. Official documents, including the Higher Education Act of 1997, and the National Qualifications Framework (NQF), as well as national structures such as the South African Qualifications Authority (SAQA), and the Higher Education Quality Committee (HEQC) played key roles in the post-1994 transformation process (Mapesela & Hay, 2005; Badsha, 1999).

The post-1994 national education system is particularly aimed at holding higher education accountable for producing scholars “who can effectively participate in a global economy” (Adams, 2006: 3). The unsteady balance between public accountability and institutional autonomy forms part of the debates around higher education transformation in South Africa – as is evident in the work of Adams (2006), Bundy (2006), Christiansen and Slammert (2006), Imenda (2006), Johnson (2006), Kotecha (2006); Le Grange, Greyling and Kok (2006); Jansen (2004), Enslin, Pendlebury and Tjiattas (2003) and Webster and Mosoetsa (2002). Bundy (2006), Kotecha (2006) and Le Grange (2002) mention a further kind of tension in South African higher education – that of balancing global competitiveness with a (South) African focus. In addition, Bundy (2006: 10) criticises the South African university sector for its isolation and lack of global awareness:

[T]here is currently little reflection in South Africa on the overall direction being taken by the (higher education) sector, on the resemblances between local developments and those studied in detail elsewhere, or on the reasons for this isomorphism. Instead, and entirely understandably, it is local issues that preoccupy analysts and policy makers in South Africa; issues such as transformation, redress, the crises in some HDIs, ‘size and shape’, and mergers.

Authors in current literature seem to differ on the importance of local versus global debates in higher education. Adams (2006: 4) is particularly critical of policy shifts that imply a “neo-liberal agenda of globalisation, incorporating the notion of managerialism” – and that therefore lead to the demise of institutional autonomy and the individual lecturer’s academic freedomⁱⁱⁱ. Managerialism is argued to imply a move towards economic rationalism and education-for-profit within higher education institutions. Institutional management, in collaboration with national government structures (such as SAQA), becomes the driving force behind quality assurance, efficiency, accountability and funding (Adams, 2006; Bundy, 2006; Christiansen & Slammert, 2006; Kotecha, 2006; Webster & Mosoetsa, 2002). Johnson (2006) adds that the recently developed and implemented subsidy formula for higher education is output-oriented, as it focuses mainly on the number of graduates and publications produced. Adams (2006), Gould

(2006) and Altbach and Davis (1999) argue that a managerial approach equates education with any other business or service industry, and therefore degrades the idea of higher learning to mere generic management principles. Adams (2006), Bitzer (2006) and Webster and Mosoetsa (2002) furthermore argue that many higher education institutions seem to have adopted a managerialist governance model. Bundy (2006: 2) concurs with these statements and continues to describe the influence of the changes within the South African higher education context:

They (the changes) also involve new ways in which universities manage themselves and carry out their core activities; the construction of new professional identities; the accommodation of existing values and norms to new circumstances; and a series of experimental engagements with other social actors – major shifts in how universities have sought to define, govern, fund and shape their own field of social activity.

What does this imply for the idea of a (South African) university?

Imenda (2006) provides a useful overview on the idea of a university. The centrality of scholarship within a variety of the quoted references is of particular interest. For instance, Atkinson (1997, as quoted in Imenda, 2006: 249) argues that a university is to be seen as “a place where the *lost ideals of scholarship* as leisure, reduced preoccupation with business, interdisciplinary studies, and a community of readers are recovered” [my italics]. The University of Bologna Prospectus (2005 version, as quoted in Imenda, 2006: 248) refers to three criteria central to the idea of a university: (1) scholars determine the boundaries of their disciplines and discover new knowledge in a rigorous manner (research); (2) scholars transmit the knowledge created by research to learners (teaching), who follow the scholar freely (learning) outside the official boundaries of institutions such as the Church or the State (academic freedom); and (3) society, if necessary, may use the scholarly research for practical ends (engagement)^{iv}. The centrality of the notions of scholarship and academic freedom within the idea of a university becomes evident.

Imenda (2006) typifies four models of universities. Most universities are not exact replicas of any of the models proposed by Imenda (2006), but hybrids of these models. The New York model corresponds most closely to the managerialist approach to higher education described by Adams (2006).^v The New York model disregards the traditional notions of academic freedom of the individual scholar and institutional self-governance in favour of market forces and the advancement of commercial interests.

Elements of the New York model is evident in the South African higher education system, which is characterised by a drive to prepare students for the labour market (Adams, 2006; Imenda,

2006), and create structures to manage research and provide administrative support^{vi}. Mouton 2000 (as quoted in Christiansen & Slammert, 2006) states that these structures have had a counterproductive influence on research in particular, as a stagnation and possible future decline in research output is noted. While a system driven by quality assurance and coherence may be plausible, Johnson (2006) argues that such a system increases pressure on lecturers to perform under the set managerial standards and eventually removes them from their disciplinary commitments. Bitzer (2006) adds that performance incentives aimed at increasing output lead to the devaluing of certain scholarly activities, such as teaching. The situation widens the gap between teaching and research, which is contrary to the notion of integrated scholarship. Kotecha (2006: 24) asks the fundamental question: “Is the academic staff member a dedicated teacher and/or researcher or a star attraction or research entrepreneur selling his or her insights to international academia or the business community?”

It is evident that regardless of the idea (and ideals of scholarship) of a university as professed through the ages, it is the model of university in practice that will determine how scholarship is defined, practised and promoted within a specific university context. Newman’s (1854) work on the idea of a university implies a notion of integrated scholarship:

[T]he university is a place to which a thousand schools make contributions; in which the intellect may safely range and speculate, sure to find its equal in some antagonist activity, and its judge in the tribunal of truth. It is a place where inquiry is pushed forward, and discoveries verified and perfected, and rashness rendered innocuous, and error exposed, by the collision of mind with mind, and knowledge with knowledge (Newman 1854, reprinted 1996, as quoted in Kotecha, 2006: 27).

6.2.2 The decline of integrated scholarship

Johnson (2006) argues that current research has not supported lecturers in interpreting the fundamental changes to the South African higher education system. The continuing professional development (CPD) of lecturers in higher education has not kept track with all the changes, which include a diverse learner corps, a significantly changed school system and changes in higher education policy. Lecturers are often subject specialists within their respective disciplines – trained within the scholarship of discovery of the particular discipline. They do not necessarily have an educational background that supports the other forms of scholarship. More often than not they are ill equipped to develop within the scholarship of teaching or the scholarship of engagement, also referred to as community interaction in practice (Le Grange *et al.*, 2006).

This argument is supported by international literature, as the majority of the reported debates and studies seem to focus on the scholarship of teaching (and in some cases learning) as a marginalised endeavour in academic practice (Bitzer, 2006; Kreber, 2005; 2003; 2001, Badley, 2003; Atkinson, 2001; Paulsen, 2001; Benjamin, 2000; Trigwell, Martin, Benjamin & Prosser, 2000). Another body of literature seems to focus on the teaching versus research debate, which has seemingly not been resolved (Young, 2006; Durning & Jenkins, 2005; Robertson & Bond, 2005; Brew, 2003; Sorcinelli, 2002; Paulsen, 2001). The scholarship of engagement features in some studies (Rice, 2002) as a scholarly activity. The debates in literature indicate the different areas of scholarship as focal points for investigation and discussion, with relatively little attention being paid to how these areas of scholarly practice can be integrated in a sensible and sustainable manner.

A number of trends in higher education add to lecturers' inability to develop into true scholars. These trends include the growing internationalisation and massification of higher education, the adoption of corporate practices in the organisation and management of universities, and the loss of professional autonomy in the development of academic modules and programmes (Jansen, 2004; Marginson, 2000). McInnis (1995) notes a drive to formalise and create uniformity in academic work, as well as a fragmentation of academic work into discrete tasks (Lucas, 2007; McInnis, 1995). Disciplinary insularity and specialisation have contributed to a lack of collaboration and collegial culture (Kotecha, 2006). Zahorski (2002) presupposes the existence of a holistic or integrated institutional structure, such as the Faculty Development Office described in Zahorski (2002). In reality, for many academics the integration of scholarship is hampered by institutional fragmentation of structures that were initially meant to support and develop scholarship. These organisational trends have obvious implications for an integrated view on scholarship, as it also creates a fragmented orientation to scholarship in general.

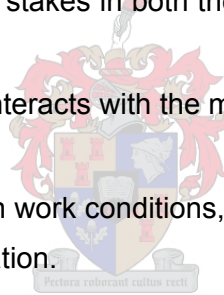
Johnson (2006) argues that a decline in informal discourse and structured intellectual conversation and less attention to social concerns have caused the deterioration of former supportive conditions that facilitated the intellectual development of scholars in the past. The current increase in managerial control over teaching, heavier administrative workloads, technological communication mechanisms (such as e-mail) and the 'publish or perish' phenomenon pressurise academics into following a more individualised path of scholarly development (Johnson, 2006). Hargreaves (1994, as quoted by Johnson, 2006: 67) refers to this as "contrived collegiality". Senior academics are tied up in administrative posts, established academics generate sufficient funds through research to buy themselves out of teaching responsibilities, and young academics tend to be burdened with high teaching loads and student numbers that limit their time for research development. These measures may provide

short-term solutions to immediate problems, but they have far-reaching implications for the development of current and future scholars in any discipline (Christiansen & Slammert, 2006).

Christiansen and Slammert (2006) and Johnson (2006) argue that the increased managerial approach to higher education practice has also resulted in an identity crisis for the individual lecturer – who has traditionally placed a high value on aspects such as academic freedom, self-regulation, control over intellectual property and flexible time. Managerialism has resulted in a feeling of disempowerment and a loss of the sense of community that traditionally prevailed in academe, and which Johnson (2006) calls a disintegration of the social fabric of academe. A differentiated system of career paths has evolved as a result of the managerial impact on higher education (McCollow & Lingard, 1996).

McCollow and Lingard (1996) identify five main academic career paths that a lecturer could follow, namely those of –

- the traditional academic, who wants to produce knowledge for the sake of science;
- the state professional, who produces knowledge for the sake of public service;
- the market professional, who has stakes in both the profession and the market (such as law and medicine);
- the corporate professional, who interacts with the market from within the university structure; and
- the worker, who faces a decline in work conditions, retrenchment and poor pay as a result of market influences in higher education.



Johnson (2006) argues that the career path of the individual is determined by position and individual choice. It is evident that the distinction made by Webster and Mosoetsa (2002) between pessimists and innovators, who are either distressed or energised by change, applies to the above-mentioned choice in career path a lecturer chooses to take. Whichever route the individual lecturer takes will have an influence on how scholarship is defined and practised within his/her profession as an academic. The choice of career path will also have an influence on how CPD is approached.

Stellenbosch University will be used to illustrate how these reported trends have come to play in a South African context.

6.2.3 A higher education approach to scholarship: Stellenbosch University as an example

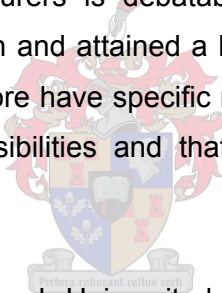
Higher education institutions in South Africa have had to deal with changes in context, such as globalisation, massification of the education system that has led to a more diverse learner

population, diminishing resources, demands for quality, responsiveness and accountability and greater competition among institutions of higher education (Boughey in Gravett & Geysler, 2004; Quinn & Vorster, 2004). The type and amount of work required from lecturers in higher education have changed considerably as a result of these contextual changes. Lecturers are increasingly required to professionalise their practice as educators, carry larger administrative loads and achieve higher standards with fewer resources as a result of down-sizing, mergers and/or financial constraints (Boughey in Gravett & Geysler, 2004). This often requires role changes in terms of the lecturers' responsibilities, for which they are often ill prepared. The challenges thus presented to lecturers have led to the introduction of accredited professional development courses for academics, especially in the field of teaching where the traditional lecture format does not seem suitable any longer. Lecturers need to cultivate a spirit of lifelong learning in their learners and therefore lecturers and their learners need to be actively engaged in the learning process (Quinn & Vorster, 2004). Moyo, Donn and Hounsell (1997) found that lecturers are ready and willing to adopt new strategies in higher education. They see CPD programmes as a way to cope with the changes and transitions that are eminent in the South African higher education arena.

Imenda (2006) argues that there is a need for a university to state its primary purpose, since its institutional identity, knowledge base and knowledge production will be determined by this purpose. Stellenbosch University is a historically white South African university. The university vision guides its scholars to commit themselves to academic excellence in South Africa, the wider Africa and the global community. The mission states that the purpose of the university is to be a place where the academic ideal of excellent scholarly and scientific practice is created and sustained, and an environment within which knowledge can be discovered, shared and applied to the benefit of the community. The values that Stellenbosch University underscores include scholarship, which is described as research, teaching, community service and management that is characterised by the kind of objectivity and critical thinking intrinsic to excellent scholarly and scientific practice. ^{vii}

Regardless of the above-mentioned statements, the university structure is governed by a top-down managerial approach, evident of the so-called 'silo structure' described by Dotterer (2002). National government provides the impetus for structured development through policy (as is also noted in the work of Adams, 2006). At national level, the National Training Board has developed a strategy within a lifelong learning framework. This led to the Skills Development Strategy for Economic and Employment Growth in South Africa, which was legislated in 1998. It advocates a vision of an integrated skills development system that promotes economic and employment services. The National Skills Development Trust Fund evolved as a result. It obliges all sectors to invest in training within a systematic and comprehensive skills

development strategy. Quality is enhanced through registered unit standards and outcomes-based education. These initiatives are aimed at the improvement of the education of all South Africans in general, including professionals (Walters, 1999). Higher education can therefore not only focus on the pre-service level of education. Both Cervero (2001) and Liu and Wan (1999) add that higher education institutions are currently forced to incorporate CPD as an integral part of their academic offering, not just as an add-on. This is necessary as part of their survival strategies resulting from external political, economic and social pressures. Recent arguments even point to a change in the meaning of the term *university*, with CPD moving from the periphery to a central, accepted and legitimate component of programmes. This has led to a system mass in size, but still elite in value. This amalgamation of functions and types might lead to a split within institutions in future, as the limited internal flexibility and adaptability of the traditional structures continue to pose problems (Teichler, 1999). Boughey (2004, in Gravett & Geyser, 2004) adds that the major location for research capacity and skilled professionals has moved from within universities to outside these formal traditional boundaries. Universities have been forced to respond to this trend by training skilled professionals rather than by producing scientific knowledge for the sake of uncovering the so-called truth. Whether an integrated CPD approach would be suitable to lecturers is debatable. These adult learners have already completed their pre-service education and attained a high level of subject expertise (usually in the form of a doctorate). They therefore have specific needs for CPD that are closely related to their professional roles and responsibilities and that may be quite different from those of professionals in the private sector.



Institutional management at Stellenbosch University builds on national input and consequently the scholarship roles are distinctly divided into three (vice-) rectorates (research, teaching and operations). The three vice-rectors translate their development and support initiatives to academe via three centres/divisions: the Division for Research Development, the Centre for Teaching and Learning, and the Division for Community Interaction.

These distinct divisions in the institutional structure mark a consequent distinct division of the scholarship roles (although quality assurance may be simplified via these obvious avenues of report structures). It is up to the individual lecturer to integrate his/her scholarship roles in a sensible and balanced manner – for which little (if any) support is provided. Some support structures (for instance the library services, statistical services and language centre) may cut across the obvious scholarship divide, but do not specifically support lecturers in integrating their diverse roles and responsibilities, to which Bitzer (2006: 384) refers as “very little mutual reinforcement” in university management structures. This type of structure tends to support the arguments put forth by Johnson (2006) and Le Grange *et al.* (2006) that lecturers in the South African higher education system are not supported to make sense of their scholarship roles and

development. Zahorski (2002: 37) recommends that “faculty development professionals must try and gain a new vision of space^{viii}”.

Figure 6.1 graphically represents the current structures in place in the institution that support the various components of scholarship as initially described by Boyer (1990), Lynton (1995) and Lynton and Driscoll (1999).

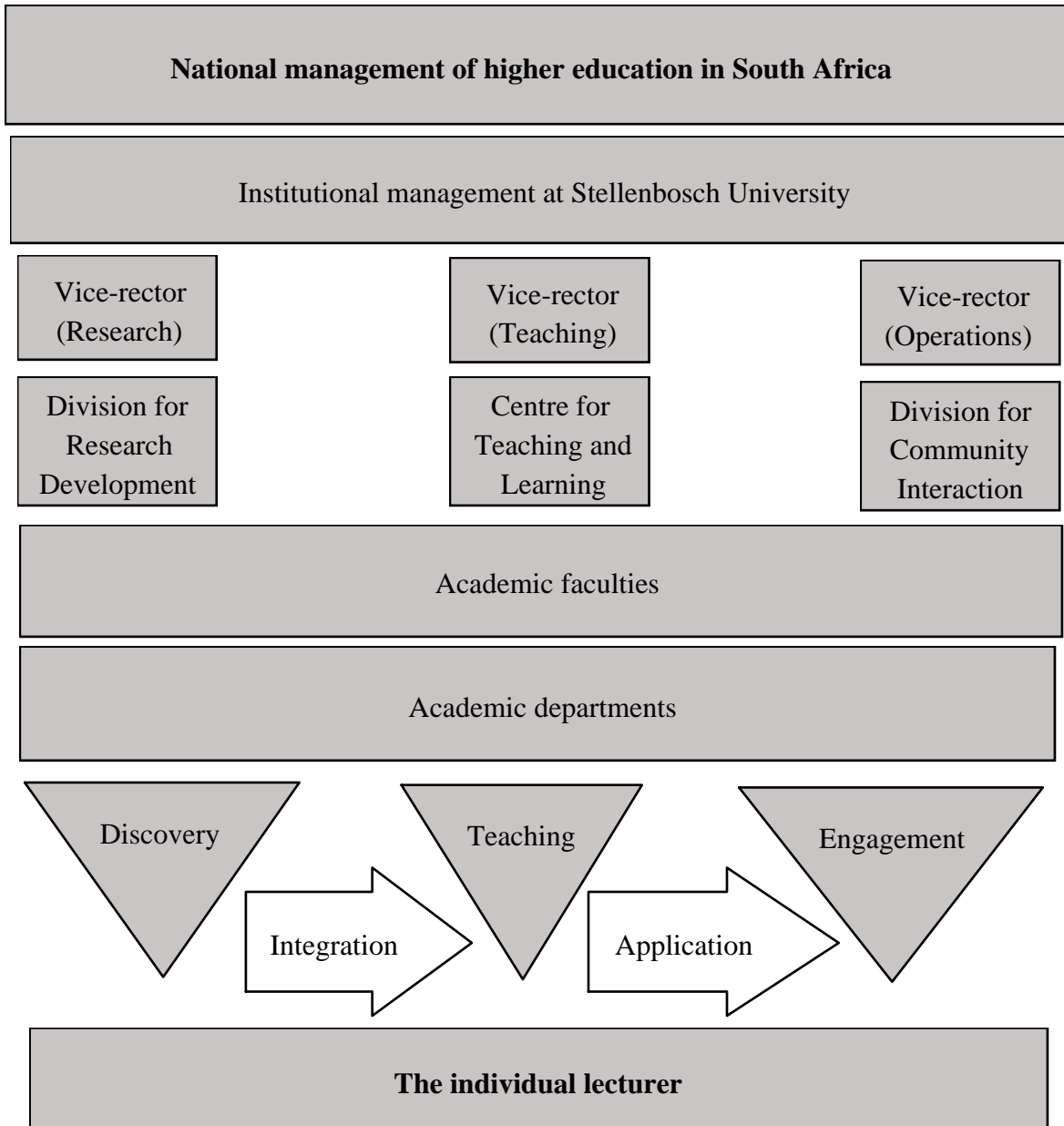


Figure 6.1: A managerial approach to scholarship at Stellenbosch University

Figure 6.1 does not imply that administrative structures such as the Division for Research Development, the Centre for Teaching and Learning, and the Division for Community Interaction directly manage academic departments or individual lecturers on a day-to-day basis. However, these structures were put in place partly to develop institutional policies, ensure national and

institutional policy implementation, facilitate relevant CPD initiatives, and report to the university top management on these matters.

In the researcher's work as both an academic and a staff developer in various faculties on campus, this managerially enforced divide of the various scholarship components was evident, even though the structures themselves seem to be functioning well. Well functioning management structures do (unfortunately) not ensure an effortless integration of scholarship roles in academe.

The discussed literature and the case study presented above indicate that both the context and the nature of higher education have changed. The question therefore arises whether it is still possible to integrate scholarship in the manner in which it was advocated by Boyer (1990) nearly three decades ago.

6.2.4 An alternative view on the future of scholarship in the context of higher education

Various authors provide suggestions as to how scholarship in the full sense of the word can be revived and fostered within the current managerially oriented higher education system.

Webster and Mosoetsa (2002) focus on wider organisational changes as the backdrop to the development of an environment that is conducive to scholarship development. Innovative management techniques such as the creation of a strategic plan, the inclusion of all role-players in new decision-making structures, a move towards strong centralised leadership, decentralised budgeting, closer collaboration with business and industry, and explicit training of managers and administrators, are suggested to improve institutional coherence. Cervero (2001) points to an increase in collaborative arrangements, specifically in terms of CPD, while Teichler (1999) adds that the influence of this collaboration in terms of the other functions of higher education institutions should also be considered.^{ix} Johnson (2006) and Dotterer (2002) add management structures that are in touch with the local context and concerns of staff to the list of management techniques. Policies that support lecturers to work within industry, and accreditation of staff development units to offer credit-bearing programmes and/or modules, may facilitate the integration of the various forms of scholarship (Le Grange *et al.*, 2006).

Boughey (2004, in Gravett & Geysler, 2004) and Cervero (2001) indicate an increase in the decentralisation of CPD. Traditional providers, such as universities, can no longer ignore the corporate university as a determining role-player in the provision of CPD to academic staff^x. CPD has become part of an education-for-profit trend, of which the mergers and acquisitions of continuing education companies serve as indisputable evidence. Current competition among professional associations, higher education institutions, business and industry and

entrepreneurial agencies has resulted in a variety of CPD programmes that are offered simultaneously to lecturers within universities. Each of these providers promotes his/her programme as timely, relevant and of the highest quality. The lack of established international educational standards for CPD programmes offered to lecturers makes it nearly impossible to make an informed choice from all the offerings. The South African system of SAQA accreditation aims to prevent what one respondent in the study referred to as *a wonderful playground for private providers that come in and often present terribly unsuitable courses*. A more integrated approach is called for, which will support dialogue, collaborative inquiry, research that is sensitive to practice, and improved learning and practice. This will contribute to growth and sustainability within the field of CPD and bridge the current gap between theory and practice in professions (Daley, 2001; McDonald, 2001; Cervero, 2000; Daley & Mott, 2000; Knox, 2000; Castle, Holloway & Race, 1998). Properly planned and monitored collaboration and integration between CPD providers (both internal and external to the university) should not be seen as a threat to the university in terms of CPD. Outsourcing certain aspects of CPD offered to lecturers to private providers may lead to further collaborative opportunities as well as to the incorporation of specific expertise otherwise unavailable to the academic sector, which could benefit all stakeholders.

Christiansen and Slammert (2006), Johnson (2006) and Sorcinelli (2002) advocate collaboration through collegiality as a way through which scholarly development and work can be fostered. Collegiality is described by Johnson (2006: 60) as –

the special practices of a community of scholars or academics, since it refers to their professional autonomy, their quest for knowledge and their recognition of working together, whether formally or informally, in striving towards their scholarly accomplishments ... it appears to be a useful way of coming to grips with what might be changing as 'managerialism' enters the lives of academics.

Collins (2000, as quoted in Christiansen and Slammert, 2006: 17) refers to this type of collegiality as "interaction rituals", where scholars obtain both emotional energy and cultural capital to further their scholarly development. Intellectually engaging communities arguably provide more opportunities for scholarly development than do incentives or financial support. Incentives and financial support are usually mostly accessible to the minority of established academics already immersed in mainly the scholarship of discovery. A number of practical suggestions are made by various authors to facilitate collegiality, including reviving of shared spaces for critical discourse – such as conference participation, tearoom discussions, interdisciplinary research groups, journal clubs, regular seminars, and mentoring programmes. These spaces are to serve as places of belonging and sounding-boards for scholars (Christiansen & Slammert, 2006; Johnson, 2006; Sorcinelli, 2002). Dotterer (2002) adds that

undergraduate research can also be used to foster collegial collaboration and integrate scholarship^{xi}.

Costley (2001), Cervero (2000) and Castle *et al.* (1998) emphasise that collaboration should be a three-way partnership between the individual learner/professional, the organisation and the provider of CPD (including both internal and external providers of CPD). The individual has needs in terms of self-development and career advancement. The organisation has certain strategic needs to remain competitive. Collaboration also offers the organisation more direct access to educational expertise and current research. The provider of CPD forms the third party that negotiates a compromise between the other two parties in the form of a CPD programme. The provider's programme should be flexible and assessable, and it should enhance quality learning. Customised programmes have become increasingly popular as CPD is tailored to specific needs and reflects organisational priorities. Potential benefits to the provider arise from the fact that CPD is a mechanism by which to gain access to technology infrastructure and marketing expertise and to secure research contracts, student internships, consultation opportunities and possible profits. The acquisition and allocation of resources can facilitate or hinder these types of collaboration facilities and should be carefully co-ordinated. These resources include time and funding (Cervero, 2001; Knox, 2000).

The responsibility of CPD may have to be redirected in future in order to achieve successful collaboration. Governance issues, however, remain contentious in collaborative efforts. Who controls the content and how profits and losses are shared, need to be clear to all stakeholders. Effective collaboration thus depends on a mutual understanding and co-ordination of the goals, probable benefits and contribution of resources of all those involved. The struggle between the learning and political economic agendas will not cease to exist. Therefore continuous negotiations on resolutions to these issues of power will be necessary to focus CPD towards a sustainable learning agenda (Cervero, 2001). Brew (1995) adds that CPD should incorporate institutional priorities and policies, but not be totally subservient to them.

This study provides a basis for further inquiry in this regard, as it has identified the prominent role that industry and other national and international institutions of higher education play in the continuing development of the lecturers in the natural sciences. Projects in collaboration with industry and collegial interaction through joint ventures, conferences and study visits reportedly play an important role in the professional development of lecturers in the natural sciences. Project work can support effective CPD through aligning the individual, departmental, faculty and institutional needs. It can encourage collaborative efforts. Brew (1995: 66) describes project work as "an investment in change". Quiñones and Ehrenstein (1997) propose that collaboration should incorporate elements of cognition (knowledge), behaviour (skills) and attitude (feeling).

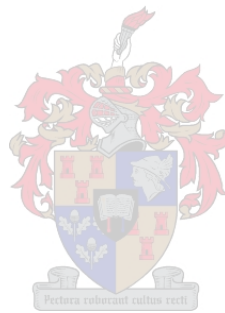
Future research should therefore be directed at investigating the CPD potential of these initiatives and how collaborative initiatives compare between different faculties and across higher education institutions. Collaboration between various stakeholders can integrate and improve the current pluralistic and dispersed opportunities for CPD and should form part of future CPD programme development strategies (Cervero, 2001). It is an important consideration in a global society with an increasingly mobile population (Clawson & Jordan, 2001).

