A LEARNING FACILITATION FRAMEWORK TO ENHANCE ACADEMIC SKILLS DEVELOPMENT AMONG UNDERPREPARED LEARNERS IN SOUTH AFRICAN HIGHER EDUCATION

by

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Thesis submitted in fulfilment of the requirements for the degree
Philosophiae Doctor in Higher Education Studies
(Ph.D. Higher Education Studies)

in the

CENTRE FOR HIGHER EDUCATION STUDIES AND DEVELOPMENT
FACULTY OF THE HUMANITIES
UNIVERSITY OF THE FREE STATE
BLOEMFONTEIN

MAY 2007

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DECLARATION

I declare that the thesis hereby submitted by me for the Philosophiae Doctor degree in Higher Education Studies at the University of the Free State is my own independent work and has not previously been submitted by me at another university/faculty. I further more cede copyright of the thesis in favour of the University of the Free State.

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S.M. Brüssow **Date**

To Maryn, Heinrich and Emé

I tried to teach you all about life, but you taught me what life is all about. You inspired in me two sentiments; affection for what you are, and admiration for what you became

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to the following:

- My promoter, Prof. Dr A.C. Wilkinson, Division Head, Centre for Higher Education Studies and Development, Faculty of Humanities, University of the Free State, for her unending encouragement guidance, support and advice during the study.

- My co-promoter leader, Prof. Dr M.M. Nel, Head of the Division of Health Sciences Education, Faculty of Health Sciences, University of the Free State, for her valuable feedback and recommendation during the study.

- The National Research Foundation for financial assistance.

- Sonja Liebenberg for her endless editing of the thesis.

- The students and respondents who participated in the study and without whom this investigation would not have been possible.

- Maryn for her support during the analysis of the data.

- Marcel for supporting me in completing this work. I owe more appreciation than I could ever express.

- My parents for their prayers and encouragement and whose belief in my abilities never faltered. I can express only admiration for your tenacity and gratitude for all you have done.

- Soli Gloria Deo.

Saretha Brüssow Bloemfontein

June 2007

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LIST OF ACRONYMS

AAHE	American Association of Higher Education
ALACT	Action, looking, awareness, creating and trial
ALARPM	Action learning, action research and process management
APBC	Academic Planning and Budgeting Committee
AR	Action research
ASGISA	Accelerated and Shared Growth Initiative
CHE	Council on Higher Education
CIQ	Critical incidence questionnaire
CM	Concept mapping
CPD	Continuing Professional Development
CTM	Committee for Tutorial Matters
CTP	Committee of Technikon Principals
CUT	Central University of Technology, Free State
DIT	Durban Institute of Technology
DoE	Department of Education
EL	Engaged learning
EPWP	Expanded Public Works Programme
ERIC	Educational Resource Information Centre
FSPG	Free State Provincial Government
GCIS	Government Communication and Information System
HEI	Higher education institution
HEIs	Higher education institutions
HELTASA	Learning and Teaching Association of Southern Africa
HEQC	Higher Education Quality Committee
HERDSA	Higher Education Research and Development Society of Australasia
IRIN	Integrated Regional Information Networks
ITL	Improving teaching and learning
JIPSA	Joint Initiative for Priority Skills Acquisition
LPI	Learning Preference Inventory
ML	Meaningful learning
MoE	Ministry of Education

MUSTER	Multi-Site Teacher Education Research Project
NAEP	National Assessment of Educational Progress
NPHE	National Plan for Higher Education
NQF	National Qualifications Framework
NRF	National Research Foundation
NSSE	National Survey of Student Engagement
OBE	Outcomes-based Education
OBET	Outcomes-based education and training
ODR	Office of District Research
OoP	Office of the Premier
PALS	Personal Academic Learning Systems
PBL	Problem-based learning
QA	Quality assurance
QIC	Critical Incidence Questionnaire
RAB	Radiographic Management
RAD	Radiographic Practice
RAU	Rand Afrikaans University
RSA	Republic of South Africa.
SAAHE	South African Association of Health Educationalists
SAARDHE	South African Association for Research and Development in Higher Education
SAHRC	South African Human Rights Council
SAQA	South African Qualifications Authority
SAUVCA	South African Universities' Vice-Chancellors' Association
TAP	Teaching Assessment Poll
TIMSS	Third International Mathematics and Science Study
TLESs	Teaching and Learning Enhancement Strategies
TSTC	Texas State Technical College West Texas
UFS	University of the Free State
UNISA	University of South Africa
USA	United States of America
WITS	University of the Witwatersrand

ORIENTATION TO THE STUDY

> *Today, more than ever before in human history, the wealth – or poverty – of nations depends on the quality of higher education. Those with a larger repertoire of skills and a greater capacity for learning can look forward to lifetimes of unprecedented economic fulfilment. But in the coming decades the poorly educated face little better than the dreary prospects of lives of quiet desperation*
>
> (Gillis 2000:18).

1. INTRODUCTION

The study is a three-year research project supported by a grant from the National Research Foundation (NRF) in the area Education and Challenges for Change for the period 2005 to 2007 as part of the Thuthuka (Researcher in Training) project. The project will map shared opinions on the phenomenon of underpreparedness as well as the concomitant influences affecting student learning and persistence at higher education institutions (HEIs). The study will explore the perspectives of higher education educators[1] and practitioners[2] on the factors associated with academic failure and achievement of students who are underprepared for higher education. It aims to promote better teaching and learning that is directed at increasing access for *all* students[3] not just with a view to enrolment, but also to reap the benefits of degree completion. In short, the study seeks to develop theoretical insight and practice on effective teaching and learning.

[1] The teacher or facilitator who deals with students in higher education to advance learning.
[2] The educational developer and specialist in teaching and learning in higher education.
[3] "Student" and "learner" are used interchangeably.

This thesis is presented in the format of five related articles. The five articles have been organised in terms of the key themes identified and explored during the research on issues pertaining to the academic skills development of underprepared learners in South African higher education. The academic skill focused on in this study is the ability to learn effectively. To comply with the requirements that all articles form an integral and fundamental part of the whole thesis, these five articles focus on teaching and learning experiences and perspectives. The research-based findings of each of the articles point towards efforts to improve teaching practices and the creating of educational environments that encourage learning. Since the thesis is judged as a coherent whole, the articles successively focus on researching:

- A generative learning strategy (Article 1).
- Reflective teaching (Article 2).
- Underpreparedness for higher education (Article 3).
- Engaged learning (Article 4).
- A learning facilitation framework (Article 5).

Each article is organised in the same format, namely:

1. The theme under consideration is introduced and perspectives from relevant higher education literature and recent research are discussed.
2. The purpose, applied methods and methodologies underlying the particular research problem and question are outlined.
3. The results are summarised, discussed and presented.
4. The focus of the different articles as part of the thesis as a whole is put forward.

This orientation to the study presents the arrangement of the thesis and also reviews the background to the study. The impetus to advance the academic skills development of underprepared learners came from the researcher's involvement in undergraduate teaching at the Central

University of Technology, Free State (CUT), in the learning programme radiography. The objectives that initiated this research were concerned with how to teach; how best to motivate students to learn; and the need to equip learners with academic skills to scaffold the learner at risk of failing. In addition, it was evident that poor throughput rates and retention in higher education were also a matter of concern experienced on national level.

The negative impact of past historical factors, equity and redress, the widened access to higher education, the success rates and academic skills development in academically underprepared learners received wide attention in the background to the study. An understanding of the background to the study is important in assessing its outcome. The Parliamentary briefings and statements of the Minister of Education and education statistics with regard to academic success in South African higher education described in this orientation will lead the reader to understand the purpose and necessity of the research.

2. BACKGROUND TO THE STUDY

The Minister of Education, Naledi Pandor, stated: “Though our education history spans some four hundred years, our education system today bears most visibly the dread design of apartheid education” (RSA MoE 2005a:1 of 1[4]). The minister further expanded on the negative impact of “Bantu Education” which, according to her, was a system that was intended to prepare black learners for work in the lower levels of the economy and to force them to believe in and accept a lack of ability and failure. The consequences of this for South Africa, according to the Minister, were that educators believed that they could not improve the system. Administrators, on the other hand, believed that making an effort would be of no value,

[4] To refer to the pages of an internet source throughout the thesis the researcher displayed the content in print preview and indicates for example the pages as 1 of 10.

while learners believed that failure was their destiny. When the apartheid era ended in 1994, 80% of the workforce in science, technology and engineering was white. As a first step towards equality, the education system, including higher education, needed to be expanded.

