Cape Peninsula
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ENHANCING ACADEMIC WRITING COMPETENCE IN RADIOGRAPHY EDUCATION

by

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Thesis submitted in fulfilment of the requirements for the degree

Master of Technology: Radiography

in the Faculty of Health and Wellness Sciences

at the Cape Peninsula University of Technology

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Groote Schuur
September 2011

DECLARATION

I, Lizel Sandra Ann Hudson, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

This thesis records a study undertaken by a radiography lecturer at a satellite campus of a University of Technology (UoT) in the Western Cape Province of South Africa. The study investigated the academic writing practices of first year Radiation Science learners and focused on an intervention to assist learners to enhance their academic writing competence. Three research questions were addressed:

1. What did radiography learners perceive to be the factors that enabled and constrained their academic writing competence during the first year of academic study?;
2. What were the 2010 first year learners' perceptions of the changes in their academic writing following an academic writing intervention?; and
3. According to the 2010 first year lecturers, how did the academic writing of the learners change following the intervention?

To answer these questions, the research comprised two qualitative approaches: firstly a case study approach, to gain an in-depth understanding of learner writing in radiography; then the insights gained allowed for the design of an appropriate academic writing intervention, carried out in two action research spirals. Thereafter the intervention was evaluated for its impact on learners' writing competence.

The findings and interpretations from this study culminated in a forward looking model that is recommended for use by radiography educators to enhance first year learners' academic writing competence. The model reflects a zone for the optimal enhancement of academic writing competence for entry-level learners. This 'zone' is created in the region of overlap of three contributing factors: collaborative guidance and support, peer mentoring and technology. The model also represents applicable underlying theories (critical theory, constructivism, and academic literacies theory) which provide the theoretical framework for enhanced academic writing competence.

ACKNOWLEDGEMENTS

I wish to thank:

- My supervisors, Dr Jenny Wright and Associate Professor Penelope Engel-Hills for their support and reading numerous draft copies of this thesis.
- Part-time lecturers, such as Theresa Binz, Linzi Bourhill and Lindsay Jaftha who willingly assisted me to finish this project on time.
- Elizabeth de Graaff and Leigh Story for transcribing the interviews in a professional and efficient manner.
- The participants, who committed their time and assistance which made this project a success.
- Mr. J. Hudson for taking the time to proofread the final copy of this thesis.
- My family, friends and colleagues for their prayers and motivation when I needed it most.
- God Almighty for giving me the strength and perseverance to finish this project.

The financial assistance of the Research and Innovation Fund for Teaching and Learning (RIFTAL) towards this research is acknowledged. Opinions expressed in this thesis and the conclusions arrived at, are those of the author, and are not necessarily to be attributed to the fund.

DEDICATION

My dearly beloved husband, Randall: Thank you for your prayer, patience and support.

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LIST OF ABBREVIATIONS AND ACRONYMS:

ALT	Academic Literacy Test
CCFOs	Critical cross-field outcomes
ECP	Extended Curriculum Programme
FAL	First Additional Language
HEI	Higher Education Institution
HESA	Higher Education South Africa
HL	Home Language
ICL	Integrating Content and Language/Content and Language Integration
ICLHE	Integrating Content and Language in Higher Education
MOI	Medium of Instruction
NBT	National Benchmarking Test
NBTP	National Benchmarking Test Project
NLS	New Literacy Studies
OBE	Outcomes Based Education
QDA	Qualitative Data Analysis
QLT	Quantitative Literacy Test
SAQA	South African Qualifications Authority
UoT	University of Technology
WIL	Work-integrated Learning

GLOSSARY:

Academic literacy: Refers to academic competence such as reading, writing, analysing and engaging with the academic knowledge base and texts of the radiography discipline.

Academic writing: Formal writing used in higher education for teaching, learning and assessment purposes.

Blended learning: A flexible approach that combines traditional face-to-face teaching and learning methods with technology-based initiatives to optimise the learning experience of the learner.

Discipline: Refers to professional health care disciplines such as Nursing and Radiography.

Academic writing competence:

The term ‘academic writing competence’ is used and not ‘academic writing skills’. To distinguish: the Oxford Concise Dictionary (2002:235) defines a competence as “the ability to efficiently complete a task”, and a skill (2002:1099) as “the practical ability to do a task well”. A skill does not involve judgment, discretion or the appreciation of an audience or context, which are needed to develop a competence

(according to socially approved norms). The researcher uses 'competence' as a universal concept which includes 'competencies' and/or 'competency'.

Medium of instruction:

This is also referred to as 'language of learning'. English is the language used in formal instruction at most higher education institutions in South Africa.

Technology-based intervention:

An adjustment or change to existing teaching and learning strategies, using computer technology. In this study, electronic mail was used as an electronic method of communication between the lecturer and learners and Microsoft Power point® as instructional technology software.

Work integrated learning:

Learning towards a qualification, for example, National Diploma: Radiography is designed in such a way that the clinical practice component of the programme takes place within the workplace (Wyrley-Birch, 2008).

CHAPTER ONE

INTRODUCTION

1.1 Introduction

> *"X-ray and gamma rays are the photon on which have the high energy light wave, they can easily pass through the body, and are classified as penetrating radiation, apron is the method or lead on which provide … the medical procedure for the patient to stop x-ray from reaching the reproductive organ. X-ray is penetrating device that can be used in diagnostic medicine to reach within human bones or organ made by opaque by a dye".* (Extract from the initial draft of L1/2010's[1] first essay.)

1.1.1 Focus

This thesis records a study undertaken by a radiography[2] lecturer at a satellite campus of a University of Technology (UoT) in the Western Cape Province of South Africa. The study investigated the academic writing practices of first year radiography learners (the extract above is an example of one such learner's academic writing) and focused on an intervention to assist learners to enhance their academic writing competence.

During the intervention, a blended teaching method was used (Harden, 2008). In the case of this study, existing subject-specific teaching and learning activities (for example lectures, group work and non-electronic teaching materials) were modified to include electronic instructional technology (such as the use of Microsoft Power point®); and explicit writing instruction was supported through technology-based communication (in the form of electronic mail).

The teaching and learning activities focused on the disciplinary knowledge of one of the first year theory subjects in the radiography curriculum. This subject, Radiation Science I, is an essential building block for radiographic science-related subjects in the second and third levels of study, as well as for clinical practice at all levels. For all summative assessments of this subject an average pass mark of 50% is needed to advance to the next level of study.

The research was based on the premises (a) that a reasonable level of writing competence is needed for learners' academic success; and (b), that the formal, structured integration of academic writing practices into the subject-specific content of the radiography curriculum has the potential to enhance learners' academic writing competence.

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[1] This is an event reference comprising the identity (L1) of the participant involved and the year of the data collection event (2010).

[2] Radiography comprises four sub-disciplines: Diagnostic, Nuclear Medicine, Radiation Oncology and Ultrasound where ionising and non-ionising forms of radiation are used for diagnostic and/or therapeutic purposes.

1.1.2 Research questions

Three research questions formed the basis of this inquiry:

1. What did radiography learners[3] perceive to be the factors that enabled and constrained their academic writing competence during the first year of academic study?;
2. What were the 2010 first year learners' perceptions of the changes in their academic writing following an academic writing intervention?; and
3. According to the 2010 first year lecturers, how did the academic writing of the learners change following the intervention?

1.2 Background

1.2.1 The higher education context as a changing educational landscape

Higher education institutions are not spared from the rapid changes society is experiencing. These institutions are forced to change in order to produce graduates that can cope in an increasingly complex and changing global environment (Du Pre, 2001).

The establishment of Universities of Technologies (UoTs) has been one way of South Africa addressing societal changes. Such a university has particular characteristics: it draws on a greater diversity of learners than traditional universities and has a new role of making knowledge useful in the world of work; and there is a difference in focus and ethos between traditional universities and UoTs which often accommodate a wider diversity of learners in higher education (Du Pre, 2004). In defining the ethos of a UoT, there is a shift in the emphasis of its core academic functions: the university is re-conceptualised as learner-centred rather than faculty-centred; and, being a learning organisation, one of the key characteristics of a UoT is the creativity used to identify and develop hidden talent and skills in the preparation of a new generation of knowledge workers (Du Pre, 2004; Winberg, 2004). As a learning organisation, a UoT promotes learning that enhances its members' capacity to create and produce knowledge (Winberg, 2004). The author (2004:46) further explains that such knowledge should be "based on an understanding of technology, drawing on key concepts and principles of science, while recognising the social world in its diversity and unity".

The UoT where this study was conducted developed a strategic plan to address and meet the challenges of an ever-changing global environment (Institutional Strategic Plan, 2006). This plan intended to "describe and develop new directions in teaching and learning,

[3] Participants are usually referred to in a gender-neutral way. However, when gender is referred to, the feminine pronoun, for example, she/her is used.

research, and regional and community engagement …" (Institutional Strategic Plan, 2006:2). One important principle of the plan concerns the university's pledge to "integrate research and training with the needs of South Africans" (Institutional Strategic Plan, 2006:2). This intended integration is made possible by the university's aim of "creating an environment where learners and staff are committed and empowered to research and learn, and to teach in ways that are relevant to a modern information society in which knowledge is shared and applied" (Institutional Strategic Plan, 2006:3).

1.2.2 The changing radiography education context

Like higher education, radiography education is also changing, due to technological advancements in the profession (Engel-Hills, 2005). This change calls for relevant, up to date health care education, producing qualified practitioners "who have broader skills without the loss of competence in their profession" (Engel-Hills, 2005:13). Such education should therefore focus on and support the needs and aspirations of the learner. A learner-centred environment is created in a curriculum when educators respond to learner diversity in ways that enable learners to become confident, self-directed, and independent, lifelong learners (Engel-Hills, 2005).

Educators in the radiography education context need to adjust to these technological, professional and societal changes. Engel-Hills (2005) refers to the impact of the various changing contexts of the radiography profession and radiography education. Globally, the status of the qualified radiographer has changed. This newly emerged professional can now partake in decision-making processes as a member of the multi-disciplinary health care team (Hammick, 1995).

Academically, radiography education has moved from hospital based diploma courses to university based professional degrees (Malamateniou, 2009). This move has contributed to changes involving the teaching site, learning methods, curriculum, professional status, educational funding and public expectations (Engel-Hills, 2005; Malamateniou, 2009). Coffey et al. (2004) published an updated version of the European Core Curriculum for Radiation Therapists to accommodate these changes, developments and educational philosophy. In the South African context, after the successful registration of four professional radiography degrees (representing the four sub-disciplines) with the South African Qualifications Authority (SAQA) and with input from clinical stakeholders, lecturers are engaged in curriculum development for a four-year professional degree scheduled to commence in the near future.

One notable development in radiography education both locally and globally, is that research in radiography is now a requirement and not an option because for radiography to progress

as a profession, professionals need to contribute and build the knowledge base of radiography through research and publication. According to Malamateniou (2009), developments in the research base of radiography are moving in the right direction. Some of these developments include research as a core academic module and a significant increase in the number of peer reviewed radiography journals published (Coffey et al., 2004; Malamateniou, 2009).

However, there are still deterrents to research in radiography, which include a lack of time, a lack of funding and a lack of knowledge and application of research methodology, quite apart from challenges involved in the dissemination of research (Challen et al., 1996; Malamateniou, 2009). The need to develop the competence needed for the dissemination of research findings cannot be ignored or delayed: Harris (2000) emphasises the fact that the communication of research is as important as the research itself. Therefore radiography educators and professionals should direct their efforts and equip themselves and the learners under their supervision to engage in research and disseminate research findings successfully.

1.2.3 Academic writing in the current radiography curriculum

According to SAQA (2005:3), 'curriculum' can be broadly defined as documents, processes and actions dealing with standard setting, learning programme development and delivery (including assessment), as well as the quality assurance of delivery and assessment processes. The radiography curriculum fits this definition because it is a SAQA registered qualification which constitutes the 'map' for the learner to meet the specified outcomes of the radiography programme. These outcomes are delivered and achieved by a "design down, deliver up" approach (SAQA, 2005:5). Such a curriculum is designed first by looking at the purpose of the qualification, then writing outcomes to achieve this purpose and to meet the requirements of the workplace. Assessment practices are selected according to the appropriateness to assess the specified outcomes. Finally, the teaching and learning activities which will produce the knowledge, skills and values required by the assessment activities, are defined (SAQA, 2005). The successful delivery of any curriculum thus depends on the constructive alignment of teaching, learning and assessment activities with the outcomes and the purpose of the qualification (Biggs, 1996); and learners need to show competence in achieving these outcomes. Most of the assessment methods used in the radiography curriculum throughout the three or four years of study require competence in oral and especially written communication. The role of written assessments in the curriculum will now be discussed.

At this particular research site learners are required to demonstrate their knowledge of subject content through written assessments including assignments, tests, case reports and case studies. In the first year of the radiography curriculum, offered at the research site, learners are expected to write an average of four assessments per subject, of which essays and technical reports require the most writing. In the second year of study, learners move to their discipline of choice for two of their four registered subjects. Each discipline has a different number of assessments with the majority of these being written. The third year of the radiography curriculum is discipline specific, with no common assessments and an average of four written assessments per subject. The types of assessments also change across the three years of undergraduate study. At first level (first year of study) an average of four class tests are written where learners demonstrate their knowledge and understanding of course outcomes through writing. At the third level of study, learners need to critically evaluate concepts by writing extensively using case studies and technical reports. For example, Ultrasound learners need to compile a written report for each investigation in the clinical context. These reports, accompanied by an image, form the basis of academically sound case studies submitted as summative assessments.

In spite of the lack of systematic focus on academic writing at the National Diploma level, should learners decide to continue with a fourth year of study towards a Bachelor of Technology (BTech) (Honours equivalent degree), all assessments of the three subjects are written assignments requiring considerable use of literature and discussion. At the research site, supervisors and examiners of all four disciplines then also expect a research report written in an article format for publication as an assessment task for one of the modules. Learners who cannot produce such a well-written report may fail the module, which will lead to failing the subject and, consequently, failing the fourth year of study.

A continuous assessment policy is used in the radiography curriculum at the research site. Continuous assessment comprises formative (assessment for learning) and summative (assessment of learning) assessments (SAQA, 2005). Formative assessments precede a summative assessment task. One or more formative assessments are used to prepare a learner for a summative assessment task (where specified outcomes are assessed). In the radiography curriculum, a mark is awarded for summative assessments, but not for formative assessments. This summative mark contributes to a particular weighted mark towards the total subject percentage. Currently a small percentage (5% – 10%) of the total weighting of each summative, written assessment is awarded to academic writing. Assessment criteria include, for example, language, referencing and logical organisation of information. Rewarding learners' attempts to improve their academic writing competence through

assessment is intended to focus the learners' attention on the importance of these aspects of writing competence and encourage them to make an effort to improve those aspects of their academic writing which are unsatisfactory.

1.2.4 The academic and social profile of the learner entering higher education

Globally, large numbers of learners are entering higher education institutions (Coffin et al., 2003). This, together with the diversity of the learner population, is one of the major changes that institutions need to cope with (Coffin et al., 2003). Diverse learner populations include the following: increasing numbers of 'non-traditional' learners (e.g., learners from historically excluded social groups, many of whom are socio-economically disadvantaged); mature learners; and professionals taking up part-time and/or distance education (Coffin et al., 2003). These learners also have diverse academic profiles, which include different educational backgrounds and cultural expectations. Each of these dimensions influences their academic literacies (knowing how to use academic information appropriately). However, other than the fact that these learners may be in small class sizes (class size is directly influenced by the number of learners that can be placed in clinical settings), the academic profile of first year learners entering the radiography learning programme at the research site is not much different to that of those learners entering other programmes at the same and other higher education institutions. Like these other learners, first year radiography learners who have succeeded in gaining admission have met the institutional admission requirements. However, they would also have met an additional set of requirements specific to the radiography programme: because, from the first quarter of their first year, these learners entering the radiography programme go into the workplace to interact with health care professionals and care for patients, they need to be able to cope not only with the academic, but also the clinical, demands of the programme.

Many learners entering higher education institutions in South Africa are unprepared for the academic demands of learning programmes offered by these institutions (Makoni, 2000; Carlisle, 2009). Makoni (2000) notes that such demands include, but are not limited to, poor linguistic proficiency in the language of instruction and assessment. Learners are also having to cope in a learning environment with diminishing resources (which often includes limited academic literacy support from academic development programmes), and different specialised writing and oral literacy expectations and proficiencies required across disciplines (Makoni, 2000). Higher education specialists refer to learners not meeting these demands as being "academically inept" (Carlisle, 2009) because they have poor essential reading, writing, mathematics and comprehension skills compared to entrants of about ten years before (Frick, 2008; Carlisle, 2009). Currently, the literacy levels and the ability of many learners to cope are classified as 'poor' or 'inadequate' compared to their predecessors

(Frick, 2008; Carlisle, 2009). Higher education institutions compensate for this academic unpreparedness by offering academic support - either integrated in the curriculum or 'stand-alone' through tutor support and writing centres. Registered entry-level learners of a UoT may be offered a combination of academic writing support. However, writing centre support is not directly available at the research site – which is a satellite campus of a large UoT. Learners cannot walk in at a writing centre at their personal convenience. Time needs to be arranged for learners to travel to one of the two main campuses, and thereafter, if possible, technology-based support is offered. Thus, in the context of this study, an integrated academic writing support model at the teaching and learning site seemed to be the most suitable practical alternative.

This academic unpreparedness could be attributed to some of the major changes in South African education. For example, since the introduction of Outcomes Based Education (OBE), the South African schooling and higher education systems have undergone major changes (Malan, 2000). Du Pre (2001) explains that outcomes-based programmes at higher education level are evidence of the Department of Education's intention to restructure higher education in response to the needs of the South African workplace and also to make the country internationally competitive. Du Pre (2001) adds that such programmes – based on the learner mastering outcomes – offer employability benefits to graduates in a rapidly transforming employment market. However, although employers seek graduates with specialised knowledge, many are more interested in employing "rounded but adaptable people who can successfully tackle a range of tasks and be effective members of a team" (Du Pre, 2001:2). Educating for such a graduate outcome depends on the knowledge, expertise and motivation of the educator and the willingness of the learner to take responsibility for working hard and actively participating in the learning process (Van der Horst & McDonald, 2003). By implication, commitment and competence from both the educator and the learner are essential for success in higher education institutions. Frick (2008:2) therefore argues that universities need to adapt their teaching and learning practices to a new "educational dispensation" observed at school level. The Department of Education has devised a new education plan called 'Schooling 2025' to replace OBE that has been highly criticised by both teachers and education experts (DBE, 2011).

Boughey (2005) adds that the rules and conventions of what counts as knowledge in the discipline of study should be made known to learners entering higher education. However, it is difficult to adapt and change practices if the characteristics and abilities of these learners are unknown. It was for this reason that the National Benchmark Tests Project (NBTP) was initiated. This will be discussed briefly here to introduce the concept and again in section 3.7.3 in relation to the researcher's selection of learners to participate in this study.

1.2.4.1 The National Benchmark Test Project (NBTP)

This project was commissioned by Higher Education South Africa (HESA) out of concern for the academic standards of learners entering higher education. According to NBT (2009), the aims of the project are:

- To develop curricula;
- To identify the academic needs of incoming learners;
- To assess the relationship between the entry level requirements of higher education and the exit level outcomes of high school;
- To supplement the information provided to higher education institutions (HEIs) by the results of the National Senior Certificate (NSC) to assist with placement of learners on either extended or mainstream learning programmes in higher education;
- To assess entry level academic literacy, quantitative literacy and mathematics proficiency; and
- To alert academic staff at HEIs to possible difficulties of learners so that appropriate academic interventions may be put in place.

The NBT consists of two tests, namely an Academic Literacy Test (ALT), and a combined Quantitative Literacy Test (QLT) and Mathematics test. The ALT assesses the learner's ability to cope successfully with the demands of academic study when English is the medium of instruction (NBT, 2009).

After completing the two tests, the learners' scores are matched to three bands: proficient, intermediate and basic. These bands indicate the level of support needed at higher education level. (The purpose of the results for the study will be discussed further in section 3.7.3.) At the time of this study, lecturers on learning programmes offered by departments at HEIs could request prospective applicants to write both tests prior to admission, or successful applicants could do the testing after admission. In 2009, lecturers of the radiography learning programme requested applicants to write both tests prior to the 2010 admissions to complement the NSC results. Together, these results assisted with the placement of learners in either the mainstream or an extended curriculum programme (ECP) where the first year of study is split over two years. The ECP is offered as part of the radiography learning programme to those learners who need additional academic support to cope with the demands of higher education.

1.2.5 Medium of instruction

The medium of instruction (MOI) in the radiography curriculum at the research site is English. This is an additional language for most learners. Limited proficiency in the instructional language and poor writing competence are dual constraining factors that could lead to poor expression of a learner's understanding of a new learning area, leading to failure (Lillis, 2001). In the researcher's view, lecturers' understanding of the factors that have an impact on learners' success could assist these lecturers to enhance the learners' academic writing competence by using appropriate teaching and learning strategies and interventions.

1.2.6 Complexities of overlapping contexts in radiography education

Radiography learners are educated in two overlapping contexts: radiography practice, which constitutes the clinical context; and academic radiography, which is the theoretical context. The learners must be able to communicate verbally and non-verbally, effectively and efficiently, in both domains. The "ability to communicate effectively in the learning and health care environment" is a critical cross field outcome (CCFO) that forms part of the radiography qualification registered with SAQA (SAQA, 2005:9). The emphasis on written communication is not the same in the clinical context as in the theoretical context due to the different purpose and audience. Learners therefore often find it difficult to adjust to the professional and academic communication practices used in these contexts (Wyrley-Birch, 2008).

1.3 Rationale

The researcher's interest in academic writing competence, practices and conventions in higher education was motivated by her observations as a novice content lecturer who expected that learners would enter the programme with adequate writing competence. However the curriculum offered at the research site, did not include formal, credit-bearing writing support. Before the intervention described in this thesis, any academic writing development was implemented on an ad hoc basis. Over a period of four years, the researcher observed widespread unsatisfactory levels of academic writing; and this situation did not meet the expected standards of the programme lecturers. Learners tended to write incoherently and failed to acknowledge information sources. The learners apparently developed academic writing competence informally by, for example, completing theory based academic literacy related worksheets which included very little practice of conventions such as referencing. They therefore often missed out on foundational knowledge (also referred to as 'literacies' or 'life skills') required for academic success. The researcher also observed that learners seemed to be resistant to improve their writing competence. Perhaps like the learners in a study conducted by Scutter (2002), they did not see the need for competent academic writing; and, during their secondary schooling, they had not been sufficiently guided in this regard.

An intervention to improve learners' academic writing competence seemed the logical response to this situation. It was desirable that the learners should begin to improve their writing competence from their first year and continue to develop this competence over their remaining years of study.

In light of this need for enhanced writing competence, the relevance of the UoT's Strategic Plan - "… to be responsive in our curriculum and research activities and to address the needs of our students and the society in which we function" (Institutional Strategic Plan, 2006:2) - is self-evident. In the context of this study, 'society' refers to the theory- and practice-based radiography profession as part of the health science education context; and using technology-based initiatives to adapt existing teaching and learning strategies and to integrate academic writing activities into the curriculum were deemed essential to realise the goals of the radiography profession.

Two of the six strategic directions of the UoT's Strategic Plan are addressed by this study:

1. Teaching and Learning: "… by focussing on the development of student-centred teaching methodologies and continuing to improve and enhance the academic support systems for students" (Institutional Strategic Plan, 2006:9). This was done by the researcher following a constructivist approach to teaching and learning during all teaching and learning activities.
2. Research: "… ensuring that relevant research along with local, national and international experience informs teaching and learning" (Institutional Strategic Plan, 2006:11). The outcome of this study was intended to inform the researcher's future teaching practices within radiography education, equip her with knowledge to assist future learners and contribute to the body of knowledge on academic writing in undergraduate programmes.

This research is also important because it investigates a significant aspect of radiography education: the development of competent academic writing. The results will be used to attempt to:

- Provide new insights into the factors that enable and constrain the academic writing process of first year radiography learners;
- Lay a sustainable foundation for academic writing integrated with the content of the radiography curriculum in the future; and
- Provide the building blocks for a blended teaching approach (where electronic teaching methods are used to complement previously used non-electronic methods) in radiography education.

In today's electronic age, the learners need to learn about and stay abreast of computer-based technology so as to be able to use it to enhance their academic writing and professional practice. The addition of technology-based learning to the radiography curriculum will synchronise well with the technological advancements of the radiography profession. Potential applications of this technology-based, blended teaching and learning approach (Oliver, Herrington & Reeves, 2005), where face-to-face lectures (using Microsoft Power point®) complement academic writing instruction (using e-mail), are used in other levels of undergraduate study and also in other health science education contexts like Nursing.

In light of the afore-mentioned background and rationale of this study, the research goals and delimitations of this research will now be discussed.

1.4 Goals of research

1. To understand first year radiography learners' perceptions of academic writing by exploring factors that enabled and constrained their academic writing competence.
2. To support entry level learners to enhance their academic writing in higher education through technology-based teaching and learning interventions and support.
3. To assess changes in the academic writing of first year learners following the academic writing intervention.

1.5 Delimitations

1. This study reflects the views of only a sample of first year radiography learners and lecturers at one satellite campus offering radiography at a UoT in the Western Cape Province of South Africa.
2. Academic writing in the discipline was the key focus of this study and not other forms of academic literacy (language, reading and comprehension). However, it is acknowledged that, in practice these are not possible to separate. (Refer to discussion in Section 5.4.1).
3. This study was also delimited to the integration of one of the five theory subjects offered during the first year of study, namely Radiation Science I.
4. Writing in the workplace (professional writing) and non-academic writing were not explored in this study.
5. The views of qualified radiographers working in the clinical context are not presented in this study.

1.6 Overview of the thesis

A brief outline of the chapters in this thesis is given here:

Chapter 2: Review of the literature:
This chapter includes the framework of theories namely critical theory, constructivism and New Literacy Studies that were used to explain the researcher's philosophical orientation in conducting research into academic writing practices in higher education and to understand academic writing. Literature related to the practical implementation of academic writing in the health science education environment is also outlined. This review then goes on to consider literature detailing the lecturer's role in the academic writing process. A discussion of literature on the relationship between technological interventions to support academic writing and lecturers' and learners' perceptions of using such technology concludes this chapter.

Chapter 3: Methodology:
This chapter starts by describing the qualitative methodology used to answer the research questions. Two research approaches are then discussed: a case study used to understand learners' perceptions about academic writing; and an action research project used to plan and implement a blended teaching and learning approach to improve first year radiography learners' academic writing competence. Two action research spirals were used where face-to-face instruction was complemented with technology-based communication and support.

Details of site and participant selection are provided. Selected qualitative data collection methods are discussed. These include an evaluation of written documents, focus group discussions and individual interviews. Thereafter, the blended academic writing intervention used to enhance academic writing competence is discussed. Data analysis is described and ethical considerations are also outlined.

Chapter 4: Findings:
In this chapter, the research findings of the collected and analysed data are presented.

Chapter 5: Improving academic writing competence in radiography education:
In the final chapter the researcher suggests a model depicting a zone for the optimal enhancement of academic writing competence in the existing and future radiography curricula. Challenges and limitations of this study are presented and discussed. Recommendations are made; and possible areas for further research and the contribution of this research to the existing knowledge base are outlined and discussed. This chapter concludes with a personal reflection.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This research investigated the academic writing competence of first year Radiation Science learners and focused on a technology-based intervention to improve their academic writing competence.