Le Grange *et al.* (2006) promote a more individual approach to the development of scholarship in the form of continuing professional development (CPD), which can address different facets of scholarship and incorporate different forms of learning. Personal development plans (PDPs) can be used as a strategic tool in the continuous development of both the institution and the individual scholar. In this way the strategic goals of the institution can be merged with the developmental needs of the lecturer. Bitzer's (2004) concept of professional profiling aligns closely with the notion of PDPs proposed by Le Grange *et al.* (2006). Le Grange *et al.* (2006) emphasise the necessary link between CPD and performance management if it is to receive priority and cultivate integrated scholarship. The risk, of course, exists that this approach will develop into yet another managerially driven system without any true integration of scholarship components.

Sensitivity to differences between disciplines needs to be taken into account, even though there may be generic elements across disciplines (Andresen, 2000). In the disciplinary context, the integration of content knowledge, pedagogical knowledge and pedagogical content knowledge (Paulsen, 2001 specific to the discipline informs practice – not only in the scholarship of teaching. Scholarship, however, remains “something that is transferable across disciplines ... a term of recommendation, of challenge. It demands and expects something that can and should be achieved in academic work ... We are engaged in promoting a set of intellectual values” (Andresen, 2000: 138). It may be useful to follow Andresen's (2000) lead in this regard – making a distinction between scholarship at the micro- (disciplinary) and macro- (trans-disciplinary) levels.

Both Diamond (2002) and Andresen (2000) provide criteria for scholarly endeavour, which can be summarised as any academic activity that is inquiry-driven, has clear goals, is innovative, requires discipline-based expertise, uses appropriate methodology, can be replicated and expanded upon, is documented, peer-reviewed and disseminated, and encourages critical reflection.

The above-mentioned authors all provide valuable insights into the integration of scholarship, but an integrated framework for scholarship still seems elusive. Figure 6.2 tentatively provides such a framework^{xii}.



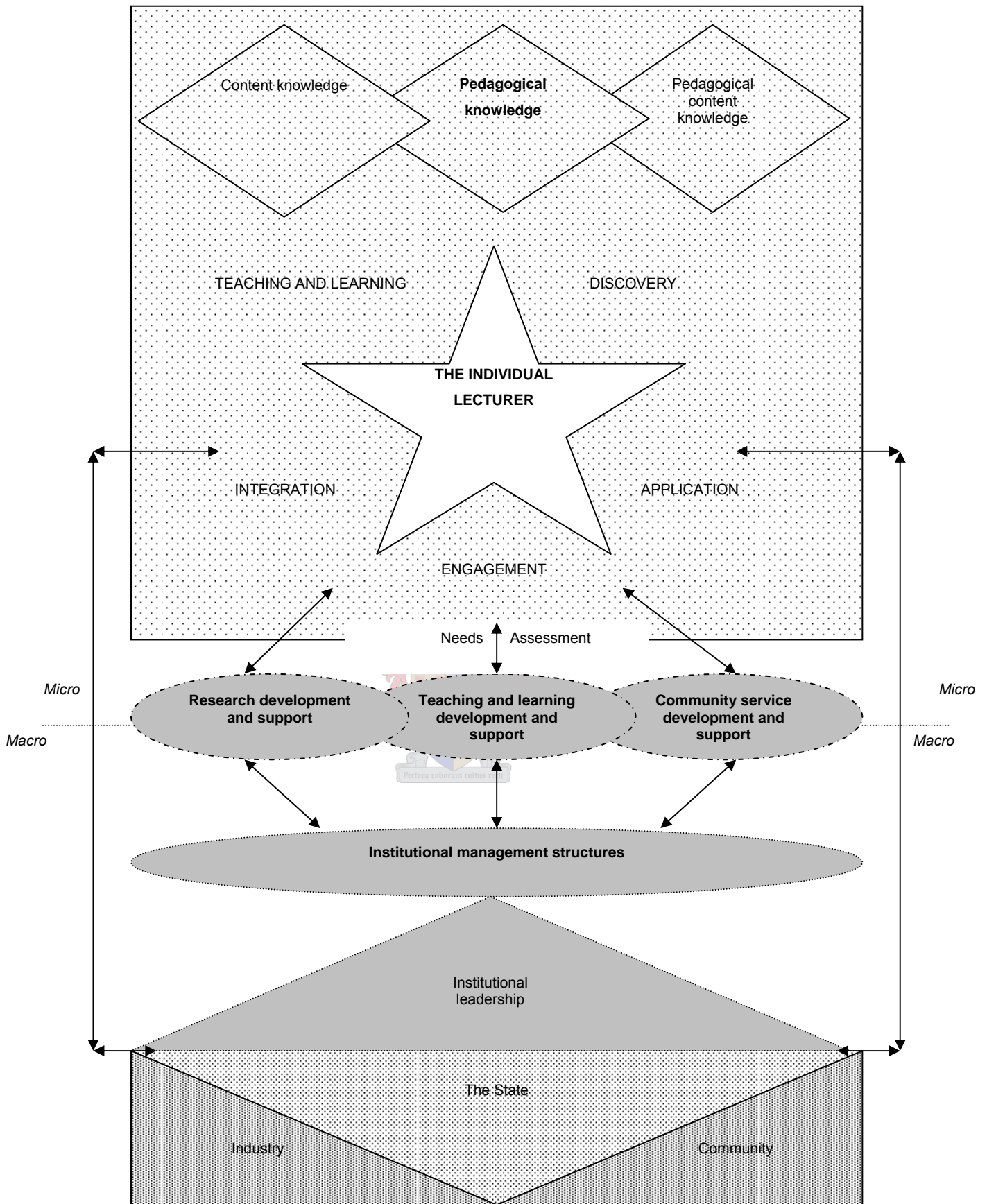


Figure 6.2: An integrated framework for scholarship in higher education

The tentative framework for the integration of scholarship presented in Figure 6.2 places the individual academic at the centre of the scholarship framework. The context for scholarship is formed and supported around the academic, rather than the academic being at the receiving end of a managerially driven system (as in Figure 6.1). The notions of academic freedom and accountability lie with the individual, rather than within an institutional structure. This redistribution of scholarly power does, however, not necessarily lessen the importance of national or institutional imperatives – it merely empowers the individual lecturer to negotiate a professional identity within the existing structures. A more diffuse and flexible system is suggested that will incorporate all facets of the higher education environment in greater synergy with the various scholarship components.

The implications for the higher education system, should such an integrated scholarship framework be adopted, can be summarised as follows:

- An integrated framework of scholarship in higher education in South Africa will have to be nationally debated, negotiated and implemented. Buy-in from all stakeholders (the State, higher education institutions, the lecturers themselves) is necessary for such an approach to succeed. Advances are, however, possible within an institution itself.
- An integrated approach to scholarship in higher education demands a greater emphasis on leadership than management within an institution.
- A flexible, integrated system implies that change should come from within – from the lecturers themselves. Benjamin (2000) refers to this principle as “critical reflexivity” and Badley (2003: 305) calls it “going meta”. In such a case scholarship is not a fragmented and institutionalised imperative, but an internalised vision of each scholar that is facilitated by fluid and collaborating institutional mechanisms.
- Existing institutional structures may need to be reconfigured to support scholarship development effectively.
- The CPD of lecturers is essential within an integrated framework of scholarship. Lecturers will need initial orientation, mentoring and continuous development in all (not only some) scholarship components.
- A rethinking of the current performance appraisal system may be necessary, as proposed by Bitzer (2004). Currently, research output is mostly measured in quantitative terms (for example, number of papers at conferences; number of publications). Mallard (2002), however, suggests that more emphasis should be placed on a qualitative assessment of research output (where what is published, rather than how much is published). Although teaching output is to a certain extent also measured quantitatively (number of classes, student numbers and student throughput), various authors (Atkinson, 2001; Bitzer, 2004; Trigwell *et al.*, 2000) call for qualitative teaching measures (such as portfolios, or

professional profiles). The variance between quantitative and qualitative measures of scholarship components seems to be an exercise of comparing apples to pears, figuratively speaking. An improved alignment of the appraisal of scholarship components is suggested (for instance by means of PDPs).

- In accordance with a possible restructuring of the performance appraisal system, incentives, rewards and funding also need to be revisited if scholarship is truly to be integrated. A true scholar will therefore not necessarily be the most outstanding researcher, nor the most profound teacher, or the most community-involved member of staff. A scholar who truly integrates academic practice will need to find an eloquent balance between these components. Many an (unbalanced) academic has posed the counter argument that this juggling act breeds mediocrity, but even within a globalised, massified, diverse and market-driven South African higher education system the core business of any academic remains research, teaching and service (as it is included in the above-mentioned university mission statement).
- An integrated system affords a more flexible interpretation of all the scholarship roles. What counts as research may be widened to include research in the scholar's education practices: teaching can be transformed into supervising/leading undergraduate research projects, and service can include the dissemination of scholarly work, to industry and an inter-disciplinary community of scholars.
- An integrated system of scholarship implies a balance between the various components of scholarship – both in the extent to which the various components of scholarly practice are developed and how they are practised. It may be necessary to redefine these components within a specific institutional context and even discipline.
- The scholarship of engagement needs to be included more effectively in academic practice. Current literature seems to focus on service learning as the key concept in the scholarship of engagement. Case studies of good practice of service learning need to be documented. Service learning may, however, not be a viable option in all contexts. Other forms of practising the scholarship of engagement need to be investigated, debated, developed and documented.
- The scholarship of teaching needs to be valued as an integral part of scholarly practice in an integrated framework of scholarship. The best possible training will not make a sustainable impact if lecturers themselves do not value the contribution teaching (and learning) can make to their scholarly development and stature.
- Peer review of teaching (as advocated by Atkinson, 2001) needs to be investigated and debated within a specific context if it is to become an evaluative measure used in both teaching and research.

- The debate around quantity versus quality in research will need to continue in an integrated framework of scholarship. All disciplines will need to contribute to this debate in order to gain a holistic picture of the reality in South Africa.
- Sustainable ways of developing the scholarship of integration and application need to be investigated within an institutional context. The current managerial approach (as typified in Figure 6.1) does not lead to the effective incorporation of these components in academic practice. Integration of and collaboration between the academic support structures can facilitate the improved use and distribution of knowledge as created and developed within universities.
- Scholarly endeavours that build and sustain collegial collaboration need to be acknowledged and even rewarded.
- It is suggested that CPD initiatives be developed that promote the integrated practice of scholarship but are differentiated according to the level of expertise of the lecturer. Lecturers at different levels of expertise may have dissimilar developmental needs that require varied approaches to CPD to enhance the integration of scholarship.

Boyer's (1990) Carnegie Report entitled *Scholarship Revisited* served as a starting point for many debates and scholarly inquiries into the practice of scholarship in higher education across the globe. Global and local changes that have had an impact on higher education necessitate continuous debate on how scholarship is envisioned and practised within a specific context – as Andresen (2000: 141) explains: “[S]cholarly knowing, about anything whatsoever, is never final, but always subject to public scrutiny, discussion, reconsideration, and perhaps change.” Revisiting scholarship in South African higher education demands an inclusive (scholarly) debate on what it means to be a scholar in the specific context.

The changed idea of a university has had a profound influence on the concept of scholarship (Webster & Mosoetsa, 2002). Global influences of a market-driven economy have spilled over into the education sector. The idea of knowledge for the sake of knowledge has had to make way for a fast-paced system that is accountable to both the public (State) and industry. Universities cannot ignore the pressure – from both industry and the public – to produce globally competitive professionals. The post-1994 transformation in South African higher education has evidently led to a more managerial approach in the local higher education sector. As a result, scholarship has been fragmented into ‘manageable’ components.

The irony of the situation is that lecturers are still expected to fulfil all the scholarly roles and responsibilities as originally described by Boyer (1990), even though the expectations of the system itself have changed. Research evidence suggests that lecturers are not coping with juggling their scholarship roles amidst these changes. They tend to find short-term coping

mechanisms that could be detrimental to their long-term scholarly development and discipline. If integrated scholarship is to be achieved in the context of South African higher education, systemic changes may be necessary to support lecturers. Integrated scholarship demands a greater emphasis on support and facilitation, rather than on governance. Visionary leadership, rather than management, is needed to revive integrated scholarship for the generations of scholars to come.

All of these suggested future changes add up to a fundamental shift in CPD providers' vision, purpose and mission, as proposed by Berge, De Verneil, Berge, Davis and Smith (2002), Cervero (2000) and Daley and Mott (2000). CPD has an advantage over other stages of professional development in promoting effective practice. There are more so-called 'teachable moments' when professionals are most likely to be aware of a need for improved practice. But this natural advantage can only be exploited if CPD moves beyond the mere update model in terms of content and educational design. Moyo *et al.* (1997) state that induction programmes alone are not sufficient to address the CPD needs of lecturers throughout their careers. Programmes that provide a systematic grounding in knowledge and skills and build on current practices should follow the induction process and capitalise on teachable moments.

Berge *et al.* (2002), Cervero (2000) and Daley and Mott (2000) propose an expanded vision to eliminate the current gap between CPD and actual professional practice. CPD should form a part of the entire process of learning that continues throughout the lifespan, with the CPD provider as a bridge between continuing development and professional practice. A shift in purpose from providing educational programmes to improving the quality of client outcomes through improved professional practice is necessary. Education is only one of the components of this process. The professional's ability to make knowledge out of mere information, which can be transferred into the context of practice, must therefore also be developed and fostered. This calls for a more integrated, learner-centred and practice-centred role for CPD and the development of skills in education, evaluation and consultation. Cervero (2001) advises a move towards more problem-centred curricula, as opposed to a subject-centred curriculum. This will prevent a narrow-minded focus on content alone and ensure that what is attained in terms of knowledge, skills, attitude and improved performance forms an integrated whole. Only then might the professional's needs for competence, responsibility, skill and appropriate value systems be properly addressed through CPD.

6.2.5 The role of the university as organisation in facilitating integrated scholarship through continuing professional development

Battersby (1999) proposes the so-called 'learning organisation' as a possible mechanism in facilitating continued professional growth in the higher education context. The future context of

practice should be seen in terms of a balance between the university as a learning organisation and the individual science lecturer as a professional scholar. Therefore future research in CPD should focus on how to achieve this balance in the ever-changing academic practice arena. Cervero (2001), McDonald (2001), Mott (2001), Calman (2000) and Castle *et al.* (1998) state that CPD is still in its early development stages, with major growth and development expected in future. However, this important growth sector often goes unnoticed, as it is submerged in the workforce, takes place on a part-time basis and does not receive much publicity. Yet this growth trend is likely to continue in future and has far-reaching implications for the variety of providers associated with CPD. This applies for the situation in South Africa as well. Collaboration between providers seems to be the only viable option. Growth and development in CPD necessitate research to investigate and mould the context of practice.

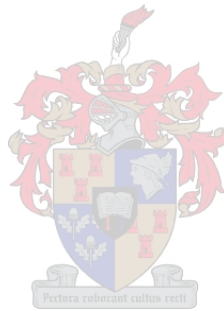
Terms such as *quality learning circles*, *total quality learning* and *organisational learning* are frequently used in current organisational jargon and indicate the importance and value of both individual and group learning within organisations. These types of organisations are currently expanding and will continue to do so in future. Stellenbosch University (1999) aims to be a learning organisation in that it tries to provide equal opportunities to all staff and encourages their career promotion by exposing them to relevant development programmes. Lifelong learning is a focal point in preparing staff to effectively meet the challenges presented by changing circumstances in higher education. The policy on staff development proposes a system of professional development contracts between individual staff members and the institution within the context of the performance management system (Stellenbosch University, 1999). This policy places a responsibility on the university as learning organisation in terms of CPD – not only as a provider, but also in creating a supportive environment for learning and development, which might be outside the traditional boundaries of the university.

Although there is a certain need for more prominence of CPD in organisations, it is only one determinant of improved professional performance and not the panacea to all workplace issues. Organisational culture plays a determining role in establishing a context for learning. It refers to how things are done and how people relate to each other. It implies a heritage, tradition, continuity and a consolidation of processes, practice and content. A change in organisational culture may sometimes be necessary for innovation, empowerment of employees, collaboration and group learning to flourish (Calman, 2000; McDonald, 2001). Stellenbosch University has faced major changes and challenges in the past decade (and will continue to do so in future) in terms of changing its organisational profile and culture in order to align itself with the broader South African society and to become a role-player in the global higher education sector. This has led to changes in professional practice and context and therefore also in lecturers' need for CPD.

Adams (2001), Cervero (2000), Sadler-Smith, Allinson and Hayes (2000), Battersby (1999) and Brew (1995) advocate that CPD needs to be aligned with individuals' learning needs and preferences, as well as with organisations' strategic directions. The struggle between a mere updating of knowledge and improving practice through CPD remains a central debate with no conclusive answer. The substance of learning is an important factor in any future research venture. What is expected to be learned, what is taught, what is actually learned and used in future practice are important considerations within CPD. The underlying rationales and modes of CPD delivery will have a significant effect on maintaining competence in any profession (Oliver & Aggleton, 2002; Teichler, 1999). Clarity on the extent to which CPD really takes place over life stages has yet to be determined. The impact of shorter pre-service education in higher education and more emphasis on lifelong continuing professional development on the competencies of learners must be addressed in future research, as it will have a determining influence on CPD provision and learning (Teichler, 1999).

Hake (1999), Livneh and Livneh (1999), Grzyb, Graham and Donaldson (1998) and Brew (1995) therefore recommend future research directed at CPD within organisations, as it no longer takes place within traditional educational zones only. This should include more informal types of learning and development. Moyo *et al.* (1997) propose that the demand for learner-centred approaches in higher education should lead to increased direct involvement of academic staff in the development of CPD programmes. This will enhance ownership, build credibility and create a partnership between the providers and receivers of CPD. Longitudinal studies are needed to determine whether participation in CPD can be contributed to either internal or external influences or personal or professional characteristics that change over time. Organisational culture, the practice setting, as well as life and career experiences or transitions, should be considered in these studies. Studies on learners themselves have focused on demographic and socio-economic characteristics, rather than on learner characteristics such as skills, values and attitudes. These results will have implications for prediction of participation, recruitment, curriculum development, instructional strategies, programme marketing and delivery, and finally participants' ability to integrate learning into practice. The development of a model that combines and explains this complex interplay will help CPD providers to effectively address the continuing educational needs of professionals and organisations. The evident values and attitudes that guide professional practice of lecturers in the natural sciences include academic freedom, scholarship, and attaining excellence through developing subject-specific expertise and promoting collaboration. These values and attitudes need to be taken into account in any CPD initiative aimed at this particular target audience.

Figure 6.3^{xiii} presents the future context of practice in which a balance between a university (such as Stellenbosch University) as a learning organisation and the individual natural science lecturer as a professional is proposed. When either the one or the other carries more weight, it will disrupt the balance of the CPD context and limit the provision of and opportunities for CPD that address the needs of both the organisation and the individual.



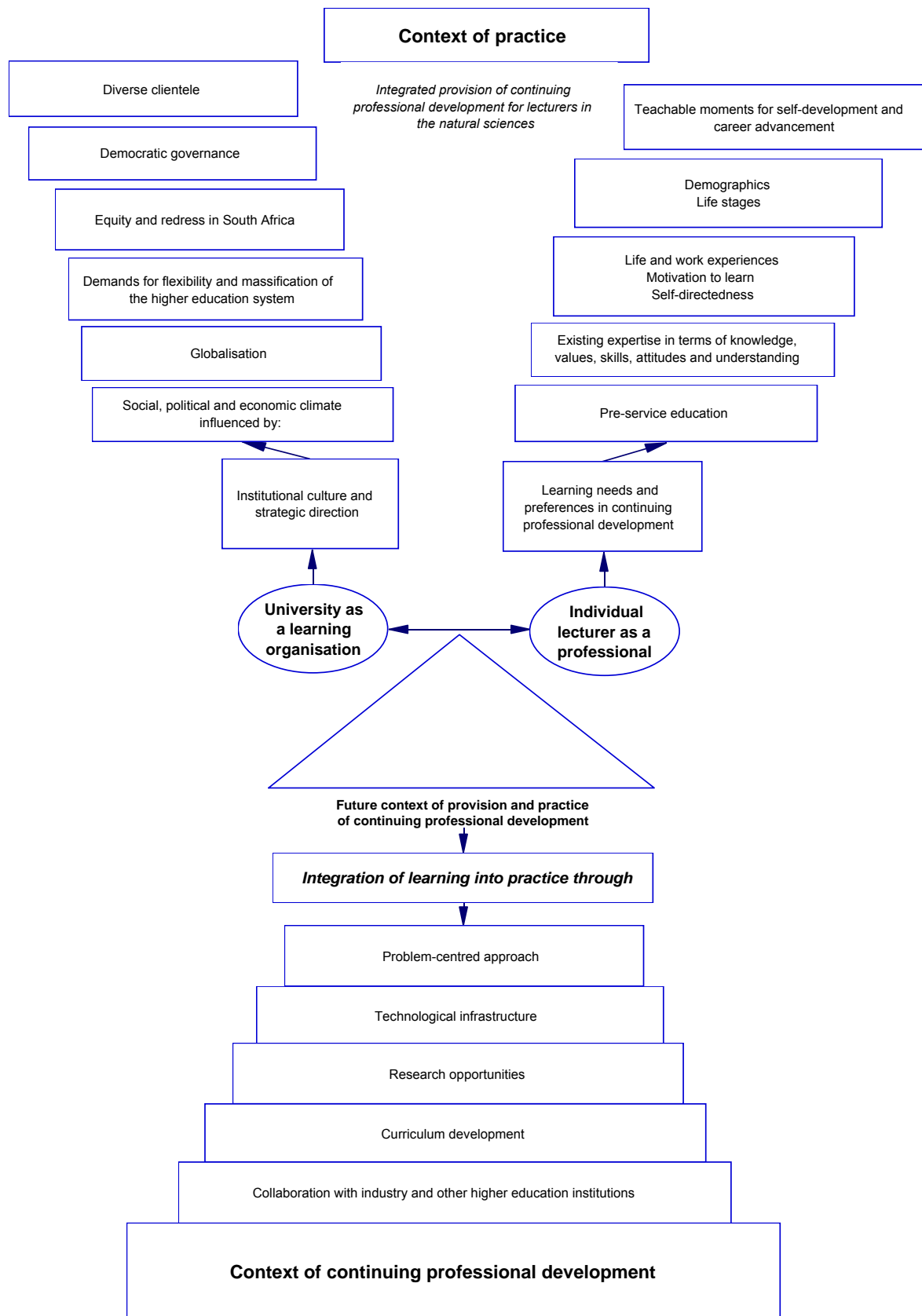


Figure 6.3: The future context of practice – a balancing act between the organisation and the individual

Figure 6.3 shows that the process of balancing organisational and individual needs will open opportunities for innovation and collaboration and promote the integration of scholarship. CPD

then becomes more than organising workshops and organising speakers. Its mission then becomes the identification of problems in professional practice and determining how education can contribute to professional development and the improvement of client service in an uncertain, confusing and dynamic world of practice as described by De Verneil *et al.* (2002), Cervero (2000), and Daley and Mott (2000).

6.3 THE ROLE OF EXPERT LECTURERS AND THEIR FUNCTION IN THE FUTURE OF HIGHER EDUCATION

Socio-economic and cultural changes have had an influence on the nature of professional practice and have given rise to new ethical issues. These changes have obvious advantages to the development within professions acting in a consumer-driven global world, but at the same time they have led to fragmentation and the manipulation of standards for political reasons (such as external regulations and policies). Moreover, they have weakened professionals' claim to a comprehensive body of expert knowledge (Beatty, 2001; McDonald, 2001; Daley, 2000; Kachingwe, 2000; Lawler, 2000). The added strain of an increasingly critical client base places the professional in a vulnerable position (Cervero, 2001).

6.3.1 The expert lecturer as a guardian of ethical and competent practice

The common reaction of a profession to demands for accountability is usually the development of a code of ethical conduct, prescribed and guarded by experts in the discipline. How this approach to enhancing accountability can be developed for the higher education context in general, and the natural sciences in particular, presents a major challenge. In this regard, the future role of the South African Council for Natural Scientific Professions (SACNASP) will be interesting to follow. The SACNASP has an existing code of conduct, but its current sphere of influence and direct role in higher education and CPD seem to be limited. The code of conduct expects professional conduct of registered members that reflects the dignity, standing and reputation of the profession at all times. It also requires the fulfilment of duties to employers and clients to the best of the professionals' abilities and consideration for public safety and health. Professionals should not advertise their services or undertake work for which they are inadequately trained or for which they do not have the necessary experience. The code expects professionals to refrain from any malicious or negligent conduct that would harm, directly or indirectly, the business, reputation or prospects of any other person or organisation. Professional natural scientists should refuse to disclose confidential information concerning any person or organisation acquired in the course of their professional practice under the code of conduct prescribed by the SACNASP (South African Council for Natural Scientific Professions, 2003). This code of conduct seems to be universally applicable to all natural scientists, but the professionals who find themselves in the higher education sector of practice will have to negotiate compatibility between the imperatives of the professional organisation and those of

the higher education institution. Lecturers are involved in a wider context of practice with more diverse roles and responsibilities expected from the professional (such as teaching and engagement), which also need to be taken into account in conceptualising a code of conduct and CPD for this group of professionals.

Cervero (2001) indicates that CPD is increasingly used to regulate expertise in professional practice. Mott (2001) refers to the important role universities can play in terms of an increased demand for licensure and certification. They are in an advantageous position to provide this type of CPD, but they have to understand what motivates the professional to take part in such an endeavour.

What motivates professionals in academia to grow and develop continuously? Bitzer (2004) argues that reward and punishment (such as licensure and certification) are indicative of control rather than of increasing quality through intrinsic motivation and academic freedom. Self-improvement within the realm of academic freedom is indicative of lecturers' motivation to take part in CPD and develop their expertise. The study conducted amongst lecturers in the natural sciences confirmed that although reward and recognition are important factors, they should not come in the form of licensure and certification. This would be counter-productive and act more as a deterrent than a motivator in CPD. These professionals perceive themselves to be the guardians and transmitters of expertise in their specific disciplines, even though they might not be experts in all the scholarly roles they have to fulfil. Their subject-specific expertise does, however, award them a certain amount of academic freedom, which they value highly and which has a determining effect on the parameters of their professional development.

The debate around assurance of expertise and professional autonomy emphasises the importance of education embedded in context and the role of experiential learning in the continuous development of responsible professionals. CPD as such offers the opportunity to make professionals aware of ethical issues and encourages dialogue in this regard (Lawler, 2000). Mott (2001) argues that CPD will only make a difference in the 21st century if ethics become a central issue. Professionals should investigate how other professions handle these issues and construct codes of ethics. This is especially important in higher education, as it deals with a wide variety of content areas and professions (Lawler, 2000).