2.1 Widened access to higher education

Widened access to higher education has been one of the key driving forces of education reform since 1994. This course of action was intended to admit those who had been excluded from further education by decades of racial discrimination. The widened access resulted in an increased enrolment of black students, who now account for over 72% of enrolments in higher education (RSA MoE 2005b:1 of 1). The political and geographical effect of apartheid was also removed through the merger process, which brings together historically black and historically white institutions. According to Pandor, the challenge of all this is to create success. Pandor pronounced in the Beyers Naudé Memorial Lecture *Access to higher education: is it a right or a privilege?* (RSA MoE 2005b:1 of 1) that more disadvantaged learners than learners from advantaged backgrounds entered higher education during the transformation period.

2.2 Academic failure

Nearly 50% of all learners at South African HEIs failed to complete their studies in the past five years. Of 120 000 students who enrolled in 2000 for different three-year higher education qualifications, only 22% graduated, 50% dropped out and only 28% are still in the system five years later (Naidoo 2005:1 of 1). Naidoo, of the Higher Education Quality Committee (HEQC), who reflected on these statistics, expressed the need for “systematic initiatives” to deal with teaching and learning in the South African higher education system in order to address the general standard for intake and, above all, successful completion of studies. In a newspaper article Vakalisa, a professor of curriculum studies at the University of South Africa (UNISA), states that many black learners come from "a

culture of not learning", a culture that was shaped in the school system by teachers who formed part of a lack of learning environment. McKenna, the Director of the Centre of Education Development at the Durban Institute of Technology (DIT), remarked that initiatives to transform higher education teaching and learning should be pursued in response to Pandor's criticism against the quality of education in institutions of higher education (*The Mercury* 2005:1 of 1).

2.3 Academic support

As more disadvantaged, low-income students gain access to higher education, academic support initiatives play an increasingly important role to ensure that these students not only attend but also successfully complete a qualification. Institutional as well as government commitment is crucial in providing early intervention and academic support for students from disadvantaged backgrounds. The importance of such interventions is not only to ensure that these students are successful in obtaining a qualification, but also that higher education contributes to the development of skills in our country. Marshoff (FSPG OoP 2005:1 of 1) puts forward that education is the basis of all forms of progress, specially the development of skills that are essential to create job opportunities and, as a result, alleviate poverty.

2.4 Impact on society

Economic growth therefore depends on providing opportunities for all students to develop the appropriate skills needed in a global, knowledge-based economy and – since South Africa's unemployment rate is so high – these opportunities will have to increase to raise the education and eventually the income levels of South Africa's population (Benton 2006:2 of 3). The raising of education levels of all income groups in South Africa is a main goal of the government. The Deputy President, Phumzile Mlambo-Ngcuka, in briefing the media in Cape Town on Government's Accelerated and Shared Growth Initiative (ASGISA) indicated that one of the most

important problems in job creation was South Africa's skills crisis (Mlambo-Ngcuka 2006:6 of 8). She stated that the government intended to increase access to education as well as the developing of training programmes to address this lack of skills. President Thabo Mbeki (2005:8 of 20), in his *State of the Nation Address* delivered on 11 February 2005 stated that the government would "raise the skills levels of our people" and proposed that positive outcomes could result from government intervention in education.

2.4.1 *Skills gap*

The report "Projection of Future Economic and Sociopolitical Trends in South Africa up to 2025", compiled by the University of South Africa (UNISA) in Pretoria and in which 13 prominent economists participated, also reported that there was great concern over the widening skills gap in South Africa. It prophesied that unemployment would be a major barrier to overcome in the decades ahead. One of the authors of the report, van Aardt (IRIN 2006:1 of 1), said that South Africa's unemployment rate was between 30 and 40 percent and the country could not afford economic growth without job creation. Van Aardt's view is that the highly skilled worker who takes part in the knowledge economy is gaining the most from South Africa's economic growth, while the lower and unskilled worker's job opportunities are decreasing, which leads to higher levels of unemployment. In 2004, the government started a R100 billion Expanded Public Works Programme (EPWP) in an effort to create employment opportunities for unemployed semi-skilled and unskilled South Africans. The aim of the EPWP was to address the problem by creating 200 000 temporary jobs every year over a five-year period. However, analysts pointed out that it was not likely that these "short-term jobs" would improve poverty or improve the skills levels of workers (IRIN 2006:1 of 1).

The South African Deputy President had pointed out that the shortage of skills in South Africa was the major obstacle to the advancement of public infrastructure and private investments. She added that – if South Africa did

not strongly seek the development of skills that included professional skills possessed by engineers, scientists, managers, financial personnel and skilled technical employees – the positive steps taken by ASGISA would be futile. The "binding constraint" of a skills shortage in South Africa is seen as a critical priority and is receiving urgent attention through a new initiative, known as the Joint Initiative for Priority Skills Acquisition (JIPSA) which is to be established in the near future. The aim of this undertaking is to provide evidence of the urgently needed skills and to come forth with immediate and effective solutions Mlambo-Ngcuka 2006:6 of 8). Mbeki (2005:8 of 20), in his abovementioned *State of the Nation Address*, also mentioned this issue.

According to van Aardt (IRIN 2006:1 of 1), the demand for unskilled employment in mines and agriculture is declining and a greater demand exists for highly skilled people. For these reasons, increased access to higher education to address equity is a major objective of the National Plan for Higher Education (NPHE) (RSA MoE 2001:14) in South Africa.

2.5 Academic success

The envisaged increased access necessitated more flexible entry requirements to admit previously disadvantaged learners. However, these learners are inadequately prepared for higher education. According to McLean (2001:408), past political and historical factors are responsible for the fact that these learners are underprepared and, as a result, their academic development is obstructed. The South African Universities' Vice-Chancellors' Association (SAUVCA) insists that institutions consider this in teaching and learning initiatives (SAUVCA 2002:6). Therefore, the expansion of access to higher education must be broadened to embrace the idea of access to academic success.

The principle of equity and redress requires learners both to enter higher education and to succeed. Applying the principle of equity implies a critical

identification of existing inequalities and a programme of transformation with a view to redress. This includes not only abolishing discrimination, but a commitment and an initiative that will enhance academic skills development in academically underprepared students. Because low academic achievers frequently continue with little guidance or specific educational interventions to improve their performance, their learning problems are not attended to and their learning environment remains unchanged, leading to repetition of failure (Sayer, De Saintonge, Evans & Wood 2002:643). Apart from initiatives to advance increased access to higher education, the authors emphasise the need for increased educational support for learners and point out that little information is available about successful strategies for dealing with academic failure. Higher education educators and practitioners should therefore face the challenge of academic failure and stay committed to an understanding of educating the underprepared. Student retention and success should be seen as a resource to be developed and HEIs in South Africa must be prepared to meet the learning needs of academically underprepared populations.

2.6 Key solution

According to the literature discussed above, the key solution to the academic failure encountered in higher education in South Africa is to address the inability of the learners to learn independently, while education should be based on an educational strategy in which the facilitator directs the learning process and guides learners to develop academic skills through learning facilitation strategies and methods. The statement that learners from diverse and academically deprived backgrounds require more support and encouragement in taking advantage of active learning and facilitator support (Holsgrove, Lanphear & Ledingham 1999:99) is a fact also noted by the Committee for Tutorial Matters (CTM) (2001:15): "Learners might initially require more support and consultation opportunities before they master self-directed learning''.

For optimal progress, it is thus vital that learning facilitation be conducted with precision and sensitivity to accommodate individual differences and needs to guide learners who are underprepared for higher education.

Numerous articles have appeared in higher education journals exploring empirical and practical issues regarding educational approaches that contribute to academic success. Since outcomes-based education and training (OBET) encourages various learner-centred teaching and learning strategies which lead to self-directed learning and, ultimately, independent learning, the aim of the study is to identify the main focus of teaching and learning practices that support learners to reach this level of self-directed and independent learning. It seems appropriate to explore the interpretations of higher education educators and practitioners of the conceptual, empirical, and practical issues related to the construct of learning facilitation methods that could enhance academic skills that encourage self-directed and independent learning. The question to answer is: How can higher education educators apply learning facilitation strategies and methods to encourage self-directed and independent learning in learners who are inadequately prepared for higher education?