To provide a relevant framework for the study, this chapter starts with a brief explanation of the theoretical framework used in this research. It then discusses relevant literature related to education and learning theory, with a particular focus on academic writing and perceptions of this literacy. The chapter concludes with a discussion of literature on the use of technology to improve entry-level learners' academic writing.

2.2 Theoretical framework

The researcher adopts Anfara and Mertz's (2006:xxvii) definition of a theoretical framework as "... more than methodologies, it is any empirical ... theory of social and/or psychological processes, ... that can be applied to the understanding of a phenomenon". The authors (2006) argue that no research can take place without theory. It is not only methodologies and underlying epistemologies (theories of knowledge) that influence theory in research, but also the researcher's knowledge. In a study, therefore, there are no clear boundaries separating what is and what is not affected by the theoretical framework (Anfara & Mertz, 2006).

At a macro level, the theoretical framework for this research is a critical orientation. Critical theory goes beyond surface practices to discover underlying assumptions (Johnson, 2000). This is done by researchers 'repositioning' themselves and looking at issues from the perspectives of those people who are not dominant in a society (Carspecken, 1996:ix).

At a meso level, the research focuses on educational and learning theory in relation to the teaching and learning context and practices. Here Vygotsky's (1978:87) knowledge acquisition in a "zone of proximal development" and Bruner's (1986) learning theory are strongly influential.

At a micro level, the research focuses on literacy theory, including academic literacy, from a social practice perspective (Lea & Street, 1998).

An explanation of how theory was applied in this research at each of these levels will now be discussed.

2.2.1 A critical orientation

The researcher has a critical philosophical orientation towards studying academic writing practices of first year radiography learners. Carspecken (1996:x) describes the value orientation of critical research as being "…concerned about social inequalities and directing research toward positive social change". As a research framework, critical theory is quite universal in the phenomena it is used to investigate; it is also used by a wide variety of practitioners such as sociologists, anthropologists, educational researchers and psychologists (Carspecken, 1996).

According to Carspecken (1996), critical qualitative research is referred to as an orientation rather than a methodology because not all researchers in the field (criticalists) agree with each other when describing a 'critical' methodology. The author (1996) notes, however, that what critical researchers do fully agree on is that contemporary society is unfair, unequal and oppressive for many people. Criticalists do not support these conditions and endeavour to bring about positive change. Carspecken (1996:8) suggests that a critical epistemology should not provide a recipe for researchers to help the "poor" and "down trodden", but should rather provide them with principles for conducting valid research into any area of human experience.

Waghid (2000) is of the opinion that the most important dimension of critical theory is the fact that it is driven by an emancipatory interest. The purpose of such research is to contribute to change in people's understanding of themselves and their practices and thus free them from constraints of society brought about by cultural, social and political beliefs. The author (2000) also notes that critical educational theory provides resources to critique and change the world by developing theories that have a practical purpose: to help people change an unsatisfactory situation. Research underpinned by critical theory is therefore seen as research that has the potential to transform and empower. These characteristics make this macro theory a suitable overarching framework for investigating factors that constrain learners from writing competently and implementing an intervention to improve the situation. The researcher's critical approach to education was also intended to generate among first year learners a more critical orientation to their studies, and establish conditions to replace one unsatisfactory set of academic writing practices with another - hopefully less unsatisfactory - set of academic writing practices.

2.2.2. Using constructivist learning theory

The theoretical base used to understand academic writing competence in this study was constructivism. Constructivist theorists which this study draws upon are Vygotsky (1978) and Bruner (1986). Constructivism is a theory that describes how learning happens. This theory stems from Jerome Bruner's interest in appropriate forms of education (GTC, 2006). Bruner's (1986) particular view of constructivism is that learning is an active process where, based on past knowledge and experience, new ideas are constructed (GTC, 2006). Bruner argued that in order to enable the transfer of thinking processes from one context to another, learners needed to learn the fundamental principles of subjects rather than just master facts. He advocated learning through inquiry, with the teacher providing guidance to accelerate learners' thinking. This theory falls into the interpretive paradigm with research aims focussing on interpreting and understanding a phenomenon or situation.

Perkins (1992), like Bruner (1986), emphasises that, in the constructivist view of educational practice, the learner is an active agent who constructs meaning rather than passively acquires information, as in a didactic, instructivist approach. Knowledge construction by individuals is relative to the context in which it occurs and collaboration amongst learners is a further distinctive feature of constructivist learning (Bruner, 1986). Perkins (1992:61) thus refers to learners being "... in the driver's seat, finding their own way through large parts of learning".

The role of teaching is a process of supporting that construction rather than communicating information. It is not assumed that the learner will acquire expert knowledge with the first attempt at a task, but rather that the educator, through a process of facilitation and guidance, will challenge the learner's thinking. The focus of learning is thus mainly on the process and not necessarily on the final product (Caudery, 1995).

In a constructivist approach, the instructor or educator is referred to as a 'facilitator' of learning, which is someone who assists and encourages learners to develop reflective thinking and their own understanding of content (Tylee, 1999). The emphasis moves from the facilitator and the content towards the learner. The facilitator's role is to provide a supportive learning environment and be able to adapt and direct the learning experience to the maximum benefit of the learner (Bruner, 1977).

Bruner (1977) believed that the lecturer's facilitation of basic concepts and learners' understanding of such concepts is of utmost importance. Facilitators should continuously revisit these concepts and build upon them until learners understand them fully. He referred

to such a curriculum of revising concepts as a ‘spiral curriculum’ or a ‘scaffolding’ curriculum (Bruner, 1977).

Scaffolding is also used as a metaphor when referring to support structures used to assist learners to develop new understandings and to make meaning of new texts (Hammond, 2001). Initially, a high level of support and guidance is provided by the facilitator. The support is gradually reduced as the learner moves toward mastering learning tasks and texts independently. This approach enables learners to achieve higher levels of performance than they could have achieved on their own. Learners become more confident and willing to approach new tasks (Koop & Rose, 2008).

Scaffolding has a strong ‘futures orientation’ (Gibbons, 2002:64) and moves learners along a learning continuum from, for example, being novice writers requiring extensive facilitator input and guidance to becoming learners completing tasks efficiently and competently with minimal facilitator assistance. Vygotsky (1978:87) called this continuum a “zone of proximal development (ZPD)”. This zone is known as an area of initially immature, but maturing processes. In this literacy context, this means “invisibly present” assistance by the facilitator, in the form of structured writing activities, moves learners along the continuum (Gredler & Shields, 2004:22). The authors (2004:22) use the term ‘invisibly’ because learners make meaning of texts and approach activities within a structured framework, guided and assisted by the facilitator who is available to help but does not direct processes. Learners discover and explore new concepts, building upon concepts learnt during previous activities (that is, not only through visible instruction present in the current activity). Novak (2003) adds that learners progress best with peers who are in the same ZPD as this contributes to collaborative learning. Peers in the same ZPD have perhaps mastered certain writing concepts and are in a position to assist fellow learners to progress through the ZPD.

In light of the above, therefore, if a learner enters a writing culture and is surrounded by role models and peers who write, they will be expected to, will want to and will get to a stage where they *will* write without explicit instruction (Gredler & Shields, 2004).

This scaffolded approach develops learners’ literacy far more broadly than being able to read, write and spell. Learners gain access to the academic ways of speaking, thinking and writing which are necessary for educational success (Koop & Rose, 2008).

2.2.3 Literacy as a social practice

Lea and Street (1998) view literacy as a cultural and social practice rather than it being about educational judgements of, for example, ‘good’ and ‘bad’ writing.

This cultural and social practices view is based on earlier work done by Gee (1990), Street (1993) and others of the ‘New Literacy Studies’ (NLS) movement. Theorists of this movement believe that reading and writing are inseparable from – and so must be studied in the context of – the social practices of which they form a part (Prinsloo & Baynham, 2008). Adapted from Barton and Hamilton (2000), some of the characteristics of a NLS perspective are as follows:

- Literacy is best understood as a set of social practices which are observable in events mediated by written texts;
- There are different literacies associated with different domains in life;
- Literacy practices are purposeful and embedded in broader social goals and cultural practices; and
- Literacy practices change and new ones are frequently acquired through processes of informal learning and sense making, as well as through formal education and training.

Lea (2004) states that following a NLS approach to literacy means recognising that literacy is not a unitary concept: reading and writing literacies are cultural and social practices which vary according to the particular context in which they occur. Authors such as Barton and Hamilton (2000) link literacies in specific contexts and broader practices by discussing the relationship between texts and practices as located in particular times and places – referred to as situated literacies. Situated literacies theory builds on a NLS framework through researching particular contexts of higher education (Lea, 2004).

Research findings in the academic literacy field indicate that a complex relationship exists between the acquisition and development of subject-based knowledge and writing in higher education (Lea, 2004). Such findings highlight the difficulties learners face when trying to “unpack the ground rules of writing in a particular context” (Lea, 2004:741).

Lea (2004) states that this academic literacies orientation has brought to the fore the different ways in which learner writing is conceptualised in higher education, and offers alternative frameworks for understanding how writing is related to deeper questions of epistemology. Thus an academic literacy approach was important in this research as it provided a clear cultural and social orientation for understanding learner writing in higher education. Following

on from this discussion of literacy as a social practice, it is important to consider the role of academic writing in a particular discipline or community.

2.3 Academic writing

The researcher asks the question: “What constitutes ‘good writing’?” From a critical theory perspective, good writing may result when the individual writer is freed from all constraints – whether personal or as part of the learning environment – in order to produce texts that are suitable for academic success. Looking at ‘good writing’ through a constructivist lens, the observer will see a collaborative approach by peers building and changing their knowledge structures through writing. The change is brought about through reflection, where “learners talk to themselves in writing” (Archer, 2000:141). When looking at the question through a NLS lens, good writing could be defined as writing that is appropriate for the practices of a specific discipline (in this case, radiography). For learners to gain access to the radiography discipline, one of the requirements is to be able to write effectively in the discipline before earning recognition as an active member of that discipline. According to Ellis (2006:372) the ‘quality’ of writing relates to a deep understanding of the content being studied and not necessarily to learner performance.

2.3.1 Defining academic writing

Badley (2009) is one of many authors with particular views on academic writing. He (2009:209) views academic writing as a dynamic set of practices and activities and uses the following metaphors when describing academic writing: “constructing, deconstructing and reconstructing knowledge; connecting, disconnecting and reconnecting concepts; describing and re-describing our views of the world, as well as shaping, mis-shaping and re-shaping ideas”. He (2009:209) advocates that academic writing is a “problematical” and “tentative” exercise in critical reflective thinking. In this thesis, the term ‘academic writing’ will be used in Badley’s (2009:212) sense of a “...constructive and creative process of learning [and] transforming what we know”.

2.3.2 Challenges of academic writing for learners

Academic writing is an extremely difficult competence to develop, especially for learners for whom English is an additional language (Archer, 2000; Owen, 2008*)*. Jaffer et al. (2007) emphasise that academic language proficiency is more difficult to acquire in a second language. These learners are often labelled as ‘at risk’ due to poor learning and literacy competence; and this makes it even more difficult for language learners for whom English is an additional language to adapt to the literacy demands of higher education, which involves new ways of understanding, interpreting and organising knowledge (Lea and Street, 1998).

Archer (2000:131) views academic writing as “messy”, and Bloxham and West (2007:80) refer to it as a “complex” and exhausting process, including many different activities (or sub-processes). However, instead of looking for reasons why academic writing is so difficult, Coffin et al. (2003:9) draw the reader’s attention to “influential approaches” to improving learner writing. Such approaches refer to writing as a text, as a process and as a social practice.

Historically, textual approaches to writing followed an imitation model, focussing on the end product and not on the process. Coffin et al. (2003) share the instance of learners imitating examples of good writing, with little knowledge of the intended audience or context in which their writing occurred. Bloxham and West (2007) explain that, for the learner, contextual writing activities involve the acquisition of tacit knowledge (knowledge that cannot easily be articulated), new social practices and forms of expression, as well as negotiating the meaning and demands of individual assignments.

2.3.3 Academic writing to achieve academic goals

Academic writing is needed to achieve a variety of educational goals: to assess knowledge, promote critical thinking, to stimulate creativity, and to gain access to a discourse community (Hamman, 2005). Each of these goals will now be discussed.

2.3.3.1 Academic writing to assess knowledge

Radiography learners are involved in both academic (theory) and practice-based (practical) professional learning environments, where they are expected to express themselves in oral and written forms of communication. These learners’ academic and, eventually, practice-based professional success depends on their ability to present information and ideas through writing (Luckett & Sutherland, 2000; Coffin et al., 2003). Therefore in studying radiography, as in many other learning programmes, learners write because they need to express their knowledge of course concepts for assessment purposes (Archer, 2000; Coffin et al., 2003). Unfortunately, writing is not often regarded in the long-term by learners as a medium to communicate within their chosen profession or as a step towards becoming critical thinkers but merely as a means of passing assessments. One of the most noticeable implications of this observation is that if learners are not able to express their understanding in writing, they may fail and so may not enter the particular disciplinary community with the often anticipated ease.

The way facilitators assess writing plays a vital role in influencing learners’ perceptions of the value of academic writing. Thus, when assessing learner writing, if lecturers focus on both subject content and the form of their writing, this serves as an indication to learners that both

are valued and that writing is not decontextualised (Jacobs, 2005). Integrating academic writing with subject content and assigning a credit weight to the writing aspects is a strong motivator for improving learner writing (Wright, 2006).

According to Coffin et al. (2003), in an applied field such as health care, typical forms of writing for assessment purposes include essays, case studies, laboratory reports, journal articles and reflective writing. In a study reported by Brennan (1995), nursing facilitators and learners were alerted to the educational benefits of essay writing and this changed their perceptions of writing. Prior to that, due to facilitators and learners not valuing the importance of feedback and learners being unaware of assessment procedures and the sub-processes of the writing process, the essay was seen as a task and not as an opportunity for learning (Brennan, 1995).

Stephenson (1985) and later Brennan (1995) describe essays in higher education as an assessment tool that demonstrates learners' understanding by explaining subject content, suggesting alternative ways of problem solving and evaluating ideas, actions and events. Due to the effort involved to organise one's thoughts and express them in detail in writing, this assessment tool could be seen as one of the main vehicles for learning in health science education (Brennan, 1995; McDowell, 2008). McDowell (2008:423) calls this academic view of essay writing "argument" and associates it with a deep approach to learning due to the focus on meaning and not an intention to retell or reproduce knowledge.

2.3.3.2 Academic writing to promote critical thinking

Writing is an essential tool for learning. Various writing activities, such as free writing, journal writing and dialogue writing (Van der Westhuizen, 2009) can assist learners to make meaning of disciplinary knowledge. These forms of writing also develop the learners' general abilities to reason and critique (Coffin et al., 2003). Badley (2009) adds reflective writing as a method to shape and re-shape learners as critical participants in academic life. He (2009) adds that reflective writing promotes critical thinking by contributing to knowledge and to social, political and educational practices.

Castle (2009) views the development of critical thinking in the undergraduate radiography curriculum as one of the main aims of higher education. Critical thinking is an important competence needed by a qualified radiographer in clinical practice. Castle (2009) uses an appropriate definition to define critical thinking for undergraduate learners owing to the current educational debate about the term. The author (2009:70) suggests that critical thinking is at "...the level where a student is able to interpret, analyse, evaluate, explain and infer concepts and ideas". This definition emphasises the higher order thinking competence

needed for academic success. As interpretation, analysis and evaluation are scaffolded throughout the levels of study in radiography education, academic writing may be used to assess and promote these competencies.

2.3.3.3 Academic writing to stimulate creativity

Academic writing to stimulate creativity is not particularly overt as an educational goal in higher education, but is as important as the afore-mentioned two. Creativity is often overlooked as an enabler of academic writing. Badley (2009:217) refers to creative writing as a "new" or "alternative" form of writing in higher education, which is perceived as "developmental, therapeutic and self-expressive rather than academic".

Krashen's fifth hypothesis of his theory of language acquisition, known as the "affective filter" (Krashen & Terrell, 1988:37-38), focuses on the improvement of learning if writing is seen and experienced as a pleasure. The authors (1988) argue that the best situations for language acquisition seem to be those situations which encourage lower anxiety levels. Thus, second language learners who have positive attitudes towards, for example, writing, will be more motivated to interact with and use English (as MOI) with confidence than those learners who are anxious. Therefore, learners with a lower affective filter are described as having "optimal attitudes", which can include positive self-image, confidence and motivation (Krashen & Terrell, 1988:39). These learners often enjoy writing and are therefore motivated to write, which in turn might improve their writing. Krashen and Terrell (1988) encourage facilitators of writing to create opportunities and conditions that will promote a low affective filter.

2.3.3.4 Academic writing to gain access to a discourse community

Lillis and Turner (2001) argue that there is a need for a deeper understanding of what learner writing entails in order to inform meaningful pedagogies and interventions. The authors (2001) state that the emphasis should move away from what learners cannot do (or write), towards what is involved in learner writing (what and how they should write). This view supports the current move in writing studies to make explicit the requirements of different text types (Bloxham & West, 2007) and how a text type, like an essay, can differ in different disciplines (Gee, 1990).

Gee (1990) uses the term 'Discourse' (capital 'D') when he refers to the use of language in a particular discipline or community. The author (1990) argues that one does not learn Discourse by overt teaching and instruction, but by becoming a member of a community; one starts out as a novice and progresses towards becoming an expert in that community. Language, writing and competence in other literacies are not Discourses, but general

purpose tools used by various Discourses. Such tools are referred to as being 'general purpose', because they are used differently in various Discourses (Gee, 1990:172). The author (1990:172) further states that, at tertiary level, "...it is Discourses like linguistics, philosophy, physics or religion that ought to teach students to write in the act of teaching them to read, think, talk, value and act like linguists, philosophers, physicists or people in religion do". Jacobs (2005) supports this argument by stating that it is meaningless to teach writing outside a Discourse since there is no reading, writing or thinking outside a Discourse and the community that controls it.

To relate this to the research site, academic writing occurs in the social context of the health science education environment, where learners learn to write like health care professionals. Academic writing then becomes part of their social and personal identity. However, some learners might find it more difficult, or feel less comfortable, to take on the identity of a health care professional than others.

Elsewhere, Gee (2003) refers to a semiotic domain, where one or more modalities, like oral or written language and images, are used to communicate distinctive types of messages. This domain will have a distinct design grammar, which is a set of principles or patterns in terms of which materials in the domain are combined to communicate complex meanings (Gee, 2003). A person entering a community must know (consciously or unconsciously) the design grammar of that semiotic domain in order to understand or communicate messages appropriately in that domain. Groups of people who have differentially mastered the domain, but who share norms, values and knowledge of what constitutes degrees of mastery in that domain are referred to by Gee (2003) as affinity groups. In this thesis the Radiation Science curriculum is the semiotic domain; the technical terminology and practice-related jargon constitute the design grammar; and the radiography profession is the affinity group that the learners are seeking to access.

Outlining the challenges and educational goals of academic writing in the health science education context provides a backdrop for a discussion on what lecturers need to aspire to as role players in the practical implementation of the academic writing process. The following section will therefore highlight the important roles of the lecturer as a facilitator of writing and the learner as a novice academic writer in higher education.

2.4 Lecturer's role

Looking through a critical lens, facilitators of writing in higher education are in a position to empower learners through a process of transforming their writing. Through a constructivist lens, transformation and empowerment are possible by implementing, for example, scaffolded academic writing activities, and by facilitators providing constructive comments on samples of writing. From an academic literacies point of view, those radiography lecturers who are themselves accustomed to academic writing, know the academic writing expectations of the radiography learning programme and the disciplinary conventions of the profession and are well placed to guide learners appropriately in these areas.

Bloxham and West (2007) caution educators not to give excessive explanatory detail that will, for example, turn essay writing into a mechanical piece where learners fit their writing into a writing template. The written piece (or text type) must demonstrate their understanding of a topic which is achieved by practice, imitation and observation (Bloxham & West, 2007).

Educational approaches that lecturers could use to improve learner writing, such as being aware of learners' learning styles and making academic writing instruction part of content delivery, will now be discussed.

2.4.1 Catering for different learning styles

Before writing competence can be enhanced, facilitators need to align teaching and learning activities with learners' learning styles (Hyland, 2003). Sandars and Homer (2008) argue that learners will be more motivated, more actively engaged and subsequently perform better when teaching and learning activities align with their learning preferences.

Hyland (2003:43) defines these learning styles/ preferences or intelligences as the "...cognitive, affective and perceptual traits that indicate how learners perceive, interact with and respond to their learning environment". These intelligences are further shaped by cultural backgrounds and prior experiences (Gardner, 1983). Some learners have multiple intelligences that allow them to switch styles according to the context, which is a challenge for facilitators when designing teaching and learning activities (Hyland, 2003). The Multiple Intelligence (MI) theory was developed by Howard Gardner in 1983. The theory suggests that traditional ways of intelligence testing, such as IQ tests, may be biased for certain types of individuals (Gardner, 1983). The author (1983) suggests that everybody has a different mind and that no two profiles of intelligence are the same. He therefore proposes eight primary intelligences:

- Visual/ spatial intelligence (ability to interpret the shapes and arrangements of objects in space);
- Verbal/linguistic intelligence (ability to use language and communication effectively);
- Logical/mathematical intelligence (ability to mentally process logical problems and equations);
- Bodily/kinaesthetic intelligence (capability to control body movements to solve problems);
- Musical/rhythmic intelligence (ability to create and comprehend different styles of music);
- Interpersonal intelligence (ability to interact with and understand others); and
- Intrapersonal intelligence (ability to relate to internal aspects of self, especially emotions).

Barrington (2004) notes that, although any individual may possess all eight intelligences, each person may excel in a particular mix of intelligences. The author (2004) therefore argues that the implications of providing teaching and learning activities that engage with the eight intelligences in higher education are challenging but necessary; and being aware of the different learning styles amongst learners will ensure that facilitators provide learners with the appropriate variety of input and writing activities that will assist them to improve their academic writing competence. Such an awareness might assist facilitators to position learners on Vygotsky's (1978) ZPD, which may serve to indicate where individual learners 'are at' and what support is needed to achieve the required academic writing competence. Taking MI into account also links teaching and learning practices with constructivism that focuses on "where the student is at" (Barrington, 2004:423).

Cuthbert (2005), when comparing learning styles to learning approaches, concludes that an awareness of learners' individual differences is of more benefit to higher education educators than to the learners, because educators who "are concerned enough to investigate any teaching and learning encounter are concerned with improving their own teaching practice" (Cuthbert, 2005:246). Improving educators' teaching practice will, in turn, benefit learners.

2.4.2 Making writing expectations explicit

The writing demands and expectations of different subject areas should be made explicit to entry-level learners. Coffin et al. (2003) argue that, due to an increase in the number of inter- and multi-disciplinary courses, learners struggle between the different writing expectations of different subject areas. Their prior experience of high school writing differs from writing at university level. They should therefore be assisted to recognise and produce the writing required and valued in each higher education discipline.

Coffin et al. (2003) go on to say that, if they are assisted by facilitators, learners will have greater control over their writing, and develop an explicit awareness of the writing conventions of their particular discipline. Activities would be scaffolded with appropriate guidance so that learners can build their knowledge and understanding in the discipline through writing.

Lecturers are therefore responsible for informing learners explicitly and concretely of their writing expectations to enable learners to meet the required outcomes of the course. This principle is supported by Brennan (1995), who adds that such expectations are usually related to the writing requirements of the discipline. Learners should not have to guess what lecturers are expecting them to do; and teaching, learning and assessment activities should not be planned to trick the learner. The use of assessment criteria and level descriptors should define for learners what is important (Coffin et al., 2003; Luckett & Sutherland, 2000). This is an important change that has been introduced by Outcomes Based Education in South Africa (see section 1.2.3).

Another educational approach where lecturers are innovative role players in the academic writing process is to integrate academic writing with discipline specific content, which will be elaborated on in the following section.

2.4.3 Integrating academic writing with subject-specific content

There is a vast amount of literature available on language and content integration (ICL). Mohan (1990:1) defines ICL as "...the mutual support and cooperation between language teachers and content teachers for the educational benefit of limited English proficient students". Jacobs et al. (2006:3) use a broad statement to define ICL: "...the provision of linguistic access to content language". The authors (2006:3) advise that ICL is achieved by subject-lecturers becoming "...teachers of the language of their discipline and language [communication] lecturers familiarising themselves with the subject [disciplinary] content to teach communication skills in a disciplinary context".

In ICL collaborations, values from literacy-based fields such as fluency of expression, independent thinking and insight need to complement discipline-based values such as accuracy, technologies and professionalism in order to enhance teaching and learning (Jacobs et al., 2006). For a content and language partnership to be successful, both lecturers need to understand the nature of learners' writing in higher education (Lea & Street, 1998). Gee (1990) adds that subject-content and academic literacy (or 'language' or 'communication') lecturers should have a shared understanding of not only writing, but of

how knowledge is constructed. Both lecturers must have one goal in mind: the academic development of the learner.

This collaborative approach to the academic development of the learner (Lea & Street, 1998; Jacobs, 2005; Wright, 2008) should not merely locate problems with the individual learner, but instead engender an institutional approach for "...considering the complexity of writing practices" (Lea & Street, 1998:158). Through such an approach, collaborating lecturers need to create "discursive spaces - where a common understanding between academic literacy and content lecturers exists - to embed academic literacy teaching in the discipline of study" (Jacobs, 2005:475). Through these discursive spaces, subject-content and language lecturers then become collaborators to address learner writing difficulties. During such collaborations, the expertise of both lecturers is used to create a common understanding of the purpose of academic writing in the two disciplines. Therefore, such collaborations are not only about language learning (or learning academic writing conventions of higher education) but also about understanding subject content (Jacobs et al., 2006; Harran, 2011). The use of subject-specific content to develop academic writing competence is emphasised by Archer (2000).

Lillis and Turner (2001) note that learners entering higher education do not know the academic writing conventions of higher education. Entry-level learners therefore do not understand the guidelines used in writing instruction. The authors (2001) add that such guidelines may raise more questions than assist learners because, while learners are expected to write using a particular set of conventions, they struggle to understand exactly what those conventions mean in relation to their academic writing. That is why content and academic writing integration is so important, especially for those non-traditional learners (distance, mature and from diverse backgrounds) entering higher education for the first time (Lillis & Turner, 2001).

2.4.4 Responding to learners' writing

Lecturers should encourage learners to read and act on comments received on their writing. Constructive comments should be communicated in meaningful ways to learners (Coffin et al., 2003). The question is: "How?" Juwah et al. (2004) identify seven principles of making effective comments on learner writing. In summary, these principles focus on comments that:

a. Facilitate the development of reflection in learning;
b. Help clarify what good performance is, in terms of goals, criteria and expected standards;

c. Provide opportunities to close the gap between current and desired performance;
d. Deliver high quality information to learners about their performance;
e. Encourage positive motivational beliefs and self-esteem, and
f. Provide information to facilitators that can be used to help shape teaching.

These principles support a constructivist approach to teaching and learning, where learners become active participants in the feedback process through reflection and collaboration with their peers. Hyland (2003) views commenting on learners' written work - particularly those for whom English (as the MOI) is an additional language - as a very important task of facilitators, because such comments offer individual attention that is not possible under normal classroom conditions. The author (2003) regards formative feedback as instrumental in the development of learners' writing to improve and consolidate their learning. Hyland (2003:177) links comments (as guidance and a response to learners' writing) to Vygotsky's (1978) zone of proximal development, where the learners' "cognitive growth about writing is extended".

2.4.5 Writing as a collaborative process between learner and lecturer

Even though the lecturer has the primary responsibility for planning and facilitating teaching and learning activities, improvement requires the learner to take an active role as a writer. Learners becoming active role players in their own writing satisfy the goals of a constructivist approach to teaching and learning.