6.3.2 The expert lecturer as scholar

The role of the expert would therefore not only be to provide subject-specific ethical professional practice itself, but also to be involved in the evolution and training of ethics as professional demands change over time. The following responses from lecturers in the natural sciences who

participated in the study demonstrate this integration of subject-specific knowledge and ethical practice into their professional conduct and practice:

Educating students (both at undergraduate and postgraduate levels). Training students in critical and deductive thinking. Stimulate interest and motivate students in a particular field (one that you feel qualified in). [Lecturer in Zoology with 5.5 years of academic experience]

To use my talents, training and experience to deliver a service to the advantage of the community and science. This service must at all times be of the highest ethical and academic standard. [Senior lecturer in Biochemistry with 14 years of academic experience]

The scholarships of teaching and engagement may be to the advantage of CPD. Academics were traditionally the elite of the profession, but current practice shows that they do not always maintain a current knowledge of the realities of practice. Expert practitioners may enrich the sources of knowledge beyond the boundaries of academia. The emphasis current systems place on research-based knowledge hinders a free flow of expertise between theory and practice (McDonald, 2001; Castle *et al.*, 1998). Daley and Mott (2000) propose the establishment of Centres for the Advancement of the Professional Practice to achieve this. These centres should be self-supporting, self-sustainable and include a multitude of services and expertise. The traditional role of higher education as the creator and transmitter of knowledge that can be generalised can then be expanded to enhance the knowledge capacities of individuals and professional communities through education, consultation and evaluation. Experts are therefore essential as collaborators in the training of future professionals and the community in general.

Evans, Ali, Singleton, Nolan and Bahrami (2002) propose appraisal of the professional as learner as a means of supporting professionals in identifying and meeting their learning needs. Bitzer (2004) refers to professional profiling (which is documented as a professional portfolio) as a means of professional appraisal. The unique nature of professional knowledge is that it is specific to a context and cannot always be taught. Therefore CPD should enable professionals to develop their own knowledge in their own practice. Cervero (2001) adds that the most effective models of CPD include opportunities for professionals to learn from and in their everyday work practice. Experts in a specific field could provide invaluable input, especially to novice professionals, where generalised initial training fails to address specific contextual situations – as indicated by the following respondent to the study:

It (CPD) must take into account the realities of teaching today, the pressure on lecturers because courses are changed every few years. Because lecturers only

really get recognition for research publications and not for teaching. That certain innovative practices just do not work with more than 100 students in a class. That there are many students sitting in class that simply aren't interested in the subject and want to pass it with the least possible effort. I think the CPD must be presented by people that have practice experience of being a lecturer. [Lecturer in Physics with 1.8 years of academic experience]

The different types of clientele for CPD may play a role in determining the future need for CPD. A clear differentiation between these types to provide CPD suited to their distinct needs may have to be established. How their motivation, capabilities and future life prospects change over time also needs consideration. This will indicate whether they are sufficiently motivated, or if additional incentives and/or support are needed (Teichler, 1999). Even within the natural sciences, the clientele for CPD are a heterogeneous group of professionals that see themselves as unique practitioners within their own fields of expertise. Needs assessments are therefore of the utmost importance. The roles and responsibilities of experts in the natural sciences in higher education are diverse and there are various external influences that determine the focus of professional practice in this sphere.

Figure 6.4 gives a concise graphic representation of the role of the expert in the higher education context, as could be determined from the data sourced from lecturers in the natural sciences at Stellenbosch University. It is clear that an integrated model of practice is currently followed and this will continue to be the case, at least in the near future. It not only complicates (and enriches) professional practice; it makes the strategic placing of CPD a complicated task. The role of the expert in the natural sciences in higher education seems to call for integrated as well as differentiated CPD provision. CPD would be integrated into the professional practice of the professional as part of lifelong learning in such an approach. It is suggested that CPD be differentiated according to the different needs of the individual expert in terms of level of expertise, priorities in roles and responsibilities and demands of the specific discipline in which the professional practices. A needs-based approach to CPD is therefore proposed.

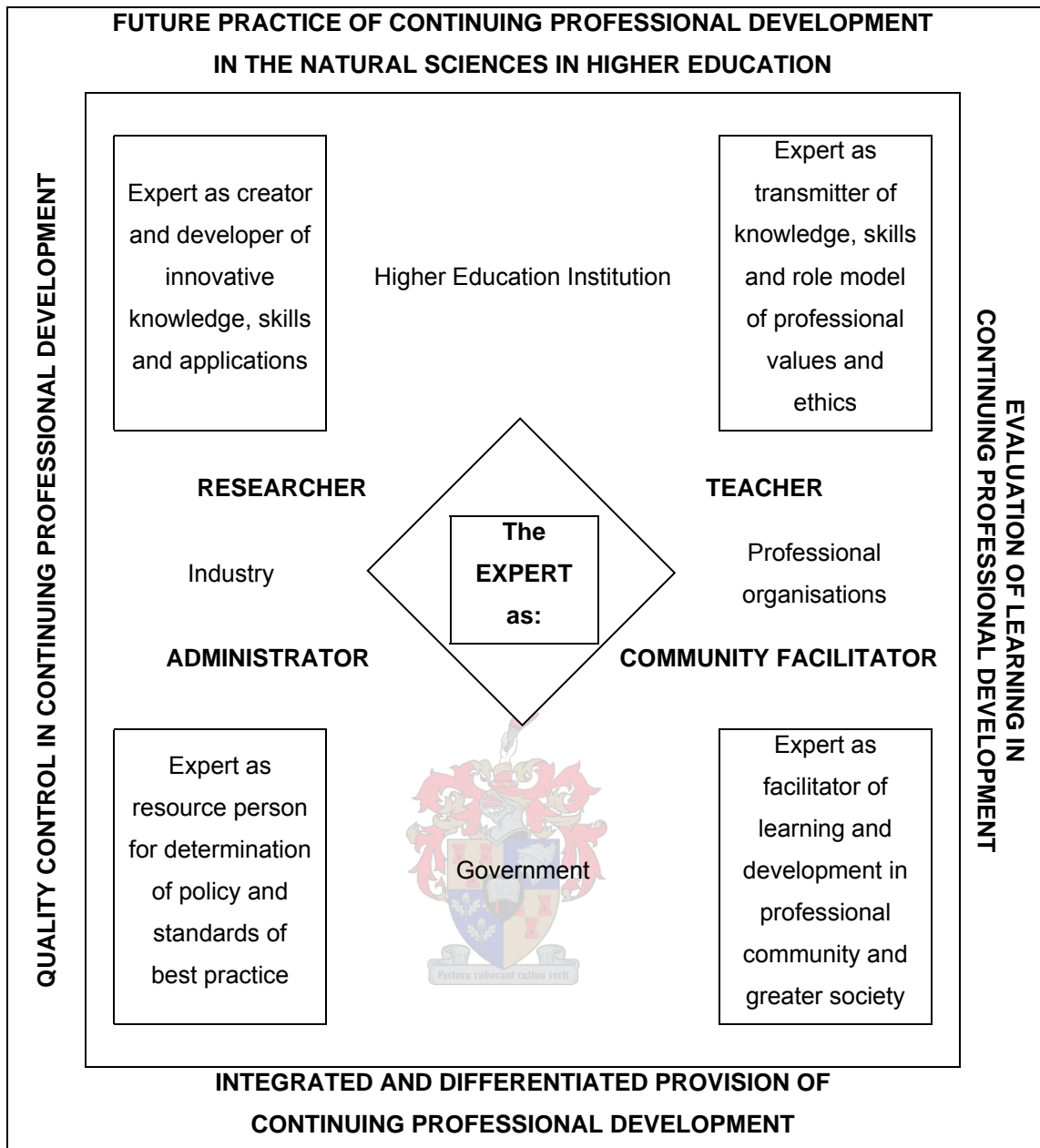


Figure 6.4: The role of the expert lecturer in scholarly professional practice in the academic setting

The role of the expert in the natural sciences in higher education is diverse, complex and integrated into every practice at various levels. Experts are indispensable in terms of their input as transmitters, facilitators, resource persons and creative developers in their various roles. They mould the future context of practice. It therefore becomes clear that professional experts have an important role to play in the future of CPD and the higher education context as a whole.

6.4 THE EDUCATION OF EXPERT LECTURERS IN THE NATURAL SCIENCES IN HIGHER EDUCATION

At present, too few professionals learn throughout their careers and the opportunities to encourage this quest are less than optimal (Novikov, 1999). Is CPD the answer? CPD constitutes the longest period of lifelong learning and as such it is the phase during which there is likely to be the greatest change in practice. But we still need to determine to what extent CPD is a substitute and a catalyst for work-based learning and how it complements it. Novikov (1999) suggests that professional education at all levels (including the pre-service level) become mutually complementary and so form a continuum of lifelong learning. This process should start off at the pre-service level and continue till the professional forms a significant part of a learning community, as is illustrated in Figure 6.5.

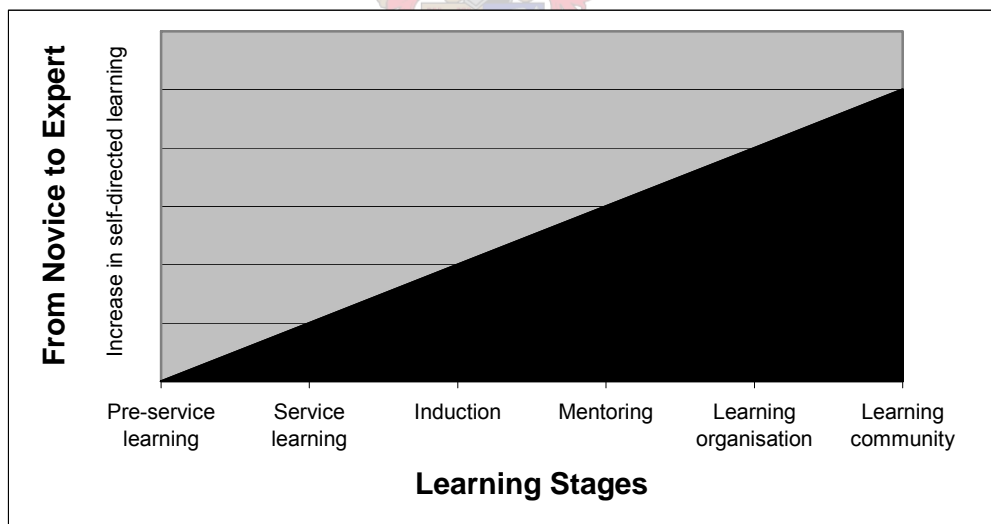


Figure 6.5: The continuum of lifelong learning for professionals (Adapted from Novikov, 1999, McDonald, 2001 & Knox, 2000)

Pre-service learning forms an important conceptual base for CPD (McDonald, 2001). CPD will only be effective if it is related to the level of general education already achieved and the time at which it was done (Odini, 1999). CPD is not merely an extension of pre-service education (McDonald, 2001), nor is it a substitute for preliminary education (Odini, 1999). Bridging the gap between pre- and in-service education may lead to a lifelong educational continuum. This is

beneficial in several ways. The transition between pre-professional education and in-service education can be facilitated more effectively. The characteristics of occupations need to be recognised, which will then inform CPD within those professions. A learning continuum can facilitate the design of CPD in order to encourage and sustain lifelong learning and increase self-directed learning along the continuum. Learning communities may assist professionals in seeking opportunities to engage in these collaborative efforts. Career development can be fostered when there is a common understanding of professionals' learning and transformation processes. A perspective of CPD that encompasses lifelong learning facilitates the development of professionals in all their life roles (Knox, 2000).

Various forms of scholarship lie at the centre of academic practice. Doctoral studies as part of pre-service education form an important part of the preparation for academic practice^{xiv}. It follows logically that these studies should prepare the student to become a scholar in the full sense of the word. However, research related to doctoral studies, debates on doctoral education, and reported practices indicate a strong research focus at the doctoral level – which points to an emphasis on the scholarship of discovery in future scholars' preparation for academic practice. It is therefore not surprising that the literature on scholarship itself tends to focus on other forms of scholarship (especially teaching) as undervalued components of academic practice. The Faculty of Science at Stellenbosch University is used to illustrate that the current emphasis on research output, innovation and throughput in doctoral training does not adequately prepare its candidature for academic practice. It is argued that if the pinnacle of postgraduate studies (a doctoral degree) does not adequately prepare future academics for practice, other forms of in-service training need to be developed. Hoggart (1957: 244) commented that "(t)he scholarship student has been trained like a circus horse, for scholarship winning". The roles of doctoral programmes and continuing professional development in becoming a scholar are discussed in the following part of the chapter.

The process of becoming a scholar (as described by Barnacle, 2005) entails moving from being a scholarship student to becoming a responsible scholar (Lin & Cranton, 2005; Lovitts, 2005). But what does it mean to be a scholar in academe, and how does a person become a scholar?

The meaning of scholarship and scholarly development has been at the centre of debates and studies in higher education for at least two decades. The seminal work of Boyer (1990) and later Rice (2002; 1996; 1991) and Diamond (1999; 1993) identified and described various scholarship roles, including the scholarship of discovery, teaching (and learning), application and integration. Lynton (1995) and Lynton and Driscoll (1999) added the notion of a scholarship of engagement. Various authors (O'Meara & Rice, 2005; Badley, 2003; Sorcinelli, 2002; Zahorski, 2002) refer to the ideal of an integrated approach to scholarship that balances the

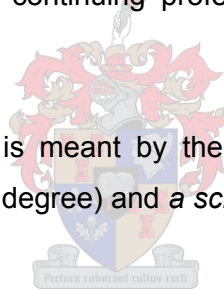
various scholarly roles. These scholarship roles need to be contextualised against the backdrop of a specific discipline (as advocated by Diamond, 2002; Rice, 2002; Paulsen, 2001 and Andresen, 2000) – contextualised within the natural sciences at one South African university in the case of this study.

The central questions addressed in this section are:

- Does a doctorate in the natural sciences prepare a person to become a scholar in the full sense of the word?
- If not, what can be done to facilitate scholarly development in the natural sciences?

It is argued that being a responsible scholar entails a commitment to lifelong learning and being part of a scholarly community. The initiation into this community of practice takes place through doctoral studies. The natural sciences within a specific institutional setting is used to illustrate that scholarly development through postgraduate (doctoral) training is limited, as there is a singular focus on the scholarship of discovery within doctoral programmes. Two approaches are considered in addressing the issue of scholarly development: a change in postgraduate programme format, and the role of continuing professional development within the specific institutional setting.

First it is important to define what is meant by the central terminology, namely a *doctoral graduate* (having obtained a doctoral degree) and a *scholar*. This will form the point of departure for the arguments that follow.



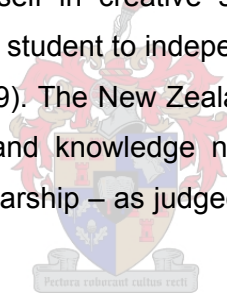
6.4.1 The doctorate: Process or product?

The origins of a doctorate, or doctor of philosophy (PhD as it is referred to in the natural sciences context), can be traced back to the ancient Greek words *philos* referring to a form of love, and *sophia* meaning wisdom. Therefore, philosophy implies the love of wisdom, and a philosopher can be described as a lover of wisdom (Barnacle, 2005). Barnacle (2005) describes the essence of a doctor of philosophy as a perpetual desire and search for wisdom. The term *wisdom* in itself entails more than mere knowledge; it refers to a comprehensive understanding of knowledge, sound judgement, and insight. A doctor of philosophy is therefore more than a mechanic of knowledge, but can judge knowledge and advise with insight.

Barnacle (2005) adds another interesting dimension to what constitutes a doctorate – that of becoming. Becoming implies movement over time, progression, and transformation. This process of becoming can take on various forms, such as a professional doctorate (which can be described as a doctorate aimed at practising professionals and one that contains coursework components), or a more traditional PhD (which refers to a mostly research-based programme)

(Lester, 2004; Neumann, 2005). The central question, irrespective of the programme format, remains the same: what is the postgraduate student becoming through the doctoral experience?

Various contemporary definitions of a doctoral degree can be found in literature. The British view on a traditional PhD focuses on the development of professional researchers (Bourner, Bowden & Laing, 2001) who, through the creation and interpretation of knowledge within a discipline, will eventually be able to conceptualise, design and implement projects (United Kingdom Quality Assurance Agency for Higher Education, 2001). The Australasian Qualifications Framework Advisory Board (1998: 53) also emphasises the undertaking of an original research project that results in a significant contribution to knowledge and/or the application thereof within a specific discipline. Lovitts (2005: 138, referring to the Association of American Universities 1998 definition) describes the PhD as "... a research degree, one that signifies that the recipient has acquired the capacity to make independent contributions to knowledge through original research and scholarship". This definition corresponds to that of the United States of America Council of Graduate Schools (1977, as quoted in Bargar & Duncan, 1982: 1), which refers to the main purpose of a PhD as a preparation for "a lifetime of intellectual inquiry that manifests itself in creative scholarship and research", and with its completion marks "the transition from student to independent scholar" (United States of America Council of Graduate Schools, 1995: 9). The New Zealand Qualifications Authority (2001) refers to the development of both skills and knowledge necessary for an original contribution to knowledge through research or scholarship – as judged by independent experts and by utilising international standards.



The importance of independent and original research in doctoral studies is thus evident in all these definitions. Even though scholarship is mentioned regularly, the emphasis on the scholarship of discovery through research is prominent in all of the cited definitions. It can therefore be expected that scholarly development in the doctorate will largely be limited to that of the scholarship of discovery.

There seems to be a worldwide trend for doctoral studies to be aimed at the development of the candidate as a researcher, as examples from Europe (Enders, 2005; Enders & De Weert, 2004), Britain (Enders, 2005; Henkel, 2005; Leonard, Becker & Coate, 2005; McAlpine & Norton, 2006), the USA (Manathunga, Lant & Mellick, 2006; Enders, 2005; Lovitts, 2005), Canada (McAlpine & Norton, 2006), and Australia (Barron & Zeegers, 2006; Manathunga *et al.*, 2006; Alpert & Kamins, 2004; Lizzio & Wilson, 2004; Kemp, 1999) indicate. This trend is driven by the increasing pressure to trade in knowledge as a commodity, where universities take on an entrepreneurial role in commercialising research findings through partnerships with industry. Doctoral candidates become key contributors in creating prosperity through innovation and

consequently a doctoral degree becomes a product rather than a process (Barnacle, 2005). These trends inevitably lead to a focus on the development of the scholarship of discovery through research in doctoral programmes. It is, however, arguable whether this focused approach to doctoral development adequately prepares the student for becoming a responsible scholar in academic practice. The transferability of the doctoral experience to academic practice (and the various scholarly roles therein) comes into question^{xv}.

6.4.2 The scholar: What's in a name?

Scholarship is a multi-dimensional concept and the scholar is expected to negotiate what Barnett (2000, in Harris, 2005: 426) describes as “dynamic relationships between social and epistemological interests and structures”. Scholarly identity is therefore a product of an individual's values and beliefs, as well as institutional culture and positioning of the particular discipline. Developing a scholarly identity has become increasingly difficult in an academic environment that makes multiple demands on the scholar (Harris, 2005), but with research as “the strongest academic currency in higher education” (Henkel, 2005: 164). Scholarly development and identity therefore tend to focus heavily on the scholarship of discovery in a specific discipline (Andresen, 2000).

Alpert and Kamins (2004), Kember and Leung (2005) and Leonard *et al.* (2005) argue that the development expected to take place in a doctoral programme entails more than acquiring the knowledge base of a specific discipline – it also encompasses generic skills that should enable the student to think and act beyond the knowledge boundaries of the discipline. The question arises as to whether current doctoral programmes enable students to develop the generic skills expected of a responsible scholar in academe.

Barnacle (2005) argues that an instrumental approach to knowledge in doctoral education removes the student from the knowledge and the knowing, which is contrary to integrative models of learning (as proposed by Barnett, 1997 and Schön, 1983). Such an approach inhibits the transformative power of knowledge, as eloquently stated by Barnacle (2005):

We need to situate Doctoral candidates for the knowledge economy but in such a way that we also engage fully with the potential of Doctoral becoming. An account of Doctoral becoming that treats the learning outcomes purely as a commodity is impoverished, and misses the real import of the learning experience: that it is transformative.

McClintock (2003) argues that the education system has failed higher degree students in this regard in that they are not prepared to take care of their responsibilities as scholars independently. Lin and Cranton (2005: 449) refer to this state in the following way: “[B]eing

educated is associated with knowing lots of things rather than knowing how to think about those things.”

Lin and Cranton (2005: 453) further state that meaning is created through experience. If doctoral candidates are only given the opportunity to experience a certain kind of scholarship, they will be ill prepared to practise other forms of scholarly activities in academe (Le Grange, Greyling & Kok, 2006). The integration of scholarly roles can easily become a dilemma for the academic, especially at novice level. McAlpine and Norton (2006: 8) comment on this situation in the following way:

... learning to deal with greater demands for productivity, scrutiny of performance, and expectations for excellence in teaching as well as research ... they are trying to balance these factors and situate themselves in their new community of practice ... While academics are aware it is their research skills, not their teaching abilities, which will lead to success in the academic world, they are still expected to spend a great deal of time teaching courses as well as supervising students. Yet, they may not have been socialized to perceive supervision as a teaching responsibility or have thought about their discipline in terms of learning or teaching tasks. This historic disregard for developing pedagogical expertise during doctoral education results in academics having little or no opportunity to learn how to support their own doctoral students ...

It is therefore not surprising that the international debates on scholarship seem to focus on the scholarship of teaching (and in some cases learning) as a marginalised endeavour in academic practice (Bitzer, 2006; Harris, 2005; Kreber, 2005; 2003; 2001, Badley, 2003; Atkinson, 2001; Paulsen, 2001; Benjamin, 2000; Trigwell *et al.*, 2000), even though Christiansen and Slammert (2006) report that young academics are often burdened with high teaching loads. The teaching versus research debate also receives constant attention (Young, 2006; Robertson & Bond, 2005; Durning & Jenkins, 2005; Brew, 2003; Sorcinelli, 2002; Paulsen, 2001), while the scholarship of engagement (community service) features in some studies (Rice, 2002) as a scholarly activity. These reports, however, are more limited.

Academics in practice may be unwilling to change doctoral programmes they perceive as adequate and functional. They often have not received any training in supervision, and therefore employ supervisory approaches modelled on their own experiences as postgraduate students (Phelps, Fisher & Ellis, 2006). On the surface, it may seem that doctoral students are performing well and meeting the requirements of the programme (which are often externally determined on a national level). But the compliant student has not necessarily found his/her own scholarly voice, identity, or confidence (a vital step in becoming a responsible scholar).

According to Freire (1970), as quoted in Lin and Cranton (2005: 458), a responsible scholar “has the courage and confidence to take risks, to make mistakes, to invent and reinvent knowledge, and to pursue critical and lifelong inquiries in the world, with the world, and with each other”.

Do doctoral candidates receive adequate preparation to become responsible scholars? There seems to be limited research on the usefulness and effect of gaining a doctorate over time (Leonard *et al.*, 2005; McAlpine & Norton, 2006). Most policy documents are formulated from the assumption that the doctoral student will become a researcher (McAlpine & Norton, 2006; Leonard *et al.*, 2005). This is also the case in South Africa, where the South African Department of Education (2004), as well as the National Research Foundation (1998) promotes research training as the foundation of a doctorate degree. In addition, the higher education environment itself has contributed to this emphasis on research in doctoral education, as a doctorate has become a requirement for credibility, a basis for taking part in research-related activities, and a prerequisite for an academic position (Leonard *et al.*, 2005).

Institutional conceptions of research and doctoral education are commonly built on the assumption that the apprenticeship model is followed (Barron & Zeegers, 2006; McCormack, 2004; Phelps, *et al.*, 2006). Nixon (1990, in Lizzio & Wilson, 2004) refers to the apprenticeship model as the scientist-practitioner model. This model is most often used to train future professionals in the sciences. The model focuses on applying science and scientific findings to practice through acculturation into the discipline by following a master (the supervisor), but it disregards the affective, intuitive and ethical elements integral to professional competence (Max-Neef, 2005). Lizzio and Wilson (2004: 470) emphasise the affective and experiential nature of learning that informs practice and which leads to “adaptive flexibility”. Lizzio and Wilson (2004) argue that traditional educational processes add little value to the development of students’ applied metacognitive ability – that is, awareness and control over implementing their knowledge in a practical and unpredictable professional setting, and subsequent reflection in performance. In practice this means that scientists have to cope within institutions that have become varied, flexible and open in structure. Career trajectories are less predictable as a result. Enders and De Weert (2004) argue that these changes have a direct impact on research training. Doctoral candidates still need competence in research design and techniques, but also generic skills. Tensions may result from the difference between institutional demands and student needs, which Brew (2001: 13) describes as “ the potential of research to transform the lives of practitioners through their engaging with ideas over a long period of time and the pressure to bring work to a speedy conclusion”.

The apprenticeship model presumes a one-size-fits-all linear approach to research, which disregards the intricacies of the transformation that takes place in postgraduate learning (McCormack, 2004). The current challenge to postgraduate education is ensuring that educational imperatives of quality are not sacrificed due to market-related forces that demand output and massification of higher education (Barron & Zeegers, 2006).

Enders and De Weert (2004), however, take a broader view on career development in the sciences. They argue that there are marked inter-related changes that will have a significant impact on doctoral education and therefore on the possible contribution of the doctorate to scholarly development. Firstly, the introduction of policies aimed at addressing the singular focus on disciplinary specific research of the apprenticeship model of doctoral education is becoming more commonplace. Secondly, the employability of doctoral candidates outside the traditional realm of academe has become a concern to the majority of higher education institutions worldwide. A one size fits all approach to doctoral education may therefore not be suitable any longer. The influence on higher education of external stakeholders as employers of the doctoral graduates is also seen to gain impetus. The third aspect relates to the increasingly blurred boundaries within the academic environment, and between the academic environment and other fields of professional practice. The increasing diversity in institutional and inter-institutional structures warrants a constant re-interpretation of what scholarship means, and what contribution a doctorate makes to becoming a scholar. These arguments are supported by Manathunga *et al.* (2006), who promote an interdisciplinary approach to doctoral pedagogy.

If scholarship is still *de rigueur* in academe, the question arises how scholarly development can be enhanced. The following section investigates two options by which the various forms of scholarship can be developed: through changes in doctoral education itself, and through continuing professional development (CPD). Transdisciplinarity is proposed as a mechanism through which scholarly development can be enhanced in both doctoral education and CPD.

6.4.3 The future of scholarly development

Lizzio and Wilson (2004) comment on the reality shock that commonly occurs when graduates enter the workforce. Their assumptions about work are often challenged and proven inaccurate, which could lead to work-related stress and even burnout. What role does the university play in professional socialisation in order to prevent such stressors? The answer to this question lies on two levels, namely the initial preparation of the future scholar during doctoral education, and at a later stage support for the academic through continuing professional development (CPD).

There are two possible ways of addressing the lack of scholarly development during postgraduate education – one being a change in the philosophy and structure of doctoral

programmes, the other placing more emphasis on a holistic approach to scholarly development within academic practice through CPD.