3. RATIONALE FOR THE STUDY

The rationale for this study is based on the recognition that the current literature regarding learning facilitation has a number of limitations. The first is that the current factors that influence learning are not well defined in a South African higher education context. The second limitation is that much of the research regarding learning facilitation has mainly explored the contributions of individual factors to academic achievement, rather than contributions of combinations of factors. It is therefore important that an all-inclusive framework should be developed explaining how key factors relate to one another and how they work in combination to advance self-

directed academic skills in underprepared students. Exploring academics' experience, interpretation and implementation of learning facilitation methods and strategies that improve academic skills has the potential to increase the effectiveness of education and training in higher education. Identifying the most prominent factors that affect competence or achievement; constructing a framework of how these factors influence one another; and determining the fundamental mechanism(s) that explain the relationships between learning facilitation and academic skills development will result in the development of a framework that can be used by academics for underprepared students at risk of academic failure.

This framework, although idealistic, might hold the potential to advance academic performance and throughput rates in HEIs. Moreover, in referring back to the background to the study in which the skills gap issue received wide attention, the delivery of more graduates could address the skills crisis mentioned by various authorities in South Africa. In the following paragraphs, the problem statement will be defined, the aim and objectives of this study will be explained, and the significance will be outlined.

4. STATEMENT OF THE PROBLEM

Past political and historical factors are largely responsible for the fact that students are underprepared and, as a result, their academic skills development is obstructed. Low academic achievers frequently continue with little guidance or specific educational interventions to improve their performance; their learning problems are not attended to and their learning environment remains unchanged, leading to a repetition of failure. This ongoing lack of academic success in HEIs is ascribed to the fact that students with academically deprived backgrounds require substantial support from facilitators to take responsibility for their own learning

(Holsgrove *et al.* 1999:99). For this reason, OBET – which focuses on independent learning (Mokhobo-Nomvete 2007:1 of 1) – might be inadequate to address the educational needs of the present academically underprepared student population in South African HEIs. In addition, learning facilitation methods currently in use do not always focus on strategies that scaffold the learner at risk of failing by creating an environment that enhances learner retention and achievement. There is, however, a lack of research evidence to validate the extent and effectiveness of learning facilitation that encourages academically deprived students to master self-directed and independent learning in order to be academically successful. In light of the above reasons three research questions arise which direct the study:

1. Which factors obstruct student learning in students underprepared for higher education in South Africa?
2. Which teaching and learning strategies advance academic proficiency and performance?
3. How can educators scaffold students to become academically skilled?

5. THE PURPOSE OF THE RESEARCH

The purpose of this research flows from the above-mentioned questions, namely ***to develop a learning facilitation framework to enhance academic skills development among underprepared learners in South African higher education.*** The factors associated with academic achievement and failure, predictors of academic performance, educational approaches[5] that focus on interactive teaching, reflective teaching, and generative study skills were taken as starting points to set the stage for the design of the proposed framework. The development of the learning

[5] Educational- or teaching and learning approaches are used interchangeably and are all-encompassing terms for educational theories, methods, teaching-learning strategies, practices and principles used in the teaching and learning of students.

facilitation framework is based on principles of effective teaching and learning and the outcome of the four preceding articles; underpreparedness and the concomitant predictors of academic performance; interactive engagement; reflective teaching; and a generative learning strategy.

5.1 The objectives of the study

To achieve the aim of the study in addressing the problem statement, the following objectives were pursued:

- To gain perspectives into best practices of teaching and learning through an extensive literature survey in three domains: factors facilitating or constraining students' learning, educational strategies and innovations in the field of higher education, and academic skills development in underprepared students.
- To conduct a survey to explore the perspectives of higher education educators and practitioners on underpreparedness and the potential role played by predictors of performance and teaching and learning strategies.
- To make use of an action inquiry to assess the value of interactive engagement, reflective teaching and a generative learning strategy in the researcher's own educational setting (Radiography education at the CUT).
- To construct a learning facilitation framework based on findings from a two-cycle action research process, an action inquiry, two questionnaire surveys, and in-depth interviews.

6. SIGNIFICANCE OF THE RESEARCH

Research that validates strategies or supports the value of practices used in teaching that enhance the learning situation is needed, so that valuable time and resources are not wasted on ineffective strategies. The significance of the research is thus put forward:

- The study is timely, since the Minister of Education expressed concern in a press release (June 2005) about the low success rates for African students in HEIs. She added that this indicated problems in the equity of success. This problem can be addressed, since the proposed framework will create an awareness to develop academic skills in academically deprived or underprepared students.
- The study outcome will lead to a learning facilitation framework that includes a purposeful and structured set of guidelines for higher education educators and practitioners to optimise the learning experience of academically deprived students in South African higher education.
- The framework will also be in line with international perspectives on teaching and learning practices with an emphasis on interactive engagement, reflective teaching, and a generative learning strategy and will therefore show the potential to develop the capacity of underprepared students to advance academic skills to retain and integrate knowledge to become academically successful.
- The framework will also provide a foundation for systematic appraisal of the quality of teaching and learning, since it has a formative role, identifying areas where teaching can be improved; or a summative role, judging the effectiveness of teaching.
- The proposed framework will further provide an outline or hypothesis for future research that addresses the limitations of current knowledge and by exploiting the claim of the designed framework.

7. THE SCOPE OF THE RESEARCH

The study took place within the field of Higher Education Studies. The area of concern is learning facilitation, with specific reference to its interpretation and implementation to support academic skills development in the academically underprepared higher education student in South Africa. The three research questions mentioned in paragraph 4 determined the foci of the research.

Articles 1 and 2, namely concept mapping as a generative learning strategy and reflective teaching, focus on the use of particular teaching strategies and the evaluation of their success in certain settings. These quantitative and qualitative action research and action inquiries are on a small scale and involve personal and reflective elements of student learning and teaching practices. These practically orientated expositions initiated the research undertaken in Articles 3 and 4. The initial perspectives gained from the first two endeavours and the evaluation of their success in certain settings to promote academic proficiency laid the foundation for the empirical investigations into underpreparedness and engaged learning. Research in these two areas was on a larger scale and based on two different questionnaire surveys as well as in-depth interviews. These surveys included practitioners, researchers, educators and experts in the field of teaching and learning in higher education on a local, national and an international level.

The focus of the study is threefold: First, it is theoretical, since different views expressed in the literature are compared and contrasted. Second, the focus is conceptual; the perspectives on learning facilitation are drawn from the results obtained from the action research and inquiry in Articles 1 and 2. Third, it is empirical, since the study explores different interpretations of key concepts in the in-depth interviews, and the questionnaires completed by higher education practitioners and educators

locally and on a national and an international level in Articles 3 and 4.

8. RESEARCH DESIGN

Research on effective teaching revealed that the development of effective teaching and learning practices is related to inquiry and reflection (Harris 1998:179); therefore, the process followed in this study is based on inquiry and reflection. Quantitative non-experimental information through questionnaires, enhanced by qualitative data from in-depth interviews, was collected from key participants.

The idea of the research in Articles 1 and 2 is not to come forward with some scientifically valid generalisation, but to benefit the students directly. For this reason, action research was regarded as the most appropriate. The second reason for using this methodology was that action research is in effect a problem-solving approach because it encourages educators to question their actions and then to take action to improve their teaching practices. It was thus seen as a process in which teaching and learning was investigated to improve students' learning in the researcher's own educational setting. In other words, it is not research for the sake of research, but research for the purpose of improvement (Hall 1997:125).

The process generally associated with action research is a cyclical process of different phases that include action, observation, reflection, and planning and back to action and observation (Dick 1999:1 of 1). The following features of action research, namely reflection, action, research on a small scale and having the research carried out by the educator and not a third party, best positioned this research, since situational information is collected in a natural setting. These fundamentals of the concept of action research best fit the inquiry and are supported by Edge (2001:5), who points out that the purpose of action research "is not simply

to describe, interpret, analyze and theorize – the stuff of traditional research – but to act in and on a situation to make things better than they were".

The research is further situated in the phenomenological paradigm. Since the researcher is part of what is researched, theories are created through induction and educational events are observed holistically (Zuber-Skerritt 2003:155). The preferred approach in this type of research, according to Zuber-Skerritt (2003:156), is not to formulate and test hypotheses, but to build on ideas through the generation of data using various methods to determine points of view of observable facts.

Articles 3 and 4 are based on the subjective perspectives and experience of individuals (higher education educators and practitioners) who form an integral part of the problem being investigated. Underpreparedness was explored by means of empirical surveys that included both quantitative and qualitative elements. These tools were used to increase awareness and understanding of underpreparedness. The research in these two articles is positioned in an interpretive paradigm. The researcher relied heavily on Cohen, Manion and Morrison (2000:21-22) to place the reader in the context of this approach, an approach that has unique characteristics, namely that:

- various perspectives and interpretations of single teaching and learning actions and conditions exist;
- teaching and learning actions are distinctive and for the most part cannot be generalised;
- the world of education is multifaceted and complex;
- several teaching and learning actions cannot be reduced to straightforward interpretations – that is why "thick descriptions" are necessary rather than condensed versions; and
- teaching and learning actions are seen from the perspective of participants and not from that of the researcher.