Writing as a process approach acknowledges the different steps and stages the writer follows. Appropriate teaching and guidance about the forms and conventions of academic writing must accompany this process. Coffin et al. (2003) view reflection as an important stage in the process writing approach. Reflection needs to be made part of the writing process as it provides learners with an opportunity to critically reflect on their learning experiences and thereby improves their writing.

Writing activities may be used within a framework to assist learners to develop their writing (Lloyd, 2007). The PROCESS framework as suggested by Lloyd (2007) is one method of providing learners with a way to remember the important stages of the writing process. These stages should include: Planning, Referencing, Organisation, Composition, Engineering, Spelling and Structure. Lloyd (2007) describes each stage as follows:

Planning: For the learner, planning saves time and resources before meeting with a writing tutor or submitting a draft to the facilitator. Reading the assignment guidelines and paying

attention to the assessment criteria are examples of how learners can prepare for this initial stage of the writing process.

An important activity in the planning stage of the writing process is prewriting. Prewriting is defined as activities which learners engage with prior to writing for a specific purpose. Planning also includes, but is not limited to, freewriting, outlining and drawing of concept maps (Weston et al., 2010). Proske and Narciss (2008) emphasise the fact that writing is a complex task, where prewriting stages require hard work, like generating ideas, setting text goals, text structure, etc. Any form of prewriting is therefore regarded by Greenhalgh (2001) and Proske and Narciss (2008) as a very effective method to develop inexperienced writers' writing competence.

Referencing: According to Lloyd (2007), some learners in higher education perceive this stage as a cut-and-paste list at the end of an assignment instead of adhering to academic writing conventions such as in- and end-of-text referencing. The author (2007) emphasises the fact that the referencing stage begins when information is gathered. Referencing needs to be thought through from the start of the writing process and should be done according to the guidelines provided by the institution.

Organisation: This stage will assist learners to develop a structured format for their written assignment. Such a structure is necessary to help the learner focus on the topic. Ideas generated through reading will assist learners to formulate their assignment. Some learners will use mind maps or story boards to organise their ideas. The organisation stage follows directly from the planning stage.

Composition: This is the stage where writing is related to assessment criteria. An understanding of different level descriptors will enable learners to compose their ideas to the required level (Luckett & Sutherland, 2000).

Engineering: This term is used to describe how learners effectively draw their ideas together following comments from their facilitators or peers. Coffin et al. (2003) call this the reflection stage of the writing process. They (2003:41) add that learners look at their work "...with a fresh pair of eyes" after receiving constructive comments. Reflection time with input from others could assist learners to see gaps in various areas, such as text structure or referencing. This stage could be seen as an application of Bruner's (1986) scaffolding approach, where learners build upon existing knowledge.

Spelling: Spelling and grammar assist the reader to understand the topic under discussion. It is also an indication that the learner has paid attention to details of the written work, as poor spelling and grammar may obscure the message or confuse the reader.

Structure: This stage is seen as the final stage of the writing process where learners edit, proofread and polish their text. An important and often overlooked aspect of this stage is to make final changes to the structure to improve the flow of ideas. The final product needs to be checked against the assignment guidelines before submission.

2.5 Promoting academic writing in higher education through instructional technologies

Sandars and Homer (2008) draw the reader's attention to the current learner generation's comfort in a technologised learning environment. A learner-centred curriculum should therefore make provision for this "net generation" (Sandars & Homer, 2008:877).

Gee (2007) argues that good video games incorporate good learning principles, because players are able to learn "...something that is long, hard and complex, and yet enjoy it" (Gee, 2007:41). When playing these games, learners apply strategies learnt in preceding stages or similar games. This application of knowledge occurs without their realising it. However, if such strategies are to be applied to teaching and learning in higher education so that learners gain maximum benefit, computer-based activities should be planned and coordinated (Greenhalgh, 2001). For learners to use technologised activities such as gaming for learning purposes, they should do so reflectively and strategically (Gee, 2007). This implies that the purposes and sequence of such activities should be made explicit to learners.

Garrison and Akyol (2009) state that collaborative constructivist ideas and emerging instructional technologies are transforming higher education. Facilitators can create and sustain collaborative learning communities when not "...constrained by time and space" (2009:20). For learners to produce academic writing and to get their lecturers' response today is easier because of the Internet. Learners are able to access teaching and learning activities from remote sites, like other campuses or even computer laboratories in university residences; they are not bound to work on assignments when attending face-to-face lectures. Each learner can therefore, potentially, progress at her own pace.

For many years, a face-to-face lecture has been part of the traditional instructivist approach to teaching and learning. Garrison and Akyol (2009) note that, with the introduction of the Internet to higher education, and a more constructivist approach to teaching and learning,

this mode of delivery has shifted to either the sole use of computers, or the use of computers to complement face-to-face lectures to facilitate teaching and learning. These authors (2009:21) also argue that "...instructional technology in the higher education context is a necessary ingredient for academic success and future employment".

The instructional landscape of higher education institutions is changing to accommodate these educational and technological changes. Hyland (2003) notes that some educators in higher education perceive the integration of new technology-based pedagogies as a means of enlivening instruction, improving learners' writing competence and facilitating collaboration and interaction, both within and beyond the classroom. The whiteboard used to be part of the 'traditional' classroom; now, in many institutions at least, some lecture rooms have been transformed into state-of-the-art digital venues. Learners retrieve and download class notes and information using digital devices and cell phones instead of taking notes using pen and paper. Class notes are either distributed via e-mail or by using a learning management system. These factors indicate the major impact new technologies could have on learner writing. Everyday examples of advances in classroom technology include digital voice recording, where learners audio-record a lecture and review it before a test – no written notes are needed.

It is important to bear in mind that a critical attitude to technology is imperative: technology is not a method but a resource which can support a variety of teaching and learning approaches to change learners' writing behaviours (Hyland, 2003:145). However, these technological advances come with complications and implications. Westbrook (2006) warns that higher education institutions first need to address design, ethics, quality and economic issues before the positive benefits of such instructional technologies can be reaped. Hughes (2007) also identifies the following complications which are inherent to the user of those technologies: English as an additional language, a low self-esteem, and poor computer literacy.

Ketner (1996:281) has a strong opinion about technology and its consequences for society, stating: "To act without examining the ends and consequences of technology in terms of the common interest and good would be to engage in the uncritical application of bad technological modes of thought". Selfe (2008:93) also warns against the danger of an "uncritical use of technology in the classroom". Facilitators therefore first need to investigate technologies, institutional infrastructure and learners' technological abilities before using such technologies to complement teaching methods.

2.5.1 Technological interventions to support academic writing

Writing competence, together with learners' abilities to use and communicate information in an appropriate and effective way, are key requirements in today's environment of rapidly changing healthcare and information technology (Tarrant et al., 2008). Jaffer et al. (2007) list a number of educational roles which information and communication technologies can fulfil, from providing a catalyst for rethinking teaching practice, developing graduates and citizens required in an information society, improving educational outcomes (one of which is improved pass rates) to enhancing and improving the quality of teaching and learning.

To realise these educational goals, suitable curricular interventions are needed to develop and strengthen learners' information literacy and academic writing competence. To accommodate learners from the 'net generation', facilitators need to use technologically enhanced teaching methods to assist their learning. However, according to Jaffer et al. (2007), not all technological interventions are suitable to improve learners' academic writing competence. They (2007) claim that the teaching and learning context should drive the technology-based intervention rather than using technology just for its own sake. Researchers are beginning to alert the reader to current debates which are moving beyond the use of technology towards a concern regarding effective learning in an electronic environment. For example, Czerniewicz (2007) discusses this in a report about Information and Communication Technology (ICT) and higher education in Africa; and Cook (2009) in a discussion on the use of e-learning in a global context. It is the educational needs and capabilities of the higher education institutions that should drive the design and use of technologised learning environments, not the other way around (Jaffer et al., 2007).

In the South African teaching and learning context, a range of web supplemented, web dependent and a few online courses constitute technologised learning environments. Some web-supplemented courses retain face-to-face delivery, but add computer mediated elements such as electronic course material. Web dependent courses have less (if any) face-to-face interaction and offer more online, interactive activities. Sometimes online courses replace face-to-face encounters totally and an online learning resource centre supplies materials and assistance (Czerniewicz, 2007).

Even though using computers to learn how to write is a major advantage of the availability of educational technologies in higher education (Novak, 2003; Tarrant et al., 2008; Garrison & Akyol, 2009), Ellis (2006) notes that computers are used for only part of the writing process. Learners would therefore need to be made aware that computers form part of a "part-whole relationship" (Ellis, 2006:373) of the writing process. When incorporating computers into the writing process, the planned technologised writing activities need to be structured, flexible

and introduced early in the curriculum to assist learners to become competent writers (Tarrant et al., 2008).

There is sometimes resistance from facilitators to using instructional technologies as a resource for teaching and learning, with a strong belief that the quality of writing will depreciate (Hyland, 2003). Proske and Narciss (2008) argue that this need not to be the case if writing instruction is meaningfully complemented with computer-based scaffolding. Fortunately, lecturers at the research site did not resist technological change and supported the use of technology-based teaching and learning strategies to improve learners' academic writing competence.

Goldberg, Russel and Cook (2003) found in a meta-analysis of the effect of computers on learner writing that those learners who used computers when learning to write produced better written work than those learners who wrote by hand. The authors (2003) attribute this difference to learner motivation, an increased independence and a greater level of engagement with the text (which includes revision).

The afore-mentioned discussion indicates the diverse opinions among experts regarding the use of any form of technology to support learner writing. The following section will focus on learners' and lecturers' perceptions of instructional technologies.

2.5.2 Learners' and lecturers' perceptions of using technology to learn

Hamman (2005) argues that lecturers should not start initiatives in academic writing before assessing learners' perceptions thereof. It is therefore necessary and important first to evaluate entry-level learners' attitude to any 'new' writing activity before it is introduced. Should learners not know how to perform an activity or why they should perform it, the purpose/s of using the activity will not be met and will be less likely to succeed.

Learners often perceive academic writing conventions used in higher education as being difficult (Bangert-Drowns, 1993; Lillis & Turner, 2001; Ellis, 2006; Owen, 2008). Owen (2008:722) suggests a blended, scaffolded approach to assist learners to overcome this attitude barrier to writing; and adds that learner attitudes toward academic writing could be improved by "using technology as a catalyst". The author (2008) warns, however, that time and careful planning are needed to make a success of such an approach. Ellis (2006) notes, too, that lecturers need to make the importance of using instructional technologies explicit to learners by informing them about why and how the technologies are used.

Jaffer et al. (2007) warn that technology should be used in moderation, because it could become a distraction. Owen (2008:721) adds that this is because learners might become overwhelmed by its "technological possibilities" and therefore not appreciate its educational benefits.

Cook (2009) is of the opinion that instructional technology is neither inherently superior nor inferior to traditional instruction. He (2009) suggests that the complementary strengths of each method should be effectively applied to benefit both learners and facilitators educationally.

The "universal truth" that health science education will be enhanced by computer assisted learning is acknowledged by Greenhalgh (2001:40). However, the author (2001) notes that the educational advantages of new technologies are of little value without the support of faculty management in terms of funding and training. Training of both lecturers and learners is listed as important by the author and, if not thought through carefully, could prove to be an "expensive disaster" (Greenhalgh, 2001:40). Therefore, before computer-assisted learning is initiated and expanded, a cultural (and mindset) change is necessary on the part of both management and academic staff. Careful strategic planning, sharing of resources amongst departments, staff incentives, active promotion of multi-disciplinary work and effective quality control is needed to sustain any computer-assisted learning initiative (Greenhalgh, 2001).

2.6 Summary

This literature review began with the researcher's discussion of a critical orientation on the part of facilitators to empower learners to become better academic writers. A constructivist approach to learning is endorsed as it allows for learner-centred teaching and learning activities. Work done by theorists of the New Literacy Studies movement - who view writing as a social practice - focuses on the collaboration between academic literacy and content experts to assist learners to construct appropriate discipline-specific texts.

This theoretical positioning was followed by a review of literature focussing on the value of academic writing, learner needs in relation to academic instruction (scaffolding), the lecturer's role and the practical implementation of academic writing. In highlighting aspects of learner writing in higher education, the researcher explained why and how writing activities and technology can be used successfully to improve the academic writing competence of first year learners in the health science education environment. Emphasis was placed on lecturers' establishing the learning styles of learners and accommodating these styles when guiding learners through the academic writing process. Challenges were also discussed. Entry-level learners perceive the academic writing expectations and conventions of higher education learning as difficult and demanding. Even though educators in higher education

attempt to guide learners in their writing, first year learners often do not understand the need for competence in academic writing and can therefore not follow the guidelines provided by facilitators.

The discussion concluded by focussing on the different type of learner entering the doors of higher education institutions today. Technology may be used to improve such a learner's writing. In order to match electronic instructional technology and academic writing instruction successfully, however, facilitators need to understand which, how and when electronic resources can meet the academic writing needs of the learner.

The topics emphasised in this review foreground the discussion in Chapter 3 regarding the research intervention which focused on addressing questions regarding factors that enabled and constrained learners' academic writing, as well as assessing to what extent such an intervention could enhance radiography learners' academic writing.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

After a statement of the research problem and the questions that are the foci of this study, two research approaches - namely a case study and an action research intervention - that influenced the research design of this study are described. The selection criteria and procedures that were used are then explained. Data collection techniques and modes of analysis used to interpret the data will then be elaborated on. The trustworthiness of the collected data will also be discussed before the chapter concludes with a discussion of the ethical considerations of the research.

3.2 Research problem

This study focused on an intervention to address the unsatisfactory academic writing competence of first year radiography learners through a blended teaching approach using technology-based instruction and support.

Three research questions formed the basis of this inquiry:

1. What did radiography learners perceive to be the factors that enabled and constrained their academic writing competence during the first year of academic study?;
2. What were the 2010 first year learners' perceptions of the changes in their academic writing following an academic writing intervention?; and
3. According to the 2010 first year lecturers, how did the academic writing of the learners change following the intervention?

3.3 Qualitative research

This research is located in a qualitative research paradigm, owing to the exploratory nature of the research questions and the researcher's intention to describe and not to measure (Brink, 1996). This study rests on the assumption that reality is constructed (see section 2.2.2) and there are ever-changing interpretations of it (Murphy & Yielder, 2010). Qualitative methods provide insight into the meaning of underlying empirical data in an area of study (Babbie & Mouton, 2001). In line with this, this thesis provides "… an in-depth and interpreted understanding… of a social practice [academic writing] of research participants through learning about their experiences and perceptions" (Snape & Spencer, 2003:3). The purpose of gaining this understanding was to improve upon unsatisfactory academic writing practices. A qualitative research paradigm therefore enabled the researcher to study learner writing in

its entirety in a real-life context to address the nature of the phenomenon (unsatisfactory learner writing) and the factors related to such a phenomenon (Brink, 1996).

The use of qualitative research methodologies in radiography research has increased over the past decade (Adams & Smith, 2003; Ng & White, 2005; Murphy & Yielder, 2010). However, there is still a need for qualitative methodologies to "define more clearly what radiographers [in practice and education] do and how they do it" (Adams & Smith, 2003).

3.4 Research design

The complementary strengths of a case study and an action research project were used to conduct this research. The case study was used to develop an understanding of learners' academic writing competence. On the basis of this understanding, the action research approach was used to facilitate the design and implementation of an intervention to change practice (the way learners write). Each of these two approaches will now be discussed.

3.4.1 Case study research

Brink (1996:116) refers to a case study as a "non-traditional" research design, because it does not fit easily into either the experimental or non-experimental research categories. According to Tellis (1997) and Masters (2000), case studies were historically used to investigate issues of poverty and unemployment experienced by immigrants in the United States of America. Case studies were appropriate because they accord special attention to completeness of observation, reconstruction and analysis of the case under study (Tellis, 1997).

Around the 1930s, the use of case study research declined because case studies were regarded as not scientific enough, as quantitative measures could not be used to analyse the data (Tellis, 1997; Masters, 2000). However, Tellis (1997) notes that the grounded theory concept, developed by Strauss and Glaser in 1967, revitalised the use of case study research designs and contributed to their broader acceptance.

A case study is a qualitative research approach that is used to study individuals, small groups or events in a natural context (Yin, 2003). According to Brink (1996:116), a case study not only provides descriptive information, but also explains the "what" and "why" of a phenomenon. A case study approach was therefore suitable for studying a selected participant group of first year radiography learners in a classroom context. Before an intervention could be implemented to address their unsatisfactory academic writing, it was necessary to gain in-depth insight into the teaching and learning context and the characteristics of the participants (first year radiography learners) in order to provide a comprehensive understanding of the circumstances and characteristics of those under

investigation. This case study therefore satisfied the three tenets of qualitative research: describing, understanding and explaining (Babbie & Mouton, 2001).

A frequent criticism of case study research is that the results cannot be generalised for various reasons, one of which is the typically small study sample. Yin (2003) argues that the goal of a case study is not to generalise to a broader population. Instead it should be used to gain in-depth insights of the particular case. In this research a case study was used to understand factors that enable and constrain first year learners' academic writing in order to improve their writing. The researcher's aim therefore was not to generalise the results, but to use these understandings to improve teaching and learning to benefit future groups and build knowledge of academic writing competence in radiography education in general.

With the understanding derived from this case study, an academic writing intervention, using iterative spirals of action research, was used to improve learners' unsatisfactory academic writing competence.

3.4.2 Action research

Action research was chosen as a second research approach to implement the research plan. Punch (2006:151) defines action research as "...using empirical procedures, in iterative cycles of action and research, to solve practical problems". The plan was to use spirals of planning, implementation and reflection on teaching and learning events to encourage learners to develop writing competence such that they would move away from being passive receivers (absorbing information) and become active constructors of meaning (Tellis, 1997).

All definitions of action research focus on four themes: "…empowerment of participants, collaboration through participation, acquisition of knowledge and social change" (Masters, 2000). Brink et al. (2006) likewise see action research as a strategy that brings about social change through action.

Zuber-Skerritt (1982:15) emphasise the benefits of using action research in higher education:

> Through systematic, controlled action research, higher education teachers can become more professional, more interested in pedagogical aspects of higher education and more motivated to integrate their research and teaching interests in a holistic way. This, in turn, can lead to greater job satisfaction, better academic programmes, improvement in student learning and practitioners' insights and contributions to the advancement of knowledge in higher education.

According to Grundy (1988), there are three minimal requirements for action research to take place:

- A social practice that needs improvement.
- The project (or inquiry) must proceed through a spiral of cycles of planning, acting, observing and reflecting.
- Participation in the inquiry needs to expand over time to include others affected by the practice.

Riding et al. (1995) add that the insights gained from the initial spiral feed into planning the next spiral; then the plan of action is revised and modified before the research process is repeated. Knowledge is created by the critical reflections of the researcher and the participants on their actions and experiences; and it is expanded through sharing such reflections with others.

Carr and Kemmis (1986) view action research as a form of self-reflective inquiry which draws on the perceptions of others. However, Riding et al. (1995) emphasise that action research is only reflective when participants analyse and develop theories about their experiences. Elliot (1993:51) writes about “unreflective” teaching and teachers needing reflective judgements to improve their teaching. He (1993) emphasises reflection as one of the important aspects of action research. In this study, reflection - by both learners and the researcher - was a very important aspect. Learners were intended to learn, develop and grow by reflecting on their actions through the use of various methods such as reflection sheets (see Appendix A, for example). A personal journal was also used by the researcher to reflect on key events that took place during this study.

3.4.2.1 Choosing a suitable action research approach

According to McKernan (1991), there are three forms of action research:

1. the scientific-technical view of problem-solving;
2. practical-deliberative action research; and
3. critical emancipatory action research.

In the first approach the researcher’s aim is to test an intervention based on an existing theoretical framework. The collaboration between the researcher and the participants is technical and facilitatory (Masters, 2000).

This approach did not suit this inquiry because the researcher’s aim was not to *test* an intervention against an existing theory to promote effective and efficient practice by participation, but rather to *change* or improve poor academic writing through implementing

pedagogic changes and exploring the effectiveness of these changes through consultation with participants and through reflection.

In the second approach, the researcher and participants identify problems, then discuss possible causes and interventions together. Practice is improved by applying the knowledge of all participants (Masters, 2000).

This approach did not suit this inquiry, because the participants were not involved in planning the intervention. The knowledge of all the participants was not used to take practical action to understand their poor academic writing competence - although learners' prior experience of academic writing informed the intervention process.

The particular form of action research that was applied was critical emancipatory action research (Carr & Kemmis, 1986). This framework is used when the researcher is concerned about social inequalities and is attempting to work towards positive social change (Carspecken, 1996). There is a move beyond interpretation and understanding to emancipation and empowerment by assisting people (in this case, radiography learners) in different ways (through instruction, interaction and reflection) to improve their chances of academic success to contribute meaningfully to positive change of an unsatisfactory situation (in this case, contributing to improve the participants' academic writing competence).

These three modes of action research do not necessarily employ different methodologies, but rather differ in the "underlying assumptions" (Grundy, 1988:363).

According to Waghid (2000), action research that is shaped by critical theory starts with a problem-posing phase characterised by a process of critical reflection about the phenomenon under study. The aim of such reflection should ultimately be to initiate change. The nature of the intervention used (iterative spirals of action research in this study) depended on an understanding (acquired through the case study) of the phenomenon under study.

The planning for the action research intervention was guided by the following requirements:

- The academic writing competence of first year radiography learners needed to improve in order to meet the lecturers' expectations.
- Planning, implementation and reflection on technology-based teaching and learning strategies and learners' academic writing went through two spirals to attempt to understand and improve learners' poor academic writing competence. (The term 'spiral' is used instead of 'cycle' because a cycle has a beginning and an end,

whereas a spiral represents a continuation of an activity or process and suggests progress over time).

- Although the progress of only the selected sample was closely monitored and researched, all first year learners were exposed to the intervention.
- First year radiography lecturers, who are directly exposed to the learners' writing, were also included in this inquiry.
- The results of this study would be disseminated to colleagues and could be applied to other levels of study in the radiography curriculum as well as to other health science programmes such as Nursing.

The diagrammatic sketch (Figure 3.1) was developed to represent a summary of the two research approaches - the case study and the action research spirals - used in this study. The broken arrows indicate how the researcher constantly reflected on the initial insights gained through the case study, thus maintaining a dialogue between the case study and the action research spirals.

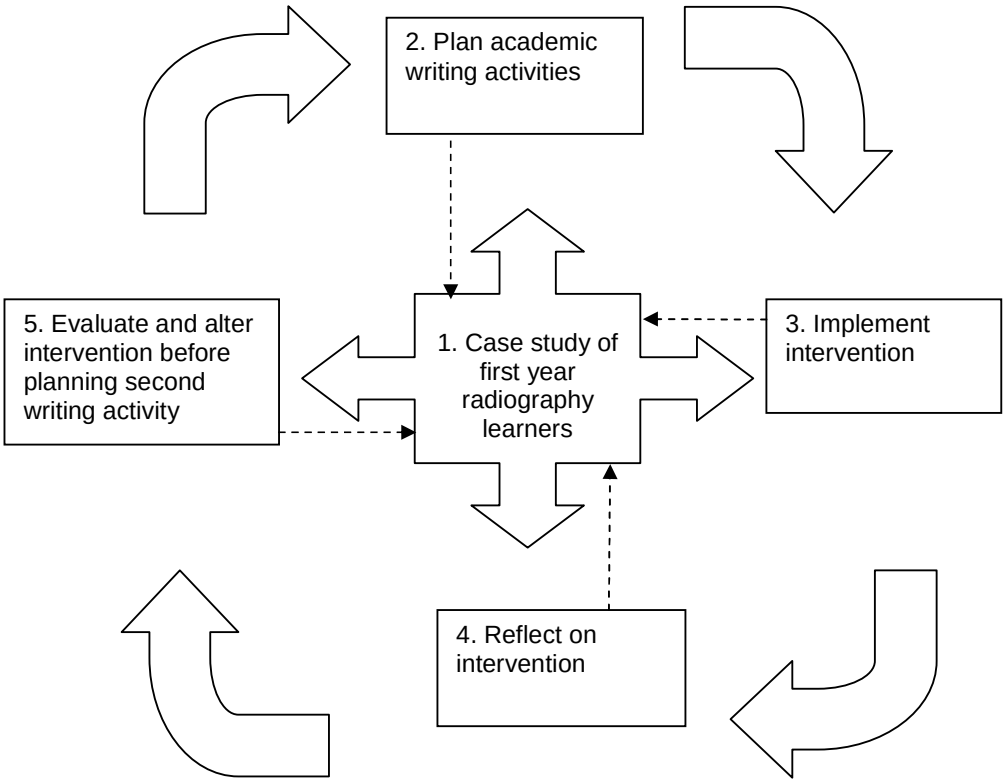


Figure 3.1 Diagram of the research design

3.5 Site selection

Leander and Prior (2004:205) describe a research site as "…a research rich environment which yields rich data for the types of questions that the researcher asks". The authors (2004:205) note that 'classroom' sites tend to be filled with teacher talk and little writing. Before choosing an appropriate site, the following questions about the site therefore needed to be asked and answered: "What types of writing related activities are present?" and "How visible are such activities to the researcher?" The research site for this study was selected as it was the learning spaces where the majority of written textual data needed for this study was produced: a radiography classroom, library and a computer laboratory of a satellite campus of a UoT attached to a tertiary public health hospital.

The radiography curriculum of this campus uses a work integrated learning (WIL) model where, from early in their first year, learners are alternately exposed to the clinical workplace and academic lectures in short cycles of two to four weeks (i.e. a 'block' system). This WIL model was developed so learners can apply their theoretical knowledge in practical contexts for enhanced learning and improved graduate employability (Engel-Hills et al., 2011). A WIL educational approach therefore aligns academic and workplace practices for the mutual benefit of the learner and the workplace. WIL operates on the principle that learning which is appropriate to the qualification is demonstrated and is assessed wherever it takes place (Engel-Hills et al., 2011).

The practical context did not form part of the research site, because the form of writing used in clinical departments is professional writing in the form of patient records and reports. However, learners were encouraged to draw on the insights and experiences gained from their clinical experience in their academic writing. Also, it was considered that an improvement in learners' academic writing competence would enhance their professional writing competence.

3.6 Selection of events

To address unsatisfactory academic writing practices and improve a learner's response to a task, the researcher deemed it necessary to identify any problems, shortcomings or uncertainties affecting learners early in the academic year. The research events (Refer to Table 3.1 for event description) used for detailed study were therefore planned for the first half of the academic year to equip learners with academic writing competence needed to complete the academic year successfully.

The first two topics in the Radiation Science I curriculum (radiation protection and radiographic imaging) were used as the main foci of the writing events (essays).

The intervention comprised spirals of teaching, writing events and reflection on these events. Interviews were then held with the participants to gain insight into how they had perceived these teaching and academic writing events. These insights were used to evaluate each event, then plan and prepare for the next one. Table 3.1 summarises all the research events and data source references.