6.4.3.1 Changes in doctoral programmes

McAlpine and Norton (2006) call for a reconsideration of curricula and support structures (such as funding) in doctoral education. Various forms of doctoral programmes currently exist worldwide, varying between the traditional project or research-based doctoral, and the more structured programmes that include coursework and sometimes interdisciplinary components (Enders, 2005; Lester, 2004; Manathunga *et al.*, 2006; McAlpine & Norton, 2006). Enders and De Weert (2004) argue that a uniform structure for doctoral education may not be the ideal, as national contexts and disciplinary cultures warrant a variety of programme structures. However, higher education institutions need to consider how best to address the variety of roles and relationships expected of the doctoral graduate, and whether the traditional thesis format is still the best way by which to disseminate knowledge. Hybrid forms of the doctorate need to be investigated.

Enders (2005) promotes doctoral education that incorporates research training, knowledge dissemination and preparation for diverse career options. Alpert and Kamins (2004) support this view by arguing that coursework included in a doctoral programme broadens and deepens the student's knowledge of research in general and develops the subtle skills of judging the quality of research. Manathunga *et al.* (2006) add that an interdisciplinary approach to doctoral education promotes higher order thinking, an understanding of divergent epistemologies and creative problem-solving behaviour. It cannot be assumed that doctoral candidates will necessarily already possess, or will be able to develop, these scholarly skills during traditional doctoral training of a thesis-only approach.

There are, however, various counter-arguments to a more structured approach to doctoral education. McAlpine and Norton (2006), Enders (2005), and Enders and De Weert (2004) are of the opinion that a significant portion of doctoral graduates do not enter academic practice, but progress to industry or other research organisations^{xvi}. These graduates would therefore have limited use for an approach that integrates the development of various forms of academic scholarship into doctoral education. Alpert and Kamins (2004) add that coursework components in doctoral programmes can be perceived as dogmatic – which is counterproductive to original thought and contribution imperative to this level of education. McAlpine and Norton (2006) and Leonard *et al.* (2005) also found that doctoral studies consisting of only a research project tended to have a shorter completion time than doctoral programmes that incorporated compulsory coursework and non-research-related skills development. The current emphasis on throughput rates will strengthen the argument for an approach that facilitates the shortest

possible completion time. Manathunga *et al.* (2006) state that students may find the demands of coursework and a research project overwhelming and may struggle to negotiate divergent views and expectations of supervisors in an interdisciplinary environment.

But training for research cannot be seen in isolation from the wider academic environment.

Enders (2005: 121) notes:

‘Research training and career’ are not an independent commodity but a tightly dependent variable presupposing a well functioning university system, adequate resources for teaching and research, and developed links with society and the market place.

It takes ‘balanced’ scholars to develop, maintain and function within such a complex system. A research-focused initial education may therefore be inadequate in preparing the future scholar for academic practice or the wider work environment outside academe. We therefore need to consider alternative forms of developing scholars. The notion of CPD may provide us with some answers to the conundrum of integrating all forms of scholarship into academe.

6.4.3.2 The role of continuing professional development in scholarship

Continuing professional development (CPD) becomes the obvious vehicle for facilitating the integration of scholarship roles in academic practice, especially if Henkel’s (2004: 180) description of the construction of the academic identity as “a career-long ‘project’” is considered. CPD can take on an individualised approach, or a collaborative group format. The focus of this section will fall on the more collaborative approach to scholarship development through CPD.

Jawitz (2007), Christiansen and Slammert (2006), Johnson (2006) and Sorcinelli (2002) advocate collegiality as a way through which scholarly development and work can be fostered.

Johnson (2006: 60) describes collegiality as –

... the special practices of a community of scholars or academics, since it refers to their professional autonomy, their quest for knowledge and their recognition of working together, whether formally or informally, in striving towards their scholarly accomplishments ... it appears to be a useful way of coming to grips with what might be changing as ‘managerialism’ enters the lives of academics.

Collins (2000, as quoted in Christiansen & Slammert, 2006: 17) refers to this type of collegiality as “interaction rituals”, where scholars obtain both emotional energy and cultural capital to further their scholarly development. Intellectually engaging communities arguably provide more opportunities for scholarly development than incentives or financial support. Incentives and

financial support are usually mostly accessible to the minority of established academics already immersed in mainly the scholarship of discovery.

Jawitz (2007: 186) uses the situated cognition theory to explain how collegial learning can take place in professional practice. The idea of a community of practice is central to the situated cognition theory. Wenger (1998) makes an important contribution to the understanding of communities of practice. The components of a social theory of learning that form the basis for Wenger's (1998: 5) notion of communities of practice include the elements of *meaning* (how individuals and/or groups communicate on understanding the world and essentially what is considered as meaningful), *practice* (the sharing of historical and social resources, frameworks and perspectives that can sustain all stakeholders' engagement in action), *community* (with reference to specific social configurations that influence what is seen as worthwhile actions and within which competence is defined and recognised), and *identity* (how learning leads to change and creates personal histories of becoming in the context of a particular community)^{xvii}.

Communities of practice can be facilitated by creating shared spaces for critical discourse – for example conference participation, tearoom discussions, interdisciplinary research groups, journal clubs, regular seminars, and mentoring programmes. These spaces are to serve as a place of belonging and a sounding-board for scholars (Christiansen & Slammert, 2006; Johnson, 2006; Sorcinelli, 2002). Dotterer (2002) adds that undergraduate research can also be used to foster collegial collaboration and integrate scholarship. Henkel (2004) adds that the proliferation of research centres and institutes as structures that cut across disciplinary divides is evidence of a more network-based approach to academic practice and scholarly development.

Scientists can no longer afford to have a singular focus on their own development as researchers, as Henkel (2004: 174) observes:

Educational responsibilities extend into continuing education, advanced professional education, lifelong learning and the public understanding of science ... scientists will increasingly be required to explain and justify their work more fully and to more varied constituencies ... Many will be required to negotiate their agendas with multiple stakeholders.

Jawitz (2007), however, warns that communities of practice are still fragmented according to scholarly divisions in academe, with little integration taking place in practice. Harris (2005) holds the view that key social institutions are geared towards the individual rather than the group. The novice academic often has to choose a specific career trajectory according to the fragmented communities of practice structured within a department. The research community often

becomes the community of choice, as it is the community for which the young academic has been trained in doctoral education. Furthermore, the research community affords more status and opportunities for promotion than other communities – such as teaching or engagement. The trend set during doctoral education therefore easily becomes legitimised in eventual professional practice through acculturation into a distinct academic tribe (McAlpine & Norton, 2006).

Enders and De Weert (2004: 135) attest to the importance of disciplinary environment (the tribe, as described by Becher & Trowler, 2001) as a so-called ‘invisible community’. There needs to be sensitivity to differences between disciplines (tribes) and any CPD initiatives ought to take cognisance of the nested context of an individual within a department, which is in turn nested in an institution and the larger societal context (McAlpine & Norton, 2006). Scholarship, however, remains generic across disciplines (Andresen, 2000: 138). Harris (2005) advises that scholars “need to find ways of exchanging ideas and ways of working within and across disciplines and institutions which are underpinned by shared values and understandings about the moral purpose of working in academia”.

6.4.3.3 Transdisciplinarity as route to scholarly development

Manathunga *et al.* (2006)^{xviii} and Max-Neef (2005) argue that the greater problems facing science and society will not be solved if they are viewed from a uni-disciplinary stance. Willis (2005, as quoted in Gould, 2006: 242) warns that a singular disciplinary focus may be an orthodox approach that stifles creativity:

The real political debates in academe have to do not with voting behaviour but with the social implications of scholarly and pedagogical methods and disciplinary paradigms. And those debates are too often settled, or stifled, by the ubiquitous tendency of academic departments to exclude or marginalise scholars whose approach diverges from prevailing orthodoxy ... Nor is the phenomenon absent from the hard sciences: It may be harder for a camel to pass through the eye of a needle than for a biologist working on something other than the genome to get a job or a grant these days.

Even multi-disciplinary approaches have limited utility, as the epistemology and therefore ingrained language of the disciplines involved remain stagnant (Max-Neef, 2005). Gould (2006) adds that job security and promotion usually reside within departmental and disciplinary boundaries, wherein a jury of peers reside who value scholarly work. Andresen (2000), however, argues that the notion of scholarship transcends disciplinary boundaries.

Transdisciplinarity provides a possible route through which scholars can develop at both the postgraduate and practice levels in the academic milieu. Transdisciplinarity, as promoted by Max-Neef (2005)^{xix} and Henkel (2004), has significant implications for both doctoral education and CPD thereafter.

Transdisciplinarity has created room for the integration of scholarship of academics – especially in their supervisory capacity. Henkel (2004) goes further in stating that even the traditional views of scholarly roles have come under scrutiny as demands on academics have multiplied. As a result, it has become increasingly difficult to integrate all forms of scholarship expected of an academic. New roles and relationships have emerged, although scientists remain grounded in the epistemological and value frameworks established during their postgraduate education. Transdisciplinarity demands that supervisors identify and provide for both their students' research and educational needs. The shift in emphasis from Mode 1 (basic) to Mode 2 (applied) knowledge in recent times (Enders, 2005; Enders & De Weert, 2004; Gibbons, 1998) and public demands for higher education accountability (Barron & Zeegers, 2006) pressurises the academic to relate to the world outside the traditional disciplinary community. Henkel (2004: 179) summarises the need for a more integrated view:

In this way they may be more prepared to confront the political changes in the world of research, a task for which they will need skills not just of presentation but of argument that can incorporate the perspectives of multiple worlds.

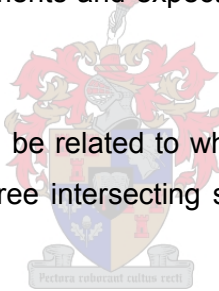
Andresen's (2000) distinction between scholarship at the micro (disciplinary) and macro (trans-disciplinary) levels may be useful in understanding and integrating scholarship. Henkel's (2004) conceptualisation of academic identity adds to our understanding of scholarly development. Henkel (2005) emphasises the importance of communities of practice in establishing scholarly identity. The individual's identity is established at the micro-level (discipline) through a self-regulating community of peers – the foundation of this identity being doctoral education. The public identity (at the macro-level), which extends to forms of scholarship beyond that of discovery, is built on this initial foundation. The community into which the doctoral candidate is initiated remains important, as it forms the values and epistemic basis on which interaction with the wider scholarly community is built – even if the disciplinary self-regulated influence has faded somewhat in recent times due to larger social, economic and environmental factors impacting on higher education (Henkel, 2004). Doctoral education is still important in developing a scholarly identity and it will influence how scholarship is viewed in later academic life.

Values are central to identity development (Henkel, 2005). Max-Neef (2004)^{xx} places values at the highest level of transdisciplinarity, and therefore it could be argued that values need not be governed by one discipline alone. Values can be grounded in and informed by a variety of

disciplinary underpinnings, although an individual's identity tends to remain rooted in a particular discipline (Henkel, 2005).

The autonomy and the related notion of academic freedom are basic values on which academic identity and practice are built, but Harris (2005) warns that traditional conceptions of these values are no longer feasible in academic practice. Enders and De Weert (2004) pose an interesting argument on academic autonomy that has implications for the future development of scholars. They argue that the traditional views of professional autonomy and academic freedom need to be repositioned as a result of institutional boundaries that have become more permeable to external influences. As a result, the influence of the singular discipline and the doctoral thesis as an original contribution in the particular field need to adjust to a more transdisciplinary approach positioned within a wider community of practice. The production of knowledge may take on a different and varied form in comparison to previously accepted proof of doctoral competence (Enders, 2005). Autonomy assumes a collective meaning as research agendas become governed by national policies, industry and the wider society. In doctoral education transdisciplinarity implies that "students are being exposed to a greater variety of values, choices and working environments and expected to develop a wider range of skills and knowledge" (Henkel, 2004: 176).

The concept of transdisciplinarity can be related to what Lee, Green and Brennan (2000) refer as a hybrid curriculum, where the three intersecting spheres of university, profession and the workplace infuse doctoral education.



Transdisciplinarity provides room for innovative and integrated scholarly development in both doctoral education and CPD.

The discussed literature provides suggestions on how scholarship in the full sense of the word can be revived and fostered, but limited literature could be found that focuses directly on the holistic development of scholars through doctoral programmes. A brief case study of the doctoral programmes at the Faculty of Science at one South African university illustrates why this may be the case.

6.4.3.4 Scholarly development of lecturers at the Faculty of Science at Stellenbosch University
 Stellenbosch University is a historically advantaged South African university^{xxi}. The university vision guides its scholars to commit themselves to academic excellence in South Africa, the wider Africa and the global community. The mission of Stellenbosch University states that its purpose is to be a place where the academic ideal of excellent scholarly and scientific practice is created and sustained, and an environment within which knowledge can be discovered,

shared and applied to the benefit of the community – thus integrated scholarship. The values that Stellenbosch University underscores include scholarship, which is described as research, teaching, community service and management, and which is characterised by the kind of objectivity and critical thinking intrinsic to excellent scholarly and scientific practice.

The university structure is governed by a top-down managerial approach, which is supported by three centres/divisions: the Division for Research Development, the Centre for Teaching and Learning, and the Division for Community Interaction. These distinct divisions in the institutional structure mark a subsequent distinct division of the scholarship roles. The individual academic becomes responsible for integrating his/her scholarship roles. Little support is provided for the integration – a situation characteristic of what Bitzer (2006: 384) calls “very little mutual reinforcement” in university management structures.

The Faculty of Science consists of eight departments, organised according to disciplinary divisions (including Biochemistry, Botany and Zoology, Chemistry and Polymer Science, Geology, Mathematical Sciences, Microbiology, Physics, and Physiological Sciences). The faculty has a strong academic tradition of research. The mission and vision of the Faculty of Science at Stellenbosch University emphasise the centrality of research in developing the faculty as a noteworthy role player in the international community of science. The faculty mission promotes research of an inter-disciplinary nature. Teaching and community interaction are mentioned as part of the faculty mission, but no mention is made of how faculty members are prepared to fulfil these components of the mission. The delivery of employable graduates is noted as a specific mission of the faculty.

An analysis of the annual research reports of the faculty of the past five years indicates that the doctoral degrees awarded in this period focused on discipline-specific research topics. Some of the departments work in closer collaboration with industry than others. The focus on either Mode 1 or Mode 2 research or both (as described by Gibbons, 1998) is therefore not universal throughout the faculty.

The doctoral output of the faculty indicates a current (2007) total of 190 registered doctoral candidates, with the majority registered as full-time residential students (only 17 are registered as part-time students). Over the past five years, an average of 30 students per year registered for the doctoral programme, whilst an average of 28.4 students completed their doctoral studies each year. The average completion time for doctoral students at the particular faculty is 3.28 years. This brief overview of doctoral activities within the faculty is indicative of the emphasis on research output and throughput. The high percentage of full-time versus part-time doctoral students and the relatively fast throughput rate are noteworthy. These figures compare well to

those presented by Mouton (2007), who found that 54% of South African doctoral candidates in the natural and agricultural sciences complete their studies within four years of initial registration.

The philosophical and practical emphasis on research within the faculty has a determining influence on how doctoral education is conducted. The doctoral programmes within the Faculty of Science at Stellenbosch University follow an apprenticeship model of doctoral education. A doctoral candidate is expected to complete a research project that is reported in the traditional thesis format, although publication of research findings in reputable journals is encouraged. The so-called 'publish or perish' phenomenon is particularly apparent in this faculty at the academic staff level. Doctoral students are socialised into the academic culture that stature is determined by publication output.

A strong positivist philosophy and discipline-based approach underlies doctoral education at the faculty. No evidence could be found of a true transdisciplinary approach to doctoral education. The doctoral candidate is assessed on the grounds of a submitted dissertation, followed by an oral examination. No mention is made in the Year Calendar of scholarly development beyond that of discovery, although generic skills' development in terms of independent thought, and scientific, language and electronic communication are mentioned as outcomes for all programmes in the faculty (including both under- and postgraduate programmes).

The predominant research culture leads to the enculturation of doctoral students into the scholarship of discovery. It could be argued that the more traditional approach to doctoral studies limits scholarly development in other facets of scholarship. In view of the vested interest of various stakeholders in the current system (which includes government, industry, disciplinary communities, and current academics educated in the established manner), it is unlikely that this approach will change. This would, however, be a limited perspective of doctoral development in the natural sciences.

Some students are employed on a voluntary basis by their supervisors as demonstrators in undergraduate practical classes, or as tutors in tutorial sessions – although this does not formally form part of the doctoral programme. Scholarly activities focused on engagement also do not form part of the doctoral curriculum, although in a limited number of cases doctoral students may come into contact with such projects if their supervisor's research group is involved in outreach programmes. Although the formalised doctoral education at the particular faculty focuses on research (and therefore the development of the scholarship of discovery), learning also takes place informally. Learning and development that take place in terms of

teaching and engagement is mostly of an informal nature and is limited to students who volunteer for such endeavours, or form part of research groups that engage in such activities.

In the cases where there is close collaboration with industry, and sometimes with communities in solving research problems, doctoral students are provided with opportunities to engage with the wider society through research-based practice – thus they are able to integrate research and practice.

The predominance of research groups (albeit within disciplinary boundaries) is evidence of the capacity of these scientists to work effectively in groups and integrate various increments of a more complex overarching problem that forms the focus of the research. The research group provides support and a critical space to the individual doctoral student and serves as an entry point into a collegial community of practice. The generic skills related to group activities learned in this manner can be translated into other forms of academic practice and therefore into the development of other forms of scholarship (such as teaching and engagement).

The drive for publication as an integral part of scholarly stature in the specific context may also have positive spin-offs in developing other forms of scholarship. Inherent aspects of the research to publication process – such as rigour and peer review – can be translated into building quality into other forms of scholarship (as promoted by Rice, 2002 and Paulsen, 2001). The current approach to doctoral education may provide scope for development that lies outside the traditional boundaries of a specific discipline. However, the informal and highly contextualised nature of doctoral education creates unequal opportunities for doctoral students to develop their scholarly abilities in a holistic manner. Furthermore, we cannot assume that doctoral students will be able to transcend the chasms that have been created between the different forms of scholarship themselves.

At present, doctoral education within the studied context of natural sciences at Stellenbosch University tends to focus on the completion and reporting of a research project. It is unlikely that a change in doctoral education philosophy and structure is a foreseeable option for scholarly development in the studied context. The scholarship of discovery will continue to be emphasised in doctoral education in the specific context. Even though valuable generic skills may be learned in the process, little attention is given to the holistic and integrated scholarly development of the doctoral candidature. We can therefore not expect these doctoral candidates to function optimally in all the scholarly roles they are expected to fulfil upon entering academic practice. The discussed literature and the case study presented above indicate that the current doctoral education does not seem to prepare future academics adequately for the multiple scholarly roles they will need to fulfil in practice – even though there are opportunities

for informal learning during doctoral education. The potential of CPD as a mechanism through which academics can grow into practice therefore needs further investigation.

The chosen route for the development of scholarship starts with how a doctorate is defined. Whether we see a doctorate as a journey or as a destination determines whether it can be used to stimulate development in different scholarly roles.

The approach to doctoral education in the Faculty of Science is indicative of an apprenticeship model of doctoral education, which may have limited success in preparing the scholars of the future. A significant change in the philosophy, pedagogy and structure of doctoral programmes at the particular faculty is not expected in the near future. This situation limits doctoral education itself as the only viable option for scholarship development. Other forms of in-service development therefore need to be implemented if integrated scholarship is to become a reality in the specific context.

CPD is presented as an in-service way in which scholarship can be developed and promoted. Group initiatives that use the notion of communities of practice are presented as viable forms of developing scholars.

These forms of development are, however, not without problems. Individual and disciplinary differences need to be taken into account – a one-size-fits-all approach in both doctoral education and CPD will probably not be the most optimal option for scholarly development. The current emphasis on research output as the driver of promotion and stature in the academic environment further hampers any effort to integrate scholarship. There is a need for acknowledgement of the various forms of scholarship, a drive to integrate the various scholarly roles, and a promotion of collegiality and transdisciplinary collaboration by the institutional management and individual academics if holistic scholarship is to become a reality in higher education.

Scholarship may need to be redefined in the light of the changing academic environment. Academics no longer work in isolation, but have to negotiate the blurred boundaries between disciplines and between the institution and the wider world of work. Transdisciplinarity offers one route through which academic (disciplinary) tribes can widen their scholarly scope.

Future debates on scholarly development and integration may have to focus on the potential contribution of theories of transdisciplinarity in both doctoral education and continuing professional development in the natural sciences. The academic environment can ill afford scholarly becoming through both doctoral and professional education that has been reduced to

linear, reductionistic modes of knowledge acquisition. The role of education as an epistemological boundary broker between traditional disciplinary divides might need further exploration. The time has arrived for the scholarship student to become more than a circus horse, as described by Hoggart (1957). The responsible scholar who transcends disciplinary boundaries will be the true winner of the future.

6.5 MAINTAINING EXPERT LECTURERS' LEVEL OF COMPETENCE

A change in terminology may be needed to change the cafeteria-style approach that is currently associated with CPD. The ever changing and dynamic world in which today's professionals and organisations need to function requires a long-term, integrated view and a focus on continuing professional development (CPD) that may help to refocus the field from a reactive to a more proactive approach. This will promote lifelong learning within a so-called 'seamless curriculum', where working and learning can blend in a natural progression. Individual practitioners, assisted by experts, can then plan their own career path in a flexible manner (McDonald, 2001; Battersby, 1999).

Daley (2001), Calman (2000) and Daley (1999) clearly indicate that knowledge and professional practice interact in the learning process. Future research in this area needs to focus on the difference in learning practices as a professional progresses from novice to expert. It is still not clear if this progression results from events in the professional's life or as a result of natural developmental forces. Furthermore, if we support Cervero (1988) in his view that the purpose of CPD is the development of professional artistry, it is clear that the development of expertise in practice relies on the development of expertise in learning. This implies a need for more innovative facilitative and learning strategies through which knowledge will complement practice. It also necessitates research of a more critical nature concerning CPD and learning in general (Sadler-Smith *et al.*, 2000). New generation research, such as action research, critical learning communities, development of portfolios, recording of life histories and naturalistic research are emerging as forms of research that incorporate reflective practice and collaborative elements (Ferraro, 2000; Castle *et al.*, 1998). These trends in research might define the future approaches to learning and training, to which CPD is no exception. Knox (2000) proposes research on the discrepancies between current and desirable professional education programmes as a promising direction for research.

Teichler (1999) argues that comparative research is needed to explain differences in enrolment between countries and between professions within higher education. The role of the socio-political climate and institutional culture in the provision of and participation in CPD requires further investigation. The context of CPD goes beyond the First World. According to Alemna (2001)^{xxii} CPD in developing countries should be taken even more seriously than in developed

countries. In the latter case, CPD is already regarded as a normal practice in professions, whereas this is not the case in African countries in particular. There is often a lack of a clearly defined national policy and interdisciplinary collaboration (Alemna, 2001). South Africa does have various policies in place that do address these issues, most notably the White Paper 3: A programme for the transformation of higher education (1997), the Higher Education Act (no. 101 of 1997), the South African Qualifications Authority Act of 1995, the Skills Development Act (no. 97 of 1998), the Skills Development Levies Act of 1999, and the National Plan for Higher Education Transformation (2001), as described in Mapesela and Hay (2005).

Maintaining competence extends beyond understanding national policies. It also involves curriculum development. Oдини (1999) argues that curricula should not merely mirror those of developed countries, but should meet the needs of the specific country and the challenges to professional practice. A curriculum should, however, be academically acceptable internationally and should inform its participants of international standards, trends and developments (Oдини, 1999). This is of specific relevance to Stellenbosch University as part of the South African higher education sector, as South Africa is attempting to redress past inequity through an integrated system of education and training (Boughey in Gravett & Geysler, 2004; National Research Foundation, 2004), and is also striving to be competitive in the international arena (Boughey in Gravett & Geysler, 2004; Stellenbosch University, 2000). Global competitiveness involves not only training more graduates, but also ensuring favourable enrolment patterns. In South Africa this means increasing the number of learners specifically in the natural sciences (Boughey in Gravett & Geysler, 2004), which will considerably increase the workload of the target population of the study. On the one hand, lecturers have to be able to cope with an increasingly diverse learner clientele in the classroom and engage with communities influenced by their practice. On the other hand, they need to produce research output that is on par with international standards. Thus the context presents a variety of challenges in terms of knowledge, skills and attitudes towards scholarship, professional practice and continuing development. Mapesela and Hay (2005) note that the White Paper 3: A programme for the transformation of higher education (1997) expects institutions to indicate how teaching, research, management, governance and infrastructure capacity will be built and developed to cope with the above-mentioned changes and challenges. Specific mention is made of institutional planning for sabbaticals, conference attendance, as well as academic and contact visits to develop academics' capacity.

Hake (1999) makes an interesting contribution to this debate. The author proposes that future CPD research and efforts should be directed at populations that are most at risk of social exclusion from CPD. These groups include re-entering women, ethnic minorities and older working adults. Groups, such as young male adults, whose qualifications were traditionally

thought to enjoy bureaucratic career security, but who now have to plan for flexible careers, should also be included. Research needs to focus on opportunity structures and allocation mechanisms that facilitate or hinder the access of these groups to CPD. CPD initiatives will have to find ways of addressing these issues, if they are to effectively reach these professionals.

The development of expertise in the various scholarly roles of a lecturer identified in Figure 4 has led to different needs in terms of CPD. Competency and expertise in terms of these roles and responsibilities can be achieved in various ways. The development of expertise in the various forms of scholarship will now be discussed in greater depth.

6.5.1 Maintaining competence in the scholarship of discovery

Eshiwani (1999) argues that innovation and knowledge creation may play a determining role in the future success of higher education on the African continent. Intellectual capacity building in research needs to take place through an increased emphasis on research, a deliberate effort to train researchers, and a drive to disseminate research findings (Eshiwani, 1999).

Within the research context, most CPD initiatives do not currently fall within the formal programme format. The individual professional in the natural sciences is expected to start off with a minimum qualification of a master's degree, but more often a doctorate. This initial education is supplemented with national and international exposure through conference attendance and delivering of research papers, postgraduate research supervision and building of a research team, and the publication of subject-specific research articles in reputable and accredited journals. In future the need for CPD in this sphere of practice will therefore centre on aspects that will facilitate success in these endeavours.

Collaboration, as mentioned earlier, is commonly seen as a factor that contributes to scholarly development. Research collaboration may provide the impetus for the maintenance of competence in the scholarship of discovery. Mouton (2000) promotes research collaboration as a way in which to maintain and develop research expertise. Research collaboration is seen as a cost-effective way of conducting research, as a way of sharing expertise in the light of growing specialisation, and as a mechanism for facilitating interaction between scientists. Katz and Martin (1997) cite six reasons that serve as motivators for research collaboration:

- the rising costs associated with research endeavours;
- the increased mobility of scientists brought about by cost-effective global travel and communication mechanisms;
- the need for science as a social institution to grow through the maintenance of professional networks;

- the increased need for specialisation in certain areas of science (for example high-energy physics);
- the growing need for the development of interdisciplinary knowledge areas (such as biotechnology); and
- political factors that influence the growing integration of science through collaboration.