The research in this study centres on both the behavioural and social sciences. It is behavioural because it explores higher education practitioners' and students' perceptions or interpretations of teaching and learning in higher education, and social since the inquiry takes into account the South African higher education situation. The theoretical framework best suited to this research is an interpretivist/constructivist theoretical paradigm, since the purpose of this research is the construction of a learning facilitation framework based on the interpretations of role-players in higher education.

9. THE ARRANGEMENT OF THE THESIS

This orientation to the study provides a brief introduction, direction, and background to the study. The findings of the study will be presented in a five-article format. The purpose, content, and outcome of each article that follows have been designed specifically to meet the requirements of the study aims and objectives. For this reason, an attempt will be made to reflect briefly on each article's contribution to the final product, which is the learning facilitation framework. The three conceptions of teaching put forward by Freeman (1996:91-99), namely "… *teaching as doing (the behavioral view), teaching as thinking and doing (the cognitive view), and teaching as knowing what to do (the interpretivist view)*" frame the research and justify the position and coherence of each of the five articles. To further focus the thesis, engaged learning as a basis of learning-centred teaching is used to resolve academic failure and will thus form the core of each article. Learning-centred teaching, according to Gravett (2005:viii), demands that educators have an understanding of firstly, students; secondly, the learning process; and thirdly, strategies that facilitate learning. It is then for this reason that the articles include reflective teaching (understanding of students); generative study skills and engaged learning (understanding of the learning process); and a learning

facilitation framework (strategies that facilitate learning). The articles are:

ARTICLE 1: A GENERATIVE LEARNING STRATEGY: AN INVESTIGATION INTO CONCEPT MAPPING

Owing to the complex nature of academic competence and the time constraint of academic schedules, the influence that higher education educators could have on the whole continuum of students' academic achievement is limited. However, considering the relevant literature which suggests that efforts during academic instruction[6] could make a difference to students' academic competence, a generative learning strategy[7] was considered to promote academic achievement and were therefore investigated. To deal with the factors contributing to underachievement and the resolution thereof, the present action research investigation embarked on the quantitative and qualitative assessment of the application of concept mapping interactions to promote academic proficiency. To explore concept mapping as teaching-learning strategy to optimising learning holds potential for resolving academic failure. It can be used to strengthen the students' capacity to learn and the facilitators' capacity to support their students during academic instruction. This enhances active, rather than passive learning, an essential issue in learning-centred teaching.

ARTICLE 2: REFLECTIVE TEACHING: PERSPECTIVES GAINED IN AN ACTION INQUIRY

This article on reflective teaching firstly provides background information on the concept of reflective teaching in the form of a literature review. The review includes the what, how and why of reflective teaching followed by the researcher's own experiences

[6] The in-class contact between educator and student.
[7] A process generating knowledge.

in exploring this methodology to improve learning-centred teaching practices in the researcher's own educational setting. Methods of data-gathering include four data sources, namely the Learning Preference Inventory (LPI), the Critical Incident Questionnaire (CIQ), the Teaching Assessment Poll (TAP) and the one-minute test. In sharing the findings of these different methods of student feedback in the classroom, the value of reflective teaching to improve teaching and learning practices in higher education emerged.

ARTICLE 3: THE PHENOMENON OF UNDERPREPAREDNESS: SHARED PERSPECTIVES

This article focuses on underpreparedness as causal factor of academic failure and eventually attrition from HEIs. The article, which is based on descriptive-exploratory research, aims to disclose factors associated with underpreparedness experienced by HEIs in South Africa and in other countries. It is based on the findings of the proposed empirical survey. This dialogic reflection provides opportunity for diverse perspectives on underpreparedness that could become a basis for future initiatives to improve teaching and learning. In creating awareness and understanding of underpreparedness and juxtaposing teaching and learning strategies, the specific needs of these students can be addressed.

ARTICLE 4: ENGAGED LEARNING: A PATHWAY TO BETTER TEACHING

In view of the fact that diversity in higher education has increased, it has become critical to address the needs of non-traditional students, especially the underprepared. In an attempt to address this issue and answer the question, "How can underprepared students be encouraged to become more effective learners?"

Article 4 explores engaged learning. The question forms the essence of this endeavour and the answer was searched for in the literature as well as in the outcome of this study. The emphasis of this investigation was on the identification of educational approaches that lessen the negative impact of underpreparedness on student learning. This investigation was intended to serve as a platform for educators to share perspectives and experiences on teaching and learning practices that have produced positive results in general and when dealing with the underprepared. An exploratory and descriptive approach was followed in the investigation. The findings of the investigation, which include views from the literature, suggest that engaged learning might be an effective educational approach to scaffold the underprepared.

ARTICLE 5: A LEARNING FACILITATION FRAMEWORK TO SCAFFOLD UNDERPREPARED STUDENTS

Article 5 presents learning in higher education from different perspectives and is informed by Articles 1 to 4. A learning facilitation framework that facilitates the development of academic skills through engaged learning is presented in this article. The proposed learning facilitation framework is based on educational literature on effective teaching and learning practices as well as perspectives gained from the findings of the foregoing articles. Since HEIs are increasingly pressured to be held accountable for student learning, empirical and practical issues regarding educational approaches that stimulate and nurture learning to deal with academic failure will be addressed. These critical reflections on learning can inform current teaching and learning practices, since the framework will identify the most prominent factors that affect academic competence or achievement in higher education in dealing with the underprepared.

10. DETAILS OF PRELIMINARY STUDY

Preliminary actions involved a comprehensive literature survey on the status of South African higher education, factors that influence learning in a South African higher education context, and effective practices in teaching and learning. These aspects were further investigated by means of an action research enquiry in the modules the researcher has facilitated at the CUT. To resolve academic failure in these modules the impact of an interactive engagement as an education strategy was explored. The research results were presented at two international conferences. A workshop related to factors associated with academic achievement was co-presented on international level at the American Association of Higher Education (AAHE) Conference in Colorado, Denver, that was held from 13 to 15 June 2004.

Concept mapping as a generative learning strategy was also explored and presented at the South African Association for Research and Development in Higher Education (SAARDHE) national conference that was held at the University of KwaZulu-Natal from 26 to 29 June 2005. The results of the action enquiry with regard to the effectiveness of concept mapping in enhancing academic performance led to a paper presented at the international joint conference of SAARDHE and the Productive Learning Cultures Project of the University of Bergen, Norway, which was held from 31 August to 2 September 2005.

Reflective teaching and professional development in health education were presented at the South African Association of Health Educationalists (SAAHE) regional health sciences education conference that was held at the University of the Western Cape from 19 to 20 May 2006. A paper based on research in progress, which provides a critical reflection on learning facilitation, was presented at the 2006 HERDSA international conference in Perth, Western Australia, in July 2006.

11. CONCEPT CLARIFICATION

Throughout the study a number of key words, terms and concepts are used. The definitions below are presented for the purpose of the study.

Academic competence: Academic competence is associated with the knowledge and use of effective study skills (Gettinger & Seibert 2002:350). It is defined as a multidimensional concept made up of students' skills, attitudes, and behaviour (DiPerna & Elliott 2002:293).

Academic enablers: Academic enablers are attitudes and behaviours that allow students to take part in and ultimately benefit from academic instruction in the classroom (DiPerna & Elliott 2002:293).

Academic instruction: In this thesis, the term "academic instruction" is used to describe the in-class contact between educator and student in the broad sense. Academic instruction may include but is not limited to formal lectures or instruction and in-class learning-teaching events during the social interaction with students. This interaction may include varied face-to-face instructional strategies for educating the students.

Academic proficiency: Academic proficiency entails a multidimensional concept that includes, among others, the skills of reading, writing, taking notes and taking exams.

Academic self-regulation: Academic self-regulation refers to the progression in which students initiate and maintain cognition and behaviours that are focused on reaching academic goals (Zimmerman 1998:73).

Academic underpreparedness: Literature indicates that the academic domain of underpreparedness entails a combination of a lack in English

proficiency, mathematical ability, and effective study skills (Robinson 1996:1).