Table 3.1 Events and data source references

Number	Date	Event	Reference[4] (RQ[5])	Data	Participants (reference)
1	02 Dec 2009	2009 Focus group discussion	FGD[6] 1/2009 (RQ 1)	Transcription of discussion	Learners A-I (LA-LI)
2.1A - 2.9A 2.1B - 2.9B 2.1C - 2.9C	22 Feb 2010 02 Mar 2010 06 April 2010	Draft 1 Draft 2 Draft 3	Dr1Ess1 Dr2Ess1 Dr3Ess1	Task Essay 1 Checklist	Learners 1-9 (L1-L9)
2.1 – 2.9	Final submission 12 April 2010	First academic writing activity	Ess1 (RQ 1 - 3)	Task Essay 1 Marksheet	Learners 1-9 (L1-L9)
3.1 – 3.9	12 April 2010	Personal reflection sheet 1	Refl1 (RQ 1&2)	Reflection sheets	Learners 1-9 (L1-L9)
4.1 – 4.9	16 & 19 April 2010	2010 Individual interview	II1 – II9 /04/2010[7] (RQ 1&2)	Interview guide transcription	Learners 1-9 (L1-L9)
5.1A - 5.9A 5.1B - 5.9B 5.1C - 5.9C	28 April 2010 10 May 2010 19 May 2010	Draft 1 Draft 2 Draft 3	Dr1Ess2 Dr2Ess2 Dr3Ess2	Task Essay 2 Checklist	Learners 1-9 (L1-L9)
5.1 – 5.9	Final submission 19 May 2010	Second academic writing activity	Ess2 (RQ 1 - 3)	Task Essay 2 Marksheet	Learners 1-9 (L1-L9)
6.1 – 6.9	19 May 2010	Personal reflection sheet 2	Refl2 (RQ 1&2)	Reflection sheet	Learners 1-9 (L1-L9)
7	26 July 2010	2010 Focus group discussion	FGD2/2010 (RQ 2)	Transcription of discussion	Learners 1-9 (L1-L9)
8A – 8E	27 Aug 2010	Lecturers assessing learner essays	Lect1/2010 (RQ 3)	Comment sheets	Lecturer A-E (LecA - LecE)

[4] Each event reference (see details in column 4) consists of the following information:

- An abbreviation of the event,
- The participant or activity involved, and
- The date of the event.

[5] RQ = Research Question

[6] FGD = Focus Group Discussion was used instead of focus group interviews, because a common topic of discussion (academic writing) was used for participants to share their experiences with one another.

[7] The event reference II1/04/2010 refers to an individual interview (II) conducted with the first learner participant (1) of 2010 who consented to be part of the study, in April (04) 2010. Letters were assigned to the 2009 learner participants and numbers to the 2010 learner participants and the first year lecturers.

3.7 Selection of participants

A quota sample of first year learners was taken from both the 2009 and the 2010 groups. Quota samples have the same proportions or characteristics as the broader research population (Brink et al., 2006) (in this case, the whole first year class at the research site). This sampling procedure relies on convenience choice (Brink et al., 2006) and ensures that relevant subgroups in the population are represented proportionally (Babbie & Mouton, 2001).

Even though there was a deliberate selection of participants, the 2009 and 2010 sample selections were not based on the learners' level of academic writing competence because no tests were performed at entry level to assess their initial level of competence. The researcher used the participants' Grade 12 (Gr. 12) English results as an indicator of their proficiency in the language (because English is the medium of instruction in the radiography learning programme at the research site).

Due to the diverse learner population entering the learning programme, participants with English as their home language (HL), as well as those with English as a first additional language (FAL), were included in the sample.

3.7.1 Inclusion criteria for 2009 learner sample

This sample was selected to gain an understanding of radiography learners' perceptions of academic writing in order to plan an academic writing intervention.

Nine first year learners who had passed Grade 12 in 2008 and who had almost completed their first year of radiography education were included in the 2009 sample to provide a retrospective view on their academic writing experiences. This quota sample met the following criteria:

- Learners had entered the radiography learning programme directly from secondary school.
- They were representative of the 2009 first year class in terms of female to male ratio (3F:1M).
- Each participant was proficient in at least two of the three regional languages used in the Western Cape (Afrikaans, isiXhosa and English), one of which was English.

Table 3.2 is a summary of the 2009 learner participant profile.

Table 3.2 2009 learner participant profile

Learner	Learner code	Gender	Home language	Gr. 12 English results
Learner A	LA	Male	Afrikaans	FAL (4) 57%[8]
Learner B	LB	Male	isiXhosa	FAL (5) 67%
Learner C	LC	Female	English	HL (4) 56%
Learner D	LD	Female	English	HL (4) 52%
Learner E	LE	Female	English	HL (3) 46%
Learner F	LF	Female	Afrikaans	FAL (5) 67%
Learner G	LG	Female	English	HL (5) 69%
Learner H	LH	Female	English	HL (5) 63%
Learner I	LI	Female	English	HL (3) 49%

3.7.2 Exclusion criteria for 2009 learner sample

- Learners repeating the subject (Radiation Science I) were excluded because they were already familiar with the academic writing practices and content of the radiography curriculum.
- Those learners who had any formal academic literacy instruction prior to entering the radiography learning programme were excluded from this study.

3.7.3 Inclusion criteria for 2010 learner sample

This sample was the focus of the action research intervention.

Nine first year learners who had passed Grade 12 in 2009 were included in the 2010 sample. This quota sample met the following criteria:

- Learners had entered the radiography learning programme directly from secondary school.
- They were representative of the 2010 first year class in terms of female to male ratio (8F:1M).
- Each participant was proficient in at least two of the three regional languages used in the Western Cape (Afrikaans, isiXhosa and English), one of which was English.

In addition to selecting learners on the basis of the above-mentioned criteria, a further aspect to the quota sample selection was used in 2010 due to the introduction of the National Benchmarking Test (NBT) at the UoT. As mentioned in section 1.2.3.1, the NBT consists of two tests, namely a combined Mathematics and Quantitative Literacy test and an Academic Literacy test.

[8] Refer to Appendix B for an explanation of the National Senior Certificate (NSC) scale of achievement according to Umalusi (Council for Quality Assurance in General and Further Education and Training), (2008:20).

Learners who apply to study at any higher education institution in South Africa could be requested by the institution to write one or both tests. Table 3.3 gives a summary of the scores and benchmark of each category.

Table 3.3 Researcher's adapted summary of NBT scores and benchmarks

Category	Academic Literacy Score	Description of benchmark
Proficient	65 - 100	Learners will cope with regular study.
Intermediate: Top	53 - 64	Learners need time and support to adjust to higher education. This support could be provided as part of the mainstream programme.
Intermediate: Bottom	42 - 52	Learners need extra time and support to adjust to higher education. This support could be provided as part of the mainstream programme or as an extended curriculum programme (ECP), as described in section 1.2.3.1.
Basic	0 - 41	Learners will struggle to cope with higher education studies and are placed on an ECP.

From this table it can be seen that the intermediate category is sub divided into a Top and a Bottom section. This is due to the wide variation of results in this category, indicating different levels of support required (NBT, 2009).

All participants in the 2010 sample wrote and completed the Academic Literacy Test (ALT). In line with NBT guidelines, the researcher used the ALT results as "… a means of identifying and assisting students who might be in need of academic support" (NBT, 2009). This instrument therefore assisted in the identification of learners in need of academic support. The ALT assessed learners' ability to engage successfully with the academic demands of higher education in the MOI (English) (NBT, 2009). The ability to use the MOI reasonably well is an essential requirement for competent academic writing. For this reason, only those learners who scored in the top intermediate category of the ALT were included in this research because they were suitable candidates for additional support within the mainstream programme. Like all entry level learners, they needed to adjust to the academic demands of higher education (as mentioned in section 1.2.3). Those who scored in the bottom intermediate and basic categories were placed on an ECP, where Academic Literacy is a subject.

3.7.4 Exclusion criteria for 2010 learner sample

- Learners repeating the subject (Radiation Science I) were excluded because they were already familiar with the academic writing practices and content of the radiography curriculum.
- Those learners who had been exposed to any formal academic literacy instruction at tertiary level were excluded from this study.
- Due to an increase in the number of international applicants for the 2010 academic year, the researcher decided to exclude these applicants due to their different schooling backgrounds and the associated grading systems used.

Table 3.4 provides a summary of the 2010 learner participant profile, including the ALT results. A difference between the Gr. 12 English and ALT results is noted. This is owing to the ALT evaluating learners' general competence in English and not assessing specific subject content. Learners do not necessarily need to prepare for the ALT.

Table 3.4 2010 learner participant profile

Learner	Learner code	Gender	Home language	Gr 12 English results	NBT ALT results[9]
Learner 1	L1	Male	Xhosa	FAL (4) 53%[10]	42
Learner 2	L2	Female	English	HL (5) 64%	58
Learner 3	L3	Female	Setswana	FAL (5) 62%	42
Learner 4	L4	Female	English	HL (4) 51%	62
Learner 5	L5	Female	Xhosa	FAL (5) 69%	50
Learner 6	L6	Female	Sesotho	FAL (6) 71%	51
Learner 7	L7	Female	Zulu	FAL (6) 71%	42
Learner 8	L8	Female	Xhosa	FAL (5) 68%	54
Learner 9	L9	Female	English	HL (7) 80%	60

3.7.5 Lecturer participants

All five of the academic lecturers involved with teaching, learning and assessment at first year level during the 2010 academic year, were approached to take part in this research. All lecturer participants (LecA – LecE) had a BTech (Honours equivalent degree) and a post school education qualification. Three of the five participants had an MTech. Due to the small but diverse lecturer profile, anonymity was ensured by not separating each lecturer participant's details in table form. Such a representation would have made it easy for colleagues and faculty members to identify the individual participant.

[9] Refer to Table 3.3 for an adapted summary of the NBT scores and benchmarks.

[10] Refer to Appendix B for an explanation of the National Senior Certificate (NSC) scale of achievement according to Umalusi (Council for Quality Assurance in General and Further Education and Training), (2008:20).

3.8 Data collection

Richardson and St Pierre (2008:479) use the term ‘crystallisation’ to indicate the complex, multi-faceted nature of the topic under study. Denzin and Lincoln (2008) liken the crystallisation process to a writer telling the same tale from different points of view. Multiple sources of data and methods of collection were thus needed to capture the complex, in-depth reality of events as clearly and accurately as possible (Brink, 2006) and to help plan the interventions (Ferrance, 2000). This multi-faceted approach reflects the researcher’s attempt to secure an in-depth understanding of poor academic writing competence of entry-level learners.

Data collection tools are defined by Sassa (South African Social Security Agency) (2008) as strategies used to collect information. These were necessary to enable the researcher to assess the relevance, effectiveness, efficiency and impact of the intervention to improve academic writing. The tools which the researcher found suitable to answer the three research questions will be discussed in this section; and the similarities in the data collection tools used for the two research approaches will form the main foci of this discussion.

When using a case study research strategy, Yin (2003) suggests the following sources of data:

- Documents,
- Archival records, and
- Interviews.

According to Ferrance (2000), action research vehicles for textual data collection include, but are not limited to:

- Interviews,
- Audio tape recordings,
- Focus groups,
- A personal journal (researcher), and
- Samples of learners’ tasks and assessments.

As both case study and action research approaches were used to complement each other, the following provided the primary sources of data:

- Archival records in the form of learners’ Gr. 12 English results and the NBT ALT results,
- Documents in the form of essays (assessments) and reflection sheets,
- Audio taped focus group discussions,
- Audio taped interviews (semi-structured individual), and

- The researcher's personal journal.

These will now be discussed.

3.8.1 Archival records

In this study, archival records such as Gr. 12 English and the ALT results were used for participant selection. Learners' Gr. 12 results were used to assess their proficiency in English, because the MOI of the radiography learning programme is English. As mentioned in section 3.7.3, learners who scored in the top intermediate level of the ALT were included in this study because they would benefit from additional support in the mainstream programme.

3.8.2 Documents (essays and reflection sheets)

Documents (in the form of reflection sheets (Appendix A) and written essays (Appendices E and L) from the 2010 learner participants) were used in this study to observe learner writing before, during and after the intervention. Babbie and Mouton (2001) explain that the use of personal documents in qualitative research allows the researcher to come to know the author of a document and the author's views of events with which the document is concerned. In this study, such documents were rich sources of data which were intended to increase the trustworthiness of insights gained (see section 3.11) during the focus group discussions and the individual interviews.

3.8.3 Focus group discussions

Focus group discussions are a non-directive style of interviewing where the researcher is interested in a variety of view points on the topic of discussion (Kvale & Brinkmann, 2009). This kind of discussion is used to gather data about the same topic from more than one participant at the same time, but also provides an opportunity for participants to learn from and share their experiences with one another (Brink, 2006). Kvale and Brinkmann (2009:150) emphasise the suitability of focus group discussions for exploratory studies because "... the lively collective interaction may bring forth more spontaneous, expressive and emotional views than in individual ... interviews". For these reasons the researcher decided to include focus group discussions.

The first focus group discussion in 2009 provided the first data set (refer to Appendix C for the discussion guide used). Data collected from the 2009 sample provided a retrospective view on participants' academic writing competence close to the end of their first year of study. The event was referenced (see event 1 in Table 3.1) and data was then coded.

3.8.4 Individual interviews

> Qualitative interviews have operated for us like vision goggles, permitting us to see that which is not ordinarily on view ... (Rubin & Rubin, 2005:vii).

While the focus group discussion's "conversational partners" (Rubin & Rubin, 2005:14) could learn from one another's experience and their interaction could stimulate discussion, individual, face-to-face interviews allowed for honest and open dialogue between the researcher and each participant. In this study, semi-structured individual interviews were held with learner participants to gain in-depth insight into their perceptions of academic writing. Rubin and Rubin (2005:vii) term an approach where the interviewer responds to, and asks further questions "responsive interviewing", because the researcher reacts to the responses of the interviewees. The researcher's use of this kind of responsive approach encouraged the learner participants to provide the rich, detailed data that was needed for this study.

Qualitative interviewing needs to adapt as circumstances or situations change (Rubin & Rubin, 2005). A process of adaptive planning was necessary for the iterative spirals of the action research approach used in this study. For example, the researcher chose the initial activity (an essay on radiation protection) and then, through reflective, iterative and flexible planning, she redefined the subsequent activities based on what had been learnt from the interviewees.

An interview guide (Appendix D) was used to initiate the individual interviews with the 2010 learner sample. It lent some structure to the interview. Rubin and Rubin (2005) refer to an interview guide as a conversational guide which serves as a protocol or an outline of the main questions to ask during the interview. Such a conversational guide assists the researcher to make meaning of what the conversational partners are saying, and then, in response, ask appropriate, thought-provoking follow-up questions (Rubin & Rubin, 2005). Where necessary during the interview, the researcher thus used probing questions that were not initially planned to clarify unclear responses (Kvale & Brinkmann, 2009). This clarification also assisted in the identification of themes during the analysis.

Kvale and Brinkmann (2009) suggest the use of two interview guides: one with the research questions (formulated in thematic, academic language for use by the researcher) and the second guide with the interview questions (expressed in the everyday language of the interviewees to stimulate their thinking and to encourage in-depth responses). Using everyday language assists with natural conversational flow, while the research question provides a focus when the researcher is asking probing questions.

3.8.5 Personal journal

A personal journal provides a space to document reflective thought. Reflective writing is an acceptable form of writing to document personal feelings, but can also be used as a method for health care professionals to document their professional growth (Findlay et al., 2011). The authors (2011) note that a personal journal is often used as a medium to guide reflection and reflective writing.

In this study, the researcher used a personal journal to write down events related to the study. Journal entries were structured in response to the following questions to guide and encourage reflection: "What happened during the event?", "What went well during the event?", "Why?"; What did not go so well during the event?", "Why?".

Due to time constraints and being actively engaged in teaching and learning activities, the researcher did not manage to reflect during each event; therefore journal entries were based on reflection-after-action (Milinkovic & Field, 2005). During reflection-after-action, the researcher returns to the experience – either in mind or written format – and recalls the event, paying full attention to his or her feelings (as the interviewer) and reactions (of interviewee) (Milinkovic & Field, 2005).

3.9 A blended intervention to improve academic writing competence

The academic writing intervention used in this study – summarised in Figure 3.2 – will now be described.

A blended academic writing intervention comprised explicit academic writing instruction using radiation protection and radiographic imaging content. Such instruction was supported by the use of e-mail between the lecturer and the participants. Electronic mail (e-mail) was used to support learner writing because it was freely available and widely used at the research site. Each participant had an e-mail address and was confident and competent to use this form of technology to send their academic assignments to the lecturer and to communicate with the lecturer about their academic writing.

Other forms of instructional technology, such as instant messaging, the university's learner management system and social networking were not used due to their non-availability and the level of training needed to use such media by both the researcher and the participants.

Assessment of initial task

In 2010, all first year radiography learners were given an initial academic writing task (see Appendix E) without any prior academic writing guidance. This was done to assess their initial level of academic writing on entering university.

Event 1: Formative tasks - Figure 3.2 (a) and (b)

The planned intervention was not a once-off event, but rather a process including writing instruction and guidelines conveyed through face-to-face lectures and electronic mail (e-mail). Support material in the form of learning outcomes, reading lists, worksheets and formative assessment tasks (in preparation for the summative task) were sent via e-mail to all learners prior to face-to-face lectures in Radiation Science I. The aim of the lectures was not only to deliver subject content, but to familiarise the learners with technical terms which they had to use at a later stage in their academic essays.

The learners were asked to submit three drafts of the first academic writing task before the final submission. Before each draft submission, aspects like finding information, essay structure and referencing of sources were discussed during face-to-face lectures. Appendices F and G are examples of worksheets used to introduce “Referencing”. These worksheets were also e-mailed to the learners in order that they could refer to them at any time.

After each draft submission, the essays were returned to the learners. They received written comment focussing on academic writing conventions from an academic literacy[11] lecturer (on the hard copy) and comment relating to the Radiation Protection content from the content lecturer (via e-mail). After each submission, the learners had to apply the academic writing principles discussed in class and changes suggested by the academic literacy lecturer to revise their essays for final submission. Should learners not understand the comments, they could contact the lecturer involved via e-mail.

Event 3: Reflection - Figure 3.2 (a) and (b)

The 2010 participants were asked to reflect on their perceptions of the effectiveness of this process writing intervention after the final submission of the essay. Appendix H is an example of a participant’s completed reflection sheet (used with permission from the participant).

Event 4: Interviews - Figure 3.2 (a)

Following this intervention with the 2010 first year class, semi-structured individual interviews were conducted with the 2010 learner participants.

[11] At the time of data collection the academic literacy guidance formed part of the orientation programme (during the first three weeks of the academic year). For the purpose of this study the assistance of an academic literacy lecturer was used for both academic writing activities after orientation. This was done to assist learners with all academic writing aspects (style and tone, logical organisation of text and referencing) of assignment writing.

The researcher formulated interview questions in line with the research questions. Questions were also planned on the basis of an analysis of data gathered from the draft essays, final essays and reflection sheets.

During these individual interviews participants were encouraged to give an honest response to the questions asked. Interviews were conducted in a familiar and safe environment (Rubin & Rubin, 2005). By evaluating the interview transcripts (see Appendix I for a collation of individual responses), the researcher could adapt aspects of the first intervention before proceeding with the next academic writing activity which focussed on Radiographic Imaging.

Event 4: Focus group discussion - Figure 3.2 (b)
A focus group discussion was held with the 2010 sample following individual reflection on the final submission of the second essay. This discussion was held in the second semester of the academic year by which time participants were used to the learning environment and their peers. This focus group discussion provided a platform for reflection-after-action, where participants had an opportunity to share their personal experiences of, and their different approaches to, academic writing.

Event 5: Lecturer response - Figure 3.2 (b)
The last data set was collected from all the full-time radiography lecturers teaching at first year level during the 2010 academic year. They were asked to comment on the academic writing competence of learner participants on the basis of a comparison between the final submissions of the learners' first and second academic essays. To limit the volume of required reading by the lecturer participants, the essays of only three participants were selected on the basis that one learner achieved a low (less than 50%), one an average (50 – 59%) and one a high (60% and more) mark for the first essay. These marks were not disclosed to the lecturers.

Each lecturer participant was provided with a comment sheet (Appendix J), as well as the task and assessment criteria for each activity. Lecturers were asked to comment on and assess the learners' use of language, style and tone; structure and logical organisation of text; and referencing. These comments were used to assess if the lecturers had perceived any improvement in the 2010 learner participants' academic writing competence in the second essay following the intervention.

Figure 3.2 is a summary of the blended academic writing intervention used to improve the academic writing competence of first year radiography learners.

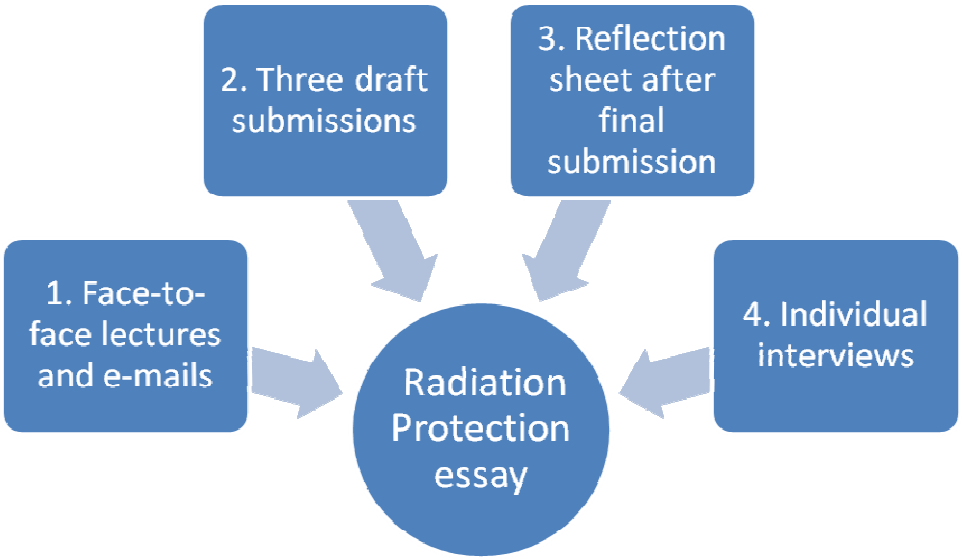


Figure 3.2(a) First academic writing activity

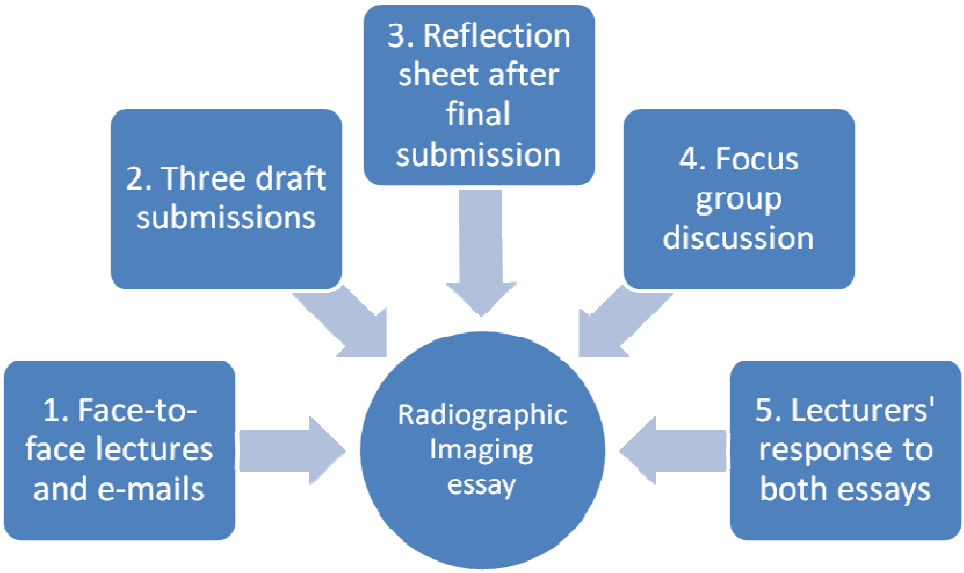


Figure 3.2(b) Second academic writing activity

Figure 3.2 Summary of the blended academic writing intervention

3.10 Data analysis

Analysing textual data involves examining, categorising, tabulating, testing and/or recombining evidence to address the initial research questions (Yin, 2003) and the reconstruction of meaning from all sources of data (Carspecken, 1996). Yin (2003) suggests four principles to ensure high quality data analysis in a case study. These principles may also be applied to analyse action research data (Ferrance, 2000):

1. Address the most significant aspects of the case study (research questions).
2. Use researcher's own prior knowledge by demonstrating awareness of current thinking about the topic (literature review).
3. Look at all the evidence produced (data).
4. Include all major rival interpretations in the analysis (use multiple views on the same issue).

Seidel (1998:1-11) reports on the 'basic' process of qualitative data analysis (QDA). This process focuses on the researcher collecting data, noticing interesting 'things' in the data and thinking about how and where those 'things' fit into the phenomenon being studied. However, Seidel (1998:14) proposes a more 'complex' model for QDA than this basic process. Although this model incorporates the use of computer software which was not used in the researcher's study, aspects of the model were adapted for the data analysis as they emphasise the iterative and recursive aspects of QDA. His (1998:14) model consists of four main sections:

1. The basic "Notice, Collect and Think" process;
2. The computer software used to import and label data (in Seidel's (1998) model, 'The Ethnograph' - a software package to analyse qualitative data - was used);
3. "Analytic discoveries" focussing mainly on identifying patterns, sequences and themes; and
4. The above three steps occurring repeatedly.

Figure 3.3 is a schematic representation of how the researcher adapted Seidel's (1998) complex model of QDA to suit this study.

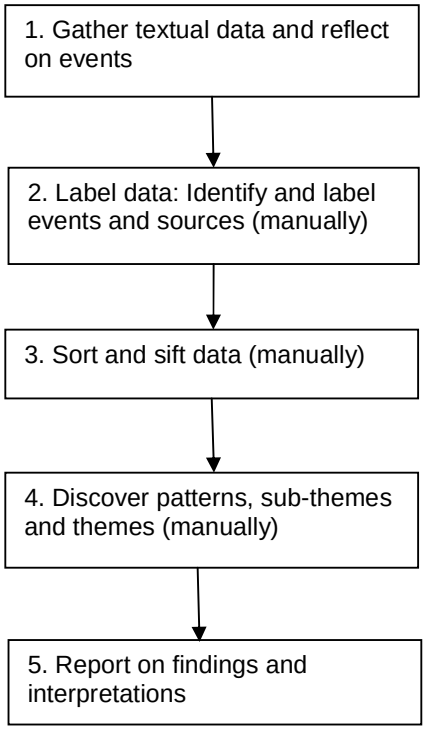


Figure 3.3 Researcher's schematic representation of textual data analysis process

From the researcher's adapted model, it will be noticed that no computer software was used to analyse the data collected during this study. The amount of textual data could be managed and interpreted manually. When the amount of textual data is unwieldy, computerised software is useful for analysis (Seidel, 1998).

Initial themes were identified in the academic writing of the 2009 learner sample. The process whereby a set of initial themes is identified and then compared over time with emerging themes noticed during ongoing interaction with data is known as Guided Analysis (Freeman, 1996). Identifying initial themes made it possible for the researcher to be alert to the presence of those themes in interactions with the data, while remaining open to new themes that might emerge over time. During these interactions, questions to clarify and verify emergent themes were developed for use during individual interviews and the 2010 focus group discussion. It was therefore important for the researcher to clarify and verify her interpretations of participants' responses during each interview and focus group discussion. The interpretation of responses played an important role during the thematic analysis of the data. For example, when LC/FGD1/2009 commented that "…the more essays I wrote the better I got", the researcher had to establish if 'more' indicated more than before the study, or more than what had been done during the study?

A selection of events, research questions, uncoded transcriptions and themes were sent to both research supervisors to check the alignment of collected data with the research questions. The supervisors also did an independent coding of themes in transcripts for purposes of comparison and discussion with the researcher.

3.10.1 Unit of analysis

A unit of analysis is used to keep the researcher focussed on what aspect of the case was under investigation (Yin, 2003). The units of analysis for this research were the learners' academic writing competence and the discourse of the first year radiography lecturers regarding the learners' academic writing competence between the first and final essays.