Mouton (2000) adds that the political history of South Africa plays a contributing role in the need for collaboration and integration in science in the South African higher education sector. He argues that the previous South African government policy isolated South African scientists from the international science, which added difficulty to the geographical isolation that had already removed them from the international playing field (Mouton, 2000). The policy of apartheid also had a negative impact on a national level, as it created polarisation and inequalities within the national higher education system. Current policy documents – such as the 1996 White Paper on Science and Technology (Republic of South Africa, 1996) – therefore emphasise mechanisms and incentives to increase research collaboration amongst scientists as a way in which to address these issues. Transdisciplinary initiatives are specifically mentioned as a mechanism to stimulate innovation and address current socio-economic challenges.

Mouton (2000) notes difficulties within the practice of collaboration – starting with the question of what is meant by research collaboration – despite the general consensus in literature on the positive contribution of collaboration to academic practice. It is therefore not surprising that Mouton (2000) found that relatively low levels of inter-disciplinary^{xxiii}, inter-institutional, and inter-sectoral collaboration existed within and between South African higher education institutions^{xxiv}. Differences between science cultures were more significant than any other variable (gender, age or qualification) in terms of research collaboration^{xxv}.

Mouton (2000) did, however, find that the natural sciences had an above-average occurrence (49%) of co-authored publications (in comparison to other discipline groups such as the humanities). There was also a moderately positive correlation between multiple authorship and research output. Natural sciences furthermore had the highest mean number of collaborators (2.02 in comparison to the sample average of 1.36). The reported collaboration in Mouton's (2000) study was mostly confined within disciplinary and institutional boundaries. Transdisciplinary and inter-institutional research are limited.

Mouton's (2000) extensive study is valuable as it indicates the deficiencies in terms of research collaboration in South Africa in general and in the natural sciences in particular. It is encouraging to note that research collaboration seems to be the most prolific in the natural sciences, which provides scope for CPD initiatives that aim to maintain research competence

through collaborative efforts. Mouton (2000) recommends joint fund-raising as a mechanism to ensure sustained collaboration, as a joint effort demands joint and sustained commitment of all parties concerned.

6.5.2 Maintaining competence in the scholarship of teaching

The debate on professionalism in higher education is not new, but professional accreditation of teaching competence in higher education is a relatively novel idea. Although it is often met with great resistance, especially from the hard-core scientists such as those in the natural sciences, it does address their need for coping with their diverse clientele in the most effective way. It also promotes active teaching and learning in a setting where the traditional one-way transfer of knowledge through lectures was (and often still is) the main method of instruction (Brown, 1998b). Brew (1995) adds that accreditation can serve to recognise and reward development initiatives formally. Åkerlind (2007) notes an increase in compulsory teaching courses and/or qualifications for lecturers in higher education in the United Kingdom.

Quinn and Vorster (2004) recommend a strong and well-articulated theoretical foundation for CPD programmes for lecturers. Facilitators must be sensitive that participants, especially from fields such as the natural sciences, may find it bewildering and threatening to be challenged in terms of their paradigms and views. They may find it difficult to follow the discourse used in educational jargon. Facilitators must support participants to move beyond these constraints. Novices may not have enough experience to understand the theoretical foundations of their own disciplines fully and therefore may find it difficult to articulate these epistemologies. They may not have enough teaching experience on which to reflect and make a CPD programme such as a Postgraduate Certificate in Higher Education and Training (PGCHET) worthwhile. Novices may feel overwhelmed by the many new demands placed on their time and expertise. Initiatives such as the PGCHET should therefore rather be directed at lecturers with a few years of experience than absolute novices to academic practice. Mastering basic skills and developing confidence and an enthusiasm for teaching may be more appropriate at the novice level than developing reflective practice. Quinn and Vorster (2004), Moyo *et al.* (1997), Brew (1995) and Murray (1995) furthermore emphasise the importance of support if academic practices are to change in an ongoing and meaningful manner. This includes support from programme facilitators, but more importantly from top management and departments. Institutional policies on teaching and learning lend credibility to CPD initiatives in this regard and send out the message that teaching and learning are valued activities within the institution.

Moyo *et al.* (1997) support the introduction of an accredited, award-bearing programme in higher education as part of CPD for lecturers in higher education. Quinn and Vorster (2004) propose the Postgraduate Certificate in Higher Education and Training (PGCHET) as one

option to encourage and develop critical reflection in lecturers. The South African Standards Generating Body (SGB) for higher education and training has drawn up a set of unit standards for the PGCHET at Level 8.1 on the National Qualifications Framework (NQF) and of an equivalent of 120 credits. Quinn and Vorster (2004) describe the PGCHET (referring to the format presented at Rhodes University, South Africa) as a practice-based course that facilitates the professional development of lecturers in terms of learner assessment, evaluation of own practices, developing knowledge within the field of higher education and providing professional accreditation. Their research concluded that encouraging lecturers to reflect critically on their practices, to examine the epistemologies underlying their disciplines and the implications thereof for teaching and learning, and introducing them to a variety of theoretical frameworks can change their conceptions of teaching. However, Quinn and Vorster (2004) also warn that course facilitators of this type of CPD programme should understand the factors that inhibit or prevent lecturers from implementing new ideas and developing their professional practice in terms of teaching competence. Currently (2007) no PGCHET is offered at Stellenbosch University, but it is comparable to the MPhil (Higher Education) offered by the Centre for Higher and Adult Education at Stellenbosch University^{xxvi}. These two qualifications are compared in Table 6.1.

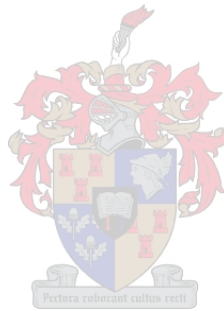


TABLE 6.1: Comparison between the Postgraduate Certificate in Higher Education and Training and the MPhil (Higher Education) as possible continuing professional development programmes in the development of lecturers in their teaching capacity, adapted from the Centre for Higher and Adult Education (2004), the Ministry of Education (2004) and Anon (2003)

Programme Attribute	Postgraduate Certificate in Higher Education and Training	MPhil (Higher Education)
NQF level	Level 8	Level 9
Format	Unit standards format This offers flexibility in terms of: <ul style="list-style-type: none"> - provision of SETA-funded skills programmes - ease of assessment of prior learning - use in qualifications in other fields. 	Programme format This is in accordance with the programme format that the rest of Stellenbosch University has followed in terms of outcomes-based higher education (HE).
Access to the qualification	A minimum of an NQF Level 6 qualification, or an NQF equivalent in the learner's main academic field(s) of expertise Persons wishing to pursue this qualification are assumed to have: <ul style="list-style-type: none"> - sufficient knowledge of their discipline to enable them to teach in an HET institution - proficiency in the language(s) of instruction. 	Potential participants must either have: <ul style="list-style-type: none"> - an applicable honours degree and be employed by an education or training institution, or - any other academic-professional combination of studies equal to an honours degree, or - reached a standard of competence in his/her particular study area.
Target group	Practitioners in Higher Education and Training (HET). It is aimed at persons with HET teaching experience at NQF Level 5 and above and persons who want to specialise in HET as a field of study. The target group includes in-service academic staff at HET institutions and academic staff registered for HET learnerships in terms of the Skills Development Act.	The programme is aimed at lecturers, learning facilitators and leaders of higher education institutions. Currently there are no national formalised requirements for teaching qualifications in the higher education field, therefore it is considered as a basis for institutional requirements.
Recognition of prior learning	Providers are required to develop structured means for the assessment of individual candidates on a case-by-case basis. Such procedures and the assessment of individual candidates must be subject to moderation.	Stellenbosch University is currently working on an institutional policy for the Assessment and Recognition of Prior Learning (RPL) and thus there are no conclusive institutional policy guidelines to assess RPL applications. A faculty procedure is used in the interim.
Purpose of the qualification	This qualification is intended to provide professional development and recognition for HET practitioners who lack formal HET teaching qualifications. It enables persons with high levels of discipline-related qualifications to qualify themselves for specific roles within HET.	The programme aims to equip participants with knowledge and skills that will enable them to function optimally in their professional capacities within the institutions where they are employed. Participants' research skills are developed, enabling them to gain access to advanced studies and a career in HE.

TABLE 6.1: (continued)

Programme Attribute	Postgraduate Certificate in Higher Education and Training	MPhil (Higher Education)
Learning outcomes	<p>This qualification will:</p> <ul style="list-style-type: none"> - facilitate the training and development of practitioners in HET and respond to the growing international recognition of the need for greater professionalism in HET - improve the quality of teaching, learning and assessment in HET in South Africa - contribute to the fostering and retention of professionally skilled teaching staff - contribute to attaining employment equity - enable HET practitioners to develop their knowledge in this field of study - enhance the accountability of HET practitioners to learners and the public by increasing their field-specific knowledge - serve as a point of articulation between discipline-specific qualifications and further higher level educator qualifications. 	<p>Critical generic outcomes:</p> <ul style="list-style-type: none"> - Self-management; problem solving; critical evaluation; effective communication; systemic thought <p>Specific outcomes:</p> <ul style="list-style-type: none"> - Knowledge of national and international perspectives on higher education - Insight into how learning takes place and how facilitation of learning influences learning outcomes in HE - Curriculum planning; programme-writing skills - An appreciation of the role of the modern lecturer - Planning and execution of tutoring and facilitation of learning - Knowledge of research traditions and effective use of research methodology in HE - Knowledge and application of skills in technology-based learning support and delivery - Knowledge and the implementation of assessment and evaluation techniques - Skills in planning and utilising staff evaluation and development strategies - Knowledge of and perspectives on leadership and leadership development in the HE environment.
Assessment	<p>Formative Assessment:</p> <ul style="list-style-type: none"> - The extent to which practitioners can teach competently and effectively in HET institutions - The extent to which practitioners have integrated the roles envisaged in each of the core unit standards and the chosen elective unit standards - The practitioners' applied competence, which refers to the ability to apply theoretical knowledge critically to their educational practice - Evidence of competencies will be collected by a range of assessment strategies that are appropriate to the purpose and NQF level of the qualification. <p>Summative Assessment:</p> <ul style="list-style-type: none"> - The acquisition/mastery of the competencies articulated in the relevant unit standards and their relevant assessment criteria - Each unit standard is equated to an exit level outcome. 	<p>Formative Assessment:</p> <ul style="list-style-type: none"> - Assignment completed within institutional contexts for Modules 1-10 - Group activities and tasks for each of the 10 modules during the two-week residential period at the beginning of each year - Learning sessions facilitated by the students during the residential period - Self-reflective study portfolios spanning the total time of study <p>Summative Assessment:</p> <ul style="list-style-type: none"> - A demonstration of the integration of acquired knowledge at the beginning of the third semester of study - A thesis on a chosen topic which focuses on an issue in Higher Education. This will also be examined orally in cases where the result might not be absolutely clear. The thesis can, alternatively, be replaced by a research portfolio consisting of advanced assignments, case studies and research reports, which should measure up to the scientific criteria for an academic article. This component will be examined orally.

TABLE 6.1: (continued)

Premature exit possibilities	Each unit standard is equated to an exit level outcome. Assessment criteria are detailed in each of the unit standards and therefore the Standards Generating Body did not produce additional assessment criteria for the exit level outcomes	All academic requirements must have been met to obtain a degree. A student must be registered for a minimum of two years. A learner can qualify for a Postgraduate Diploma in Education (PGDE) by completing all prescribed modules successfully, but without submitting a thesis.
Further study	After completing this qualification, practitioners will be eligible for admission to an MEd or equivalent qualification.	After completing this qualification, practitioners will be eligible for admission to a PhD.

Table 6.1 indicates that the two qualifications are comparable in terms of most aspects. There is, however, a difference in NQF levels and subsequently possible further studies. The PGCHET is at an honours level (NQF level 8) and therefore leads to an MEd or equivalent qualification in comparison to the MPhil (Higher Education), which is at a master's level (NQF Level 9) and can therefore lead to a PhD degree. Table 6.2 compares these two qualifications in terms of structure and credit values.

TABLE 6.2: Comparison between the Postgraduate Certificate in Higher Education and Training and the MPhil (Higher Education) in terms of structure and credit values, adapted from Anon (2003) and the Centre for Higher and Adult Education (2004)

Structure and credits of modules	Postgraduate Certificate in Higher Education and Training		MPhil (Higher Education)	
	Core unit standards (Compulsory)	Cr	Year 1	Cr
	Analyse HET mission, context & legislation	10	Perspectives on HE	9
	Interpret and design learning programmes and modules for HET	20	Programme/curriculum design	15
	Manage learning facilitation in HET	10	Teaching in HE	15
	Mediate and facilitate learning in HET	20	The learner in HE	15
	Mentor and advise learners in HET	10	Scholarship	15
	Conduct research into HET practice	10	Research methodology	15
	Design, develop and implement assessment of learning in HET	20		
	Elective unit standards (minimum 20 credits to be selected)		Year 2	
	Design and develop Web-based learning	10	Technology in HE	15
	Manage an HET learning programme	10	Assessment and evaluation	15
	Design and implement experiential learning in a workplace	10	Staff development in HE	15
	Supervise research in HET	10	Leadership in HE	15
	Moderate assessment	10	Thesis	105
	Total Credits	120	Total Credits	240

It is clear that the PGCHET is highly comparable to the MPhil (Higher Education). The thesis component in the latter programme makes the main difference in total credit values and therefore also in the possibilities for further study.

In terms of international comparability of the PGCHET, the Staff and Educational Development Association (SEDA) of Great Britain developed a scheme as late as 1994 that sets benchmarks for the field. The scheme is based on the submission of a portfolio of evidence (similar to that required in the PGCHET in South Africa) and the qualifications are called a Fellowship and an Associate Fellowship (the latter having only one third of the portfolio size of the former). The SEDA qualification is highly comparable to the PGCHET in terms of its standards and core objectives. However, the PGCHET includes additional aspects relevant to the South African context, such as a core unit standard on mission, policies and legislation. Furthermore the PGCHET contains specific elective unit standards (such as Web-based learning and Experiential Learning and Supervising Research), which are indirectly addressed in the British SEDA (Anon, 2003).

The PGCHET is furthermore comparable to Australia's Prompts for Good Practice, which is published by the Higher Education Research and Development Society of Australasia Inc. (HERDSA). It consists of collections of questions on the roles of the higher education educator. These roles are similar to those that give structure to the PGCHET. The PGCHET's unit standards and core objectives also compare favourably to the prompts given in the above-mentioned publication, which forms the basis for the development and certification of higher education professionals in Australasia (Anon, 2003).

Professional practice in higher education in the United States of America has been greatly influenced by the Seven Principles for Good Practice in undergraduate education^{xxvii}. These principles are based on a synthesis of decades of relevant research and provide guidelines for the development of higher education professionals. The principles can be closely associated with the unit standards and core objectives of the PGCHET. There are, however, no cited university programme qualifications in the United States of America that are directly comparable to the PGCHET. Most of the programmes that are offered are at a master's and doctoral level and focus on administration, student affairs, leadership, policy studies, student development or counselling and research (Anon, 2003).

It is still debatable whether a qualification in education will motivate lecturers in the natural sciences to buy into a CPD initiative such as the PGCHET or the MPhil (Higher Education). There are varying responses in this regard:

... (a formal qualification in higher education and training) *could be very beneficial – will take some effort to accomplish though, from both the employer and employee. (It) will take a long time to phase in – and will only work if the university facilitates the process – i.e. allowing enough time and workload compensation.* [Professor in Microbiology and former recipient of the Rector's Award for Excellence in Teaching]

If the university is serious about teaching quality it will surely be a good thing if personnel that teach attend courses that they develop in the area of teaching. It must be fit in part-time and the time it takes must be taken into account in the workload and the performance appraisal of the personnel that are busy with the course. If the university however sees research as its first priority and only really give recognition for research when it comes to performance appraisal and advancement, lecturers cannot be forced to spend time on such a thing. [Lecturer in Physics with 1.8 years of academic experience]

It is very relevant. I would want to do it as I had no training in this field. [Junior lecturer in Physiological Sciences with 5 years of academic experience]

I think it is absolutely essential and will become more so. [Senior lecturer in Chemistry with 9 years of academic experience]

Firstly one would need to do a needs assessment. This might include convincing lecturers that 'something' is wrong (which might not be easy, as they have been doing this job for many years). One would then have to ensure that teaching is placed on the same footing as research. One could possibly promote what is known as 'scientific teaching'. [Director: CTL]

A doctorate degree should stand for professional maturity ... after that it is an undermining contradiction to force any professional person to any course. [Senior lecturer in Mathematics with 32 years of academic experience]

No. Partly because inconsistencies (and together with this unhappiness) will appear when staff are appointed from outside and that come in with various levels of experience. Experienced staff may not be willing to come to Stellenbosch (unless a country-wide system is introduced) or from abroad if forced to go through such a programme. [Professor in Microbiology with 29 years of academic experience]

This is totally counter-productive. In the highly competitive international scientific arena, in which I continually have to make a significant contribution to the knowledge in my field, to be recognised as a scientist with an international profile, this would be devastating. How would this help me to convince scientists from the world's best universities that I know something of my particular field of study? By flaunting a piece of paper before them, telling them that I can teach at a smallish university in Africa? By the way, this piece of paper would have cost my university at least two MSc students that I could have taught, while I was obtaining a qualification in something that I have been doing quite successfully for the past 14 years. [Associate professor in Microbiology with 6 years of academic experience]

It is right at the bottom of my list of priorities. [Associate professor in Computer Science with 8 years of academic experience]

This would be a complete waste of time. [Associate professor in Zoology with 16 years of academic experience]

Åkerlind (2007) also notes negative reactions of academics towards compulsory initiatives aimed at improving teaching in higher education. The variation in understanding of the nature of teaching development could partially explain this reaction. The various understandings result in either a match or mismatch of lecturers' and academic developers' notions of how to develop the scholarship of teaching. Åkerlind (2007) identified five categories that typify how lecturers approach their own teaching development:

- the lecturer who aims to increase content knowledge in order to develop teaching expertise (Category 1);
- the lecturer set on acquiring practical experience as a strategy to develop his/her teaching capabilities (Category 2);
- the lecturer who views the accumulation of teaching strategies as beneficial to teaching development (Category 3);
- the lecturer who tries to find out what works in practice from the teacher's (lecturer's) perspective (Category 4); and
- the lecturer who tries to find out what works in practice from the students' perspective (Category 5).

Åkerlind (2007: 34) notes marked differences in what would effectively entice lecturers in these various categories to become involved in improving their practice:

Of course, any compulsory course is likely to put academics off, but this only partially explains the negative reaction of some participants. An additional

explanation is that academics who believe that the best route to improving teaching is to focus on becoming more familiar with what and how to teach, through increasing content knowledge and acquiring practical experience (Categories 1 and 2), must logically see no purpose to such courses [in reference to compulsory courses aimed at improving teaching]. From this perspective, staying in touch with the research literature in their field and gaining teaching experience would always be seen as more valuable for teaching development. The particular perspective would also lead to the common argument that experience as a teacher makes participation in such courses redundant.

However, Åkerlind (2007: 34-35) goes further to explain that there are lecturers who view educational programmes or courses as a way in which to develop as scholars of teaching:

At the same time, academics see the best route to improving as a teacher lying with building up a repertoire of teaching strategies and finding out which of these strategies work best for them (Categories 3 and 4) may value teaching development courses as such, but only if they focus on teaching methods in an instrumental fashion. This means that the only academics likely to value a theoretically-oriented course on teaching and learning in higher education are those who see (or come to see while undertaking the course) the best route to improving as a teacher as becoming more effective in facilitating students' learning (Category 5).

It is therefore essential for any formal programme aimed at enhancing teaching expertise to aim at finding the nexus between lecturers' understanding of what it means to develop as a teacher, and what academic developers (as facilitators of these programmes) view as teaching development (Åkerlind, 2007). Åkerlind (2007) concludes that, in order to be effective, any teaching development initiative needs to be tailored to individual academics' intentions and understandings of teaching and teaching development. This means that either the development support provided should be closely aligned to these lecturers' understandings, or that their understandings have to be expanded in order for a broader range of support initiatives to be adopted. Castle *et al.* (1998) stress the importance of recognition of prior learning for those professionals who have already achieved a certain level of expertise and competency.

Lecturers in the natural sciences are research-driven professionals with little time or inclination to devote their energy to such an extensive endeavour. Small group workshops aimed at specific problems and/or needs may bear more fruit in this sector. Åkerlind (2007) promotes various forms of inquiry, such as interviews with colleagues about their approaches to teaching,

action research, or action learning projects as useful ways in which to promote self-reflection on the nature of the lecturer's own teaching ontology, epistemology and methodology. Therefore CPD for the development of teaching does not end with an educational programme itself. The maintenance of competence in professional teaching practice is of equal importance and can be a difficult quest for those involved in CPD.

Attaining a qualification does not guarantee the maintenance of competence or expertise. The actual practice of CPD in maintaining competence needs more investigation, especially in terms of the link between professional work, constructivist learning and transformative learning. CPD providers often assume that the simple transmission of information in the educational setting will influence practice, yet Ryan, Campbell, and Brigham (1999) report that research results on the effect of CPD on behavioural change have not been consistent. It cannot be assumed that CPD will have a positive effect on practice. CPD is only effective to the extent to which it is implemented in practice and the outcomes can be measured. Multiple variables need to be considered to determine why behavioural change does or does not occur.

6.5.3 Maintaining competence in the scholarship of engagement

CPD in terms of the scholarship of engagement is usually embedded in the development of research and teaching skills, as community interaction within the natural sciences is commonly centred within the subject-specific community (such as professional organisations and industry^{xxviii}) or in the transfer of subject-specific knowledge to the wider community (which requires teaching skills). Thus, there is limited scope for the development and implementation of CPD initiatives that focus specifically on community service in the academic sector of natural science^{xxix}.

Van Wyk (2004), Daniels (2003) and Brown (1998a) propose service learning as a way to bridge the pre-service to in-service gap and to further professional practice in enhancing the scholarship of engagement. Service learning is a structured work-based learning experience. Service learning that is incorporated into a learning experience can facilitate reflective practice and critical discourse within a profession. Learners are actively engaged in the learning process: they draw upon prior knowledge and experiences in order to process, interpret and negotiate meaning of new information within their social contexts. Therefore, service learning can help professionals to gain a sense of relevance through engaging in the political, economic, environmental and social problems that influence the community in which professionals have to practise their craft. It especially helps novice practitioners to develop a professional identity embedded in both their indigenous South African context and the international, competitive professional sphere. Service learning might facilitate career development outcomes from a pre-service level and help to build social networks for future access. It provides an environment in

which these learners can acquire organisational, team and problem-solving skills, attitudes and capabilities necessary for future learning and practice. The manner in which service learning should be conceptualised and implemented in the natural sciences presents unique challenges. It is not a practice area characterised by notions of reflection and discourse on this basis. It does, however, not mean that the concept of service learning is not applicable or suitable to this context. It may just need some context-specific revision and planning. The training of the facilitators of this type of learning is vitally important. It should be centred on the principles of service learning and ought to include visits to successful programmes, training in the development of appropriate curriculum, and learning activities that integrate all these aspects at classroom level. Critical thinking, team building, communication, conflict resolution, problem solving, project management and career planning are issues that could be addressed.

An institution-wide debate on the definition of community and the practice of the scholarship of engagement may be necessary, as was recommended in the Council on Higher Education's Institutional Audit Report (2007). The broad definition of community that is currently used within Stellenbosch University enables lecturers such as those in the natural sciences to include a wide array of activities – including some within their disciplinary boundaries – under the scholarship of engagement. Even though the broadly defined notion of community – and by implication engagement – was criticised by the Council on Higher Education Panel, it can be argued that such an encompassing definition creates room for more integrated scholarly practices in a context such as the natural sciences.

6.5.4 Maintaining competence in the scholarship of integration

The integration of scholarly roles may be difficult for the individual lecturer in a system driven by quality assurance and measurable output. CPD may play a facilitative role in helping lecturers develop the necessary knowledge, skills and attitudes to successfully integrate the demands of scholarly practice.

Novice lecturers may find it especially difficult to integrate their scholarship roles while adapting to academic practice. Well organised induction programmes can facilitate the transition from pre-service to in-service learning for novice lecturers. Weiss and Weiss (1999) found that these programmes lead to higher retention rates and better professional capabilities in the first period of professional practice. An effective programme should build on constructivist learning principles, and encourage reflection, collaboration and mentoring practices. The PRONTAK/PREDAC and Thuthuka programmes are examples of good practice on which to build future CPD practices aimed at induction, mentoring and the development of expertise. The PRONTAK/PREDAC programme is an initiative of the Stellenbosch University Centre for Teaching and Learning. It is aimed at supporting newly appointed lecturers. The National

Research Foundation initiated the Thuthuka programme in an effort to support young academics from previously disadvantaged groups through mentoring. Mott (2001) adds partner-based study through bi-directional peer relationships as a viable option to overcome difficulties in moving from one stage to the next. Pre-service education, service learning, induction programmes and CPD should be complementary in their approaches and methods in order to facilitate the transition between the different stages in education (Oliver & Aggleton, 2002). The current induction programmes available to novice lecturers in the natural sciences at Stellenbosch University still seem to have limited focus areas in terms of research, teaching or engagement. An induction programme aimed at the integration of these areas of practice may be an area for future development.

McDonald (2001) suggests some fundamental changes in CPD approaches, including a professional CPD curriculum that integrates theory with technical and practical knowledge, provides for critical reflection on the curricula and cultivates an attitude that contributes to lifelong learning. This may help to bridge the existing gap between education and practice (McDonald, 2001; Knox, 2000; Mott, 2000; Livneh & Livneh, 1999). It is, however, debatable on which role of the academic and level of expertise this type of curriculum should focus and if such initiatives should be mandatory – or not. Lecturers in the natural sciences who contributed to the study are not unwilling to learn and develop – on the contrary. They are inclined towards self-directed lifelong learning but prefer to have a choice and freedom where CPD is concerned. The CPD initiatives that will probably be most successful are those that are needs-based, problem- and learner-centred, that are presented by facilitators who have stature within the specific context, and that successfully integrate the different facets of professional practice. Short courses, workshops and collegial interactive sessions also receive a more positive response than formal, extended programmes. Technological advances in education can also contribute significantly to the development of CPD initiatives that adequately address the various scholarly needs of lecturers in the natural sciences.

The role of the individual lecturer in developing as an integrative scholar must not be overlooked. Battersby (1999), Clair and Adger (1999) and Castle *et al.* (1998) emphasise the important role the individual professional should play in developing and providing CPD. The traditional mode of teacher-to-learner transfer of information in CPD inhibits professionals from reaching their full potential. When professionals are given control over their own thinking and learning, significant transformation can take place in the individual, the organisation and eventually, society. This argument is underscored by Costley (2001), Calman (2000), Sadler-Smith *et al.* (2000) and Hake (1999), who indicate that professionals at all levels are now expected to take responsibility, to think for themselves, to participate in decision making and to manage their own development. Hake (1999) warns that although making the individual

responsible for CPD can lead to greater opportunities to make choices, it may put a certain part of the professional population at risk. It can threaten social cohesion and lead to social exclusion from educational activities. This emphasises the need for CPD, but also for the involvement of the professionals themselves in the process. Work-based projects and peer-learning schemes may help the individual develop, learn, reflect and change, whilst still having a certain amount of autonomy.