Action research: A research method in which educators consider their individual teaching practices. This method creates theory both about educational practice and through educational practice (Zuber-Skerritt & Farquhar 2002:111). This improved knowledge could directly lead to improved teaching practices (Feldman & Minstrell 2000:3 of 26).

Active learning: Active learning is a process in which students become engaged in making meaning of information when facilitators include opportunities in a class where the students are engaged in an activity in which they use new knowledge or skills (Huang & Carroll 1997:14).

Approaches to learning: Approaches to learning, that is surface or deep learning, refer to the association between intent, motives and learning strategies among students (Diseth 2002:221).

Collaboration: This is described by Henderson (1996:248) as a kind of "facilitative interchange" among educators.

Collaborative learning: It is a method of academic instruction in which groups of students work together to reach a shared goal. In addition, the students could contribute to one another's learning (SWAP 2006:1 of 1).

Competency: The aptitude to draw on knowledge, understanding, and skills to perform effectively, or to reach a required standard (SWAP 2006:1 of 1).

Constructivism: Constructivism is a philosophy of learning founded on the premise that learning takes place through the construction of

knowledge and, eventually, meaning by both peer and educator social actions (Biggs 1999:3).

Constructivist learning: This is a multipart relation between students' individual purpose, their previous experiences, knowledge and their inquiry into the subject (Henderson 1996:8,349).

Constructivist teaching: It is the use of teaching activities and learning events intended to smooth the progress of students' active understanding through inquiry (Henderson 1996:6).

Continuing professional development (CPD): This process includes learning events that allow educators, among others, to increase their own knowledge and skills on a continuous basis (SWAP 2006:1 of 1).

Cooperative learning: This entails a process in which learning takes place by means of the cooperation among students in which the aim is to reach a given outcome (SWAP 2006:1 of 1).

Cultural underpreparedness: Students who enter university from a cultural environment that differs from that of a typical HEIs are distinguished as the culturally underprepared (Robinson 1996:2).

Discourse: Refers to the systematic exchange of ideas, formed by systems, which direct and frame opinions and expressions (Adler 1991:139).

Diversity: The multiplicity of students with dissimilar backgrounds, needing various means of entry to higher education and of academic instruction (SWAP 2006:1 of 1).

Education: It is a process that includes teaching and learning aimed at directing students to reach a particular level of competency through purposeful learning "that aim[s] at development of the mind and of theoretical understanding" (Gravett 2005:viii).

Educational approach (teaching-learning approach): An all-encompassing term for educational theories, methods, strategies, practices and principles used in the teaching and learning of students.

Educational or instructional outcomes: These are statements which describe what students should be able to master (Wojtczak 2002:238).

Effective learning: Dewey (1916:89-90) defined effective learning: "It is that reconstruction or reorganization of experience which adds to the meaning of experience, and which increases the ability to direct the course of subsequent experience."

Emotional underpreparedness: Relates to the emotional side of underpreparedness, which involves those students portraying, among others, a lack of motivation, self-efficacy and self-regulation (Robinson 1996:2).

Engaged learning (EL): Engaged learning entails the use of interactive engagement methods. These methods aim to support conceptual understanding and involve heads-on and hands-on actions that provide direct feedback (Hake 1998:65).

Experiential learning: That is learning through experience (Henderson 1996:205).

Facilitating: To facilitate entails the use of educational approaches that advance student learning (Gravett & Geyser 2004:xi).

Facilitator: To facilitate students' learning, educators become the "facilitator" of learning (Neville 1999:393).

Generative learning strategy: Hauser, Nükles and Renkl (2006:243) classify meaningful learning as an intricate activity that entails organisation and elaboration – thus "generating" knowledge. Because the activity of creating a concept map generates learning, the term "generative learning strategy" is used.

Higher education educator: The researcher reviewed the meaning of the terms "practitioner", "lecturer", "academician", "academic", "faculty", "educator", "teacher", and "facilitator" in the educational literature. It appears that these terms are used interchangeably in different countries in higher education without consensus on the explicit connotation to the specific roles that these individuals fulfil in teaching higher education students. The teacher is generally seen as a person who conveys knowledge during instruction, while a learning facilitator creates an environment in which learning is facilitated. However, when a teacher creates a learning environment in which knowledge is constructed or discovered, the teacher becomes a facilitator of learning.

Harapnuik (2006:1 of 1), in asking the question: "Does how we define what we do affect what we do?" emphasises the value that should be attached to the use of or the critique against the use of a specific term. Malcolm and Zukas (2000:1 of 5) describe the typical higher education educator as a reflective and critical practitioner; a facilitator of learning; and a learner within the teaching environment. For the purpose of this thesis, the researcher thus adopted the term "higher education educator". The description of the term denotes the most coherent concept of a teacher, or facilitator that deals with students in higher education to advance learning.

Higher education practitioner: To differentiate between the role of the "higher education educator" and the extended role that is fulfilled in either a teaching and learning developmental capacity, or the conducting of higher education research, the researcher takes up the term "higher education practitioner". This denotes the educator that is an educational developer and specialist in teaching and learning in higher education.

Interactive education (of teaching and learning): Interactive education or interactive pedagogy is the process in which students are induced or encouraged to work cooperatively in a social environment (Garcia & Alban-Metcalfe 1998:176).

Interactive learning: Acting or capable of acting on each other/one another to gain knowledge and comprehension through experience or study (*The American Heritage Dictionary of the English Language* 2000:1 of 1).

Learner support: Learner support includes all the actions enabling or supporting the learner in the learning process (Rekkedal & Qvist-Eriksen 2003:17).

Learner-centred education: An educational strategy in which it is expected of the students to accept responsibility for their own learning (O'Neill & McMahon 2005:28).

Learning facilitation: An umbrella term that includes all actions taken by the educator that support, enable or advance learning (Gravett 2005:viii).

Learning styles or cognitive styles: Learning styles refer to the preferred way in which an individual learns (Diseth 2002:219).

Learning: Learning is seen by Fraser (2006:4) as a process of knowledge construction.

Meaningful learning: Is learning that involves a process of making connections between old and new knowledge to form a cognitive structure (Fraser 2006:6).

Optimal learning: This type of learning is defined as attaining the highest results that a learner is able to attain at a specific point in time (PALS) (UCLA Early Academic Outreach Programs 2003:1 of 3).

Phronesis: Phronesis is described as practical intelligence, practical wisdom, or prudence, which involves "knowing how to apply general principles in particular situations" (Birmingham 2004:314).

Reflection: The practices by means of which students consider teaching and learning incidences or events experienced, and reflect on their impact (SWAP 2006:1 of 1).

Reflective teaching: Reflective teaching entails "thinking about one's teaching", a process in which an educator reflects on his/her teaching practice with the intent to improve (Parker 1997:8).

Research design: A plan for collecting and utilising data so that required information can be obtained with adequate accuracy to test a theory.

Scaffolding: This allows students to perform tasks, supported and guided by the educator, which would generally be beyond their ability (Can 2007:1 of 1).

Self-efficacy: Individuals' beliefs about their performance capabilities in a specific context, task or domain (Linnenbrink & Pintrich 2002:315).

Teaching and learning strategies: A set of definite goals, priorities and intentions at institutional level within a particular period for the managing and enhancement of teaching and learning (CHE 2004:16).

Teaching: Teacher behaviour that makes learning possible in another person (Gravett 2005:viii).

Widening access: This is the actions that an institution takes to provide disadvantaged students with the opportunity to participate in its learning programmes by altering entry requirements (SWAP:1 of 1 2006).

12. CONCLUDING THOUGHTS

Contemplating the findings of the research endeavours in the five articles the researcher faced three challenges, namely first, to convert the findings of the practical research (action research, action inquiry and reflective teaching) into substantive theoretical text; second, to validate the practical work that was done with a deeper and epistemological reasoning; and third, to bring together the strands of all the articles to form a coherent whole.

With the reflection of the HEQC on the poor pass rates of students in HEIs and the need for “systematic initiatives” to deal with teaching and learning in the South African higher education system and to address successful completion of studies, it was evident that a need exists for an initiative to improve teaching that will result in improved learning. The learning facilitation framework could indeed address this need. Therefore it indeed seemed meaningful to explore perspectives on learning facilitation in higher education.

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A GENERATIVE LEARNING STRATEGY: AN INVESTIGATION INTO CONCEPT MAPPING

The power of concept mapping lies in the understanding represented in the resultant concept map, in the actual process of constructing concept maps, and in the potential the process has for facilitating a more equitable relationship between the teacher and the student

(Fraser 2006:17).