3.11 Trustworthiness of data

Golafshani (2003:597) and Murphy and Yielder (2010:64) find terms like 'validity' and 'reliability' suitable in a quantitative paradigm due to the experimental methods and quantitative measures used to test hypotheses. In the quantitative paradigm, validity and reliability of a specific instrument is the focus; and the question to ask for validity is: 'Did the instrument measure what it was supposed to measure?'; and, in the case of reliability, 'Would the same instrument produce the same result if used under identical conditions?'

In the qualitative paradigm, concerns of validity and reliability are covered through the use of "...lenses of precision, credibility and transferability" which are used to evaluate the quality of research findings (Golafshani, 2003:600). Due to the qualitative nature of the research questions in this study, the integrity of this study was addressed by focusing on 'rigour', 'credibility' and 'trustworthiness' (Golafshani, 2003; Fereday & Muir-Cochrane, 2006; Murphy & Yielder, 2010).

Fereday and Muir-Cochrane (2006) link the rigour of a study to the researcher's ability to demonstrate integrity and competence while conducting the study. The rigour of this study is demonstrated by in-depth planning (refer to the research schedule: Table 3.1), sampling, careful selection of data and sources that have significance in terms of the research questions, and the transparent analysis process.

The credibility of qualitative research depends on the ability and efforts of the researcher (Golafshani, 2003). In this study, credibility is demonstrated by the researcher reading extensively about the topic under investigation, her experience in teaching at higher education level and two supervisors overseeing this study with complementary expertise.

The trustworthiness of a qualitative research report means that confidence in the research findings needs to be established (Golafshani, 2003). Murphy and Yielder (2010) draw attention to the current confusion around terminology used to address quality (or 'goodness') in qualitative research. They (2010:64) argue that terms such as 'credibility', 'dependability', 'transferability' and 'confirmability', are appropriate due to their overlap in addressing quality, and encompass the trustworthiness of the qualitative research process. Trustworthiness is therefore demonstrated in this study by the reflexivity of the researcher and by the researcher ensuring that the research findings reflect the meaning of the participants as closely as possible. This is demonstrated through supporting interpretations with quotations from participants.

Transparency is an essential requirement for the trustworthiness of any qualitative study (Fereday & Muir-Cochrane, 2006; Murphy & Yielder, 2010). The step-by-step process of analysis outlined in Figure 3.3 indicates the transparency of the research process. Details of collected data are attached to this thesis as appendices to indicate that no documents were fabricated. Transcriptions of all voice recordings were shared with the participants to check and verify the transcribed text.

3.12 The researcher's position relevant to this research

One approach to minimise misinterpretation of research findings is for the researcher to be aware of, and explicit about, personal bias (Richards & Schwartz, 2002).

Researcher bias in this study could have been caused by shortcomings in the researcher's personal academic writing competence. As an English second language speaker, the researcher found that academic writing was extremely challenging but necessary as writing and publication are crucial to the development of a successful academic career. Antoniou and Moriarty (2008) state that these two competencies are no longer associated solely with research active staff, but are expected of all higher education lecturers.

Writing competence is improved by the numerous writing tasks a lecturer encounters on a day-to-day basis, from writing e-mails to drafting assessment responses. The availability of technical and practical support from the institution contributes to one's academic writing process, but not necessarily to the quality of one's academic writing. Antoniou and Moriarty (2008) advise that writing quality improves over time by writing more and more often, sharing written work and receiving constructive comment.

3.13 Delimitations

This research was limited to studying the academic writing competence of recent school leavers at entry level of the three year National Diploma in Radiography at one satellite campus of a University of Technology in South Africa.

The teaching and learning intervention was informed by data gathered from the retrospective views of 2009 first year learners (see FGD1/2009 in Table 3.1) who participated in a semi-structured focus group discussion about their academic writing experiences.

This research study only reports on the academic writing activities of the 2010 learner participants. Their academic reading progress was not assessed.

Only two topics (Radiation Protection and Radiographic Imaging) of Radiation Science I content were used during this study. Due to the integrated radiography curriculum, concepts like patient care and communication were also incorporated into the content.

3.14 Ethical considerations

Ethics approval

Ethics approval was obtained from the higher education institution's Faculty of Health and Wellness Science's Research Ethics Committee before this study commenced. An ethics clearance certificate with reference number: HW-REC 2009/H014 was issued on 19 August 2009.

Informed consent

Richards and Schwartz (2002:137) refer to informed consent as "...a prerequisite for all research involving identifiable subjects…". The authors (2002:137) further state that the "...minimum requirement for an interview should be written consent … from [all] participant[s] …". All learner participants completed a written consent form (Appendix K) indicating the extent of their participation in this study.

The lecturers involved also indicated their commitment to participate in this study by replying to an electronic request for participation and returning the completed comment sheet.

All participants were involved in this research with full knowledge of the researcher's intentions.

Due to the nature of qualitative research, Richards and Schwartz (2002) see consent as a process. Themes emerging during data analysis could be unexpected but appropriate to the

study. Therefore participants need to be informed about how data will be used during and after each data collection event. They should also be given an opportunity to withdraw from the study at any time (Richards & Schwartz, 2002).

Opportunities to withdraw from study

At the start of each research event, the researcher gave learners a brief oral summary of the progress regarding all the data produced and collected during previous research events. Participants were given an opportunity to withdraw from the study if they were not comfortable with how the data had been used. Participants were reminded that withdrawal from the study would not jeopardise their academic success.

Confidentiality

Confidentiality in this study was essential due to the large amount of textual data collected. Any personal information from participants was only available to the researcher. The reference system[12] used protected the identity of all participants.

Audio tapes and transcripts were locked in a secure storage space at the research site. According to the UoT's Post Graduate Policy (2010) data produced by this study should be kept and stored for fifteen years by one of the supervisors.

Risk to participants

It is often assumed that involvement in non-invasive research is relatively harmless, but the actual risk to participants is unknown (Richards & Schwartz, 2002). A research ethics framework proposed by these authors (2002:135) draws researchers' attention to four potential risks to research participants: "anxiety and distress"; "exploitation"; "misrepresentation"; and "identification of participants when dissemination of research findings occurs".

3.14.1 Addressing potential risks

In this study, the researcher addressed these potential risks to all participants as follows:

Anxiety and distress

The use of individual interviews and focus group discussions are data collection tools which may cause anxiety and/or distress to research participants (Richards & Schwartz 2002; Rubin & Rubin, 2005). The researcher was known to all learner participants and attempted to conduct all the interviews and discussions in a safe and familiar environment that would allow the participants to be comfortable and not feel intimidated (Rubin & Rubin, 2005).

[12] Refer to bottom of Table 3.1 for an explanation of how this system was used.

At the beginning of each interview, participants were reminded that all their views were important contributions to the study and that there were no “right” or “wrong” answers.

Exploitation

The inevitable power relationship between the researcher (as lecturer) and the learner participants did not lead to the exploitation of any participant. Voluntary participation allowed learners not to feel pressurised. The researcher did not coerce learners to participate through any means.

Interviews were conducted at a suitable time and place for all participants to attend. No additional expenses were incurred by them due to their participation in this research. The inconvenience to participants was minimised as far as possible.

Misrepresentation

During the analysis of the collected data, care was taken not to use any views of participants out of the research context. The researcher reduced the risk of misrepresentation of participants by giving all the learner participants an opportunity to view the interview transcriptions as a form of member check.

Identification of the participants by themselves or others

Even though the coding system used was only known to the researcher, there is a possibility that participants may identify themselves in the quotations used in this thesis.

3.14.2 Reducing the risk of harm

In this study the researcher attempted to reduce the risk of harm to all participants by addressing the following:

Scientific soundness

Scientific soundness is a fundamental ethical requirement of any research (Richards & Schwartz, 2002). This was addressed by appointing two suitably qualified supervisors with complementary professional expertise in the field of research to guide all research activities.

The scientific soundness of this study was also enhanced by the researcher following institutional and faculty guidelines and procedures regarding research.

Follow-up care to participants

Richards and Schwartz (2002) recommend that researchers should ensure that, where appropriate, follow up care is arranged for participants to reduce the risk of harm to them.

Research participants might expect assistance during or after the inquiry (Richards & Schwartz, 2002). The researcher addressed this by clearly stating for learner participants on the consent form the aim and research boundaries of this study (Appendix K).

3.15 Conclusion

The complementary strengths of a case study and action research approaches were used to design this study. A case study was used to develop an understanding of learner writing before a suitable intervention was developed and iterative spirals of an action research approach were used to implement an academic writing intervention.

The basis of data, site and participant selection was outlined. Data analysis methods were described: a simplified version of Seidel's (1998) complex qualitative data analysis model was used.

Due to the qualitative nature of the data, the trustworthiness of the data was explained in a discussion of 'rigour', 'credibility' and 'transferability'.

The ethical considerations of this study addressed issues such as obtaining ethics approval for the study, informed consent, confidentiality and reducing the risk of harm to participants.

In the following chapter, findings derived from an analysis of oral and written textual data will be presented. Such data (refer to section 3.8) were gathered from learners' written essays, reflection sheets, transcriptions of individual interviews and focus group discussions, and lecturers' written comments about learners' academic writing. Themes were developed through coding and identifying patterns in the data. These themes are presented in relation to the three research questions.

There were nine participants in the 2009 learner sample, nine participants in the 2010 learner sample and five participants in the first year lecturer sample (refer to section 3.7 for detailed participant profiles). Learners in the 2009 sample provided a retrospective view of their academic writing experiences and also what they perceived to be the academic writing expectations of the first year radiography curriculum. This information was used to plan the academic writing intervention implemented with the 2010 group of learners. The views of the 2010 participants were used to evaluate whether or not the intervention had enhanced their academic writing competence.

The researcher presents findings from the case study that was used to understand learner perceptions of writing at entry level (2009 group), as well as findings from the action research

intervention that was implemented to enhance learners' academic writing (2010 learner group). These findings could be represented together because, despite the 2010 intervention, both groups of learners experienced common difficulties applying academic writing conventions in their writing.

As discussed in section 3.10, Guided Analysis (Freeman, 1996) was used to analyse the research findings. In the first stage, the researcher was guided by the data gathered from the participants' reflections on their essays and the lecturers' perceptions of the learners' writing. These data sets were coded. During coding, the researcher removed all personal identification and assigned an individual and event reference to each activity (refer to Table 3.1 for a summary of event and data source references). Coding for words and/or phrases allowed the researcher to compare textual data qualitatively (Seidell, 1998). For example, the researcher identified words associated with factors that enabled academic writing, such as 'motivate', 'assist' and 'guidelines'. Words and phrases indicating constraints associated with academic writing included 'difficult' and 'need help with'.

As the data was coded, the researcher began to identify initial, broad emergent themes; through further coding and identifying group patterns within each theme, sub-themes were also identified in relation to the research questions. For example, as repeated comments such as "writing is difficult" occurred, they were grouped within a "constraint" theme. This continued until saturation occurred and all comments had been grouped in a relevant theme or sub-theme.

Finally, the researcher's initial, fairly numerous sub-themes like 'poor referencing' and 'willingness to use technology' were redefined under broader emergent themes which included 'enablers of academic writing', 'constraints of academic writing', 'learners' perceptions of their own writing after a technology-based intervention', and 'lecturers' perceptions of learners' academic writing'. A sub-theme such as 'guidance and support from lecturers' was placed under the broad emergent theme, 'enablers of academic writing'. This broad theme was evident in recurring patterns such as 'guidance' and 'lecturers' appearing in the same phrase/sentence.

The learners' essays were used to check that what they had said during the interviews and focus group discussions were evident in their writing. Figure 3.4 is a flow diagram that represents the analysis process used in this study. This flow diagram represents the sub-processes between numbers 3 and 4 as reflected in Figure 3.3.

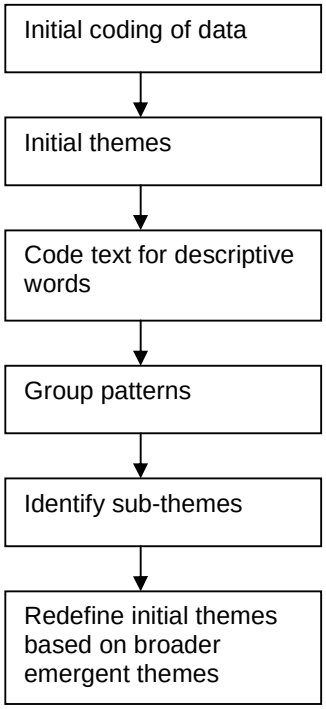


Figure 3.4 Flow diagram representing analysis of findings

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter presents the findings of the case study that aimed to develop an understanding of the perceptions of first year radiography learners (2009 sample) about their academic writing competence and, on the basis of these findings to design and implement an academic writing intervention to enhance the 2010 learner sample's competence.

The findings of this study will focus on two broad topics: factors that enabled academic writing, and those factors that constrained first year learners from writing successfully.

4.2 Factors that enabled academic writing

Findings from the 2009 and 2010 groups indicated three important factors that improved learners' academic writing: collaborative guidance and support, peer mentoring and technology.

Data analysis revealed that the supportive academic radiography department at the research site encouraged academic writing. This theme emerged from all the data sets. Participants did not always respond favourably to this encouraging environment, but they acknowledged that the existing radiography curriculum was a contributing factor that encouraged them to improve their academic writing competence, as noted by II3/04/2010:

> Academic writing is important in the radiography curriculum, because radiography is not easy, it is too broad and needs the writer to understand what she/he wrote and the structure that she uses, if its correct.

According to the learners, the factors which contributed to such an enabling environment were:

4.2.1 Collaborative guidance and support

LA/FGD1/2009 [13] indicated that the guidelines provided by the Radiation Science lecturer assisted her to complete a written task successfully:

> Usually I find the lecturers' guidelines more efficient; because it [guidelines] are more clear ... lecturers know what they want.

[13] Refer to bottom of Table 3.1 for an explanation of this reference.

These guidelines together with the assignment writing assistance from the academic literacy lecturer during orientation and during the academic writing activities gave learners a sense of confidence. Collaborative guidance from the academic literacy lecturer and the Radiation Science I content lecturer ensured that participants knew what was expected and how they should approach a task in order to succeed. When asked about the academic literacy assistance offered, LA/FGD1/2009 responded:

> There was that [academic literacy sessions] in orientation in the beginning of the year, about academic writing because I still have the notes ... that person [academic literacy lecturer], was really good and knew stuff. She explained her ideas and put somebody else's ideas in her [own] words.

Similar responses were made by other learners which made it clear that learners need sustained academic literacy support and practice throughout the academic year:

> II9/04/2010: There is the fact that we got given proper guidelines as to what is needed in the essays and also we got given lectures beforehand on how to write essays and how to approach essays. When we did not understand anything, the lecturer was also readily available to help.

> L3/FGD2/2010: At first we were given the structure, the structure of the whole writing [essay], like what you are supposed to write where, and we were actually given the guidelines ... we knew the guidelines and [we] knew what's supposed to be there, unlike at the beginning of the year; we used to write just the format that we used to know from high school.

Participants thus valued the academic literacy guidance and, as the academic literacy lecturer had used radiography discourse (in giving instructions) to ensure discipline-specific guidance, integration of Radiation Science content and writing principles was not a problem.

4.2.1.1 Process writing

Another factor identified by learners as part of a supportive learning environment was frequently having a chance "to correct your mistakes" (L1-L9/2010/Refl1). Participants highlighted the importance of lecturer response to multiple submissions of the same essay:

> II5/04/2010: It [multiple drafts] has helped a lot because I knew nothing previously about referencing, but the multiple drafts has given me a chance to gain a lot of knowledge.

> II7/04/2010: It [multiple draft submissions] instructed me and corrected me where I was wrong. It was very helpful since I was new with tertiary institution essays. The multiple draft hand ins were correcting us where we did wrong and where you [learner] need to add or change. They [multiple draft submissions] were very helpful since it was our very first essay.
>
> II8/04/2010: They [multiple draft submissions] made it easier for me to understand the topic and also to be sure of the final draft. I think it helps because at least when I submit the final, I know what is expected.
>
> L9/FGD2/2010: Also what helped a lot is that from the first to the second one [essay], we got our marks, we were assessed. We [learners] weren't assessed like ... let's be lenient. The lecturers weren't lenient. They told you exactly, 'this is wrong, you're not going to get marks for it'. And that's exactly what helped me, because you need to know that, okay I did this wrong, I can't get marks for it, so I need to not do it in the next one. That helped a lot.

Positive responses were also received regarding the nature of the lecturer's response to these drafts:

> L2/2010/Refl1: The feedback helped a lot. It equipped me with more knowledge and everything that I don't know and what I had to know.
>
> II4/04/2010: The feedback helped a lot and assistance [from the lecturer] to correct my assignment helped quite a bit.

Some learners read and acted on lecturers' comments and valued well-structured feedback that they could interpret and understand:

> II8/04/2010: I was given feedback: take this out, put that in, put this like this and when I submit the final, even if I don't pass it, I know what to do, what to say. I knew I submitted the right thing.

The general consensus from the 2010 sample about lecturer comment on their draft essays was that this enabled them to learn from their mistakes.

4.2.1.2 The presence of the clinical department

A finding from this research that was not anticipated was the link that participants made between their academic writing and how their writing assisted them to write in the clinical department. Learners also perceived the clinical department as a motivator to improve their academic writing:

> L3/2010/Refl2: It [academic writing] makes you feel that what you are writing is correct and professional, it [academic writing] helped me to write in a professional way and understand what I wrote, being professional when talking to people and writing in my logbook [in the clinical environment].

> L4/2010/Refl2: I think academic writing will help a lot in the sense if you're working or you face a situation and you've now done [written] something on the topic and you understand.

> L7/2010/Refl2: Academic writing is there to help me to get familiar with radiography [profession] and as well as the language that we use in radiography. It [academic writing] is important for us as radiography students to know what is happening in [the] radiography world since we work with patients.

By linking writing to the radiography profession they are entering, participants indicated that they understand the value of academic writing. Seeing this relationship so early in their training is a positive sign that will motivate learners to improve their academic writing, as this will benefit the future academic growth of the radiography profession.

Such findings complement work done by Gee (1990) and Jacobs (2005) who indicate the significance of teaching academic writing in an authentic context - whether theoretical or practical. Some participants of this investigation came to view competent academic writing - apart from its role in assessing their knowledge and understanding of the radiography content - as contributing to their novice professional identity. This also motivated them to improve their academic writing.

4.2.1.3 Available resources

The availability of resources, namely a prescribed communication textbook, well stocked library, dictionaries and a well equipped computer laboratory at the research site, was also an important enabling theme which emerged from this study.

Prescribed communication textbook

A communication textbook, authored by a radiographer and a communication lecturer in the health sciences, is a compulsory prescribed book for all first year radiography learners at the research site (Wyrley-Birch and Wright, 2003). Most participants expressed the view that this was a helpful resource and guideline for presentation and referencing formats.
LH/FGD1/2009 noted:

> The communication handbook that we got, it like have what you should have on the front cover [the essay cover page], how the referencing should be done: in-text and [the] Harvard [method].

This statement was confirmed by L4/FGD2/2010: "The communication textbook came in handy when I realised I did the wrong referencing".

Lillis and Turner (2001) strongly encourage educators to be clear about their expectations. Lecturers that make academic writing expectations and conventions explicit to entry-level learners assist these learners to know and apply such conventions in their writing. Scaffolded explicit guidance and support also provide the building blocks for future academic writing activities. Learners at the research site did therefore not have to 'guess' the writing expectations of the lecturer.

Computer laboratory

The research site has a twenty-nine seater computer laboratory with a technician who assists learners to familiarise themselves with information and communication technology. Participants felt that the availability of a well equipped and accessible computer laboratory was a strong motivator to write. When learners register at the institution, they are provided with a username and password to access the Internet and their institutional e-mail account. The training institution also provides learners with 30 MB of free data every month, which may be used for personal or academic purposes.

L6/2010/Refl2 applauded such infrastructure:

> It [the computer lab] is very nice because it's very easy for us to access our e-mails [from the lecturer].

In contrast to this, L5/2010/Refl2 perceived having access to such basic information technology as something new but also as a privilege:

> I didn't have access to those things [computers], so when I'm using an e-mail there are other [things] that I learn.

It should be noted that, at the beginning of this study, the researcher assumed that all learners would have been exposed to some form of computer technology, because they are part of the net generation (Harden, 2008). However, three of the participants in the 2010 sample were not confident to use a computer at all. The researcher assisted them with typing skills, computer literacy and how to send and receive e-mails. It was subsequently rewarding to note that assisting these learners with such basic computer skills enabled them to use a computer to complete their essays and communicate with the lecturer.

4.2.2 Peer mentoring

An important theme that emerged from the research findings was peer mentoring.

One of the greatest concerns all participants had about their writing was whether they were "doing it right" (FGD2/2010). They needed ongoing, accessible guidance. The satellite campus of the University of Technology (UoT) runs a mentor programme. This programme, facilitated by an academic lecturer, involves second year learners providing assistance to first year learners. Eight to ten second year learners were selected as mentors after a formal application and interview process. After being successfully selected, they each met with their group of first year learners (not more than eight learners per group) on a weekly basis to discuss primarily academic issues. If any personal or social issues were raised which the mentor could not deal with, the learners were referred to the academic lecturer who was mentor to the whole class.

Often senior learners - whether part of a mentoring programme or not - are also in a position to assist entry level learners because of their familiarity with the campus environment and available resources.

Some participants reported that their mentors were "enthusiastic" (II3/04/2010) and "committed" (II8/04/2010) to their role. II7/04/2010 also noted:

> My mentor helped me ... and also encourage[s] me to start writing early so as to be on time.

In response to a question about what assisted one participant to finish her essay on time, L1/FGD2/2010 commented: “The assistance and motivation from my mentor”.

Senior learners are willing and motivated to assist new learners because they “... have the ability and power to make a positive difference” (Treston, 1999:238). The positive responses from the 2010 participants confirmed this statement. These participants reported that they would first go to their mentors if they were unsure about anything, before they approached the lecturer:

> L3/FGD2/2010: You go to your mentor when you don’t even know where to start, where to get the information.

> L9/FGD2/2010: You first go to the mentor, then you go to the lecturer to check if its what she wants.

The 2010 participants appreciated meeting with their peer mentors on a weekly basis. The peer mentors used the notice boards to inform participants about weekly meetings. They also asked mentees to add topics to be discussed at such meetings using the notice boards. This guidance gave every mentee an opportunity to raise their concerns. The participants identified the assistance from their peer mentors and, in some cases, other senior learners, as an important contributor to the success of their writing. The mentor programme also allowed peer mentors to assist mentees with other important academic and life skills. While discussing both social and academic issues, the assistance of the mentor was highlighted in this study during the 2010 focus group discussion when L3/FGD2/2010 advised fellow participants: “Just go to the mentor and ask for help!”

4.2.3 Impact of a technology-based intervention (views of 2010 learner participants)

4.2.3.1 Attitude change towards academic writing

During data analysis, the researcher identified words expressing attitude change. Themes that were identified included participants’ positive attitudes toward reading and academic writing, and a positive response to the use of e-mails between the lecturer and the learners to communicate about writing and academic writing conventions of higher education.

The participants also identified areas which they could address to improve their academic writing competence, and this signalled a change in attitude, as they were taking responsibility for their writing. Learners therefore had a more positive attitude to their academic writing abilities after the intervention.

4.2.3.2 Reading to write

Although the focus of the intervention was academic writing, after submitting the second academic writing activity, learners reported that they were reading substantially more compared to when they had started with their first essay. From what some learners stated during the individual interviews, it was concluded that they did not 'like' reading, but that it was recognised as necessary: according to (II9/04/2010), they "... had to read in order to know what to do". This participant further stated:

> In the beginning I didn't like reading at all, but now because we're like in clinical and we have academic, you have to read to know what you have to do and that way it's easier, because like you're reading it and then you're doing it. It makes [learning] much more interesting. Reading more helped me a lot to write my essay, because I have to, no matter what!

L8/FGD2/2010 also considered the value of reading and note-taking before writing:

> Taking notes from what you are reading so that you know that when you come back [to write], just take whatever you've highlighted while reading … [and] try to see how much you understand, before you write.

4.2.3.3 Learners' raised awareness of academic writing demands

The learners felt that they were also writing more. For II3/04/2010, "writing more" was writing more in each assignment when "... I am writing complete sentences and more sentences per paragraph". This interpretation indicated how some learners became aware of their changing academic writing practices.

Following the explicit teaching and integration of academic writing into the Radiation Science I curriculum, the 2010 participants felt that if they could explain subject-content or an academic writing-related concept to a fellow learner or a lecturer, then they understood that concept. In such an explanation, they would use their own words, which then also made it easier to write about a particular concept in their own words. Recognising this relationship between oral discussion and writing is crucial to the successful development of academic writing in radiography education because the learners' understanding of both content and academic writing learning areas will improve. Such an understanding contributes to learners becoming "insiders" (Gee, 1990; Jacobs, 2005) to the radiography Discourse (thinking, talking, writing and acting like radiographers).

Examples of what the researcher terms a ‘surface’ improvement in academic writing-related concepts that learners highlighted were: the ability “…to start an essay from scratch” (II4/04/2010) and to “…subdivide the main topic into sub-headings” (II2/04/2010). These comments indicate ‘surface’ learning: they reflect participants’ understanding of how they need to write but do not indicate that they understand why they need to follow specific conventions when they write. In some cases, the researcher observed a much ‘deeper’ improvement in learners’ writing: participants could apply writing principles and conventions learnt during earlier tasks to a new task in the subject as well as in other subject areas. In other words, competence transfer occurred. This observation was confirmed in connection with referencing when some participants commented on how their referencing had improved:

> L7/FGD2/2010: Because you will start off ‘Bushong’ [author of prescribed Radiation Science I textbook] and then the next sentence again ‘Bushong’ and then you add the sentence again, because you didn’t know from school what is in text referencing … [now, I know] combine these two sentences and then reference Bushong.

McDowell (2008) associates the writing of structured argumentative essays used in health science education with a deep approach to learning because, in structuring their essays, learners are required to display their understanding of concepts by factual argument. The support and guidance provided to the learners by the academic literacy lecturer in the writing of factual argument in their essays enabled learners to demonstrate their mastery of Radiation Science I content and concepts in a logical way instead of merely reproducing information in the form in which it originally appeared in, for example, a textbook. Such alignment of content course outcomes (Biggs, 1996) with academic writing principles assisted learners simultaneously to express their knowledge of radiography logically and helped them to develop the discourse of the radiography discipline.

4.2.3.4 Using e-mails to communicate writing

The findings of this study support the thoughtful employment of certain forms of technology to compose written academic tasks (Goodfellow, 2005). Learners were enthusiastic to learn how to use e-mails to improve their academic writing. The researcher attributes this affinity to technology as a learning method to learners being part of a generation known as ‘digital natives’ (Harden, 2008:889).

During this study, the following advantages of using e-mails to facilitate communication about academic writing were noted. Here they are listed in order of importance:

1. Using e-mails between the lecturer and learner and/or between learners was an easy method of communication that saved time. Instead of waiting for an opportunity to meet face-to-face, an almost instant reply could be received. Participants felt that, after a lecture, they could not always remember all the information shared. However, by using e-mails, the lecturer's comments on their writing could be saved, and retrieved at any time when needed.

   Some of the learners reported that assignment writing-related issues were easily addressed during the electronic method of communication. They could use the spell-checker to check the spelling and grammar of written text. The computer was being used as more than just a word processor and applications such as the Internet and the university's intranet (which includes medical dictionaries) were accessed more frequently by learners compared to when they were writing by hand. This led to an improvement in learners' information literacy competence.