The scholarship of integration provides fertile soil for CPD innovation. The potential of innovative CPD approaches to professional practice will have to be determined in order to substantiate their value in future (Teichler, 1999). Novikov (1999) adds that multi-level CPD programmes are needed. Uniformity of specialist training is no longer suitable. More levels and stages in CPD will afford the individual greater opportunities to choose between offerings, to obtain qualifications in more than one field of expertise, to change career direction and/or to find a niche in the labour market. This means that professionals need to have manoeuvrability in education. This is especially relevant for lecturers, as they may come from distinctly different disciplines. The value of informal CPD should be mentioned in this regard. It should be seen as a chance for individuals to satisfy specific educational needs that were beyond the capabilities of formal education programmes or could not be dealt with as a result of restricted resources (Ramaiah & Moorthy, 2002; Novikov, 1999; Ritchie, 1998). Flexibility, suitability and individual choice therefore reign as determinants of why and how professionals learn. Formal programmes may not have the inherent flexibility that professionals demand from CPD providers. Shorter courses that are aimed at a specific aspect of professional practice relevant to a specific group of professionals and at developing further self-directed learning can be seen as the best future alternative to effective CPD. Integration of the various forms of scholarship may therefore be facilitated by formal, non-formal, or informal CPD initiatives.

Programmes will have to broaden their focus, incorporate diverse methods and formats of providing education, conduct more rigorous programme evaluations and establish new collaborative partnerships to survive in future. These proposed changes have implications for the training of lecturers, which previously focused on the improvement of teaching skills and instructional effectiveness. There is a need for more comprehensive programmes that also address leadership and management skills, professionalism, professional academic skills, coping with technological changes and organisational development (Steinert, 2000). O'Rourke (1997) states that an increasingly heterogeneous learner population, diversity in organisational cultures and rapid technological changes create a demand for leaders who are democratic, have a vision, can fill multiple roles and are adaptable to changing circumstances. This is especially true for previously marginalised groups, such as women and ethnic minority groups.

CPD should therefore play a major role in developing leadership in the scholarship of integration.

The scholarship of integration demands a wide array of competencies of an expert (in whichever discipline). Kutner and Tibbetts (1997) identify the following generic competencies an expert should possess: communication and collaboration; maintaining a knowledge base; organising instruction; managing resources (time, materials, space, people); continuous monitoring and assessment of learning; understanding and evaluating systems and relationships and understanding the mentoring functions of an educator. Lecturers should use these competencies to link professional expertise with other professional and occupational groups – for instance in transdisciplinary initiatives (as promoted by Max-Neef, 2005). This calls for reflection on practice and clarity on political and ethical issues within the practice of CPD (Wilson, 2001). Quinn and Vorster (2004) encourage reflective practice rather than developing generic skills and techniques in the professional development of lecturers. Exploring personal knowledge systems and practices accumulated through experience can lead to more significant changes in professional practice. Reflection does take place in an informal, individualised manner with most practitioners, but an intentional CPD exercise in reflective practice may make it more systematic and deliberate.

Reflection should, however, be supported by theory and collegial interaction in order to challenge or confirm the validity of their experiences and practices. Professional practice and the theories underlying it cannot be divided. The theories embedded in practice need to be made explicit in order to reflect sensibly, to want change and to be capable of bringing it about. This includes looking at the broader ethical, social and political issues that have an impact on teaching and learning within higher education today. It also means investigating how learners transform knowledge and create meaning from information. Quinn and Vorster (2004) warn that theory should be presented in such a way that participants are able to adopt a view of learning themselves, suited to their own context, and that there is not only one dominant, singular view that suits all. Reflection in and on practice may therefore facilitate the integration of various forms of scholarship.

Organisational structures and changes may have a determining effect on the way in which scholarship roles can be integrated. Cobb (1999) and Hake (1999) indicate that the future organisational context (and as a result, also its culture) will be influenced by the change in social structure and demography of the population, more flexible and part-time working, greater public involvement in decision-making, the development of information technology, and the resulting globalisation of information. Effective practice in continuing development relies on

making the best judgement in a specific context and for a specific ethical framework, as the following participant explains:

In a sense I have become more 'outcomes-orientated'. Whenever I do something I need to know how this will benefit me at the end. I have become more aware of the importance of the context within which one learns. I have become aware of the fact that we have different ways of making sense, and that it is important that you get 'everybody' to operate in the 'same way' in order to optimise the learning experience. I have also become aware of the fact that knowledge is dynamic and NOT static. It is therefore important to actively engage students in this process.
[Senior lecturer in Physics with 8 years of academic experience]

Knowledge is the most flexible commodity to transfer globally. Emerging technologies (such as electronic learning, e-mail, Internet, satellite communication) facilitate access to CPD and provide boundless opportunities for CPD aimed at integrating various forms of scholarly practice. They offer the advantages of self-pacing, excellent visual material, prompt and accurate transmission of information, ease of reviewing previously presented material, and flexibility. Technologically enhanced programmes can offer an interactive forum for the discussion of professional problems, without the limitation of geographical distance. It has changed the ways in which people communicate and learn (Adams, 2001; Clawson & Jordan, 2001; Calman, 2000; Medley, 1999). Technological advances are re-shaping the landscape of CPD, with increasing numbers of CPD providers moving to a distance education format. Cervero (2001) predicts that this will become the format of choice for learners and a competitive advantage for providers. Virtual universities are seen as a major growth area in the effective provision of CPD.

New technology has, however, also led to new issues in instructional design. These issues include identification of content, effectiveness of new forms of delivery, and evaluation. The use of technology should go beyond providing information and teaching technical procedures. It should provide instructional support and a variety of learning experiences, which are based in practice and are developed collaboratively. A balance between technology-based and face-to-face interaction is needed to maintain effective communication and group dynamics. Learners can easily feel isolated and demotivated without the camaraderie offered by group learning settings. CPD facilitators will need to adapt to the changes in order to remain relevant professionals. They will need instructional and technological support and develop new interpersonal and inter-/transdisciplinary skills. Future research should focus on constructivist learning, the altered social context and group processes for learning within a technology-based learning environment. Additional research is needed on technologies that will help sustain learner interest and commitment to learning tasks. Research also needs to focus on deterrents

to participation in this type of education if it is to reach its full potential (Healey & Lawler, 2002; Adams, 2001; Clawson & Jordan, 2001; Calman, 2000; Perdue & Valentine, 2000; Hake, 1999; Levy, 1999; Medley, 1999).

This directly shows the importance of lifelong learning in CPD within an age of advanced technology and change. CPD practice is well positioned to meet the challenges ahead, as it has a history of collaborative and transdisciplinary work. CPD provides possibilities for implementing new technologies and information practice for anytime, anywhere learning and increased learner independence. Much of the current essential knowledge will be obsolete or modified in content or meaning within five years. Scientific and technological knowledge doubles every five to seven years. CPD in the technology age therefore gains the same importance as initial professional preparation and forms a key to educational improvement (Healy & Lawler, 2002; Alemna, 2001; Beatty, 2001; McDonald, 2001; Cobb, 1999). Mapesela and Hay (2006) found that lecturers struggle to keep up to date with technological advances amidst all the other demands academic practice places on them. The fast pace of change necessitates that lecturers find innovative ways in which to balance and integrate their scholarly responsibilities.

The evaluation of learning in CPD seems to focus separately on scholarly roles. CPD is in dire need of research on effective evaluation and the development of valid and reliable evaluation tools. Satisfaction and participation are not sufficient indicators of how CPD enhances scholarly practice. Evaluation is not only an end step in CPD programmes, but should form part of the total developmental process in order to be meaningful. Research should not only focus on formal programmes, as a major part of continuing learning takes place through informal and self-directed means. Research energy and funds have to be directed to the workplace as a productive and powerful source of data. Evaluation research will further lead to the identification of practice problems and issues, which will support the identification of new educational approaches that are needed. It will also create opportunities for comparative research. Alternative multi-disciplinary evaluation models, larger and randomised sample sizes, the use of multiple evaluation methods and qualitative research (including focus groups, semi-structured interviews and nominal groups) in evaluation should be considered. Proper evaluation will form the cornerstone for the improvement of professional practice. It is also essential in terms of accreditation (Adams, 2001; McDonald, 2001; Calman, 2000; Daley & Mott, 2000; Ritchie, 1998). The study conducted amongst lecturers in the natural sciences clearly indicated a lack of effective evaluation of learning in CPD.

Major constraints to implementing new ideas, refining practice and maintaining expertise in higher education are the limitations in terms of time, learner expectations, and subject (or discipline). Departmental constraints also have a significant impact. Integrating scholarship roles

may not be a top priority if it leads to more demands on time and resources that are already limited. Extra demands on time and the complexity of practice of academics in higher education make it difficult to implement and refine new educational practices. Learners may also be resistant to active learning methods, as they expect to be taught according to the traditional lecture method. Active learning requires more work and input from learners, and patience and persistence from lecturers. It takes time and effort to change learners' perceptions of learning. Some disciplines also lend themselves more easily to constructivist learning than others. It is difficult to incorporate this into teaching and learning strategies when one is concerned with teaching fundamentals and has to cover a certain body of knowledge in a specified time (this is particularly the case and critique in the natural sciences, where subject content is believed to be value-free, neutral and scientific). Departmental culture may be a major constraint, especially when more emphasis is placed on research output than on effective teaching practices. There is a need for greater depth and interaction in the relationship between teaching and research, but this need has not yet been addressed (Quinn & Vorster, 2004).

Shah (1998) emphasises the need for professional development programmes that are relevant and meet the demands of the new millennium. Cervero (2001) refers to the Maintenance of Competence Programme for the purposes of re-certification. It is a system that utilises activities such as participation in audits of practice and personal learning portfolios to reflect the quality of continuing professional development since initial certification. This may be the most appropriate way of maintaining expertise and integrating scholarship, since it recognises prior learning, encourages reflective practice and can be designed in a context-specific manner in order to monitor the maintenance of professional practice – as aptly stated by one of the participants in the study:

It is said that information has a 5-year 'life-span'. We should therefore be constantly involved in a process of self-reflection. A process by which we critically review what we are doing in an attempt to end up with a better final product. In this sense continuing development is nothing more than 'life-long learning' – an ongoing process. [Advisor for Natural Sciences, Division for Research Development at Stellenbosch University, also emeritus professor in Chemistry]

Ideally, the idea of a Maintenance of Competence Programme could be incorporated into the proposed portfolio policy at Stellenbosch University and should be applicable to lecturers at all levels of practice. Such a policy needs to be concise but understandable, and should provide clear guidelines and contain effective monitoring structures. Effective support structures (through structures such as the university's Division for Research Development, Centre for Teaching and Learning, Division for Community Interaction and more informal structures such as mentoring) could be put in place to assist academic staff in this venture.

The maintenance of competence and expertise is the joint responsibility of the individual professional and the organisation. Lecturers will only maintain a balanced professional expertise if top management supports CPD initiatives that promote learning and development in this manner, without it being a top-down mandatory venture. The integrity of the system should also be transparent and beyond doubt. The ideal would be if a national (and even international) system of maintaining expertise could be developed, especially seen within the context of increasing mobility of academia across the world.

6.6 CONCLUSION

It seems clear that the current issues and the predicted changes in the future context of practice, the changing role of and need for professional experts, their development and the maintenance of their level of competence are all factors that contribute to a growing need for CPD in scholarly practice.

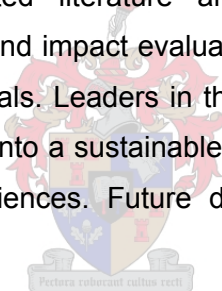
The balance between organisational and individual needs might greatly determine the future context of professional practice. If a balance cannot be achieved in this regard, the provision and practice of CPD in higher education might always remain skewed. The organisational context seems to be dependent on how the concept of a university is defined and translated into practice. It is argued that an integration of the various forms of scholarship can only be achieved if the individual lecturer gains responsibility, power and support within the organisational structure. Once this is achieved, a balance can be struck between the needs of the organisation and the individual lecturer as a scholar by integrating learning into practice through CPD.

Based on current practices, it could be expected that experts may continue to fulfil various roles in the future context of professional scholarly practice. They will play an important role in guarding and directing ethical and competent practice and will therefore also be important stakeholders in determining the future direction of CPD. If quality assurance and evaluation of learning measures are to be adapted and implemented effectively in any profession, the input from the experts within that profession will be invaluable. Only these experts will really understand the scholarly foundation on which the specific profession was built, fully grasp the current realities of scholarly practice and determine how future challenges should be tackled.

How these experts will be educated in the natural sciences at Stellenbosch University presents a daunting challenge for all those involved in CPD in this sector. It is argued that doctoral education forms the basis of scholarly education, but it seems to fall short in adequately preparing future scholars for integrating their various roles and responsibilities in practice. CPD, and in particular transdisciplinary initiatives, are proposed as ways in which to address these

deficiencies in the preparation of future scholars who have to keep up with the demands that modern-day challenges make on the professional. These demands do not only influence novices – expert practitioners will also need continuous support to cope with changes in practice. This indicates the importance of cultivating lifelong learning through needs-based and learner-centred CPD. A variety of possible CPD initiatives already exist, but these initiatives do not seem to successfully integrate the complex practice realities of the natural science lecturer into the learning experience.

Professional competence will be more successfully maintained when CPD initiatives effectively address the professional practitioners' context as a whole. Lecturers in the natural sciences have a unique and complex form of practice. Even though generic programmes may address some issues face by these practitioners, they will be more receptive to initiatives that are aimed at their realities of practice. Alternative forms of research, collaboration, educational and evaluation practices need to be adapted to suit the specific context of natural sciences. Lecturers need to be involved in this process to be able to buy into it and incorporate it into their own learning and eventually into their practices. Managerial support for these initiatives is imperative to their success. Limited literature and relevant research exists on CPD conceptualisation, provision, quality and impact evaluation that is specifically aimed at lecturers in the natural sciences as professionals. Leaders in the field of CPD have both an opportunity and a responsibility to develop CPD into a sustainable, participatory and growing learning body of knowledge within the natural sciences. Future development and research will need to address these issues.



Professionals who succeed in constantly coping with the changes and challenges presented by the future context of practice also succeed in developing into experts who are able to fulfil all their responsibilities competently. They never stop learning; they succeed in maintaining their professional competence; and they might be able to cope with the demands of scholarly practice.

Current issues seem to have a definite influence on how scholarship is practised in the natural sciences, and they will continue to exert an influence in future. To what extent is it possible to practise an integrated form of scholarship in the natural sciences at Stellenbosch University? At present there seems to be no simple answer to this question, as the profession itself remains an elusive and complex phenomenon in research and practice. Until this profession unifies into a strong and competitive entity, scholarship and consequently CPD will remain fragmented.

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ⁱ Various aspects of this chapter have been adapted for scholarly presentation, including two full peer-reviewed international conference papers and two articles currently in review:

FRICK, BL 2007. *The evolution of scholarship in the natural sciences: Providing a framework for Continuing Professional Development (CPD)*. Centre for Research in Lifelong Learning Conference: Researching transitions in Lifelong Learning, 22-24 June 2007, University of Stirling (Stirling, Scotland).

FRICK, BL & KAPP, CA 2006. Future trends in continuing professional development for natural science lecturers in higher education – survival of the fittest in the academic jungle. Teaching and Learning Forum 2006. 1-2 February 2006, University of Western Australia (Perth, Australia).

FRICK, BL & KAPP, CA (*submitted to The International Journal for Academic Development*). Looking into the crystal ball: What does the future hold for continuing professional development for natural science lecturers in higher education?

FRICK, BL (*submitted to Higher Education*). Scholarship reconsidered at a South African university: From a managerial approach to an integrated framework for scholarship.

ⁱⁱ It is interesting to note that Jarvis (1995) makes a clear distinction between lifelong learning and continuing education. Lifelong learning (or education) makes no distinction between initial

and post-initial education, while continuing education refers only to post-initial education. CPD thus forms part of both the concepts of lifelong learning and continuing education, but has its focus on the period after pre-service education (or so-called 'post-initial education').

ⁱⁱⁱ The work of Kerr (1994: xvi) is also notable in this regard. This author argues that higher education has never been fully autonomous: “[H]igher education follows its own internal logic of development in response to the wishes, in particular, of its faculties. But it must additionally respond to the changing contexts of external society. Much of the history of higher education is written by the confrontations of internal logic versus external pressures.”

^{iv} Here it is interesting to note the work of Longworth and Davies (1996: 15) who link the role of the university in society to the notion of lifelong learning: “Lifelong learning challenges the traditional university role as a repository of the intellectual capital of a nation and as a centre for research and excellence only. It is enough to make higher education staff, from vice-chancellors to lecturers, shudder, but radical change is inevitably coming, and those organizations which are prepared for it will be best fitted to survive in a polyaccessible educational world. The role of the university at the educational centre of a local or regional community needs to be taken more seriously hitherto.”

^v The New York model described in Imenda (2006) corresponds with the corporation model proposed by McNay (1995) in Ramsden (2000). Bundy's (2006) views on institutional governance seem to support these notions on entrepreneurialism and managerialism evident in South African higher education institutions. Levine (2000: 1, as quoted in Imenda, 2006) refers to Kirp who describes the essence of the New York model as follows: “In barely a generation, the familiar ethic of scholarship baldly put, that the central mission of universities is to advance and transmit knowledge has been largely ousted by the just-in-time, immediate gratification values of the marketplace Gone ... is any commitment to maintaining a community of scholars, an intellectual city on a hill free to engage critically with the conventional wisdom of the day.”

^{vi} It is interesting to note that a distinction is made between *scholarly* and *scientific* in both the mission and value statements of the university (with the Afrikaans translation of scholarship being *wetenskaplikheid* in the specific documentation).

^{vii} Manathunga *et al.* (2006) promote an interdisciplinary approach to doctoral pedagogy – in contrast to the transdisciplinarity promoted by Max-Neef (2005). The practical application of these two concepts reported by these authors seems to correspond on various levels. Transdisciplinarity is used in this article, as it implies the transcendence of disciplinary barriers on both an epistemological and a practical level.

^{viii} *Space* here refers to the environment in which scholarship (in whichever form) is practised by lecturers.

^{ix} The influence of collaboration between higher education and other stakeholders in CPD on the character and quality of CPD is a topic for future research.

^x CPD provision here refers to the provision of CPD **to** lecturers, not the provision of CPD initiatives **by** lecturers to other interested parties (such as in-service professionals that use the university as a provider for their own CPD needs in practice).

^{xi} The examples of collegial collaboration cited seem to be more focused on developmental initiatives mediated within the institution itself, although the possibility of interinstitutional collegial collaboration are not disregarded.

^{xii} The work of Paulsen (2002) was instrumental in the construction of the framework. The use of content *knowledge*, pedagogical *knowledge* and pedagogical content *knowledge* as described by Paulsen (2002) does not mean that values, skills and understanding as integral components

of development (as described by Longworth and Davies, 1996) are disregarded. Paulsen's (2002) classification included in the framework merely serves to indicate that the integrated development of scholarship cuts across disciplinary (content) and educational (pedagogical) boundaries. The notion of pedagogy development as used by Paulsen (2002) can also apply to the principles of andragogy as described by Knowles and Associates (1984).

^{xiii} It is acknowledged that Figure 6.3 is relatively generic and that many of the aspects included in the framework might apply to a variety of academic contexts in higher education. These aspects do, however, apply specifically to the studied context of natural sciences in higher education.

^{xiv} Mapesela and Hay (2005) note that the White Paper 3: A programme for the transformation of higher education (1997) mentions increased enrolments in doctoral programmes as strategy to address the shortage in high level skills in South Africa, also within higher education – which is referred to as “growing your own timber” (Badsha, 1999).

^{xv} The specific requirements put to a doctoral candidate within the natural sciences at Stellenbosch University are discussed in more depth later under 6.4.3.5.

^{xvi} Eshiwani (1999) comments on the so-called ‘brain drain’ of graduates and qualified academic staff from African universities to other countries. Although this phenomenon is not the focus of this particular study, it is important to take note of its consequences for the training of future scholars in the particular context of a South African university such as Stellenbosch University.

^{xvii} The work of Barnacle (2005) on becoming a scholar and the work of Becher and Trowler (2001) on academic tribes and their territories may be linked to what Wenger (1998) considers as essential elements in the development of communities of practice.

^{xviii} Education in general is, however, conspicuously absent in Max-Neef's (2005) structure.

^{xix} A transdisciplinary pyramid structure encompassing four levels (empirical, purposive/pragmatic, normative, and value levels) is proposed by Max-Neef (2005).

^{xxi} Stellenbosch University was established in 1916, originating from the Victoria College of Stellenbosch that initially served as a post-school agricultural training facility from 1881. Stellenbosch University was classified as a whites-only institution under the previous political dispensation in South Africa. The institution had an advantaged position as such an institution in terms of government investment and therefore the potential to create development opportunities for its lecturers. Badsha (1999) and Bundy (2006) note that research and graduate education were largely concentrated at historically white institutions before 1994. The change in government (1994) has led to major changes in the South African higher education system – including policy changes and mergers of institutions. The latter has had relatively little influence on Stellenbosch University in comparison to some other South African higher education institutions.

^{xxii} Eshiwani (1999: 40) refers to Julius Nyerere (former president of Tanzania) who, in an address to the Association of Commonwealth Universities (ACU) commented that “it is not possible to clone Western democracy and capitalism like Dolly the sheep”. However, Eshiwani (1999) also comments that the majority of sub-Saharan universities are 20th century extensions of the metropolitan university models copied after European colonialism. The university in Africa needs to grow out of these confines in order to be a valid institution on the continent, and remain viable in the global higher education context.

^{xxiii} Mouton (2000) only refers to inter-disciplinary research, but again – as is the case with Manathunga *et al.* (2006) – transdisciplinarity is implied in various comments made by Mouton (2006) and is specifically quoted from the 1996 White Paper on Science and Technology.

^{xxiv} Mouton (2000) reached this conclusion by analysing data from the National Research and Technology Audit. The Survey on Scholarship, Research and Development was conducted as part of this audit.

^{xxv} This is a significant finding in terms of the argument on the uniqueness of academic tribes and their territories, as introduced by Becher and Trowler (2001).

^{xxvi} The MPhil in Higher Education was also discussed as part of Chapter 5 (Section 5.4.2 – Evaluation within the context of the scholarship of teaching). The focus here falls on comparing two different qualifications (the Postgraduate Certificate in Higher Education and Training, and the MPhil in Higher Education) as possible ways of maintaining expertise in the scholarship of teaching.

^{xxvii} Chickering and Gamson (1987, 1991) established seven principles for good practice in undergraduate education: 1) encourage student-faculty contact; 2) encourage cooperation among students; 3) encourages active learning; 4) give prompt feedback; 5) emphasise time on task; 6) communicate high expectations; 7) respect diverse talents and ways of learning.

^{xxviii} Kotecha (2006) argues that the notion of engagement as part of the third stream revenue through industry is contrary to the obligation of a university to ensure a reciprocal flow of knowledge back to society without material gain as an incentive to engage in such activities.

^{xxix} The university regards the commercialisation of its knowledge base and technology transfer as part of its responsibility in the area of community interaction. The institution has developed administrative structures to support its commercialisation and technology transfer activities (for example, InnovUS) and has also created an enabling environment for researchers in terms of intellectual property rights. InnovUS supports technology transfer and the viability of spin-off enterprises emanating from research activities. It assists entrepreneurs/inventors to develop a business plan (Council on Higher Education, 2007: 90).



CHAPTER 7

The continuing professional development journey as a lifelong quest for scholarship

ABSTRACT

Continuing professional development (CPD) was investigated by means of a qualitative study amongst lecturers in the Faculty of Science, Stellenbosch University. The conceptualisation and the provision of CPD, the quality and evaluation of learning in CPD, as well as current issues and future trends in these areas were argued from a perspective of scholarship in higher education. This final chapter aims to summarise the development of scholarship through CPD in the context of lecturers in the natural sciences at Stellenbosch University and to provide general recommendations regarding this aspect of academic practice.

7.1 INTRODUCTION

Continuing professional development (CPD) appears to be a lifelong journey of learning that all lecturers have to undertake if they want to develop and remain relevant as scholars in academic practice. The investigation of the continuing professional development of lecturers in the natural sciences at Stellenbosch University focused on how these lecturers learn through CPD in order to develop as scholars. Various aspects were considered, including the conceptualisation of CPD, with specific reference to a definition, the need for and provision of CPD in this sector (Chapter 2). The provision of CPD for the study population was investigated (Chapter 3). In the Chapters 4 and 5 respectively, the quality and evaluation of learning in CPD were included as important aspects in scholarly development. Finally, a critical perspective was given on current issues and future trends in CPD (Chapter 6).

It has been an interesting journey, but there might be few clear routes to follow. This final chapter aims to summarise the main findings, which are based on literature and a study conducted within the Faculty of Science, Stellenbosch University (South Africa). It will also make general recommendations within each of the main components of the study.

7.2 GENERAL RECOMMENDATIONS IN TERMS OF THE RESEARCH DESIGN OF THE STUDY

Chapter 1 (pages 1-38), which provided an outline of the research design followed in the study, focused on the integration of scholarship and the continuing professional development of lecturers in the natural sciences at Stellenbosch University. The study followed an interpretive route to explore various aspects of continuing professional development that relate to scholarly practice in the particular practice setting in a qualitative manner. Interviews and questionnaires

were the main methods used to construe the data used in building a mutual understanding of the conceptualisation, provision, quality and evaluation of learning, and current issues and future trends in CPD that influence scholarly practice.

This study has been a long and interesting research journey following the indistinct tracks left by lecturers in their quest for scholarly development. A wide variety of literature has been published from various perspectives on the topic of CPD (and the related fields of continuing professional education (CPE) and staff development). Nevertheless, in exploring the phenomenon of CPD within the natural sciences in the context of higher education and one institution from a scholarship perspective, the researcher had to navigate uncharted territory.

Future studies in the areas of scholarship and CPD in higher education should be conscious of the possible constraints inherent to a study conducted in a bureaucratic system such as the one presented by Stellenbosch University. It could be difficult and time-consuming to obtain ethical clearance and permission and it would be advisable to take these aspects into account when planning such a study.

The interview phase of the study gave the researcher valuable insight into the broader topic of CPD. The purposive sampling created the opportunity to investigate the phenomenon of CPD from various perspectives in academe, including the conceptualisation and provision of CPD, the quality and evaluation of learning in CPD, and current issues and future trends that may influence CPD and the development of scholarship. Future studies may want to follow the same route, since literature is supplemented with examples from practice in various fields in this way and the researcher is given insight into the context setting of a country, a geographical area and (in this case) the broader academic milieu. This approach also enables the researcher to tentatively test theories explicated in previous studies and to refine the eventual research instrument used in the main study (in this case the questionnaire). A multi-sectoral and multi-method approach therefore proved valuable in this particular study.

The qualitative approach that was followed in the study is deemed appropriate as it provided insight into a context and a phenomenon that would be difficult to describe adequately in quantitative terms. However, lecturers in the natural sciences involve themselves mainly with empirical and quantifiable research. A qualitative approach is often regarded with suspicion. It was therefore necessary to explain the research process that was being followed accurately, concisely and without too much educational jargon. The initial scepticism that was encountered could also apply to other study populations, and future researchers need to take cognisance of the differences that are inherent to various disciplines.