Abstract

This article presents findings of an investigation into concept mapping as a generative learning strategy in the radiography learning programme at the Central University of Technology, Free State (CUT). The significance of the investigation lies in the potential of concept maps to promote academic proficiency. The article commences with a description of the structure of learning; the concept of concept mapping; the role of concept mapping in teaching and learning with specific reference to constructivism, and finally meaningful learning, collaborative learning and conceptual change. Subsequently the research design based on a two-cycle action research process, is outlined which involves both quantitative and qualitative investigation techniques in the form of achievement scores and a questionnaire survey. The effectiveness of different concept mapping tasks was contrasted with regard to achievement scores. The findings showed that concept mapping contributed not only to achieving efficacy, but also to conceptual development, while the majority of the participants positively acknowledged the use thereof.

1. INTRODUCTION

Considerable changes in higher education have emerged over the last decade. The sudden increase in contemporary forms of learning facilitation has resulted in efforts to delineate facilitation competencies within the changed nature of educational approaches. Various researchers regard active student participation in the learning process as an assenting criterion as well as an important factor for the development of effective learning[8]. It is therefore also considered as a determinant of academic achievement (Baxter & Gray 2001:396; Gettinger & Seibert 2002:350; Kumar 2003:20). Learner-centred learning and students' active participation in the learning process are also seen by the National Qualifications Framework (NQF) (2000) as ways to achieve academic success. Boyle, Duffy and Dunleavy (2003:267) concur that effective learning is characterised not only by an active, but also by a self-directed and self-regulated approach to learning.

Learner-centred strategies include among others, reflective (students reflect on their learning progress), and resource- (the use of a wide range of print, non-print and human resources in the learning process) and problem-based learning (students seek solutions to real world problems). The success of these contemporary educational approaches depends on the students' level of active involvement and students taking responsibility for their own learning. These strategies also require self-direction and self-regulation. Self-direction implies that all higher education learners are assumed to be motivated, independent, and self-regulated. However, students find the aforementioned educational approaches to be mainly unstructured and they then fail to commit themselves to independent learning (Birenbaum 2007:762-764). The result is that students in diverse and academically deprived learner populations are often at risk of

[8] Effective learning denotes learning that is based on a deep learning approach that contributes to meaningful learning which helps students to be academically successful.

academic failure (Holsgrove, Lanphear & Ledingham 1999:99). Although various authors (see Spencer & Jordan 1999:1280; Kumar 2003:20; Novak & Cañas 2006:7) have reported on the advantages of being actively involved in the learning process, the specific method for reaching this active involvement and, ultimately, self-direction and self-regulation, is not always stated.

Concept mapping shaped around the learning situation as an adaptable scaffold has the potential to initiate and maintain this progression towards self-direction and self-regulation (De Simone, Schmid & McEwen 2001:279). Concept mapping can thus set in motion this proposed shift from educator dependency to learner independency and, as a result, holds the potential to improve academic proficiency (Peterson & Snyder 1998:27). Since the focus of learning shifts from educator to learner during concept mapping (Laight 2004:232), the intent of learner-centred learning can be reached. In support of these claims Chastonay, Papart, Laporte, Praplan, Brenner, Walker, Rougemont, Guilbert and Lagoutte (1999:21) state that concept mapping not only enhances student responsibility and autonomy, but also leads to increased motivation, retention and integration of knowledge, as well as deeper levels of learning which, in due course, result in more meaningful learning[9]. Hauser, Nückles and Renkl (2006:243) classify effective learning as an intricate activity that entails organisation and elaboration – thus "generating" knowledge. Because the activity of creating a concept map generates learning, the term "generative learning strategy" will be used in this investigation.

The purpose of the study on which this article is based was thus to investigate the effectiveness of concept mapping as a generative learning strategy in learner-centred teaching approaches. The necessity of the

[9] Meaningful learning in this thesis refers to the concept that the learned knowledge is fully understood by the student.

study is rooted in the need for higher education educators to make use of effective learning facilitation strategies to improve retention and throughput, which have long been target outcomes for South African higher education institutions (HEIs).

2. PROBLEM CHARACTERISATION

Although learner-centred learning assures better learning, learners from diverse backgrounds have failed to commit themselves to this proposed independent learning. This is revealed in the poor pass rates of students at South African HEIs. A simple shift from educator to learner seems unattainable, since students with academically deprived backgrounds require much more support and encouragement to take advantage of active learning and educator support (Holsgrove *et al.* 1999:99). Higher education educators should thus design learning/teaching strategies that will not only scaffold this shift, but also ensure effective learning. To reach effective learning, Biggs (1999:11) proposes that an arrangement of constructive alignment should be pursued. According to the author, this alignment includes a link between constructivism in learning through appropriate learning activities (Biggs 2003:1) and alignment in teaching, where teaching is basically a vehicle for learning (Kinchin 1998:1 of 1; Kinchin, Hay & Adams 2000:45; Kinchin 2006:79). It is thus important that higher education educators create events or activities in which students can construct their own knowledge.

Concept mapping as a constructive or generative learning strategy was seen as having the potential to not only assist the shift from educator to learner, but also to facilitate more effective learning. However, to put the reader in the context of effective learning and the underlying principle of concept mapping, it is necessary to look at the structure of learning first.

3. THE STRUCTURE OF LEARNING

Learning is seen by Fraser (2006:4) as a process of knowledge construction. This construction of knowledge or learning is, however, only effective if existing as well as new knowledge is integrated (Clayton 2006:197). The notion is based on Ausubel's assimilation theory cited in Novak and Cañas (2006:3) and in Clayton (2006:197). This theory claims that meaningful learning involves a process of making connections between old and new knowledge to form a cognitive structure (Kinchin *et al*. 2000:44; Kinchin & Hay 2005:182; Fraser 2006:6). Gravett and Swart (1997:122) expanded on this theory in proposing that understanding should be an integral part of the cognitive structure. Gravett and Swart refer to this structure as an *integrated conceptual framework* and state that meaningful learning and ultimately conceptual change take place if the process of developing such structures leads to altered ideas.

Novak and Cañas (2006:3-4) further suggest that meaningful learning is encouraged during academic instruction if the relationship between old and new knowledge is made clear; if the student has related previous knowledge; and if the student could be motivated to learn more meaningfully. Moreover, Sinatra (2005:107-108) sees motivation as a driver of conceptual change. Concept mapping as a metacognitive tool facilitates this connection between existing and new knowledge, a process as mentioned previously that leads to deep[10] or meaningful learning (Kinchin *et al.* 2000:44; Atherton 2005:1 of 4).

Teaching and learning are complex actions that play an essential role in students' academic achievement. Buzan and Buzan (2000) argue as follows: "When the brain develops its ability to image, so it develops its thinking capacity, its perceptual abilities, its memory, its creativity, and its

[10] Deep learning implies the critical analysis of new ideas and the linking to prior knowledge that leads to understanding and long-term retention of concepts.

confidence." Furthermore, when a student experiences academic success it cultivates a positive attitude to learning. Concept mapping as a visual learning tool can thus be used to increase students' capacity to learn and higher education educators' capacity to scaffold their students in the learning process.

4. THE ROLE OF CONCEPT MAPPING IN TEACHING AND LEARNING

The difference between mind maps (widely used by Buzan and Buzan) and concept maps is that concept maps outline the association between concepts while mind maps only note the concepts without a clear relationship (Fraser 2006:14).

To summarise; concept mapping is a visual representation that portrays the integration of existing and new knowledge (Ebener, Khan, Shademani, Compernolle, Beltran, Lansang & Lippmana 2006:640; Fraser 2006:8). Novak and Cañas (2006:5) perceive it as a learning and assessment mechanism that enforces meaningful learning. Clayton (2006:202) affirms this view, based on the notion that difficult information is better comprehended and retained, thus facilitating meaningful learning. In addition, Gravett and Swart (1997:125) see it as a means of encouraging and measuring conceptual change. The use of concept mapping as a generative learning strategy is based on the previously mentioned beliefs to reach meaningful learning and in the end conceptual change. The researcher thus captured the role of concept mapping in Figure 1.

The concept map task is represented by the triangle. This triangle consequently ties all the important aspects of knowledge creation, construction and transformation as well as collaborative and social

dialogic learning together, which leads to meaningful learning (ML) and ultimately to conceptual change.