   An additional benefit, according to II3/04/2010 and II5/04/2010, was that the increased time spent using the computer in turn developed the learners' "technology skills" (such as increased typing speed). This greater ease in using technology motivated learners to improve their writing. This is described by II3/04/2010:

   > I feel very motivated and happy because ... it [using e-mails] helps me with developing my technology skills. It [e-mails] helps me to correct my mistakes [for example, spelling, grammar and referencing] faster than when I had to go around asking for help with hard copies.

2. Some participants emphasised the advantage of confidentiality when using e-mails between the lecturer and very shy learners. A personal response was given to the individual and classmates were not part of this electronic conversation. This encouraged these shy participants to ask more questions without there being an audience, as would be the case in classroom interactions. Participant II8/04/2010 reported:

   > When writing [using e-mails], you feel free to express yourself, especially if you are shy, there's no face-to-face interaction. And if there is no face-to-face interaction then I can say whatever I want, because I know I'm not looking at the person now. Using e-mails that way [asking the lecturer] will ask more [than face-to-face] if you're unsure.

> Participant II4/04/2010 added: It [e-mails] help a lot as a method of asking a mentor or lecturer and it [e-mails] helps give you positive and negative feedback and it helps you to know where you're going and get the individual attention that you've been needing.

3. The convenience of using e-mails also created a platform for learners to ask the lecturer involved for clarity about anything at any time, even when learners were based at other hospitals on clinical placements. II9/04/2010 reported that, in this situation, using e-mails was "more convenient" and more rapid than submitting hard copies of essay drafts to the lecturers.

The learner participants expressed a positive overall response to being exposed to electronic media for teaching and learning, and communication purposes.

4.2.3.5 Learners' raised awareness of academic writing conventions

Through the intervention, the 2010 participants claimed that they became more aware of academic writing conventions such as in-text referencing, end-of-text referencing and plagiarism. II4/04/2010 explained this during the individual interview:

> I've picked up the referencing. When I finished the project I actually understood what I was doing and how I should do it [reference].

This is an indication that participants developed a qualitatively different understanding of what referencing was and why they had to comply with this academic writing convention. Such an understanding was not reached without hard work, as II4/04/2010 explained:

> So, I've never referenced before, it's hard work for me to pick up [referencing] .... in the beginning it was really difficult to get it.

This statement indicated to the researcher the difficulty school leaving learners have with unknown academic writing conventions. The researcher had assumed that referencing guides for beginners would assist learners to know how to reference and that the learners would learn to apply referencing techniques if given more than one written assignment (to reinforce referencing principles). However, the statement from participant II4/04/2010 confirmed two points for the researcher: 1. that practising referencing facilitates learning the required technique; and 2. that this practice is insufficient if the tacit is not made explicit to the novice learner, resulting in competence in referencing taking some time to achieve.

When II7/04/2010 was asked to clarify why referencing was needed in academic work, she raised the issue of plagiarism, commenting:

> So as to prove that you did not steal someone's work and to ensure people who will be reading your work that it is true, it [referencing] is one way of supporting what you say. You did not copy it [text] as it is. It also encourage one to fully understand the information so as not to get a chance to copy.

II8/04/2010 supported this view, adding:

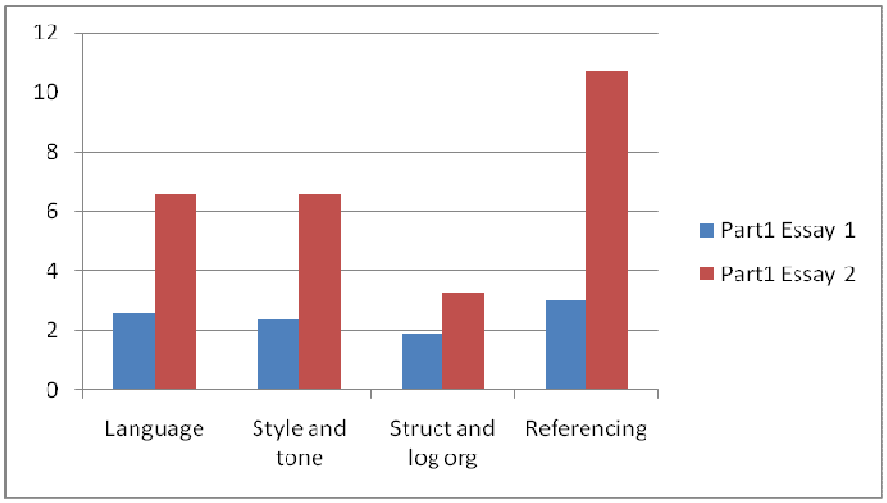
> You didn't use your own words; you used somebody's words and ideas. If there are no references that's plagiarism and it's illegal.

These statements indicate that, following the intervention, both participants were aware of concepts such as referencing and plagiarism. The rest of the participant group likewise reported a positive change in their referencing abilities. The researcher also noted the improved acknowledgment of information sources and using the correct format of the referencing method when assessing the second essay. According to Tarrant et al. (2008), such awareness will lead to a higher level of self-confidence, which, in turn, will motivate learners to write more.

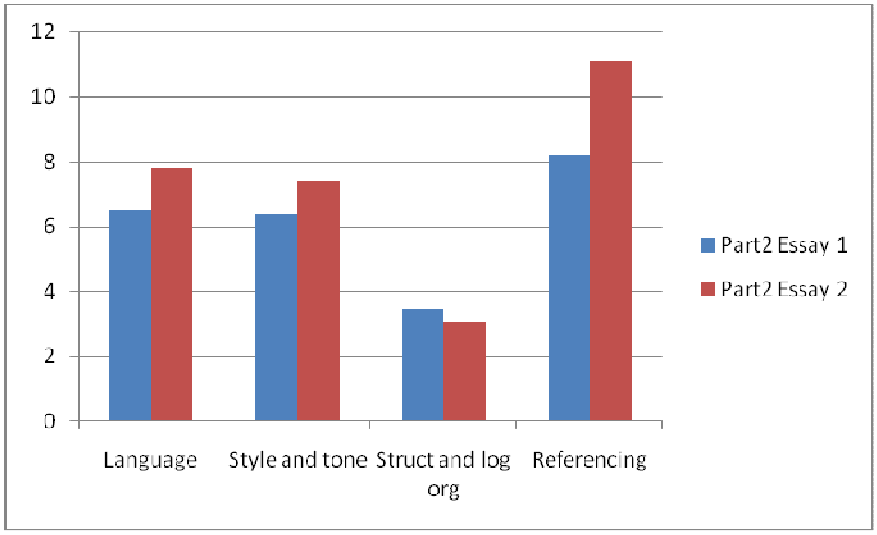
4.2.3.6 Lecturers' perceptions

This section includes a representation of findings from first year lecturers' assessment of, and comments on, two academic essays of the 2010 participants following the intervention. (Refer to section 3.9, event 6 for a detailed description of how comments were obtained from the lecturer participants).

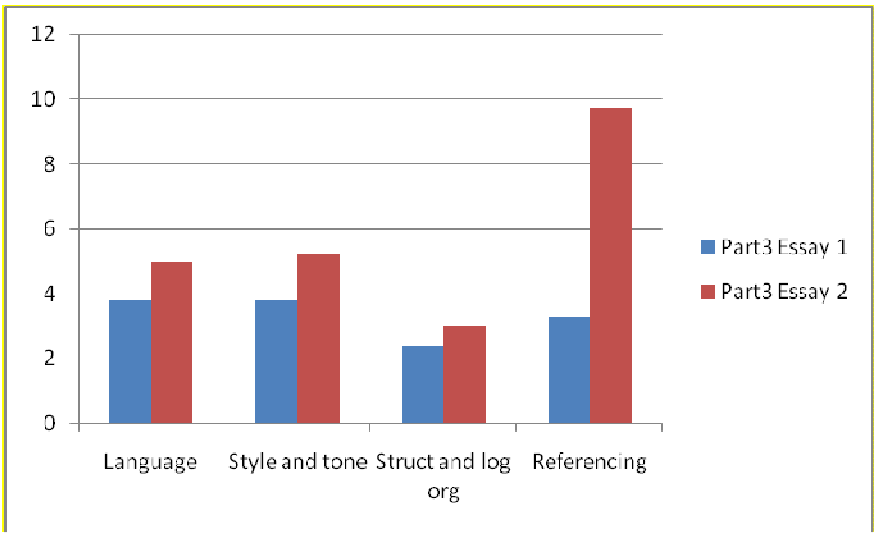
The three graphs (4.1, 4.2 and 4.3) represent the numeric scores assigned by the lecturers to the two essays of the three participants. An improvement in three of the four areas - Language; Style and tone; Structure and logical organisation; and Referencing - can be noted for two of the participants – 4.1 and 4.3.



Graph 4.1: Numeric scores assigned to participant 1's two academic essays



Graph 4.2: Numeric scores assigned to participant 2's two academic essays



Graph 4.3: Numeric scores assigned to participant 3's two academic essays

However, the researcher was also interested in the perceptions of first year lecturers about learners' academic writing following the intervention. The following is a collation of lecturers' written comments about specific differences between the two essays:

LecA: Referencing and academic tone of all three students improved.

LecB: L1: Much improved structure, coherence and referencing. Own writing still needs clarity.
L2: Improved language, tone and structure and referencing.
L3: Only referencing improved.

LecC: Significant difference in style and tone, structure and logical organisation and referencing.

LecD: L1: Huge improvement
L2: Noticeable improvement
L3: Little improvement

LecE: Very big difference in writing style of L1's second essay. Perhaps unintentional plagiarism? Referencing improved and more focused on the topic.

4.2.3.7 Discussion of lecturers' comments

All the lecturers commented on an improvement of the learners' overall academic writing ability in the selected essays that they had received. In addition to these comments, lecturers commented on the hard copies of the learners' essays. One comment included LecD expressing concern about the poor spelling ability of the three learner participants and related this to the possibility that the learners might not read enough. All the lecturers also highlighted that both essays were poorly self-edited. This was not surprising given that participants (as mentioned in section 4.3.1.6) dismissed the editing stage in the writing process as not important ("…faffing around…"and "… I won't go back [to edit]").

Another important comment from two of the lecturers was the "very big difference in the writing style" (LecC and LecE) of all the learners in their second essay. They indicated that learners could still be unintentionally committing plagiarism. An increase in the use of imaging related terminology, such as 'image', 'density' and 'contrast', was observed in the second academic writing activity. Participants used the terminology with much more ease in the second essay compared to radiation protection terminology evident in the first essay. Using the language of the discipline with apparently more confidence, without plagiarising, contributed to the reader's impression of the improvement in participants' writing. This improvement could have contributed to the lecturers' perceptions of unintentional plagiarism. However, the lecturers' impression that unintentional plagiarism had probably been

committed was owing to the grammatical errors in the introduction and conclusion compared to the mainly correct language in the body of the participants' essays.

According to LecA, this difference would have been because the participants did not know how to introduce the topic and concluded with what was learnt by "writing in their own words".

All the lecturer participants indicated that the referencing and academic style and tone of the 2010 participants had improved in their second essay. This was attributed to referencing being explicitly taught by the content lecturer to these learners early in the year as part of the intervention. They were "actively shown how to reference" (as requested by LC/FGD1/2009). (See Appendix G for a worksheet used by learners to practise the Harvard method of referencing).

Language; style and tone; and structure and logical organisation were facilitated by the academic literacy lecturer but were not monitored by the researcher.

4.3 Factors that constrained academic writing

This section will highlight themes which indicated factors that prevented learners from successfully completing written academic tasks. Although participants reported that the radiography learning environment was conducive to their writing, there were some factors within this environment which made academic writing difficult for first year learners in particular. Two major themes were identified, namely personal factors and factors which emerged from the learning environment.

4.3.1 Personal factors

Personal factors are issues inherent to the learner (Uwaifo, 2008). Those factors that emerged as significant included a negative attitude to academic writing, uncertainty about the academic writing process, challenges related to lack of disciplinary knowledge, writing 'in your [learners'] own words', prioritising time and poor academic literacy competence.

4.3.1.1 Negative attitude

All participants identified that a negative attitude towards academic writing prevented them from seeing and experiencing the educational benefits of writing. A loud complaint of "writing is difficult" resonated throughout this study.

Apart from perceiving writing as challenging, some of the participants initially perceived writing as a chore or nuisance, as yet another task that needed to be completed in order to succeed academically.

Moreover, and probably related to this 'nuisance' attitude, writing was seen as a once-off event that could be put off as long as possible and then completed quickly. This was mentioned by learners as follows:

> LB/FGD1/2009: They [lecturers] do give us the time sometimes, but you find that we do our assignments on the last minute, and
>
> II/8/04/2010: I first watch TV, because I will write quickly.

As the participants' understanding of academic writing developed, they recognised the value of writing to help them learn more about the discipline. LC/FGD1/2009 explained:

> We are actually learning something when we do our case reports and by reading instructions and give the lecturer what he wants, and [we learn] more about the discipline which we [learners] are in.

4.3.1.2 Uncertainty about the academic writing process

When the 2009 participants reflected on their academic writing abilities, they identified the most difficult steps in the writing process were how to start [approach] the task and what to do with the information gathered. The 2009 and 2010 participants displayed varying levels of uncertainty about academic writing where the lecturer first had to explain and analyse academic writing expectations before giving them a task: LF/FGD1/2009 said,

> Suddenly you get to tertiary level … and you are not familiar with it [academic writing]. We did not get a lecture on it. It [academic writing] is difficult!

The same uncertainty was displayed by a participant II8/04/2010 in the 2010 sample: "I didn't know how to [write]. I didn't know how [the lecturer] wanted the essay to be".

Even though participants reported that guidance from lecturers and the prescribed textbook assisted them with their academic writing, it seemed not to be enough to achieve competence. What they needed was sustained guidance. However, from personal experience, the researcher is aware that different learners need varying levels of support and guidance with academic writing. The individual learner's level of language proficiency in

written communication would first need to be assessed in order to ‘match’ the support given with the learner’s needs.

4.3.1.3 Challenges related to lack of disciplinary knowledge

Unfamiliar content was a major challenge to learner writing, especially when participants did not understand the topic they had to write about, as noted by II6/04/2010:

> At first I didn’t know how to approach the essay because the topic wasn’t something that I was familiar with.

Participant II8/04/2010 had a similar opinion of how a lack of disciplinary knowledge prevented her from writing successfully:

> It [academic writing] was also difficult, because I didn’t know anything about radiation protection and now I needed to write about something I didn’t know. It is better if you were given an idea [lecture], when you reference you can refer to that [lecture].

A lack of disciplinary knowledge often resulted in some entry-level learners resorting to unintentional plagiarism, which was perceived as acceptable at secondary school level. Limited academic and information literacy competence at entry level prevented these learners from accessing the correct subject-content for the first level of study. This does not only indicate the need to make the academic literacy demands of both the subject and the course known to learners, but also to provide them with well-structured and user-friendly subject information in the form of subject and learner guides.

4.3.1.4 ‘Write in your own words’

Unsolicited data (Engel-Hills, 2005) - where the researcher did not plan to gather this data from certain sources - informed the study and shaped the researcher’s understanding of both the learners’ and lecturers’ responses in this study. Informal discussions between lecturers in academic tea rooms were a source of such data. Here a frequent complaint expressed by lecturers was that learners ‘could not write’. This ‘situation’ was often perceived to be the result of the lecturers and learners having different understandings of the purpose, value and importance of academic writing. LA/FGD1/2009, for example, attempted to explain this mismatch between lecturer-expectation and learner-interpretation:

> The thing is the lecturer give they [his] ideas or perception what you must do. Then you have your own, but they [lecturers] have their specific way to do it and now you get a little confused, because your ideas and their ideas does not fit so nice.

This difference was also reflected in lecturer comments on learner writing. According to LecB, participants found it very difficult to paraphrase information according to their own understanding in order to meet the lecturer's requirement of "writing in your own words". However, although the participants interpreted this instruction as "the way the lecturers expected us to write" (FGD1/2009), they did not understand the reason(s). After discussing with the 2009 focus group why lecturers would want learners to write in their own words, LD/FGD1/2009 noted the following:

> If you copy and you plagiarise something that you don't really know, [you] don't learn that well, but if you [are] able to put it in your own words then you [are] proving that you do know.

Archer (2000:132), writing in a South African context, notes that the "... language of academia is a specialised discourse which presents a problem to all students ...". She (2000) adds that educators in higher education should assist learners to develop communication competence and that learners should familiarise themselves with the communication practices of the discipline. The findings of this study may therefore assist educators in higher education to provide appropriate support and guidelines for academic writing to entry-level radiography learners in future.

4.3.1.5 Prioritising time

The 2010 participants were not aware of how long the writing process can take. L9/FGD2/2010 said:

> I think with the first one [essay] we were all like, okay, this is going to be like a school project, it will take me a day to do it, so let me put it off [laughter]. Until you really sit down and realise this is not a joke, it's serious…

A comment like this indicated to the researcher that academic writing at tertiary level was perceived as more demanding than at secondary school level.

As the academic year was progressing and the number and frequency of assessments increased, participants did not know how to prioritise their time.

This resulted in their written assignments being neglected, then rushed, poorly structured and not edited. L9/FGD2/2010 further stated:

> If we have other things due and this [essay] is the last thing that we need to do, it will be the last thing that we do… I won't start until I'm done with tests…

This statement was a confirmation that participants did not perceive writing as a process but rather as a once-off product. They misjudged what was required for completing academic writing tasks at higher education level because of their prior experiences of writing. For example, they judged time required according to how long it had taken them to write similar tasks at secondary school. This is summarised by L8/FGD2/2010:

> I think for my first essay I was not coping with the workload, first of all, that's what made me start late. But now at least I know I mustn't wait, I mustn't say 'oh, I still have three days to go home, watch TV, do whatever'. Even if the due date is still far, there will be something else being given again, so there will be a load. So, I just need to be busy always, yes, finish it.

Setting time aside and providing space for learners and lecturers to discuss and analyse academic writing expectations of the radiography curriculum during the lecture day could serve as an indication to learners that academic development is valued in the radiography learning programme. A learning environment that includes academic writing could assist entry-level learners to commit to writing sessions and consequently contribute to more consistent attention to writing.

4.3.1.6 Limited academic writing experience

None of the participants were familiar with essay writing, the concept of referencing, nor the different referencing methods used in higher education. They found the transition from academic writing at secondary school level to the academic requirements at tertiary level very difficult. Coffin et al. (2003) argue that this difficult transition is due to learners struggling with the difficult writing expectations of the different subject areas in a learning programme. II4/04/2010 explains:

> It was hard for me to go from a high school essay … and go into a more formal and more structured type of thing [essay] …

Participants (from 2009) were concerned that they were not familiar with the academic writing conventions at tertiary level:

> LF/FGD1/2009 ... to get to tertiary level and to do work [academic writing], it's very difficult, because you come from school. You do [write] it as you do [know] it ... suddenly you get to tertiary level and you need to think about plagiarism. Referencing is done according to the book and you are not familiar with it.

Learners in both samples also did not know how to use the specified writing and referencing formats:

> LC/FGD1/2009: For me the problem was in-text referencing, because I would like do the whole paragraph and then I [would] in-text one [cite the information source], then another paragraph with one ... it all came from the same book, then I do it right at the end.

> II8/04/2010: I didn't know how to write. The in-text referencing, I didn't know how to do that. Taking the information, making it into my own words and then putting it together, because I didn't know where the in-text referencing would go. I didn't know how to do it.

They were concerned that they would lose marks and subsequently fail, as noted by L9/FGD2/2010: "... knowing that you are going to get nought if you don't submit"; and II5/04/2010: "... losing marks unnecessary".

The 2010 sample referred to a scenario where some of the participants ended up with a book filled with photocopies and did not know how to collate the gathered information into a coherent document to display their interpretation of the task. This situation clearly demonstrated the challenge participants had in order to use information according to the requirements of the assessment task. Poor written communication competence (which was reflected in participants' completed reflection sheets and essays) further increased participants' inability to approach and perform academic writing activities successfully.

Before the intervention, learners did not understand the importance of editing their written assignments. Often they did not notice those words that were incorrectly spelt or poorly structured sentences. L9/FGD2/2010 explained: "…once I read something, I go and I find the information. I'll finish it [writing], but I won't go back [to edit]". L4/FGD2/2010 described editing as "... faffing around and then you get stressed because you think you're not going to finish in time". These comments indicate that some of the 2010 participants did not value the importance of editing.

Many of the participants in this study perceived the essay as a task and not as an opportunity for learning. This echoes findings of studies conducted by Brennan (1995) and Scutter (2002): Brennan's (1995) view is that some learners do not value the importance of the sub-processes (or 'stages' as referred to by Lloyd, 2007) of the writing process. Even after the intervention, some participants still dismissed the revision stage of the writing process as "wasting time" (II9/04/2010).

4.3.2 Constraining learning environment

Constraining factors within the learning environment are those factors at the research site which may have prevented learners from writing successfully. Participants had no control over these factors.

4.3.2.1 Medium of instruction (MOI)

English second language participants in the 2010 learner sample expressed their concern that the MOI seemed to be limiting their academic writing efforts. L5/2010/Refl1 noted:

> I did not know how to start my assignment. As I am a second language student I find it difficult to understand what is really needed…

This participant realised that she lacked the competence in English to meet the academic writing requirements at higher education level. She expressed concern that she needed:

> … someone who can help me … on what is expected on my assignment, how it is supposed to look like and also in my English… (L5/2010/Refl1).

The researcher identified specific academic writing support needs of English second language participants: spelling and grammar, as mentioned here:

> II1/04/2010: I struggle with spelling, especially long words and words with similar spelling ... struggles to understand the words. I see academic writing in English as a challenge ...

> II5/04/2010: More especially language and spelling and all those grammar are more than that at the high school level, because you have to write a word as it is and you are not expected to have any mistakes. So that makes it difficult.

The following learners emphasised the need to be able to read proficiently in the MOI.

> L5/2010/Refl1: I did not know how to start my assignment, as I am a second language student. I find it difficult to understand what is really needed, and I find my assignment very poor.
>
> L3/FGD2/2010 (Xhosa as home language): …it's difficult to analyse the topic without understanding some of the words.

4.3.2.2 Confusion regarding lecturers' comments

Learners also noted that they found it difficult to interpret lecturers' comments on their writing. Often they did not understand the comments if lecturers did not indicate how marks were allocated for a particular section. Some learners also indicated that there were times when they received constructive comments on first drafts too late to incorporate into the final essays, as noted by L3/2010/Refl1: "...didn't help me so much because I got feedback on them [draft submissions] late". This is an important point, raised by the learner. Lecturers do not always realise the importance of responding to learners' written work well in advance for the next submission.

Lillis and Turner (2001) note that the academic writing conventions and guidelines provided at higher education level should be consistent and transparent to learners. Therefore, if all lecturers in the programme provide common guidelines for writing in the radiography discipline, this is likely to facilitate the improvement of academic writing. Needing to provide such guidelines will also encourage lecturers' collaboration with academic literacy experts. This is important because, according to Lea (2004), all lecturers concerned with improving learner writing need to be 'on the same page' about how learner writing is conceptualised and how it is facilitated in higher education.

4.3.3 Areas in need of further improvement

Two problem areas of writing competence were identified by the 2010 participants as unchanged following the intervention: they concluded that, although their spelling had improved, there was no change in their grammar. As II/5/04/2010 noted: "All those grammar are more than at high school level". This participant still had difficulty to structure sentences properly. Poor grammar use in learner writing, for example, sentence structure, often leads to misinterpretation of a learner's intended meaning by lecturers when they assess written assignments if sentences are not properly structured. In this study, when assessing learners' essays, the researcher personally found that poor sentence structure often led to poor assessment results and even failure.

The second area that needed improvement was the learners' ability to synthesise the same information from different sources. As II6/04/2010 explained:

> Sometimes you get ... information from two different books. They talk about the same things ... How should I say it: 'three cardinal rules' or 'golden rules'?

4.4 Summary

Some of the themes which emerged from the data were anticipated, such as learners' perceptions that writing is difficult; but most themes were unexpected, for example, the influence of the clinical department on learners' attitude towards academic writing.

It was encouraging to note the important role that peer mentoring played in developing academic writing competence. It emerged to the researcher as important that the existing peer mentoring programme at the research site could be successfully used to assist first year learners to enhance their academic writing competence.

Explicit academic writing instruction and using e-mails as a method of communication became useful everyday parts of the researcher's teaching during the intervention.

Summarising the findings of this inquiry and linking such findings back to the literature and the problem of first year learners' poor academic writing competence enabled the researcher to develop a model. It is anticipated that this model will not only assist radiography lecturers to support learner writing, but also to understand those factors that constrain novice learners from meeting the expectations of writing at higher education level. The model could also serve as a building block for sustainable academic writing development. Figure 4.1 is a Venn-diagram illustrating how, together, technology, peer mentoring and collaborative lecturer guidance create a zone for the optimal enhancement of academic writing in the area of overlap. The entry-level learner (or any novice writer) is positioned at the centre of this zone, because without a positive attitude and learners being pro-active by taking responsibility for their own learning, this zone is an empty shell where no writing – or learning – happens, in spite of the other three influences. The proposed model will be elaborated on in section 5.2.

Figure 4.1 Venn-diagram representing researcher's interpretation of enhancing factors for academic writing

CHAPTER FIVE

IMPROVING ACADEMIC WRITING COMPETENCE IN RADIOGRAPHY EDUCATION

5.1 Introduction

This concluding chapter commences with the presentation of a model that represents a contextualised interpretation of the research findings situated in the multi-layered theoretical framework used in this study. There will then be a short discussion of the challenges and limitations of this study as well as recommendations that emerged from the research findings. Further, there will be a consideration of areas for further research that have been identified, and the contribution of this research to the broader radiography knowledge base. The chapter and the thesis conclude with the researcher's reflections on the research process and the outcomes.

This study investigated the development of academic writing in a theoretical context. A model that illustrates factors that are needed to enhance academic writing, within this context was developed from the findings. This model is discussed here and illustrated in Figure 5.1.

5.2 A model for the optimal enhancement of academic writing competence

As summarised in section 4.4, the findings of this research highlight three important aspects that are needed for the optimal enhancement of academic writing competence. These aspects are: collaborative guidance and support, peer mentoring and technology. Figure 5.1 is a Venn diagram illustrating how these three aspects complement one another and, in their overlap area, create a zone for the optimal enhancement of academic writing competence, with the learner at the centre of that zone.

In this diagram, the multi-level theoretical framework is represented by layered circles: the outermost circle around the Venn diagram illustrates critical theory as a macro theory within which this study is situated. The second circle represents the constructivist teaching and learning context at a meso level. At a micro level, the innermost circle represents academic literacies theory used to understand academic writing as a social practice.