The stratified random sampling technique used in the questionnaire phase of the study facilitated the inclusion of participants from various levels of expertise and led to a sample that included persons from various disciplines within the natural sciences, and of different ages, genders and backgrounds. Although these factors were not directly accounted for in the study, it was important that the sample reflected the diversity present in the total study population.

Even though the majority of the study sample were willing contributors and a satisfactory response rate was obtained (65.91%), it remains problematic to ensure adequate responses. Potential participants are generally more inclined to talk to a researcher than to complete a questionnaire. Future studies should therefore consider alternative measures of data gathering, such as focus groups or interviews. Even in view of the multi-method approach promoted earlier, data-gathering measures such as focus groups or interviews often provide richer and more in-depth data than open questions in questionnaires. The clarification of any indistinct meanings or misunderstandings is possible in the former methods.

Possible future directions for research in this regard include comparative studies across faculties within the same institution, or across institutions and/or across countries within the same type of faculty and institution. This will possibly yield interesting data that could help describe how scholarship is practised within higher education in general and how it relates to the practice of CPD. A more in-depth investigation by means of a narrative approach could also possibly provide interesting insights into lecturers' personal experiences of scholarship and CPD in practice. This study therefore opens up various interesting research possibilities which the researcher would like to explore in future.

7.3 PLACING CONTINUING PROFESSIONAL DEVELOPMENT IN THE CONTEXT OF SCHOLARLY PRACTICE IN THE NATURAL SCIENCES IN HIGHER EDUCATION

Chapter 2 (pages 39-71) focused on a conceptualisation of CPD within the natural sciences at Stellenbosch University. The meaning that respondents attached to being a professional in a scholarly setting provided the backdrop to defining CPD within the notion of scholarship. The need for and purposes of CPD in promoting scholarly practice were investigated from the perspective of the respondents in the study.

The conceptualisation of professionalism in the natural sciences at Stellenbosch University proved to be a difficult endeavour (see page 41). The profession as such is ill defined, diverse, inconsistent in terms of a qualification system and without a statutory body that governs the total profession (as is the case in the professional practice of medicine and psychology in South Africa). Although a statutory body (the South African Council of Natural Scientific Professions) has been established, its sphere of influence within academe seems limited at present.

Furthermore, the demands that scholarship make on lecturers in terms of roles and responsibilities force them to work on the interface of professions. Are they to be seen as researchers, teachers, community facilitators, or even administrators? Role conflict is inevitable in this field of practice unless an integrated definition of the lecturer as scholar in the natural sciences can be found, formulated and used.

This lack of role coherence makes it difficult to define precisely what constitutes CPD in this sector (see page 46). Lecturers in the natural sciences are constantly exposed to a changing reality to which they are expected to adapt. CPD becomes context specific and a lifelong process as a result of these changes. The difficulty in defining CPD lies in its diversity. It takes on many forms in order to suit the individual practitioner's needs. At this stage, many efforts are informal and self-directed in nature. Therefore CPD can be defined as any learning initiative (formal or informal) that contributes to the development of scholarly expertise throughout the professional's career and that takes into account the needs of the individual, the university as employer and society as a whole.

This definition leads to a consideration of the need for (see page 47) and the purposes of (see page 60) CPD. Whether the individual scholar, the university as organisation or societal issues dictate the need for and purposes of CPD will remain debatable in the foreseeable future. Continuing debate as such is not negative, as it ensures that different stakeholders' needs are taken into account so that CPD initiatives purposefully address and positively contribute to the effective management of change and transformation, which is inevitable in higher education.

Professionalism awards a certain amount of freedom, also in terms of the practitioner's need for and choice of CPD. This particular study population's main need for CPD lies in the effective management of their diverse scholarly roles and responsibilities. At present there seems to be an imbalance between the expectations regarding the professionals' duties within the study population. Strategies that will enable them to prioritise and integrate their scholarly responsibilities in a more effective manner will enable them to be more productive and creative. University management should clearly indicate and negotiate the identified priorities with these professionals and measure their performance accordingly. Their need for CPD will then be easier to pinpoint. A comprehensive, integrated professional development approach that aligns individual and institutional needs is imperative. If such an approach is carefully designed and implemented, it could create a climate of voluntary participation where CPD becomes an intrinsic part of scholarly practice. Any such system should recognise the professional integrity of the individual and the importance of CPD, and it should create an arena for discourse where lecturers as scholarly professionals can learn in a safe environment.

It is evident that the fast-changing pace of knowledge and technological applications in the natural sciences has a direct influence on these lecturers and their learning. Not only does it force them to cope with change, keep up to date with the latest developments and continuously explore uncharted territory within their different areas of expertise, but it also necessitates continuous professional transformation to fit into their different scholarly roles. Change therefore increases and diversifies their need for CPD.

Lecturers in the natural sciences at Stellenbosch University form a distinct group of professional academics. They therefore have specific educational needs for lifelong learning within their occupational sphere. Lecturers in natural sciences, who formed part of the study at Stellenbosch University, do not see themselves as a homogeneous group and distinguish themselves from the broader academic community, also with regard to their needs within CPD. They need CPD opportunities that are specifically designed to suit their professional scholarly needs. Provision is made for CPD programmes within the university system, but these programmes are not aimed at their specific needs. Even though the origin of these lecturers' needs may be generic across disciplines and faculties, lecturers in the natural sciences perceive their developmental needs to be unique to their arena of scholarly practice and want them to be addressed as such.

The purpose of CPD currently centres on equipping educators to meet professional challenges, such as effectively coping within a rapidly changing global and multicultural workplace. Developing expertise in their different scholarship roles, coping with change and keeping up to date (mostly in a self-directed manner) were clearly articulated purposes of CPD within this study of lecturers in the natural sciences at Stellenbosch University.

The purposes of CPD are also influenced by the university as organisation. This is of importance to lecturers; especially if their professional goals differ from those the organisation establishes and provides for through CPD programmes and opportunities. A possible solution to resolve the potential conflict is the development of a learning organisation that serves the purposes of both the individual professional and the organisation. Stellenbosch University aims to be such a learning organisation. Lifelong learning is a focal point in preparing personnel to meet the challenges presented by changing circumstances in higher education efficiently. This places a responsibility on the university as learning organisation in terms of CPD – not only as a provider, but also in creating a supportive environment for the learning and development of its scholars.

It is evident that the study population's practice of CPD (even informal and self-directed variants thereof) takes place within the boundaries of the central values of equity, participation,

transparency, readiness to serve, tolerance and mutual respect, dedication, scholarship, responsibility and academic freedom held by Stellenbosch University. It appears to be practical issues such as the demands of administrative tasks, lack of funding, imbalances in division of work and time management that have a negative impact on upholding these values. It is interesting to note that whilst administration was not viewed as a form of scholarship in the relevant literature, the respondents to this study saw administrative roles and responsibilities as a major component of their practice. A supportive environment seems to be a determining factor if CPD is to achieve its purposes and to uphold the values that are integral to the institution. It is therefore of importance that Stellenbosch University has undertaken to engender via senior management a spirit of commitment to staff development, to spend a realistic portion of its budget on developing members' potential, to create and maintain the necessary infrastructure for development, to provide moral support for CPD initiatives, to offer opportunities for study leave to lecturers and to establish a management and remuneration system that encourages and rewards the development of its staff. How this takes place in practice should be monitored in a holistic manner if integrated scholarship is to become a reality in practice. This does not seem to be the case at present.

The future of CPD in the natural sciences is therefore not easy to predict. It would furthermore seem unwise to consider only one possible future scenario, as the ever-changing context of professional scholarly practice necessitates a conceptualisation of CPD that can be adapted and transformed to suit the circumstances that prevail at the specific time and place.

7.4 PROVIDING CONTINUING PROFESSIONAL DEVELOPMENT THAT ENHANCES SCHOLARSHIP IN THE NATURAL SCIENCES IN HIGHER EDUCATION

Chapter 3 (pages 72-119) discussed the influence of various categories of CPD providers on the development of scholarly practice. This includes the formal, informal and commercial providers. The influence of CPD provision in general was then discussed according to four paradigm shifts: provision of continuing professional development that encourages experimental learning, less reliance on existing research findings and more critical self-examination, a shift from individually focused learning to collaborative efforts, and a move towards problem-based learning and practice.

The definition of scholarship in a specific professional context in higher education (such as the natural sciences) will greatly determine the type of CPD provider and the provision structures that are needed. Unfortunately it seems that the process usually works the other way around, with existing providers of CPD presenting predetermined programmes, which are often determined by organisational policy and have little regard for professionals' specific needs.

The three main types of CPD providers, namely the formal sector (the State and higher education, including universities), the informal sector (professional associations, unions and non-profit organisations) and the commercial sector (private enterprises that provide education for profit) were investigated in the study. All of these providers have distinctive resources, advantages and limitations. The providers and their programmes differ in their definition of an educational strategy, scientific and technological potential, clientele, sources of finance, the nature of the training, and the type of certification they offer. CPD does not, however, end with formal programmes. The individual professional can also take responsibility for his/her own CPD needs individually or in autonomous groups, which vary in size and structure. Formal, non-formal, and informal CPD initiatives vary in the extent to which they address and integrate scholarly development. Formal initiatives seem to focus on a specific form of scholarship and it is mostly left to the individual lecturer to integrate scholarship in his/her academic practice.

The State in the South African context (see page 73) has passed several legislative measures and has established various statutory structures that support CPD through policy, reporting requirements, consultative bodies, programmes, or funding systems. The influence of the State in scholarly development should therefore not be underestimated, especially in the South African context. CPD initiatives within higher education that do not take into account national authorities and current legislation may find it difficult to succeed.

Universities remain one of the main internal providers of CPD for the development of scholarship of their own staff (see page 79). Universities are described as democratic institutions that allow their members substantial operating freedom, while providing them with a safety net of quality control. They play an important role in certifying and accrediting CPD. The study indicates, however, that the lecturers in the study population learned mostly through self-directed and opportunistic efforts, which means they generally address a learning need as it arises by consulting sources they regard as reputable – mostly colleagues and other experts within the natural sciences. These are often unintended and incidental learning experiences. Most of what is considered as CPD, however, takes the form of formal programmes. The emphasis on pre-defined formal learning results in unrecognised and unappreciated informal learning. The quality of informal learning, in particular, is also difficult to measure and its results are not easy to evaluate. Nonetheless, the value of informal learning should never be disregarded. It challenges the organisation to create a learning environment that fosters productive and continuous learning and takes into account different ways in which scholarly development can take place.

Formal programmes will, however, continue to form an important part of CPD and therefore of the development of scholarship in higher education. Academic credit is widely recognised as a

motivator for professional development. The flexibility of programmes in terms of programme and timing and recognition of prior learning is an important consideration that should be taken into account in the specific study population. The way in which programmes are presented should be critically reviewed. The programmes should be responsive to the needs of the clients, the lecturers. Time constraints are a major issue. Persons of stature that enjoy credibility within the specific field should contribute to the planning and presentation of programmes aimed at lecturers in the natural sciences.

The recognised contribution of the informal sector to CPD (see page 91) for the study population is limited in the sense that it focuses mainly on the research role of the lecturer (and therefore the scholarship of discovery). It does, however, have an important role to fulfil in this regard, as it creates a support system outside the university itself. Better co-ordination between associations nationally and internationally could help to build an integrated CPD system for lecturers in the natural sciences.

The role of the commercial sector in CPD (see page 92) also mainly centres on the research role of the lecturer, but it makes important contributions to development in practice in terms of funding, collaboration and the building of networks. Synergy between initiatives within the Faculty of Science could facilitate CPD with a broader applicability and could lead to better integration of the various forms of scholarship.

How CPD is provided to the study population was discussed in terms of four major paradigm shifts, namely a change in emphasis from transmission of knowledge to experimental learning; from reliance on existing research findings to examining one's own practice through reflective practices; from individually focused learning to collaborative efforts and from mimicking best practice to problem-based learning and practice. These paradigm shifts all point to the need for an integrated system of CPD provision and co-ordination of CPD providers, which would – in turn – provide more impetus for the integration of scholarly practice. CPD within the study population of natural science lecturers is in dire need of an integrated system of CPD provision. The current approach is fragmented, unco-ordinated and without a clear articulation of its intended outcomes. Such a system might be difficult to achieve, but not impossible. Limited resources and severe time constraints further necessitate the move towards an integrated system. Recognition of prior learning, cumulative CPD programmes and collaborative efforts are aspects that should form an integral part of such a system.

7.5 QUALITY OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT THAT ENHANCES SCHOLARLY DEVELOPMENT

In Chapter 4 (pages 120-168), CPD that facilitates learning of a high quality was presented as a viable option to promote scholarly excellence. The chapter provided an overview of what constitutes scholarly excellence in the context of natural science lecturers at Stellenbosch University. The concept of learning was approached from an andragogical perspective as an integral part of professional development. The progression from novice to expert as a result of learning during CPD was discussed. Developmental options – such as formalised governmental interventions, management input in the form of Total Quality Management (TQM), leadership development, mentorship, and situated learning – were considered in enhancing scholarly development of natural science lecturers at Stellenbosch University.

The quality in academics as professionals (see page 120) was identified as the first aspect in ensuring quality in higher education, as increasing scholarly requirements in the workplace necessitate more qualified educators. A well-trained lecturer force is essential in preparing learners to function competently within an increasingly student-centred and technology-based society. This, however, requires that lecturers as educators continuously learn and develop as well (through CPD) and that the learning and development are of a high quality. Natural science lecturers who contributed to the study are highly qualified in terms of the scholarship of discovery (with reference to their own subject-specific knowledge and practice), but they are also expected to teach, provide research supervision, interact with the wider community, manage people, and act as administrators. They can therefore not ignore the skills and attitudes necessary to fulfil these 'non-scientific' roles and responsibilities effectively. They often do not have the necessary training or conscious need to develop the capacities that enable them to deal with their diverse scholarly responsibilities.

Linking the context and professional practice through knowledge gained by both constructivist and transformative learning is proposed in order to create a holistic understanding of professional learning in a scholarly setting (see page 133). Self-direction, reflection, collaboration and learning through experience play an integral part in this process and are already evident in the valid study population's learning practices, even if they are not articulated in these precise terms. These insights and practices are mostly developed through trial and error, not through well defined learning strategies. Practical ways should be sought to help lecturers in the natural sciences reflect on, construct, and transform their knowledge and learning. In order to do this, they need to understand the context in which learning and professional practice take place. Only then will they be able to develop optimally as scholars. Lecturers in the natural sciences are often not interested in the theory of education. Therefore

such models need to be translated into practical, applicable and suitable CPD practices for this particular audience.

CPD programmes are mostly still focused on updating professionals' knowledge and disseminating information in a formalised manner. Quality of practice and further learning rests not only on a substantial knowledge base, but also on expertise – the art of practice. By the time that a person becomes a lecturer in the natural sciences, he/she has already built up extensive expertise in a specific discipline through postgraduate studies – usually a doctorate, but at the least a master's degree. There are academics who are, however, still hesitant to call themselves experts, sometimes owing to their lack of experience in their scholarly roles beyond discovery (research). Those who do see themselves as experts do so mostly in terms of their years of experience and subject-related expertise.

Other than the formal induction programmes and some information technology programmes, little distinction is made between novices and experts in the formal CPD within the CPD structures of Stellenbosch University. Different educational strategies are appropriate at different skill levels to enhance optimal learning. Understanding the differences in novice and expert learning can enhance the quality of CPD programmes and help both novices and experts to reach the desired learning outcomes. The lecturers who participated in the study indicated that they saw differences in their own learning strategies as novices and as (more) expert practitioners over time. They indicated that it took time for novices to build up professional networks and gain exposure. In this instance, support and encouragement from senior personnel are indispensable in novices' learning through CPD. Furthermore, the more expertise a professional gains in a particular area of scholarly practice, the more independent (but also interdependent) the person becomes. Experience enables the professional to distinguish between important and unimportant information, to easily grasp the essence of information (and not to waste time on irrelevant details), to rapidly recognise and retrieve familiar patterns and to disseminate the information in an understandable manner.

Novices do not develop into experts overnight; it is an ongoing and mostly self-directed and reflective process (see page 138). It takes time and effort to build up a national and international network of colleagues who contribute to collegial interaction and development in a meaningful way. Knowing how to distinguish important information from the unimportant masses of available information takes time, experience and insight. Developing an effective personal style of teaching and disseminating information to a wider audience comes through making mistakes, learning from other lecturers' examples, obtaining feedback, and being challenged by one's students or audience. This transitional process from novice to expert should be nurtured through CPD, but at this stage it is recognised in very few formal CPD programmes.

Five main areas were investigated as means to enhance the quality of learning in CPD (see page 143). Formalised governmental interventions in CPD quality assurance, the Total Quality Management system, leadership development, mentorship, and situated learning were presented as strategies to facilitate quality of learning in CPD.

Quality assurance through the Higher Education Quality Committee (HEQC) institutional audit mechanism can play a central role in ensuring the quality of CPD initiatives in higher education through formalised governmental interventions. In terms of CPD, the focus is specifically on support services such as the Centre for Teaching and Learning, and the Divisions for Research Development and Community Interaction at Stellenbosch University. It is debatable whether these academic support services should provide and monitor subject-specific development opportunities, which are mostly addressed by subject-specific organisations or self-directed initiatives. These initiatives have long established monitoring systems such as peer review of articles published in reputable journals and question-and-answer sessions following conference presentations. However, university support services are indispensable in terms of their role in creating and facilitating opportunities for CPD aimed at integrating the scholarly roles and responsibilities of lecturers at Stellenbosch University.

Accreditation is another contentious issue where government policy is concerned. Differences in opinion exist within the study population as to whether CPD initiatives should be accredited at all. Those in favour of accreditation see it as valid quality control and a way through which industry and academia will be able to judge the abilities and skills of an individual. Furthermore, it would possibly be easier to receive recognition and reward for attendance and completion if these initiatives were accredited, which would make it worth their while. Those against accreditation see it as another form of bureaucratic interference and an added administrative load, which lecturers already perceive as overbearing. They also fear that participants would end up participating only for the credits awarded (should a credit system be implemented simultaneously), rather than for inherent self-improvement. Another perceived negative aspect of accreditation as a quality assurance mechanism is that it could inhibit academic freedom in that such initiatives could become compulsory. This is the negative side of reward and recognition – that only the accredited initiatives will bear any weight when it comes to promotion and professional advancement. Both sides of the debate have valid arguments. To accredit, or not to accredit: it is expected that the debate will continue for some time within the specific context.

The Total Quality Management (TQM) system was presented as a means to achieve quality in CPD. It is defined as a management approach that is centred on quality, based on participation

and aimed at long-term success – even though it is criticised as a consumer-driven scheme unsuitable for use in higher education. However, it was argued that the TQM system could evolve into an appropriate and successful participatory CPD management strategy in the natural sciences. Even though natural scientists may initially be sceptical of the qualitative elements incorporated into the TQM system, it presents a relatively simple, yet effective mechanism through which individual lecturers can plan, execute, evaluate and defend their continuing development strategies. It is also suitable as a management strategy in collaborative initiatives and leaves room for the unique practice setting in which lecturers in the natural sciences find themselves.

Leadership development is another important aspect in ensuring and improving the quality of learning in CPD. The leader in higher education has a paradoxical role to fulfil. Leaders who value lecturers' sense of academic freedom and autonomy and encourage innovation are highly sought after in higher education. These leaders should simultaneously facilitate collaboration without creating a bureaucratically overloaded system. Leaders have the power to facilitate the integration of scholarship in higher education through the cultivation of lifelong learning and transformation.

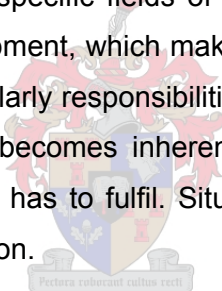
Current literature on leadership development in higher education tends to focus on transformation within the teaching role of the lecturer. However, the leadership role in terms of CPD stretches much further than only teaching. Leaders are expected to consult, initiate, participate, support and lead by example in all fields of practice: A leader in higher education (such as a head of department in the natural sciences) is expected to be a change agent. However, such leaders often lack the knowledge and skills to empower and motivate other staff members to cope with change and transformation effectively. Leadership development at departmental level through training mechanisms is an aspect that should be taken more seriously by institutional management. Initiatives by the Cape Higher Education Consortium (CHEC), such as the Creating the Leading Edge programme and the HERS-SA initiative, should be promoted and integrated into the university's leadership development plans.

Leadership development is an important tool in improving the quality of learning in CPD. The highly competitive arena of higher education demands leaders that can initiate and adapt to change. Leaders who effectively integrate all aspects of scholarly practice, and who are empowered lifelong learners in their profession, will motivate others to follow their example of continuous professional development.

Mentoring was presented as an effective human resource for the development of quality in learning through CPD. A variety of mentoring models and examples in literature support the

value of mentoring in ensuring quality of learning in CPD. The model that is adopted is highly dependent on the professional culture and the extent to which it is externally regulated. Mentoring programmes such as the Thuthuka programme, initiated and funded by the National Research Foundation (NRF), seem to play an important role in the CPD, especially that of young lecturers in the natural sciences at Stellenbosch University. It is evident from the participants' feedback that there is a need for collaborative mentoring. This may take on the form of informal individual arrangements, or more structured peer and group mentoring sessions. Interdepartmental collaboration within the faculty may also hold interesting possibilities for cross-pollination and even transdisciplinary teamwork. Collaborative efforts will strengthen a system of collegial peer review, limit the chances of academic duplication, and improve the integration of research, teaching and engagement as forms of scholarship.

A situated learning approach is particularly suited to CPD in academic practice in higher education as it integrates lecturers' different scholarly responsibilities into one learning experience. Situated learning also emphasises the role of the expert in professional practice and draws on the expert as a resource of knowledge and/or skill. Lecturers in the natural sciences are specialists within their specific fields of expertise and emphasise research as a primary means of continuous development, which makes it difficult for them to buy into broader initiatives that address the other scholarly responsibilities. Situated learning may be an effective means to achieve this, as learning becomes inherent in practice and is congruent with the different scholarly roles the educator has to fulfil. Situated learning requires expert facilitators who are respected within the profession.



Situated learning is the culmination of all the investigated aspects that enhance the quality of learning in CPD. It places learning within the boundaries set by national and general management policies. Situated learning is also an ideal way to incorporate the mechanisms suggested by the TQM system and it gives structure to mentorship arrangements. It enables academic leaders to facilitate CPD in a progressive, innovative, but also orderly and realistic manner. Situated learning ensures that real problems within the practice context are addressed.

CPD initiatives will have to broaden their focus and incorporate diverse approaches to developing scholarly practice to survive future challenges that face higher education. Comprehensive programmes that address leadership and management skills, professionalism, a variety of scholarly knowledge, skills and attitudes, technological changes, organisational development, and coping with change, will equip the academic of the future with the necessary survival skills. All-round scholarly competence, accountability, professionalism and lifelong learning should be encouraged in a CPD system that enhances the quality of its professionals.

7.6 THE EVALUATION OF LEARNING IN CONTINUING PROFESSIONAL DEVELOPMENT

Chapter 5 (pages 169-212) explored the evaluation of learning in CPD in the natural sciences at Stellenbosch University. Evaluation of learning in CPD is a much debated and contentious subject, because it is difficult to demonstrate that a specific educational initiative results in a particular outcome in practice. However, the evaluation of learning in CPD cannot be ignored, as it serves as proof of quality, monetary investment and energy spent on CPD.

The study conducted amongst lecturers in the natural sciences at Stellenbosch University clearly indicates the evaluation of learning in CPD as the main shortcoming in the total process of CPD conceptualisation, provision, quality assurance and evaluation within the institution. Accountability for the monetary investment and energy spent on any CPD initiative within the institution is therefore limited.

A brief overview of different evaluation models was given (see page 174). These models all contribute to our understanding of the evaluation of learning in CPD. The type of model selected depends on the specific context and the purposes of evaluation. This was followed by an integrated approach to the evaluation of learning in CPD. One of the major problems in evaluating learning in the CPD of science lecturers is that most of the initiatives undertaken by the lecturing staff are self-initiated and on an informal basis, which makes the evaluation of learning through formal structures an unenviable task. It is clear that there is a need for an evaluative process that integrates the strengths of various evaluative methods. Such a process should ideally incorporate the different levels of learning in combination with basic evaluative questions. Combining levels of evaluation with critical evaluative questions will give an integrated and holistic view of the evaluation of learning in CPD.

How should this assessment of quality take place in practical terms? Portfolios, peer review, open-ended problems and simulations, auditing, and observation of practice were discussed in terms of their contribution to the evaluation of learning in CPD (see page 190). These methods might elicit sceptical reactions from hardcore scientists, as they often do not present quantifiable results. Lecturers (especially in the natural sciences) will need time and proper training to buy into such evaluative schemes.

A portfolio policy for newly appointed academic staff is in the concept phase at Stellenbosch University. Although the assessment of learning through CPD does not seem to be a focal point in this concept policy, reflective practice is emphasised. Therefore evidence of continuing professional development will obviously be to the advantage of the applicant. Portfolios are also a way in which to differentially evaluate the learning of novices and experts without

compromising fairness as an evaluative criterion. It is interesting to note that most development efforts (such as the portfolio policy, mentorship and induction programmes) at Stellenbosch University are aimed at entry-level lecturers. Academics in the higher levels of expertise and practice are seen to have established themselves in terms of learning patterns and practices. Consequently, CPD initiatives are often informal and self-directed at these levels. It can, however, be argued that a lack of attention and formal development initiatives at the more senior levels of professional practice is a major flaw in the current CPD system. Senior staff are often responsible for implementing policies and evaluating the outcomes of initiatives such as mentoring and portfolio programmes. How will they be able to effectively implement policies and evaluate junior staff members in terms of these initiatives if they have never been required to go through the process themselves? Management training and an equitable staff evaluation system are called for in the current academic sphere. Evaluators should receive training and clear guidelines, especially if they are new to the approach, which may very well be the case in the natural sciences.

Peer review is an example of an evaluation of learning system that is already in place within the scholarship of discovery. Any lecturer's work aimed at publication in a reputable journal will be subject to peer review. This is a widely accepted practice in the scholarship of discovery, but it is not practised as extensively in the other areas of scholarship such as teaching or engagement. There are various ways in which peer evaluation can be expanded, but care should be taken not to create a 'policing' system, but rather a system of co-operative learning.

Open-ended problems and simulations are already applied practically in the research setting and are evaluated as such, and examples of this practice do indeed exist in the induction of newly appointed lecturers to teaching practice. There may be various other possibilities for application that are as yet unexplored. Technological advances, an increasingly diverse learner population as clientele, and the increased emphasis on the social responsibility of a university within the wider community demand a myriad of scholarly strategies. Learning and development that take place in these scholarly practices could be evaluated by posing open-ended problems and simulations to lecturers. This could take place in an individual or group setting. The observation of practice behaviours may add to peer review systems, but there are problems in terms of the reliability of observations. Moreover, some evaluators may not be qualified to do a sufficient and accurate evaluation. Evaluator training is essential. Auditing systems should not be considered an exhaustive evaluative measure. Since auditing mostly does not take the qualitative aspects of learning into account it should be used in conjunction with other measures, such as those mentioned in the rest of this section.