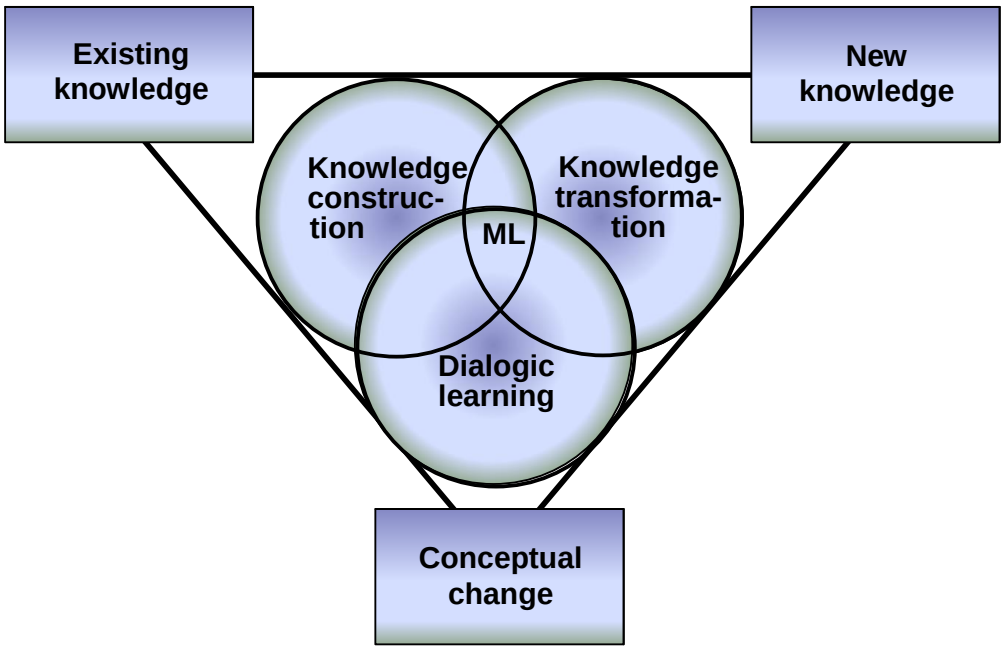

Figure 1: The role of concept mapping

Therefore, because of the mere fact that concept mapping can improve the construction of knowledge, its potential value was investigated. In further support of the use of concept mapping as a generative learning strategy, Bransford in De Simone *et al.* (2001:263) states that students experience difficulty with extracting important information, identifying associations between ideas, and integrating information with their former knowledge to form logical understandings.

In the literature, the following authors in various disciplines in education stated that incomplete traditional pedagogic learning strategies can be improved by putting concept mapping into practice in:

- the health sciences (Li-Lung 2004:9; Xiaoxue 2004:371);
- the humanities (Chularut & DeBacker 2004:248);

- natural sciences (Quinn, Mintzes & Laws 2004:12); or
- young children (Novak 2004:39; Riley & Ählberg 2004:244).

The basic concept behind generative teaching and learning strategies is that learning takes place through the formation and development of an individual's intellectual construction of information (Ritchie & Volkl 2000:83). In other words, what students do and generate during instruction are of the utmost importance in facilitating the learning process (Wittrock 1991:169). Concept mapping is seen by Güvenç and Ün Açikgöz (2007:118) as a powerful strategy that assures, not only effective learning, but also positively effects various learning outcomes. It is within this context that the researcher sees the benefits of concept mapping based on theoretical and empirical support.

5. THE CONCEPT OF CONCEPT MAPPING

Since concept mapping is a recognised form of structuring knowledge, its use could support current teaching and learning practices (Teo & Gay 2006:4 of 15). As mentioned, articulating, reflective and problem-based learning require students to be self-directed, however these approaches have a tendency to be without structure in general (Farrand, Hussain & Hennessy 2002:427). Concept mapping can be applied to give structure to the knowledge obtained during these educational approaches (Russel 2004:1).

5.1 The visual nature of concept mapping

The three typical steps in creating a concept map involves extracting key concepts, followed by arranging and linking them (Hauser *et al*. 2006:244). There are thus two parts to a concept map, namely the visual and the theoretical parts, which are linked by lines (Lim, Cheng, Lam & Ngan 2003:55). A map can therefore effectively reveal a complex structure of

difficult concepts or show multiple links between concepts. This linking of concepts is described by Fraser (2006:4) and Novak and Cañas (2006:7) as a mind scaffold that builds knowledge. The visual nature of concept maps therefore holds the potential to promote memory (Peterson & Snyder 1998:10), review and recall information (Farrand *et al.* 2002:426; Lim *et al.* 2003:55; Russel 2004:2). According to Novak and Cañas (2006:1-2), the concept map creates a hierarchical diagram that is particularly revealing and also useful in diagnosing conceptual inaccuracies.

5.2 Application of concept maps

Concept mapping is considered to be of value as a teaching strategy for developing critical thinking skills (Clayton 2006:202), an imperative in higher education. These skills establish the basic process of problem-solving and stimulate creative thinking during problem-based and reflective learning. Concept mapping is also a valid and reliable measure of what the student understands (Rye & Rubba 2002:33), since it externalises internal thoughts.

5.3 Functions of concept mapping

Concept mapping can change learning from a passive experience towards one that is more active since it requires of the student to engage in the construction of knowledge (Ebener *et al.* 2006:640). Concept mapping also influenced the learning process during academic instruction, since it encourages interaction between co-learners and higher education educators (Fraser 2006:17). During academic instruction concept mapping can have the following functions:

5.3.1 *Instruction tool*

Educator-prepared concept maps which represent the major concepts of a learning area as part of the teaching strategy may be helpful to highlight conceptual links that increase integrated knowledge formation (Kinchin *et al.* 2000:54). Laight (2004:232) further expanded on the instructive value

of concept mapping in that different learning styles are provided for which lead to increased student commitment and, ultimately, to quality learning.

5.3.2 *Summarising and revision*

Concept maps are seen as excellent summary/revision tools into which large amounts of information can be condensed (Laight 2004:231; Kinchin 2005:73). In addition, when students create a revision concept map the creation of the map forces them to study actively by manipulating the information to be learned.

5.3.3 *Assessment tool*

Concept maps are seen by Quinn *et al.* (2004:12) as both easy to use and an alternative for traditional methods of assessment. It reveals not only what students understand, but also the gaps in their knowledge (Ebener *et al.* 2006:640) or their misunderstandings (Lim *et al.* 2003:70; Novak & Cañas 2006:5). West, Park and Sandoval (2002:820), Rebich and Gautier (2005:364), and Quinn *et al*. (2004:12) see concept mapping as a powerful assessment device that explores and portrays the structural complexity and validity of knowledge. The researcher could therefore use concept mapping as an assessment tool (Peterson & Snyder 1998:15) or as a vehicle to record conceptual change (Gravett & Swart 1997:124; Kinchin, De-Leij & Hay 2005:12) which is indicative of meaningful learning.

5.3.4 *Concept map assessment*

Concept maps can be assessed by comparison with an "expert map" (Rye & Rubba 2002:33; Quinn *et al.* 2004:13) or by means of rubrics that include specific criteria in the form of elements and standards. The assessment of concept maps has been taken on quantitatively, based on a scoring system of Novak and Gowin in Roberts (1999:708). Later authors adapted the system. However, all use the number of links, the extent of cross-linkage, the number of branches, and the hierarchical

structure as set criteria. Kinchin *et al.* (2000:48) found the following elements useful in assessing concept maps:

- Hierarchy
- Processes
- Complexity
- Conceptual development
- Representation.

Nicoll, Francisco, and Nakhleh (2001:868), on the other hand, presented a three-level model to assess concept maps. This model is combined with the standards/criteria for assessing concept maps as defined by Lim *et al*. (2003:62). The following list is adapted from the criteria set out by Peterson and Snyder (1998:31) and Lim *et al.* (2003:62):

- Accuracy
- Utility
- Clarity
- Integration and complexity
- Organisation
- Creativity and stability.

The above-mentioned elements can also be used as a guideline for students when constructing concept maps for the first time.

6. ADVANTAGES AND DISADVANTAGES OF CONCEPT MAPPING

A major advantage of concept maps is that they are a visual way of communication (Freeman & Jessup 2004:159). If used correctly concept mapping encourages high-level (Pardue, Tagliareni, Valiga, Davison-Price & Orehowsky 2005:56) and critical thinking which facilitates problem-solving (Peterson & Snyder 1998:27; Farrand *et al.* 2002:427; Russel

2004:1). In addition, students and higher education educators appear to be satisfied with the usefulness, ease of use and effectiveness of concept mapping as a learning strategy (Freeman & Jessup 2004:166). Many additional advantages exist for both higher education educator and student.