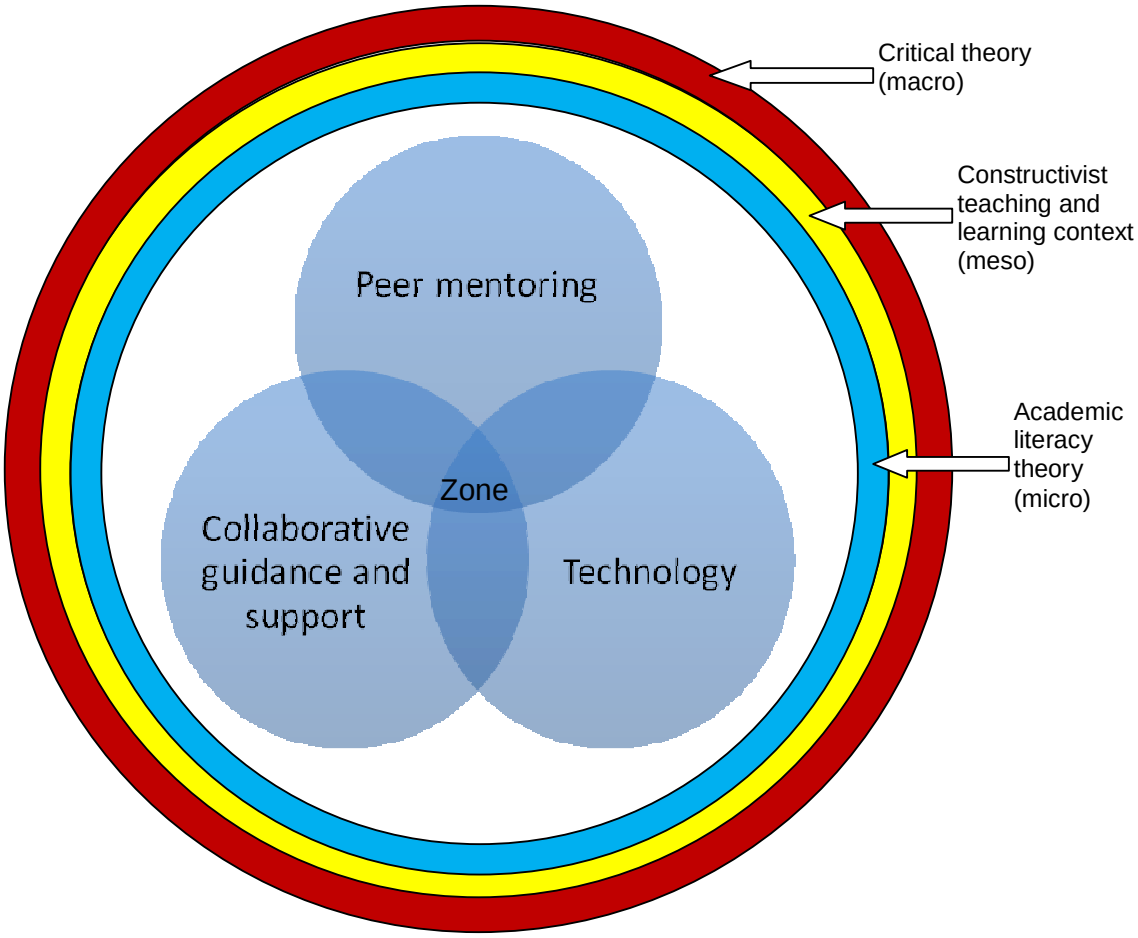


Figure 5.1 A model for the optimal enhancement of academic writing competence

This model will now be explained, starting from the macro level of critical theory, moving inward towards the zone for the optimal enhancement of academic writing competence (referred to hereafter as 'the zone'). As each aspect is discussed, the researcher will reflect on findings in relation to it.

5.2.1 Applying theory to understand academic writing

5.2.1.1 Critical theory

The broad critical framework of this inquiry allowed for the construction of a sound critical epistemology, as advised by Carspecken (1996). He (1996) also notes that the researcher must be aware of holistic modes of human understanding in order to meet the emancipatory goals of a critical inquiry.

The researcher perceived the 2010 entry-level learners as being at a disadvantage compared with their seniors, because they were new to higher education and the radiography profession. However, like all higher education learners they are expected to learn to use the discourse of their chosen discipline with competence, in this case in both the

academic and clinical contexts. An understanding of the 2009 learners' unsatisfactory academic writing competence was needed before any emancipatory intervention could be planned and implemented. By understanding how these learners perceive the academic writing process, the researcher was in a position to assist the 2010 group to see the 'big picture' of academic writing, such that each written task was not just seen as an isolated event.

5.2.1.2 A conducive, constructivist learning environment

Active learning

Constructivist theorists view lecturers as facilitators of learning. The outcomes based nature of the radiography curriculum also envisages learners being "constructive agents" (Perkins, 1992:61) of knowledge. During the intervention, the constructivist teaching approach followed by the researcher as a facilitator of learning placed learners in the "driver's seat" (Perkins, 1992:61) of their own learning. Group work and classroom discussions are examples of constructivist teaching and learning activities that were used in this study to enhance lectures (refer to section 3.9, event 2).

Scaffolding and planning

Adopting a constructivist approach to teaching and learning is initially time consuming in terms of planning and delivery. Academic writing activities had to be integrated with Radiation Science I content, but also scaffolded throughout the year to allow for the process which would encourage learners to value the importance of competent writing. Academic writing activities (refer to section 3.9) were scaffolded with guidance from the facilitator. During initial activities learners built on science related concepts learnt at secondary school.

The researcher observed that, in a constructivist approach to teaching and learning, the aim is to be consistent and plan for repetition of academic writing principles at regular intervals so learners practise conventions, for example, referencing. Improving academic writing competence is therefore a long term goal where academic writing related concepts are scaffolded within each year of study and over different levels of study. Over time, intensive one-on-one support is gradually reduced. However, the facilitator should remain available for consultation.

Explicit guidelines

Concerning assessment, by providing explicit academic writing instructions on written assessments, the researcher related academic writing expectations to the writing requirements of the Radiation Science I curriculum. Explicit academic instruction relates back to Brennan's (1995) argument that learners should not have to guess what lecturers expect

them to write. The participants' reflections of the second academic writing activity indicated that the clear and well defined instructions on the task assisted them to meet the requirements of the Radiation Science I curriculum. They knew what writing conventions to use and what content to include.

In contrast to the instructions on the imaging essay (see Appendix L), the instructions of the earlier radiation protection essay (see Appendix E) were broad and vague. There were no specific questions to answer and learners had to rewrite information from information sources, whereas the instructions for the second activity were specific questions that required them to demonstrate their understanding of the topic. The improved instructions were possible with the academic literacy expert assisting the content lecturer to integrate academic writing principles and Radiation Science I outcomes for the assessment task. This valuable assistance from the academic literacy lecturer was important for the academic development of the learners and provided the "transparent guidelines" which Lillis and Turner (2001) request from educators in higher education.

Coffin et al. (2003) confirm that facilitators using assessment criteria and level descriptors as part of academic writing instructions define for learners what is important. Including assessment criteria and level descriptors (for mark allocation) on the assessment tasks (see Appendices E and L) indicated the facilitator's expectations to the learners.

Although some participants reported that academic writing assisted them to acquire new knowledge about the radiography discipline (mastering facts), the researcher regarded their progress as gradual, with some needing more time to realise that the time taken to follow and complete all the stages in the writing process is not wasted. For example, even though some learners seemed to struggle to make meaning of new texts, they eventually explored new concepts and built upon existing (known) concepts in their writing. Such stages of growing awareness indicate some cognitive movement in what Vygotsky (1978) called learners' zone of proximal development.

5.2.1.3 Academic literacies

New Literacy Studies (NLS) theorists are of the opinion that reading and writing should be studied in the context where such practices occur (Lea & Street, 1998). Participants of this study were educated in two professional contexts within the radiography discipline: an academic context (the classroom) and the practice-based context (clinical department). Although reading and writing occur in both these contexts, the level and type differ. For example, learners read and write critically and reflectively in the academic context, but in the clinical department they scan a patient's folder and add information to an existing template.

In other words, they are not required to use information literacy, structured writing and referencing sources of information. However, radiography learners reported that acquiring writing-related knowledge in the classroom assisted them to use the required language of the discipline in the clinical department (refer to section 4.2.1.2). Learner participants therefore learned to use the design grammar (Gee, 2003) of both contexts to master the semiotic domain (Radiation Science texts) and to competently access the affinity group (radiography profession). While assessing the second academic writing activity (see Appendix L for instructions for the imaging essay), the researcher noted that there was an improved use of content-related terminology. These learners used appropriate radiography discourse and wrote like competent radiographers.

Learning to use the language of the radiography discipline to which learners are seeking access is not always an easy task, especially at first year level. Lillis and Turner (2001) and Lea (2004) emphasise the complex relationship that exists between the acquisition and development of content knowledge, and the academic writing expectations of higher education. Even though some learners reported that, in the clinical department, they could use the academic language which they used when writing in the academic context, others still struggled to implement the academic writing guidelines provided and use appropriate radiography discourse in writing. Such difficulty was reported by learners during individual interviews and this was evident for the researcher in some of the learners' imaging essays where imaging-related terms were used incorrectly and out of context (refer to section 4.3.1.3).

5.2.2 The zone

In order to improve the academic writing competence of first year radiography learners, the researcher found that an overlap of the following three fundamental aspects creates a zone for the enhancement of academic writing competence (with the learner situated centrally in that zone): collaborative guidance and support, peer mentoring and technology. The research findings indicate that, by implementing the complementary strengths of these aspects, improving academic writing competence could become a sustainable practice. Each of these aspects will now be discussed here.

5.2.2.1 Collaborative guidance and support

Another fundamental contributor to the zone is collaborative lecturer guidance. Such collaboration is not only between content and academic literacy lecturers, but also amongst content lecturers. Irrespective of the subject area, there is a need for all lecturers to demonstrate consistent use of - and emphasis on - academic writing conventions such as

referencing, format and logical structure of text, and the appropriate use of academic (and disciplinary) discourse in writing.

Wright (2006), Leibowitz et al. (2011), Harran et al. (2011) and Marshall et al. (2011) refer to the requirements for a successful collaboration between academic literacy and content lecturers; and Jacobs (2005) attributes collaborative success to the creation of discursive spaces (see section 2.4.3). This study involved collaboration of the researcher (as content lecturer) with an academic literacy expert. However, as a novice in the field of academic literacy, the researcher did not explore collaboration to include discursive spaces - where opportunities are created for exchanges between disciplinary experts so as to reach a common understanding of the discourse used in each other's discipline.

Nevertheless, even though this study did not focus on the successful integration of content and language for the benefit of learners, the findings (see section 4.2) indicate that there is a need for such lecturer collaboration in order to enhance the academic writing of learners in the radiography discipline. The findings on the enabling value of lecturer guidance and support for academic writing show that first year learners need writing and content guidance and support from the content lecturer, because that person knows not only the content but also the discourse and the writing expectations of the discipline. However, this understanding of the writing expectations and disciplinary discourse is often tacitly held. Language lecturers are well placed to bring this understanding to a level of explicit awareness (Jacobs, 2005). The language expert's guidance and support are thus also needed, because that person can assist with the academic development of both the content lecturer and the learners (especially if English is an additional language for the lecturer and the learners, as was the case in this study).

5.2.2.2 Peer mentoring

The researcher did not originally plan for peer influences in the intervention, but as an existing system, it proved greatly helpful. Authors such as Novak (2003) and Gredler and Shields (2004) note that the presence of a peer or a mentor has a positive influence on learner writing. Learner participants of this study confirmed this in describing the positive influence that their peer mentors had on their academic writing. While piloting an innovative peer-assisted learning programme in the United Kingdom, Longfellow et al. (2008:93) found that successful peers are "…better equipped and better placed than lecturers to pass on [academic writing] skills to novice learners in a peer-facilitated environment". The existing mentoring programme at the research site – where senior learners are used to mentor entry level learners – can therefore be seen as contributing to the enhancement of entry level

learners' writing. In order to be 'successful' or competent, peers would also need the guidance of lecturers.

5.2.2.3 Technology

The positive responses from participants on the impact of technology on their writing (see section 4.2.3) align with Garrison and Akyol's (2009) view that emerging instructional technologies in higher education facilitate collaborative, constructivist teaching and learning initiatives. Technological advancements in modern society make if possible for fast, effective and efficient teaching and learning resources to be the norm. However, at the research site, economic and infrastructural challenges and the diverse learner population prevent radiography education from being on the same technological level as the practice-based profession, where computerised and digital equipment are much more advanced. Therefore, in the context of the research site of this study, 'new technology' does not refer to the latest advances in technology, but to technology that is readily available and that has not previously been used for teaching and learning enhancement. For example, using e-mails as a method of communication is not a new trend, but e-mails were not previously used to support learner writing in the radiography learning programme at the research site.

Using a blended approach in this study - complementing face-to-face instruction with technology-based resources - was an attempt at "using technology as a catalyst" (Owen, 2008:722) to improve learners' writing competence in radiography education. Thus technology was used as a method to assist learners to improve their writing.

Some subjects lend themselves better to the use of technology than others. For example, the two Radiation Science I topics (Radiation Protection and Radiographic Imaging) used during the intervention were suitable to be demonstrated and delivered using instructional technology. However, practical applications of radiation protection principles, for example, demonstrating the effect of positioning a lead apron on a patient, cannot be replaced or simulated by using technology. In this study, the complementary strengths of technology, such as visual and sound effects, were effectively blended with face-to-face lectures to benefit first year learners educationally. Fast and easy to use characteristics of e-mail (refer to section 4.2.3.4) allowed the researcher to use this communication method to support learners in their writing without face-to-face contact.

Jaffer et al. (2007), Cook (2009) and Ellis (2006) support the use of electronic methods of instructional technology to complement teaching and learning methods such as face-to-face lectures. However, they say that a clear justification is needed for how and why instructional technology is going to be used in the academic writing process. In this study, electronic

instructional visual support (using Microsoft Power point® software) replaced content-related overhead transparencies during face-to-face lectures; and electronic mail (e-mail), instead of lectures, was used to support learner writing. Therefore, using electronic instructional technology and communication methods supported learner writing and so contributed to the zone for the optimal enhancement of academic writing competence.

5.3 Challenges and limitations of the research

This section focuses on aspects which the researcher experienced as challenging and that could have influenced her interpretation of the research findings. A discussion of each challenge will be followed by suggestions about how to avoid such future pitfalls when conducting similar research.

5.3.1 Disruption of plans

The radiography department at the research site follows a block system (refer to section 3.5) where learners alternatively attend two weeks of academic lectures and two weeks of clinical placements in the hospital setting. Interviews had to be scheduled during academic rotations, because some of the learners were rostered at various distant hospitals and departments during clinical rotations. Learners had the option to choose dates and times suitable to them to attend the interviews. However, it was difficult to adhere to the scheduled dates and times because some learners arrived during times when they were scheduled to attend lectures, which created the impression that participants were using their participation in the study to miss those lectures. As a result of this unsatisfactory situation, the researcher had to compile a revised, detailed interview schedule for the rest of the interviews (see Appendix M), which took all lecture times into account. Learners were then required to attend interviews outside of lecture times.

The five week break during the 2010 Soccer World Cup also influenced the implementation of the intervention, because the UoT usually has a three week winter break during June/July of each academic year. During this break, skeleton information technology (IT) support staff are usually available. However, during the Soccer World Cup there was not even limited IT support available at the satellite campus. The participants could therefore not access the computer laboratory, because there was no IT technician on duty. This was a disappointment, because this break would have been an ideal period during which e-mail communication could have been used to its full potential to enhance learners' academic writing competence. An alternative would have been if the researcher had used participants' personal e-mail addresses instead of their university accounts which are dependent on the university's server. The researcher did not consider this possibility of the intervention before the time, because she was not sure if all participants had personal e-mail accounts.

5.3.2 Plagiarism and technology

When using any electronic communication technology there is some degree of uncertainty regarding, for example, whether or not an e-mail will reach the intended recipient in time, or even at all. This uncertainty posed a great challenge to this study. More than half of the e-mails leaving the researcher's inbox were never received by some participants due to network, connection and password-related errors. Fortunately, due to the small size of the campus and the limited number of learners, those participants were always informed by fellow classmates of research-related activities and required supporting documents such as reading lists and worksheets sent via e-mail.

Using software such as Microsoft Power point® as instructional technology puts lecturers in an awkward position where learners ask to copy lectures onto removable hardware, such as flash drives. This is ostensibly for independent learning at a later stage, for example, in preparation for assessments. Although strict policies and procedures are in place to prevent unauthorised use of lecture notes by learners, this cannot be prevented or monitored. For example, the lecturer did not plan for control over learners using downloaded slides as their own in other subject areas. Diagrams and visuals used on content-related slides were used in three of the nine participants' drafts of the second essay without learners citing the original authors (who were cited on slides in the Microsoft Power point® presentation).

In another example, electronic teaching and learning material was sent to participants via e-mail. Two participants copied and pasted information from this material into their draft Radiation Protection assignments.

The researcher informed the learners of the consequences of using other authors' information as their own. Classroom discussions about plagiarism and how easily technology could contribute to unintentional plagiarism, made learners aware of the importance of referencing conventions. In future, this challenge could be overcome by converting electronic teaching material to either 'read-only' or portable document formats (PDF).

5.3.3 Factors limiting qualitative data analysis and interpretation

Data analysis would have been enhanced if the researcher had made clear, detailed notes during and immediately after each data collection event, as this would have provided an opportunity for immediate reflection-in- and reflection-after-action while the information could still be recalled easily. During interviews, for example, the researcher could have added notes and comments alongside learners' responses to the questions asked to improve the clarity of questions for future interviews. Additional notes might also have contributed to an improved interpretation of the transcribed material.

As data was often collected during or immediately after lectures, it was difficult for the researcher to spend any time reflecting on the data soon after an event. Consequently, very little of the needed reflection and in-depth discussion with self (Archer, 2000) occurred. Interpreting qualitative data and reflecting on this process should not be rushed. Reflection is crucial after each of the three important aspects of qualitative data analysis: gathering data, engaging with the data and then looking for patterns in the data. In this study the timing and the pace of reflection was in disjuncture: when reflection occurred, it was done quickly (and, to be honest, was regarded by the time-pressed lecturer as yet another task!). Full potential of analysing data was thus not achieved because of the researcher's limited time for reflection. In conclusion, regular and sustained reflection on qualitative texts, such as interview transcripts, would have allowed the researcher to identify patterns more easily and enabled a deeper level of analysis than was the case.

5.3.4 Researcher's limited academic writing experience

A limitation of this study was that, for the researcher, English is a first additional language. The researcher's experience of academic writing is limited. An advantage is that she understands the writing demands of the radiography profession. A personal driving force behind this study was the researcher's enthusiasm to improve her own academic writing and so be better able to assist learners to become competent academic writers. However, enthusiasm and willingness to assist first year learners did not immediately put the researcher in a position to provide constructive comments on learners' academic writing. The researcher had to know the academic writing conventions of English and also how to effectively comment in English when writing (and speaking) about these conventions. To compensate for these challenges, the expertise of an academic literacy lecturer was called upon at the beginning of the 2010 academic year. This lecturer assessed the learners' academic writing while the researcher focussed on whether the understanding of subject content was accurate and comprehensive. Such a partnership provided learners with constructive comments needed to improve both their academic writing and master the subject content. Throughout this study, such a partnership was confined to academic assistance for written assignments. The researcher uses the term 'partnership' and not 'collaboration' because, owing to a limited understanding of content and language collaboration requirements, the researcher made little attempt to create discursive spaces to discuss the relationship between the content and academic literacy concepts with the academic literacy lecturer.

5.4 Implications emerging from the findings

This section will focus on the implications of the findings of this study. These are listed in order of the researcher's perception of the importance of the issues involved to the enhancement of academic writing competence.

5.4.1 Reading to write

"Reading more [compared to the beginning of the academic year] helped me a lot to write my essay" (II9/04/2010). This quotation is an indication of the participant's acknowledgment that reading plays an important role in the development of academic writing competence. As noted by Prinsloo and Baynham (2008), reading and writing are inseparable from the social context of which they form a part. Therefore, writing practices cannot improve without a positive change in learners' reading culture.

First year learners entering higher education institutions need to be made explicitly aware of the close relationship between reading and successful writing. All participants reported that reading the communication textbook (Wyrley-Birch & Wright, 2003) currently used in the radiography curriculum assisted them to learn the academic writing conventions and expectations of higher education. Lillis and Turner (2001:65) note that, if learners' written texts do not meet the academics' expectations of what academic writing should be, learners' writing becomes the 'problem'. It is therefore recommended that all first year lecturers use this textbook to guide learners in the academic conventions and demands of the course. Wyrley-Birch (2008:177) also recommends that the textbook be "…revise[d] and reformulate[d] to cater for learners from first level to final year learners".

From the research findings, it is clear that more focus is needed on the interplay of reading and writing. The researcher therefore suggests that a reading programme, similar to that initiated by David Rose in the late 1990s, be implemented in the radiography learning programme. Rose's 'Learning to Read: Reading to Learn' reading programme has been used successfully in secondary schools and universities across Australia (Rose, 2005) and South Africa (Hart, 2007; Rose, 2005). In this approach, educators prepare learners to read before learners write jointly, either with a peer or an educator; finally, the learners read, then independently rewrite what they have previously written (Rose, 2005).

The 'Learning to Read: Reading to Learn' approach seems suitable for implementation in the Radiation Science curriculum where content-related texts from textbooks and other information sources are selected as learners need to be able to read, analyse and use such texts. This preparation might include guiding learners on how text is organised in various sections of a textbook or other source type, and how a textual genre, for example, the essay,

is used. Groups of learners could be given an opportunity to read and discuss the text and compile glossaries of new and unknown words. Individual learners would thus be better prepared to write an initial draft. Thereafter such glossaries could be used in discussions of the text that needs to be rewritten jointly before learners are given the opportunity to rewrite the text independently (without lecturer or peer support). This approach supports theory regarding instilling effective writing practices as it includes using writing for learning, writing as a social practice and learners reading and responding to their own writing (Archer, 2000). Learners are thereby better prepared for future independent writing activities, meeting the goals of a constructivist approach to teaching and learning. Figure 5.2 is a summary of the researcher's adaptation of Rose's (2005) Learning to Read: Reading to Learn approach:

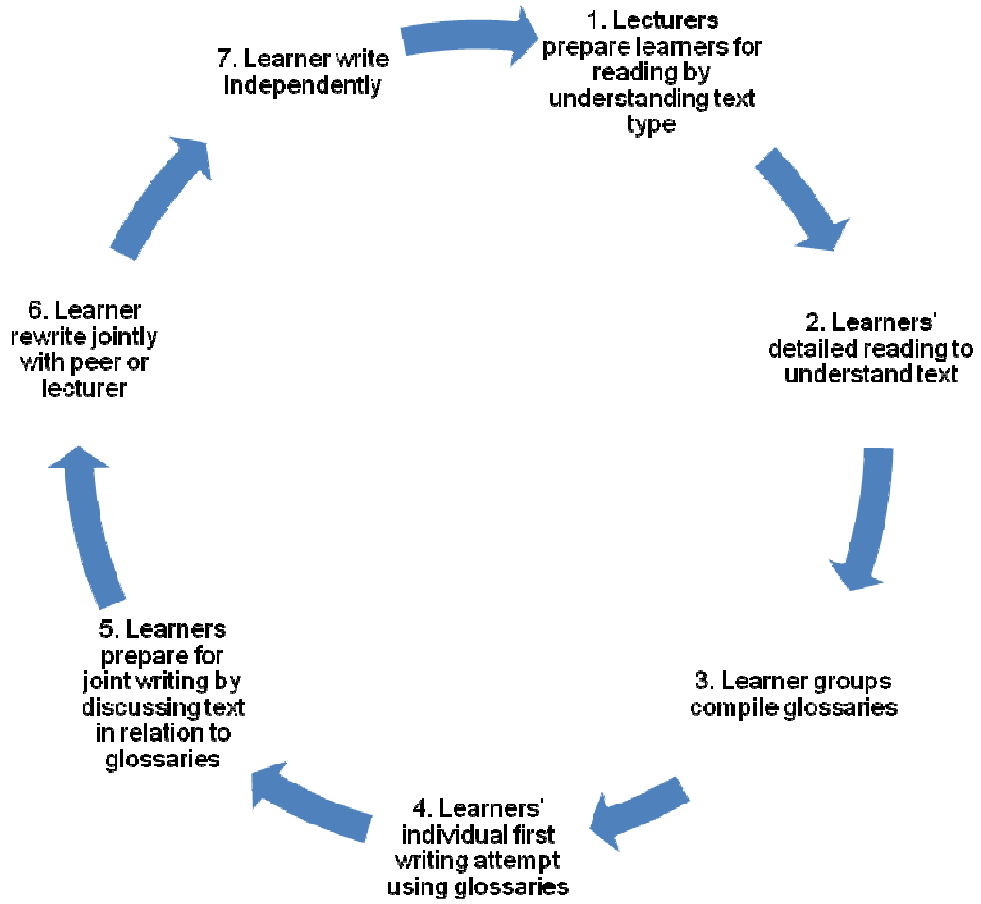


Fig. 5.2: Academic reading and writing cycle (Adapted from Rose's (2005) Learning to Read: Reading to Learn)

5.4.2 Writing as a process

Lloyd's (2007) process framework

An attempt to use Lloyd's (2007) PROCESS framework succeeded partially. Participants' attention was drawn to the referencing, organisation, spelling and structure stages of this framework, with the researcher assuming that they would be able to manage the planning,

composition and engineering stages as they used the prescribed communication textbook as a guide to complete their essays. However, it was not evident that these stages were followed in most of the learners' writing. It is therefore recommended that, together with the prescribed textbook, entry-level learners are provided with a PROCESS writing template to use as a checklist for each written assignment. This template would also include the assessment criteria. Always using such a template might ensure a consistent format of written assignments for the discipline and learners might pay more attention to all the stages of the writing process.

Prewriting activities to reduce writer anxiety

Even though a lecturer's allocation of marks for writing conventions, such as referencing and logical structure, is a strong motivator to encourage learner effort when writing, non-credit bearing (or formative) prewriting activities such as freewriting is a quick and - according to Greenhalgh (2001) and Proske and Narciss (2008) - a very effective method to develop learners' academic writing competence. This gives learners the sense that they can initially express meaning through writing in their own terms. This was Peter Elbow's intention when he initially introduced the concept of freewriting in the 1970s. According to Somerville and Creme (2005:21), freewriting involves "just writing" for a set time, on any topic, without pausing and without paying attention to spelling, punctuation or grammar. Elbow (2000:86-87) explains that freewriting takes the anxiety out of writing which makes the writing process enjoyable, liberating and empowering. Freewriting can therefore be used to reduce learners' affective filter (Krashen & Terrell, 1988).

The use of freewriting to develop learners' academic writing has been successfully used in the higher education context (Somerville & Creme, 2005; Li, 2007). Freewriting activities could be incorporated into face-to-face lecture sessions where, for example, the first five minutes of the session are used to reflect on what was learnt during previous sessions and the last five minutes used to summarise learners' understandings of what was learnt during that session. No freewriting activities were used during this study.

Learning styles

The researcher suggests that prewriting activities should be aligned with the learners' learning styles, as noted by Hyland (2003). Some learners might have a low verbal/linguistic competence (the ability to use words and language) and may therefore find even freewriting difficult. Knowing the learning styles of learners entering the radiography learning programme will be beneficial to both the lecturer and the learners. The learner participants of this study's learning styles were not tested.

5.4.3 Establish lecturer-mentor collaborations

The participants of this study emphasised the importance of assistance from both their lecturers and their mentors in the academic writing process. The participants felt comfortable to go to their peer mentors “when they knew nothing” (L3/FGD2/2010). The mentor would then assist the mentee, either by explaining the task in their mother tongue (if the mentor could speak the mentee’s home language) or by providing an example (a copy of their own written work from the previous year) of what the mentor thought was expected.