It is therefore clear that a combination of a selection of these different methods appropriate to the specific situation may be the most suitable option to yield reliable and valid evaluative evidence of learning to support findings of the influence of CPD on scholarly practice.

Who should conduct the evaluation of learning in CPD? (See page 201) Ultimately, heads of department remain the designated drivers of evaluation in CPD. They need training and support to fulfil this role adequately. Mentors could be a possible solution to the problem, but this raises questions on the desirability of tainting the mentor-mentee relationship with evaluation issues. Mentors can, however, give important input when considering the mentee's professional competence, as the mentor possibly has a closer professional relationship with the person than a line manager does. Mentors are therefore an important resource in the assessment of portfolios.

It could be argued that external professional bodies should drive the evaluation of learning in CPD. The university, however, currently also demands a certain extent of autonomy as an organisation and therefore evaluation issues are seen as internal matters. The South African Council for Natural Scientific Professions therefore only serves higher education organisations in an advisory capacity and not as a determining body in this case. Organisations such as the National Research Foundation serve as external evaluators, but only in terms of research and only to a certain extent. No integrated system for the evaluation of learning and development of integrated scholarly practice currently exists and therefore it remains difficult to assign the responsibility for the evaluation of learning through CPD.

It is clear that the lack of evaluation of learning, or the incorrect and thoughtless application thereof, can be blamed for many negative sentiments surrounding CPD. A critical re-investigation of the underlying theories, concepts, principles and application of the evaluation process within CPD can significantly contribute to our understanding of scholars as lifelong learners. Only through the consistent, critical and appropriate evaluation of learning can the quality and resulting worth of CPD be monitored as a valuable contribution to lifelong learning within the natural sciences in higher education.

Although there are many theories and debates surrounding the evaluation of learning in CPD, the theories are evidently not effectively put into practice within the Faculty of Science at Stellenbosch University. The informality, individually driven and self-directed nature of many CPD initiatives may be a contributing factor. The fear of an even heavier administrative load as a result of more policies and procedures that have to be implemented may make these academics sceptical of any initiative that aims to monitor or assess professional learning and development. The high value placed on academic freedom (particularly in this sector) further

removes any inclination to support evaluative initiatives, as these academics perceive themselves to be beyond the level where their professional practices are to be constantly monitored. The reality is, however, that society, government and the institution itself demand greater accountability and proof of investment. It is therefore important that we understand the context of practice and devise ways through which we can determine whether learning and development do indeed enhance scholarly practice.

7.7 CURRENT ISSUES AND FUTURE TRENDS IN CONTINUING PROFESSIONAL DEVELOPMENT FOR NATURAL SCIENCES LECTURERS IN HIGHER EDUCATION – A QUESTION OF INTEGRATING VARIOUS FORMS OF SCHOLARSHIP

The current issues and future trends in CPD within the context of lecturers in the natural sciences at Stellenbosch University were investigated in Chapter 6 (see pages 213-297) using four main questions focused on the future context of practice, the role of and need for experts, the education of experts, and how experts' competence could be maintained. How CPD can enable lecturers in the natural sciences at Stellenbosch University to integrate various forms of scholarship formed the foundation for the arguments in each of these questions.

- The future context of practice for CPD (see page 214)

The future context of practice should be seen in terms of achieving a balance between the university as learning organisation and the individual lecturer in the natural sciences as professional. The organisational context would be determined by both the institutional culture and strategic direction, which are influenced by globalisation, as well as by the social, economic and political climates. These climates are influenced by demands for flexibility and the massification of the higher education system, demands for equity and redress in South Africa, democratic governance at all levels and an increasingly diverse student population. The current higher education climate in South Africa seems to be managerially inclined, which leads to a top-down silo-like management structure and which limits lecturers' autonomy and scope to integrate scholarship. The individual lecturer's context is determined by learning needs and preferences in CPD, which are influenced by the professional's pre-service education, existing expertise, life and work experiences, life stage and demographics, and the teachable moments for self-development and career advancement. This calls for the integration of learning into practice through problem-centred approaches, technological infrastructure, research opportunities, curriculum development, and collaborative initiatives.

- The role of and need for experts (see page 238)

The role of experts in future professional practice is multi-dimensional, demanding expertise in all scholarly roles (discovery, teaching, engagement, and integration). Experts in a specific discipline would have to master a variety of knowledge and skills. Experts could provide invaluable input, especially with regard to novice professionals, where generalised initial training fails to address specific contextual situations.

The roles and responsibilities of experts in the natural sciences in higher education are diverse and there are various external influences (including government, the higher education institution, industry, professional organisations, and society as a whole) that determine the focus of professional practice in this sphere. It is clear that lecturers are currently expected to fulfil the full array of scholarly roles and responsibilities in practice and this will continue to be the case in at least the near future. This diversity in what is expected of the lecturer complicates (and enriches) professional practice, where CPD should be integrated into the professional practice of the professional as part of lifelong learning. It should, however, be differentiated according to the different needs of the individual expert in terms of level of expertise, priorities in roles and responsibilities and demands of the specific discipline in which the professional practises. A needs-based approach to CPD should be followed. Experts will continue to be indispensable in terms of their input as transmitters, facilitators, resource persons and creative developers in their various roles. They mould the future context of practice. It is clear that professional experts have an important role to play in the future of CPD and the higher education context as a whole.

Experts are therefore expected to be the guardians of competent and ethical scholarly practice in the natural sciences, and to function and develop continuously as competent scholars themselves.

- The education of experts (see page 243)

Experts in the natural sciences are currently educated by means of initial doctoral education as an entry point into academe. It was argued that the current format of doctoral education does not adequately prepare future scholars for the demands of integrated scholarly practice. The current focus of doctoral education is on research development. A continuum of learning is proposed as the professional increases his/her expertise. There are various routes to follow, but none of these routes integrate all the aspects of professional practice as a lecturer. The current fragmented and sometimes haphazard patterns of development (especially in non-subject-specific areas of practice) will continue if there is no movement towards a national and unified training system for lecturers.

CPD is therefore important for lecturers' development in other areas of scholarly development, such as teaching and engagement. Transdisciplinarity is proposed as a developmental approach to fostering integrated scholarship through collaboration.

- Maintaining experts' level of competence (see page 260)

The maintenance of competence and expertise is the joint responsibility of the individual professional and the organisation. Lecturers will only maintain a balanced professional expertise if top management supports CPD initiatives that promote learning and development in this manner, without it being a top-down mandatory venture.

Currently, lecturers as professionals are expected to maintain their expertise in all areas of scholarly practice without a clear and integrated system of quality benchmarks or standard evaluative practices. They are expected to perform as scholars, but without sufficient training for the majority of the roles they are expected to fulfil. Moreover, lecturers in the natural sciences are mostly evaluated in terms of their research output, which leads them to concentrate on research-related CPD to the detriment of the other forms of scholarship. The ideal would be for a national (and even international) system of maintaining expertise to be developed, especially seen within the context of the increasing global mobility of academia.

7.8 CONCLUSION

Is it possible to integrate the notions of scholarship and continuing professional development in the natural sciences into higher education?



This study has indicated that the main concepts to consider include the definition, need, purpose, quality and evaluation of learning in CPD as a component of scholarly development. The study investigated the main directions followed in the past, and the conducted research pointed to a few new directions for future consideration. It has cautioned all those concerned with CPD about the main pitfalls along the way and made tentative suggestions for overcoming these obstacles.

There is still much to be done in the quest for integrated scholarship in the natural sciences – CPD (as formal, non-formal, or informal learning) remains to develop in order to gain the stature and recognition it deserves to become a reality within all forms of scholarly practice within the natural sciences. An integrated approach to CPD is proposed and should, in the author's view, be propagated to enhance integrated scholarship in academic practice in the natural sciences.

**ADDENDUM A:
INTERVIEW SCHEDULE
NAME:** _____

DATE: _____

INTERVIEW SCHEDULE

**INVESTIGATING
CONTINUING PROFESSIONAL DEVELOPMENT (CPD)
FOR UNIVERSITY LECTURERS
IN THE FACULTY OF NATURAL SCIENCES,
STELLENBOSCH UNIVERSITY**



**LIEZEL FRICK
MPhil (Lifelong Learning)
Centre for Higher and Adult Education
Stellenbosch University**

A. General Information

Name
Highest formal qualification
Position
Years of work experience
Years at the Stellenbosch University
Years in current position

B. Defining CPD in Higher Education

- **Need**
- **Purpose**
- **Provision**

1. How would you define a professional?
 2. How do you define CPD in your profession within the context of Higher Education?
- Prompt 2.1 Do you perceive the role of CPD as improving facilitative/educational skills, or improving the participants' subject-specific expertise?

Prompt 2.2 In your opinion, are CPD programmes mainly aimed at the professional's role as an educator or as a subject specialist?

Educator	Subject specialist
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3. Do you think there is a need for CPD within your profession?
- Prompt 3.1 What are the specific needs for CPD within your profession?
4. What is the purpose of current CPD programme(s) within your profession?
 5. Do the purpose and need correspond?
 6. Briefly describe the format, timing and length of the CPD programme(s) that you have been involved in (either as a presenter/facilitator or participant):

FORMAT

- Conferences
- Formal coursework/lectures
- Workshops
- Reading of educational journals and/or bulletins
- Sharing and discussing information with colleagues
- Other (specify)

TIMING

- During normal academic year
- During academic recess times
- Other (specify)

LENGTH

- < 1 day
- 2-4 days
- 1 week
- ≥ 1 week
- Spread over a period of time
- Other (specify)

C. **Quality of CPD provided**

7. In your opinion, how do professionals learn?

Prompt 7.1 Do you think professionals learn more effectively when they:

- The transfer of technical skills through a type of “show and tell”
- Providing up-to-date knowledge through traditional lectures and dissemination relevant reading material
- The adoption of innovation posed by experts in the field
- Reflection in action (*refers to situations where professionals are confronted with problems that cannot be immediately explained or solved within their zone of mastery – they have to search for additional information*)
- Reflection on action (*reflection on actions taken by themselves within their own practices*)
- Reflective theory building (*the incorporation of newly learned theory into professionals’ existing knowledge structures by means of reflection*)
- Constructivist knowing (*the development from novice to expert in which the professional’s learning becomes increasingly constructivist and self-directed. This means that the expert is able to construct meaning from ill-defined and complex content areas by improvising and drawing on their professional experience*)
- Problem posing (*a form of problem generation that evolves as professionals explore situations, ask questions of themselves and others, learn to reason and experience the communication of ideas*)

8. What attributes would a CPD programme of high quality contain?

- Knowledge component
- Developing technical / practical skills
- Developing interpersonal skills
- Developing the art of practice – expertise
- Other (specify)

9. Does the quality of current CPD programme(s) facilitate the move from novice to expert?

Prompt 9.1 Why?

10. Are there evident differences in the learning practices of novices and experts?

Prompt 10.1 What are these differences?

11. What innovative facilitative and learning strategies would you use in CPD programmes through which knowledge will complement practice?

- Reflection in action
- Reflection on action
- Portfolio’s
- Action research
- Critical learning communities
- Collaborative elements
- Problem posing
- Mentoring
- Other (specify)

D. Evaluation of learning in CPD

12. Is there any form of evaluation that takes place in the CPD programme(s) you are/have been involved with?

Prompt 12.1 What do you think is the main reason for evaluating learning in CPD?

13. What type of learning is evaluated?

- Reaction
- Learning/knowledge
- Behavioural change
- Organisational change

14. Who is evaluated?

- Individual learner
- Co-workers
- Supervisors
- Organisation

15. Who does the evaluation?

- Self-evaluation
- Peer-evaluation
- Facilitator of programme does the evaluation
- Supervisor does the evaluation
- Central organisational evaluation
- Other (specify)

16. How do you evaluate learning?

- Smile sheets
- Traditional tests
- Portfolios
- Workplace observations
- Organisational performance records



17. Does the evaluation differ for novices versus experts?

E. Determining possible future trends in CPD from current CPD status in this sector

18. What motivates professionals to attend CPD programmes?

- Promotion
- Financial benefit
- Status
- Improvement of competencies
- Personal growth
- Institutional requirements

19. How would you ensure that CPD programmes remain relevant?

20. Do you think all CPD programmes should be accredited?

Prompt 20.1 What do you think accreditation would achieve?

21. What is your opinion on a Postgraduate Certificate in Higher Education and Training for lecturers at a university?

Prompt 21.1 Do you think such a qualification as part of a lecturer's CPD is enforceable?

22. Are there any other aspects you would like to discuss?

THANK YOU FOR YOUR VALUABLE INPUT AND TIME



**ADDENDUM B:
QUESTIONNAIRE**

QUESTIONNAIRE

**INVESTIGATING
CONTINUING PROFESSIONAL DEVELOPMENT (CPD)
FOR UNIVERSITY LECTURERS
AT THE FACULTY OF SCIENCE,
STELLENBOSCH UNIVERSITY**



LIEZEL FRICK
MPhil (Lifelong Learning)
Centre for Higher and Adult Education
Stellenbosch University

ADDENDUM B: QUESTIONNAIRE

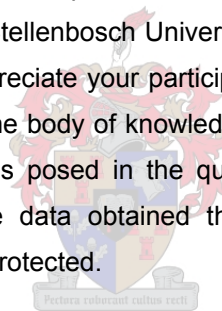
Dear Respondent

Questionnaire investigating continuing professional development (CPD)

The emphasis on lifelong learning, especially within professional practice, is a worldwide phenomenon. It is expected of the professional to remain up-to-date with the latest knowledge, skills and/or innovations. Lecturers at universities are no exception. This has led to the evolution of the term continuing professional development (CPD). It however remains unclear how CPD within the professional arena of lecturers is defined in terms of need purpose and provision. The current quality of learning and evaluation practices also warrants investigation. The university lecturer functions within a unique area of professional practice, as the practice requires elements of both subject-specific and educational expertise.

This study aims to investigate CPD from the lecturers' perspective. Emphasis is placed on four different aspects, namely the definition of CPD, the quality of CPD programmes, the evaluation of learning within CPD and possible trends in CPD that will direct its future.

You have been selected by means of a stratified random sample as a potential respondent in my MPhil (Lifelong Learning) research project, under supervision of Prof Chris Kapp. I have obtained permission from the Vice-rector (Education) of the Stellenbosch University to ask the selected potential respondents to participate in this project. I would appreciate your participation, time and input, as it will enable me to complete my studies and contribute to the body of knowledge within this area of expertise. There are no right or wrong answers to the questions posed in the questionnaire. I would appreciate your honest opinions on the aspects covered. The data obtained through the questionnaires will be analysed qualitatively and your anonymity will be protected.



Thank you for your co-operation.

Kind regards

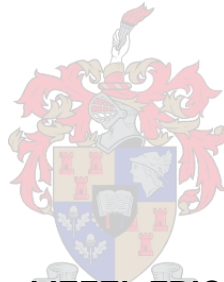
Liezel Frick

MPhil (Lifelong Learning) student

**ADDENDUM B:
QUESTIONNAIRE**

VRAELYS

**ONDERSOEK VAN
VOORTGESETTE PROFESSIONELE ONTWIKKELING (VPO)
VIR UNIVERSITEITSDOSENTE
BY DIE FAKULTEIT NATUURWETENSAPPE,
UNIVERSITEIT STELLENBOSCH**



LIEZEL FRICK

MPhil (Lewenslange Leer)

**Sentrum vir Hoër en Volwassene Onderwys
Universiteit Stellenbosch**

ADDENDUM B: QUESTIONNAIRE

Geagte Respondent

Vraelys wat voortgesette professionele ontwikkeling (VPO) ondersoek

Die klem op lewenslange leer, veral binne professionele praktyk, is 'n wêreldwye fenomeen. Dit word van die professionele persoon verwag om op datum te bly met die nuutste kennis, vaardighede en/of innovering. Dosente aan universiteite is geen uitsondering. Dit het gelei tot die evolusie van die term voortgesette professionele ontwikkeling (VPO). Dit bly egter onduidelik hoe VPO binne die professionele arena van dosente gedefinieer word in terme van behoefte, doel en verskaffing. Die huidige kwaliteit van leer- en evalueringspraktyke noop ook ondersoek. Die universiteitsdosent funksioneer binne 'n unieke area van professionele praktyk, siende die praktyk elemente van beide vakspesifieke en opvoedkundige kundigheid vereis.

Hierdie studie poog om VPO te ondersoek vanuit dosente se perspektief. Klem word geplaas op vier verskillende aspekte, naamlik die definisie van VPO, die kwaliteit van VPO inisiatiewe, die evaluering van leer binne VPO en moontlike neigings in VPO wat die toekoms daarvan sal rig.

U is geselekteer op grond van 'n gestratifiseerde ewekansige steekproef as 'n potensiële respondent vir my MPhil (Lewenslange Leer) navorsingsprojek, onder leiding van Prof Chris Kapp. Ek het toestemming verkry vanaf die Vise-rector (Onderrig) van die Universiteit van Stellenbosch, om die geselekteerde potensiële respondente te vra om deel te neem aan dié projek. Ek sal u deelname, tyd en insette waardeer, siende dit my in staat sal stel om my studies te voltooi en 'n bydrae te lewer tot die kennisveld binne hierdie area van kundigheid. Daar is geen regte of verkeerde antwoorde op die vrae wat gestel is in die vraelys nie. Ek sal u eerlike opinies op die aspekte wat gedek word waardeer. Die data wat verkry word deur die vraelys sal kwalitatief geanaliseer word en u anonimiteit sal beskerm word.

Dankie vir u samewerking.

Vriendelike groete

Liezel Frick MPhil (Lewenslange Leer) student

**ADDENDUM B:
QUESTIONNAIRE**

**Continuing Professional Development Questionnaire
Voortgesette Professionele Ontwikkeling Vraelys**

A. General Information – Algemene Inligting

1.1 Highest formal qualification
Hoogste formele kwalifikasie

1.2 Total years of work experience
Totale jare werksondervinding

Years / Jare

1.3 Years in service of the Stellenbosch University
Jare in diens van die Universiteit van Stellenbosch

Years / Jare

1.4 Current position at Stellenbosch University
Huidige posisie aan Universiteit van Stellenbosch

1.5 Years in current position
Jare in huidige posisie

Years / Jare

B. Defining of CPD – Definiëring van VPO

2.1 What does it mean to you to be a professional?
Wat beteken dit vir u om 'n professionele persoon te wees?

**ADDENDUM B:
QUESTIONNAIRE**

2.2 Briefly describe your roles and responsibilities as a professional academic.
Beskryf kortliks u rolle en verantwoordelikhede as 'n professionele akademikus.

2.3 How do you ensure that you remain on the forefront of the latest innovative practices in all your roles as a lecturer?
Hoe verseker u dat u op hoogte bly van die nuutste innoverende praktyke in al u rolle as 'n dosent?

2.4 What does continuing professional development mean to you?
Wat beteken voortgesette professionele ontwikkeling vir u?

2.5 What are your specific needs for developing continuously as a professional?
Wat is u spesifieke behoeftes vir voortdurende ontwikkeling as 'n professionele persoon?

ADDENDUM B: QUESTIONNAIRE

2.6 Do you perceive the role of CPD as improving your: (a) community involvement, (b) facilitative/educational skills, or (c) improving your subject-specific expertise as a lecturer – or all of the above?

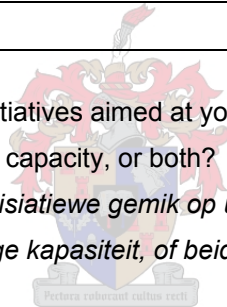
Sien u die rol van VPO as die verbetering van u: (a) gemeenskapsbetrokkenheid, (b) fasiliterende/opvoedkundige vaardighede, óf (c) die verbetering van u vak-spesifieke kundigheid as 'n dosent – of al die bogenoemde?

2.7 Are you aware of any initiatives that could contribute to your own professional development? Please describe these initiatives briefly.

Is u bewus van enige inisiatiewe wat kan bydra tot u eie professionele ontwikkeling? Beskryf asseblief hierdie inisiatiewe kortliks.

2.8 Are the current available CPD initiatives aimed at your subject of expertise, or at the development of your educational capacity, or both?

Is die huidige beskikbare VPO inisiatiewe gemik op u vakkundigheid, of op die ontwikkeling van u opvoedkundige kapasiteit, of beide?



2.9 What purpose(s) do these initiatives serve?

Watter doel dien hierdie inisiatiewe?

2.10 Do you think that these initiatives effectively address your CPD needs? Why?

Dink u dat hierdie inisiatiewe u VPO-behoeftes effektief aanspreek? Hoekom?

**ADDENDUM B:
QUESTIONNAIRE**

3.3 Has the way in which you learn and develop as a professional changed from when you started working as a lecturer? If so, in which way do you learn differently now?
Het die manier waarop u leer en ontwikkel as 'n professionele persoon verander vandat u begin werk het as 'n dosent? Indien wel, op watter wyse leer u tans anders?

3.4 In which way do you learn and develop most effectively in your professional practice?
Op watter wyse leer en ontwikkel u die effektiwste in u professionele praktyk?

3.5 If you had to develop a CPD programme for lecturers in the natural sciences, how would you ensure that it is of high quality?
Indien u 'n VPO-program moes ontwerp vir dosente in die Natuurwetenskappe, hoe sou u verseker dat dit van hoogstaande gehalte is?

3.6 What learning strategies would you recommend through which knowledge will complement practice in CPD within the natural sciences?
Watter leerstrategieë sou u aanbeveel waardeur kennis die praktyk kan komplementeer in VPO binne die natuurwetenskappe?

ADDENDUM B: QUESTIONNAIRE

D. Evaluation of learning in CPD – Evaluering van leer in VPO

- 4.1 Were any of the CPD initiatives you have taken part in accredited? Please mark the applicable block.

Was enige van die VPO-inisiatiewe waaraan u al deelgeneem het, geakkrediteer?

Merk asseblief die toepaslike blokkie.

YES JA	NO NEE	UNSURE ONSEKER
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- 4.2 If so, what form of accreditation did the programme(s) receive?

Indien wel, watter vorm van akkreditasie het die program(me) ontvang?

- 4.3 Has there been any form of evaluation of learning in any of the CPD initiatives that you have encountered? If so, please answer Questions 4.3.1 – 4.3.5. If not, please proceed to Section E.

Het daar enige vorm van evaluering van leer plaasgevind in enige van die VPO-inisiatiewe wat u al teëgekom het? Indien wel, beantwoord asseblief Vrae 4.3.1 – 4.3.5. Indien nie, gaan asseblief voort na Afdeling E.

- 4.3.1 What type of learning was evaluated? (Please mark all those applicable)

Watter tipe leer is geëvalueer? (Merk asseblief al die toepaslike)

Reaction on the CPD initiative
Reaksie op die VPO-inisiatief

Knowledge gained during the CPD initiative
Kennis opgedoen tydens die VPO-inisiatief

Behavioural change as result of the CPD initiative
Gedragsveranderinge as resultaat van die VPO inisiatief

Organisational change as a result of CPD
Organisatoriese veranderinge as gevolg van VPO

Other (specify) – *Ander (spesifiseer)*

ADDENDUM B: QUESTIONNAIRE

4.3.2 Who was evaluated to determine the learning effectiveness? (Please mark all those applicable.)

Wie is geëvalueer om die effektiwiteit van leer te bepaal? (Merk asseblief al die toepaslike.)

Individual learner

Individuele leerder

Colleagues

Kollegas

Your immediate senior staff member

U onmiddellike senior personeellid

Organisation (for example quality assurance audits)

Organisasie (byvoorbeeld gehalteversekering-oudits)

Other (specify) – *Ander (spesifiseer)*

4.3.3 Who did the evaluation? (Please mark all those applicable)

Deur wie is die evaluering gedoen? (Merk asseblief al die toepaslike.)

Self-evaluation

Self-evaluering

Peer-evaluation

Eweknie-evaluering

Facilitator of the CPD programme did the evaluation

Fasiliteerder van die VPO-program het die evaluering gedoen

Supervisor did the evaluation

Toesighouer het die evaluering gedoen

Central organisational evaluation

Sentrale organisatoriese evaluering

Other (specify) – *Ander (spesifiseer)*

4.3.4 What was the evaluation format? (Please mark all those applicable.)

Wat was die evalueringsformaat? (Merk asseblief al die toepaslike.)

Smile sheets to determine participant's reaction to CPD initiative

Tevredenheidsterugvoer om deelnemer se reaksie tot VPO-inisiatief te bepaal

Traditional tests to determine the participant's knowledge gain

Tradisionele toetse om die deelnemer se toename in kennis te bepaal

Portfolios – a compilation of evidence that demonstrates learning in practice

Portefeuljes – 'n samestelling van bewyse wat leer in die praktyk demonstreer

Workplace observations that determine behavioural changes

Werkplekwaarnemings wat gedragsveranderinge bepaal

Organisational performance records

Organisatoriese prestasierekords

Other (specify) – *Ander (spesifiseer)*

ADDENDUM B: QUESTIONNAIRE

- 4.3.5 Did the evaluation differ for novices and experts? If so, in which way did it differ?
Het die evaluering verskil vir nuwelinge en kundiges? Indien wel, op watter wyse het dit verskil?

**E. Determining possible future trends in CPD
Bepaling van moontlike toekomsneigings in VPO**

- 5.1 What motivates you as a professional to take part in CPD initiatives?
Wat motiveer u as 'n professionele persoon om deel te neem aan VPO-inisiatiewe?

- 5.2 What do you see as relevant CPD issues that should be addressed in future within higher education?
Wat sien u as relevante VPO-knelpunte wat in die toekoms aangespreek behoort te word binne hoër onderwys?

- 5.3 What factors do you see as necessary to ensure the relevance of CPD?
Watter faktore beskou u as belangrik om VPO se relevansie te verseker?

**ADDENDUM B:
QUESTIONNAIRE**

5.4 Do you think all CPD programmes should be accredited? Please justify your answer.
Dink u dat alle VPO programme geakkrediteer behoort te word? Motiveer asseblief u antwoord.

5.5 Are you aware of any postgraduate certificate, diploma or degree in higher education and training? If you are aware of any, please make a list of them.
Is u bewus van enige nagraadse sertifikaat, diploma of graad in hoër onderwys en opleiding? Indien u bewus is van enige, maak asseblief 'n lys daarvan.

5.6 What is your opinion on lectures at a university following a postgraduate certificate, diploma or degree in higher education and training by lecturers at a university?
Wat is u opinie oor die volg van 'n nagraadse sertifikaat, diploma of graad in hoër onderwys en opleiding deur dosente aan 'n universiteit?

5.7 Do you think such a qualification can be made mandatory as part of a lecturer's CPD?
Dink u so 'n kwalifikasie kan verpligtend gemaak word as deel van 'n dosent se VPO?

**ADDENDUM B:
QUESTIONNAIRE**

5.8 Are there any other relevant CPD aspects you would like to comment on?

Is daar enige ander relevante VPO-aspekte waarop u graag kommentaar wil lewer?

**THANK YOU FOR YOUR VALUABLE INPUT AND TIME
DANKIE VIR U WAARDEVOLLE INSETTE EN TYD**