According to Bloxham and West (2007), assisting learners to write is a key element of raising their achievement in learning. It is therefore suggested that senior learners (as mentors) assist entry-level learners to succeed in the academic community. However, mentors cannot do this on their own and therefore need to collaborate with lecturers. This is supported by Bloxham and West (2007) who acknowledge writing as a complex task that is not easily guided by simple mentor instruction and advice. They (2007) describe the academic writing process as one which involves the learning of tacit knowledge, acquiring new social practices and forms of expression, and negotiating the meaning and demands of the written task. In this process, initially, both the lecturer and the mentor need to be involved. Currently at the research site there is no collaboration between lecturers and peer mentors. It is therefore recommended that a lecturer-mentor relationship be established. Lecturers would need to meet with mentors to discuss written tasks given to first year learners. Ideally such a meeting should precede all written tasks, but due to time and clinical placement constraints, a general academic writing rubric (for example, the PROCESS template proposed in 5.4.2) could be discussed with mentors at the beginning of the academic year and then, knowing the expectations of the task, mentors could use this to guide entry-level learners in their writing. Such a capacity building initiative might equip peer-mentors with the academic competence needed in future levels of study, due to practice and an improved understanding of academic writing principles. This empowerment of mentors will relieve both content and academic literacy lecturers to attend to those learners who need additional guidance and support.

While both the mentors and mentees will benefit from such collaboration (Treston, 1999; Bloxham & West, 2007; Colvin & Ashman, 2010), the support from mentors is of particular importance for those learners who are least able to adjust to the academic demands of higher education because these learners need more support than what the current programme allows. Other benefits of such collaboration, as reported by Colvin and Ashman (2010), are that learners perform better academically and that the mentees are more likely to stay on their chosen programme due to a network of effective support systems that cater for their academic needs.

5.4.4 Incorporate other forms of technology

SAQA (2005:9) requires that critical cross-field outcomes be included in the curriculum, stating that learners should "...be able to use science and technology effectively" in the discipline of study. Therefore, learners need to be exposed to technology and achieve a level of competence during their undergraduate training. In her article on computer-assisted learning in undergraduate medical education, Greenhalgh (2001:44) states that "… any other option, including staying as we are, may ultimately prove unaffordable".

It is recommended that the use of web-supplemented initiatives, which suit the educational needs of the radiography learning programme and the information technology capabilities of the UoT's satellite campus, be explored. However, evidence of teaching and learning strategies and assessment tasks need to be kept by the training institutions for up to five years. The option of using open ware sources and free external e-mail and Internet accounts for teaching and learning strategies and assessment purposes should therefore be used with caution due to archiving and retrieval difficulties. This could be overcome by filing hard copies in a paper-based portfolio. Instead of this, though the researcher would suggest the use of the UoT's e-Learner Management System. Using university-supported technologies will involve no additional cost to the learner or the institution and offer the advantage that learners' academic progress can be tracked. In future, this will enable academic lecturers of the radiography learning programme to offer a flexible menu of both face-to-face and instructional technologies from which individual learners can select options to meet their unique requirements.

The possibility of incorporating other available forms of technology into the radiography learning programme (or any other programme) depends on the availability of training for both academic staff and learners (Greenhalgh, 2001). The support and buy-in from faculty management are therefore needed when such initiatives are considered due to the expenses involved in training and when incorporating computer-assisted instructional technology into existing teaching and learning strategies.

The technology-driven nature and technological advances in the radiography profession (Engel-Hills, 2005) are strong motivators to follow such technological lead. As noted by Jaffer et al. (2007), the educational needs and capabilities of, in this case, the University of Technology should drive the design and use of needed technology-assisted environments. Otherwise, if not thought through and planned carefully, using technology could be an "expensive disaster" (Greenhalgh, 2001:40).

5.5 Areas for further development

"New answers lead to new questions" (Turpin, 1991:163).

Areas suggested for further development fall within the three intersecting circles of the Venn diagram (Figure 5.1): collaborative lecturer guidance, peer mentoring and technology. It is also worth exploring new methods to extend the radiography curriculum by integrating academic writing enhancement in the existing and future curricula.

5.5.1 Collaborative lecturer guidance

The practicality of collaborative teaching between health science content lecturers and academic literacy lecturers is an area worth developing as both areas involve academic writing. Content and language integration literature focuses on social sciences (Leibowitz et al., 2011; Lillis & Turner, 2001), applied science (Marshall et al., 2011) and engineering (Jacobs, 2005). The findings of this and previous research conducted at the research site (Wright, 2008; Wyrley-Birch, 2008) suggest that there is a need and opportunity for health science lecturers, communication lecturers and health care professionals to work together. Wright (2008) suggests the inclusion of qualified radiographers in collaborative efforts, such as joint projects contributing to the radiography knowledge base with continuous educational units (CEUs) as incentive to qualified staff.

According to Leibowitz et al. (2011), specific areas for content and language collaboration would include:

- Epistemic collaborations – where the academic literacy and content lecturers have a common understanding of what knowledge is and how knowledge is constructed. This common understanding is an important starting point for epistemic collaborations, because knowledge can easily be disguised, distorted, suppressed and taken for granted.
- Managerial collaborations – where the influence of administrative support and the support from academic heads of departments are investigated as well as their contributions to successful collaborations. Content and academic writing collaboration can either be embedded in the learning programme or provided by a service department. Collaborative support embedded in the learning programme provides the context which makes successful collaboration possible.

Research in these areas would add to the knowledge base of ICLHE (the integration of content and language in higher education).

5.5.2 Peer mentoring

From the findings of this study, the researcher identified a need for further research into the existing peer mentoring programme at the research site. A specific area for further investigation is the influence of this programme on the academic writing of the mentees.

Findings of this study have indicated that using technology motivates learners to write. This is supported by previous research: Treston (1999), for example, highlights the valuable contribution of mentor programmes to assist first year learners with the acquisition of technological skills such as using e-mail and accessing web-based study material. It is therefore worth exploring the perceptions of peer-mentors about the effect of technology on their own academic writing competence when assisting entry-level learners with academic writing activities.

According to Treston (1999), technology-based communication practices of a mentor-mentee relationship is also worth investigating in order to understand and enhance both technological and written competencies.

5.5.3 Technology

As discussed, the researcher used e-mails complemented by face-to-face technology-assisted teaching because of the availability of this technology at the research site and participants' finding that these methods facilitated communication. Investigating the efficacy of other forms of technology, such as an e-learner management system to enhance the academic writing of learners at a satellite campus of a UoT, would therefore make a useful contribution to the existing body of knowledge on instructional and educational technologies.

An extension of this research would be to investigate the influences of technology on academic writing at post graduate level and, subsequently, professional writing in a clinical radiography department.

5.5.4 Curriculum development

The study findings highlighted the need for a coordinated approach to the academic development of radiography learners. Wyrley-Birch (2008) emphasises that the work integrated learning (WIL) approach of the radiography programme accommodates multidisciplinary academic and clinical teams. The researcher therefore envisages that an integrated content and language (ICL) curriculum that combines academic literacy with the existing and future curricula is feasible for the radiography learning programme.

5.6 Contribution of this research

5.6.1 Developing an academic writing model

This research has contributed to the development of a model which highlights an optimal zone for the enhancement of academic writing competence. This model represents the researcher's understanding of the influence of several aspects on learners' attempts to write successfully, especially during their first year of tertiary study. In this model (see Figure 5.1), three focus areas are identified as having an influence on this zone: collaborative lecturer guidance, peer mentoring and technology. These focus areas are situated in a multi-level theoretical context.

5.6.2 Enhancing teaching and learning practices at the research site

One of the beneficial effects of this research was the creation of a platform for first year learners to discuss their understanding of, achievements in and concerns about academic writing, such as referencing and plagiarism, which were new to them but were also crucial to their academic success. The focus group discussions used in this study allowed for an open dialogue and sharing of practical approaches to essay writing. The involvement of first year lecturers, in this study has also led to a raised awareness of learner writing among them.

Collaboration with an academic literacy expert has been established, which will allow for the sustained teaching of academic literacy (and writing in particular) throughout the first year of study. Such a partnership will allow for scaffolded academic literacy teaching in the other levels of study.

This study also enabled the introduction of the sustained use of technology – as part of formal instruction and communication – in the Radiation Science I subject. Depending on infrastructural and information technology support, the researcher envisages more technology-based development in the future, cascading into other levels of study and subject areas such as Anatomy and Physiology.

In their contribution to the existing body of knowledge on using technological interventions to improve learner writing, the research findings could be perceived as minimal. However, the enhanced awareness of academic writing in the existing radiography curriculum will assist the division's lecturers to develop support systems for entering learners as part of the recurriculation process for a professional radiography degree. This enhanced awareness would include a focus on the following: increased sensitivity to the new type of learner entering the programme; educators adjusting to the educational, literacy and technological needs of these learners without losing focus on the technical and professional needs of the

profession; and a raised awareness of the enabling and constraining factors influencing entry-level radiography learners' success.

This research has also contributed to curriculum development by keeping lecturers focussed on what is needed to achieve academic success; that it is not merely academic knowledge and competent radiographic practice (which seems to be the current situation), but for the development of competence for the future growth of the profession through radiographers researching their own practice and disseminating the findings through appropriate written publications.

The research questions of this inquiry were addressed by first year learners as they identified those factors that enabled and constrained them from meeting the academic writing requirements of the radiography curriculum. Lecturers' perceptions (and also awareness) of learner writing were communicated in their evaluation of learner writing at first year level.

This study demonstrated the need for further research on academic literacy in radiography education.

5.7 Personal reflection

The researcher found the research process difficult and frustrating at times. The focus of this study was a topic that is not traditionally seen as being part of radiography; but, from the findings of this study, it is extremely important to the academic success of the learners who study to become radiographers, as well as to the growth of the profession itself. During the course of the study (and especially writing up the study), an improvement in the researcher's own writing was noted. Initially the words of the participants, "I can't write, writing is difficult" echoed in the researcher's head; but as the thesis writing progressed, other words of participants, such as "The more essays I wrote, the better it [essay writing] got", came to mind.

Like research, academic writing is a process, a journey, and, from personal experience, should be travelled one day at a time. As Vygotsky's (1978) zone of proximal development suggests, the researcher moved along stages of a writer's continuum – starting out fearing to write an English word; going on to enrol for tertiary level studies with English as MOI; then teaching through the medium of English at higher education level; thereafter, researching and writing about academic writing competence of learners at entry level. Moving along this continuum brought about an understanding of the development of the learners' and the researcher's own writing practices. In this development, the researcher came to the important realisation of the need to make explicit to the learners what is obvious to oneself

about academic writing. In the words of Graham Badley (2009:217): “This text [thesis] contains a number of ideas I have de-constructed and dis-connected from other texts and then used to make my own connections and re-connections”.

In summary, even when educators in higher education are struggling to improve their own academic writing, they need to assist entry-level learners to approach writing as a creative craft and encourage them to present their work as competently as they possibly can.

5.8 Conclusion

The problem that this study aimed to address was the misalignment of the radiography curriculum expectations of academic writing and entry-level learners’ academic writing competence at entry-level in higher education. As mentioned in section 1.3.5, learners in the radiography learning programme are expected to express their knowledge of course content through writing and, as this is assessed, their writing competence affects their chances of success. However, as indicated by the findings of this study and other literature (Makoni, 2000; Lillis & Turner, 2001; Carlisle, 2009), many learners entering higher education institutions for the first time are underprepared for these academic demands and need support to succeed. This study therefore attempted to understand this ‘unpreparedness’ that transpires in learners’ writing in order to devise and implement an appropriate intervention employing support structures that would not only ‘fix the problem’, but set in place sustainable writing practices by both lecturers and learners.

Prior to the study, the participants did not realise that their academic writing competence did not meet the requirements of academic writing at higher education level. They knew that the expectations and demands of higher education were different to those at secondary school level, but they did not know how to overcome this “educational dispensation” (Frick, 2008). This study therefore started an emancipatory process by initiating a change in first year learners’ understanding of academic writing practices such as referencing and process writing at higher education level.

Further transformation and empowerment may be achieved in future at entry-level, as well as over the further levels of study in the radiography curriculum, because the findings of this study indicate that enabling conditions in the learning environment, such as the availability of resources, peer mentoring, as well as collaboration between subject-content and academic literacy lecturers are possible to establish in order to enhance academic writing in radiography education.

In conclusion, academic writing is a challenge. There is no simple method to improve this complex, cognitively demanding activity. Sustained, ongoing practice and effort are needed on the part of academic literacy and content lecturers working as a team. There is also a need for personal effort and a positive attitude on the part of the learner. The findings of this study indicate that, together, these influences have the potential to become a winning combination.

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APPENDICES

Appendix A: Reflection sheet

Student number:

Data collection sheet no.: **DATE:**

PERSONAL REFLECTION: Please complete this sheet to the best of your ability.

NR	**Brief description of computer-based activity**	
		What have you learnt by doing this activity? How did this activity assist you to improve your writing competence? If this activity did not assist you to improve your writing competence, why not? Please list any personal writing needs: Comments: Suggestions:

Appendix B: Umalusi National Senior Certificate (NSC) Scale of Achievement

Umalusi uses the following seven-level scale of achievement to record a candidate's performance for subjects

Rating code	Description of competence	(%)
7	Outstanding	80 – 100
6	Meritorious	70 – 79
5	Substantial	60 – 69
4	Adequate	50 – 59
3	Moderate	40 – 49
2	Elementary	30 – 39
1	Not Achieved	0 – 29

(Umalusi, 2008:20)

Appendix C: Discussion guide used for 2009 focus group discussion

Discussion schedule

Explain format of discussion to participants. Remind participants about voice recorder and stress that confidentiality is ensured.

1. What are your perceptions of academic writing?

2. From these perceptions, what are the factors that enabled the development of your academic writing competence?

3. From these perceptions, what are the factors that constrained the development of your academic writing competence?

Then, use themes from this focus group discussion and ask participants about their views on those themes during individual interviews.

Appendix D: Individual, semi-structured interview questions

Good day,
Please read through these questions and answer them as honestly as possible. Your response will be recorded. The information provided will not be made publicly available without your written consent. Please refer to the consent form that you have signed or ask the researcher (Mrs Hudson) should you be unsure about anything.

Thank you for your time and participation.

What helped you to write your first essay?

What prevented you from getting started and/or writing your first essay?

How did the multiple draft submissions help you with your writing?

How do you feel about academic writing? Why?

Is there anything specific that you like about academic writing? What? Why?

Is there anything that you do not like about academic writing? What? Why?

Why do you think academic writing is important in Radiography education?

How do you feel about using emails (between you and your lecturer and you and your classmates) to assist you with your academic writing?

Why do you need to reference sources of information in your work?

Appendix E: Initial academic writing activity: Radiation protection essay

RADIATION SCIENCE I (RSCI 10)

ASSIGNMENT 1

DRAFT HAND IN DATE: 22 February 2010

TOPIC: Information literacy & Radiation Protection

TASK: Write a five (5) page essay on how to protect yourself, as a radiation worker and your patient from ionising radiation in all disciplines of Radiography. Label this section A.

SECTION B:
Compile a glossary of all the terms that were unknown to you before you started with this essay, e.g. radiation, ionising radiation, radiation protection, etc.

Your essay should be:
Typed using 1 $\frac{1}{2}$ line spacing, 14 font size for all headings and 12 font size for text.

1. Use the Harvard method for in- and end-of-text referencing.
2. Use the PROCESS approach for assignment writing (show all stages on a separate page).
3. Essay layout:
    a. Cover page
    b. Contents page
    c. Introduction
    d. Body with appropriate sub-headings
    e. Overall discussion
    f. Conclusion
    g. Appendices – if any these must be referred to in-text
    h. List of references (Harvard method for in- and end-of-text referencing)

TASK CHECKLIST:

Presentation: (Neatness, structure, cover page, index etc).	
Glossary (accurate)	
Content (correct level, accuracy)	
Language (Clear, understandable, own words – no plagiarism)	
Followed assessment criteria	
Insight (own work, relevance, understanding shown)	
Referencing (correct method used, consistent, accurate)	

GOOD LUCK!!
Examiner: Ms Hudson

Appendix F: First referencing worksheet

RADIOGRAPHY EDUCATION
RADIATION SCIENCE I

REFERENCING

1. **Define the following terms:**

   In text referencing:

   Reference list:

   Bibliography:

   Plagiarism:

   Harvard method of referencing (give an example):

2. **List two other forms of referencing and give an example of each:**

3. **Give an example of**
   a direct quote within a text

   an indirect referral within a text:

4. **What information is needed to compile a reference list?**

Appendix G: Second referencing worksheet

Plagiarism and referencing task sheet[14]

Please answer the following questions about referencing:

1. If you find information in a textbook/ other source and paraphrase it (put it in your own words), do you still have to reference the information? (Yes / No)
2. If you quote from a source, do you have to reference the quotation? (Yes / No)
3. If you are writing an essay, should your essay be a sum of several quotes? (Yes / No)
4. What is the function of a quotation?
5. Give an example of a quotation.

Finding information for list of references:

1. With a partner, find a radiography journal, a radiography textbook and an article/information from the internet.
2. Scan each source to complete the three tables:

Textbook:

Author's surname	Initials	Title of book	Edition	City (just one)	Publisher's name	Year published

Journal:

Author's surname	Initials	Title of article	Title of journal	Year published	Volume, issue and page no's

Internet source:

Author's surname	Initials	Title of article	Date posted/ updated	Date accessed/ downloaded	URL/website

Then:
Write the reference entry for the three sources under the heading 'References'.

[14] Adapted with permission from J. Wright (colleague)

Appendix H: Example of a participant's completed reflection sheet

Student number: *replaced by participant code on raw data*

Data collection sheet no.: **DATE: 31/03/2010**

PERSONAL REFLECTION: Please complete this sheet to the best of your ability.

NR	Brief description of writing event	
		What did you like about this event? While I was doing this investigation I learnt that high school writing is not the same as tertiary writing. For example when we wrote something we were told to write only the bibliography at the end of the assignment, so I didn't know anything about references. But today I know the difference between the two. That helped because those were thought even before we were given assignments. **What did you not like about this event?** I did not like the fact that we were told to do a research on something we knew nothing about. For me it was bit difficult to write about a topic which I don't have an idea about. **How did this event assist you to improve your writing competence?** I knew what the lecturer expected when I submit their assignment, in terms of references, bibliographies, methods of referencing and essay writing structure. **If this event did not assist you to improve your writing competence, why not?** *Not answered* **What was it about the previous writing activities that assisted you with your academic writing?** *Not answered* **At this stage, what help do you need to assist with your academic writing progress?** For now I am satisfied. **Comments:** *No comments provided* **Suggestions:** I think we as students should be given a brief explanation of a topic before we can go research about it, in that way we can reduce plagiarism.

Appendix I: Collation of learners' responses during individual interviews

Opening question: "What helped you to write your first essay?"

II1/04/2010: "The second year student who briefed me to understand what is expected".

II2/04/2010: "The basics which we [students in class] were taught during the introduction to radiation sciences and radiography".

II3/04/21010: "Communications for Health Sciences [textbook]".

II4/04/2010: "Radiation Protection power points and the help from my mentors – where I should go, what I should do".

II5/04/2010: "The guideline[s] that were given in class".

II6/04/2010: "The ideas that I got from the lecture and from my mentor".

II7/04/2010: "Feedback I got … as well as my mentor, and people from Fundani [academic literacy assistance] played a big role; how to gather information and how to apply it".

II8/04/2010: "Instructions were given clearly by the lecturer".

II9/04/2010: "There is the fact that we got given proper guidelines … what was needed in the essays … and also we got lectures beforehand on how to write essays and how to approach essays".

Appendix J: Lecturer comment sheet

Lecturer comment sheet (L/Aug 2010)

Dear First Year Radiography Lecturer 06 August 2010

I am doing a research study where I look at the perceptions of first year Radiography students about their academic writing practices. These perceptions could assist content lecturers to scaffold academic writing throughout the Radiography curriculum.

Students were given two academic writing tasks (in the form of two academic essays). The first essay was submitted before any intervention. The second essay was submitted after a blended teaching approach was used to introduce subject content and essay structure to all participants. This blended approach consisted of electronic and face to face teaching methods.

Would you please comment on the six academic essays provided? There are three students, each with two essays. Your comments could provide insight into how first year Radiography lecturers perceive first year students' academic writing.

Your responses will be coded and the information provided by you will be treated as confidential.

Would you please:

1. Read both essays
2. Use the assessment criteria provided to assess both essays.

MARK ALLOCATION:

Student 1	**Essay 1**	**Essay 2**	**Student 2**	**Essay 1**	**Essay 2**	**Student 3**	**Essay 1**	**Essay 2**
Language /10			Language /10			Language /10		
Style and Tone /10			Style and Tone /10			Style and Tone /10		
Structure & logical organisation /5			Structure & logical organisation /5			Structure & logical organisation /5		
Referencing /15			Referencing /15			Referencing /15		

3. FURTHER COMMENTS:
    a. Your general impression of the learners' academic writing ability.
    b. Your comments on the assessment criteria used.
    c. Specific differences between the first and second essay.

4. ANY OTHER COMMENTS:

Thank you for your time and assistance.

Please send your comments to the researcher by Friday, 27 August 2010. Your reply will indicate your consent to participate in this research.

ASSESSMENT CRITERIA USED FOR ACADEMIC ESSAYS
(Used by all lecturers in the radiography learning programme at the research site)

1. Language

The presentation must be clear and understandable. The table below shows the range of marks you can expect for language use.

Mark awarded	Language (grammar, punctuation, spelling, vocabulary)
75 – 100%	Clearly expressed; very few errors, exceptional vocabulary.
70 – 74%	Mostly clearly expressed, a few grammar and spelling errors
60 – 69%	Fairly clearly expressed; good use of grammatical structures and vocabulary. Spelling and vocabulary could be improved.
50 – 59%	Understandable; acceptable grammar and spelling
40 – 40%	Difficult to understand, restricted use of grammar and vocabulary; weak grammar and spelling
0 – 39%	Not understandable; very weak grammar and spelling

2. Structure and Logical organisation

Your presentation needs to be organised in a logical way. There needs to be a clear introduction, a main body and a conclusion. Within the main body of your presentation you should express the points you want to make. You should also link important ideas to one another. This is called structuring your work. The table below shows what marks you can expect for structuring your work.

Mark awarded	Structure and logical organisation
75 – 100%	Clearly set out, well planned, logical. Links clear, coherent. Key ideas supported, developed. Well-integrated introduction and conclusion.
70 – 74%	Very good. Logically, systematically organised with minor faults, links mostly clear, almost totally coherent. With few exceptions, all key ideas supported and developed. Introduction and conclusion functional.
60 – 69%	Fairly clear and logical, a few problem areas, but meaning evident. Most key ideas supported and developed, although not always fully. Some incoherence. Introduction and conclusion acceptable but need to be fully integrated.
50 – 59%	Acceptable, some planning, some logical structure. Despite shortcomings, one can still follow. Some incoherence. Key ideas somewhat supported. Introduction and conclusion still acceptable but not quite well integrated.
40 – 49%	Difficult to understand. Not acceptable. Organisation needs much attention. Links infrequent and not always meaningful. Frequent incoherence. Key ideas usually not supported. Introduction and conclusion unacceptable and/or missing
0 – 39%	Poorly planned, illogical. Totally unacceptable, Impossible to follow most of the time. Almost no links. Key ideas not developed. Introduction and conclusion unacceptable and/or missing.

3. Style and tone

This refers to the appropriateness of language and tone of your presentation. Make sure that you write and present with an academic tone. Use the terms of your discipline correctly and avoid slang. The table below shows the mark range you can expect for your style and tone.

Marks awarded	Style and Tone
75 – 100%	Distinctive, sparkling sophisticated resourceful
70 – 74%	Pleasant to read and listen to, use of language entirely appropriate to content. Pleasingly fluent.
60 – 69%	Fluent; style and tone support meaning; but not particularly interesting.
50 –59%	Conveys message with some difficulty, tone sometimes inappropriate/irritating, jerky tone, slight limitations in style and mastery of idiom.
40 – 49%	Tone inappropriate. Clumsy or careless, register inappropriate, meaning clouded, stylistically poor, hazy, woolly, wordy.
0 – 30%	Totally inappropriate register, dull, boring

4. Referencing

You must always reference the source of your information.

Marks awarded	Referencing
80-100%	Referencing consistently and correctly done
60-79%	Errors/inconsistencies only minor
50-59%	A few obtrusive errors/inconsistencies in references
31-49%	More incorrect or missing than correct; text reference missing
0-30%	Referencing required but not provided/adequate. Referencing incorrect/inconsistent

Appendix K: Learner participant consent form

Participant consent form for Master of Technology (Radiography) research project.

Title: The use of technology to enhance academic writing in Radiography.

Overall aim: To improve first year Radiography learners' academic writing competence through a technology-based intervention.

Purpose and Benefits: The researcher aims to encourage first year Radiography learners to improve their academic writing competence in the discipline through technology-based academic writing activities in Radiation Science I.

Your contribution by participating in this research should provide new insights into the factors that enable and constrain the academic writing process. The use of technology-based learning will synchronise well with the technological advancements of the Radiography profession.

Researcher: Lizel Hudson

	Initial
I hereby agree to participate in this research.	……
This agreement is of my own free will.	……
The researcher will review my matriculation results for selection purposes.	……
I may withdraw from the study at any time, without any effect on my education.	……
I will be called for an interview and the conversation will be recorded.	……
The researcher may require doing a follow up interview where all the participants could be asked to participate to clarify points.	……
All personal information provided by myself will remain confidential and no information that identifies me will be made publicly available.	……
I have a copy of this consent agreement.	……

Participant: …… Position: ……..

Signature: …… Date: ……

L. Hudson Position: Principal Researcher

Signature: …… Date: ……..

Witness: ……... Position: ……

Signature: …… Date: ……

Appendix L – Second academic writing activity: Imaging essay

RADIOGRAPHY EDUCATION
RADIATION SCIENCE I (RSCI 10)

ASSIGNMENT 2

DRAFT HAND IN DATES: 28 April 2010 and 10 May 2010

FINAL HAND IN DATE: 19 May 2010 (part of 15% weighting towards final mark)

TOPIC: Imaging

TASK:

1. Choose a general, conventional radiograph (excluding Thoromat and digital radiographs) with a(n) artefact(s) (not technique related) from any reject analysis bin in the clinical department. Hand this radiograph in on the draft hand in date of this task. Your name and student number should be on this radiograph. For confidentiality reasons, **please remove the patient's name**.

2. Write a three (3) page (excluding cover, contents page, appendices and reference list) essay on the **process of latent image formation**. Include the **process where x-ray photons are converted to light photons**. Hand drawn diagrams of both processes must be included as appendices. Use the imaging reading list provided to look for appropriate resources.

    a. Your essay should be typed, 1½ line spacing, 12 font size
    b. Use Harvard method for referencing
    c. Apply the writing principles learnt in the previous assignment

Mark allocation:

Presentation: (Neatness, structure, cover page, index etc).	
Content (correct level, accuracy)	10
Language (Clear, understandable, own words – no plagiarism)	10
Referencing (correct method used, consistent, accurate)	10
TOTAL (this section)	**30**

3. Your chosen radiograph will be used during an **imaging film analysis on 19 May 2010**.

GOOD LUCK!!

Examiner: Ms Hudson

Appendix M: Interview roster

Individual interview schedule – April 2010

Venue: Mrs Hudson's office

Duration: 15 min max

Dear Participant

I need to start with the interviews for my research. The interviews will be recorded during these sessions.

The available times are:

Participant Code	Date	Time
II1/04/2010	14 April	13:30
II2/04/2010	14 April	13:45
II3/04/2010	15 April	08:15
II4/04/2010	14 April	15:15
II5/04/2010	14 April	08:00
II6/04/2010	14 April	08:15
II7/04/2010	15 April	08:00
II8/04/2010	14 April	15:30
II9/04/2010	14 April	15:45

Thank you for your participation.

Regards,
Mrs Hudson