6.1 Advantages for higher education educators

Inducing students to reveal their understanding of complex conceptual learning areas is a real challenge for higher education educators. Concept maps can assist in this process because the students can visually express their views of complex knowledge areas. Concept mapping can also serve as an instructional tool for higher education educators (Peterson & Snyder 1998:27; Lim *et al*. 2003:56). Pre-constructed concept maps presented as a teaching/learning activity are valuable as a strategy for facilitating learning (Alpert & Grueneberg 2001:36). In addition, concept mapping results in "teaching to all types" (Laight 2004:229), since it accommodates a variety of preferred learning styles (Peterson & Snyder 1998:7) often neglected by traditional instruction (Laight 2004:232).

Concept maps further allow higher education educators to deal with subject matter in greater depth since a map provides "…a framework that can be viewed, elaborated on, adapted and developed over a period of time" (Fisher in Lim *et al.* 2003:56). Mapping also stimulates the sharing of ideas. It is a visual means of building concepts from data (individually and collectively), which makes it a useful educational strategy to facilitate group work activities (Chularut & DeBacker 2004:248).

Over and above the fact that concept maps are helpful instructional and learning devices (Gravett & Swart 1997:125) they can also provide a means to assess both the process and product of knowledge production (Gravett & Swart 1997:124). This process (learning activities) and product (learning outcomes) represent two of the levels in Biggs's 3P model (Biggs

1999:18-19) of teaching and learning. Since concept mapping encourages students to reflect on the key elements of their prior knowledge or experience (Alpert & Grueneberg 2001:36), the presage level of the 3P model is also contained in the concept mapping process which has the ability to link previous and new knowledge (Novak & Cañas 2006:2).

6.2 Advantages for higher education students

Concept mapping can be used to help students learn how to learn (Gravett & Swart 1997:124; Peterson & Snyder 1998:11; Novak 2004:23; Quinn *et al*. 2004:15; Fraser 2006:1), since it condenses and simplifies advanced study material. For example, the use of ineffective learning strategies during problem-based learning (PBL) can obstruct students' ability to define and solve problems in a purposeful way (De Simone *et al*. 2001:264).

Concept maps have the ability to reveal a complex structure of ideas or multiple links among concepts (Lim *et al.* 2003:57). Concept mapping therefore structures the learning process more effectively (Laight 2004:232) with the result that higher-quality learning takes place. Concept mapping as an instrument for demonstrating knowledge stimulates students to explore their conception of key ideas; mapping also assists them in making significant patterns of their knowledge (Lim *et al.* 2003:55). Making these patterns of knowledge, the ability to conceptualise could be addressed, since Kelly, Berry and Battersby (2007:42) state that students are often unable to transfer acquired concepts to new situations. In addition, it promotes creative thinking (Novak & Cañas 2006:2) by helping students to generate ideas; to see logical association; and to view issues from a holistic perspective (Peterson & Snyder 1998:12; Quinn *et al*. 2004:15). Additional advantages described in the literature include that concept mapping can serve as a model to replace or support note-taking and note-making, which are time-consuming tasks. In addition, as a study technique, concept maps provide a revision aid and their unique patterns

make memory and recall easier (Farrand *et al.* 2002:427; Russel 2004:2). During the process of learning, concept mapping provides a framework from which to structure information that enhances learning and provides opportunities to encourage self-regulation and self-efficacy (Chularut & DeBacker 2004:249).

6.3 General disadvantages

Several authors reported on the advantages and positive rewards of concept mapping experienced by students (Chularut & DeBacker 2004:248; Freeman & Jessup 2004:166; Li-Lung 2004:9; Novak 2004:39; Quinn *et al.* 2004:12; Riley & Ählberg 2004:244; Xiaoxue 2004:371). However, like all learning strategies, concept mapping is not a cure-all; it might not suit all students or all learning situations. Students in higher education are sometimes used to formal lectures and may resist new teaching/learning activities; they could also lack the ability to construct their own maps (Quinn *et al*. 2004:15). Although easy to use, students should be guided and instructed in the process of using concept mapping as a study strategy (De Simone *et al.* 2001:282; Farrand *et al.* 2002:430). Furthermore, concept mapping is not equally effective for all educational outcomes (Lee 2004:112; Xiaoxue 2004:371). The possibility that not all students will gain the same benefit by using concept mapping should thus be considered when implementing concept mapping as a generative learning strategy.

7. PRELIMINARY PERSPECTIVES

The previous paragraphs outlined various aspects of concept mapping, namely the concept, the process, the advantages, the disadvantages and the potential use thereof. After conducting a comprehensive literature review on concept mapping, the researcher realises the worth thereof. Faced by the challenge to design and develop teaching and learning

events that build the capacity and resilience of students to construct their own knowledge through self-direction, Dewey's article *The Nature of Method* published in 1897 as part of his educational belief (Smith, Doyle & Jeffs 2005:77-80) and the views on academic learning of Gravett and Swart (1997:122-124) inspired the use of concept mapping in the researcher's own educational environment. The beliefs of Dewey are:

- Illustration is an important tool of instruction.
- Action results in the development of intellectual and rational ideas.
- Involvement constructs progress or success.
- Emotions are the spontaneous effect of actions.

The views of Gravett and Swart (1997:122-124) endorse Dewey's beliefs, since they also address illustration (schematic device), action (learning is an active process), involvement (learning is a process of interaction), and emotions (existing conceptions are transformed). The researcher recognises action (the effort to draw a map), illustration (the visual representation of knowledge), involvement (educational dialogue), and emotions (conceptual change) as key elements that motivated the investigation into concept mapping as a process in which knowledge is generated.

The investigation took the form of an action research process. The study involved the use of concept maps in a third-year radiography management class in 2005 and 2006. It was based on both quantitative assessment and qualitative evaluation of radiography students' understanding of some of the fundamental concepts of management in health care. Although concept maps have been used widely in tertiary education in radiography instruction in particular, they appear to be rarely utilised.

8. CLAIM AND PURPOSE OF THE INVESTIGATION

Taking into consideration the previously mentioned advantages of concept mapping, the researcher claims that concept mapping as a generative learning strategy has the potential to enhance the academic skills development of underprepared students since it can be used to strengthen students' capacity to learn and higher education educators' capacity to scaffold their students during academic instruction.

The overall purpose of the investigation is to confirm that concept mapping, as a generative learning strategy, has a viable place in South African higher education to enhance academic skills development in low-achieving students. To deal with the causes and the resolution of underachievement this investigation evaluated the effect of the application of concept maps to promote academic proficiency in a radiography curriculum. The findings of this classroom-based investigation were built on interpretive analysis with the objective of providing a framework for the use of concept mapping as a generative learning strategy in radiography classes. The purpose of the investigation was threefold, namely to:

- investigate the efficacy of concept mapping during academic instruction with regard to academic performance;
- evaluate the students' perception of the concept map teaching-learning strategy; and
- evaluate if concept mapping could lead to conceptual change.

9. DESIGN OF THE INVESTIGATION

The investigation took the form of action research for various reasons. The following arguments supported the use of action research as a methodology in this investigation. First, action research creates theory both about and through educational practice (Zuber-Skerritt & Farquhar

2002:111). Second, since the educator is also the researcher, improved knowledge could directly lead to improved teaching practices (Feldman & Minstrell 2000:3 of 26). Third, the action research process was chosen since these authors also claim that students might experience more learning support in this way.

The investigation was conducted over two years with successive groups of students. The action research process consisted of two phases, described here as cycle one and cycle two. Cycle one was seen as exploratory in nature in which the data gathered influenced the approach for cycle two. First, the efficacy of concept mapping was determined, based on a quantitative investigation (test and exam scores). Second, a qualitative survey (questionnaire) which established students' perceptions on the usefulness of concept mapping was utilised.

9.1 Participants

The target group, a convenience sample, included 27 third-year students from the Diagnostic Radiography programme at the CUT in the Radiographic Management III (RAB 30 at) module in 2005 and 2006 respectively.

9.1.1 *Ethical considerations*

Consent to carry out the investigation was obtained from the radiography programme head and the participants. Anonymity was assured throughout the data-gathering process.

10. AN OUTLINE OF THE FIRST CYCLE

At the outset during the first week of the second semester in 2005, the students were informed of the purpose of the research and were given an introductory lecture on concept mapping. Prior to this experience, the

students had been exposed to various forms of formal instruction and interactive instructional methods during their first and second years as student radiographers. Figure 2 displays the arrangement and format of the various interventions of the action research process in cycle 1:

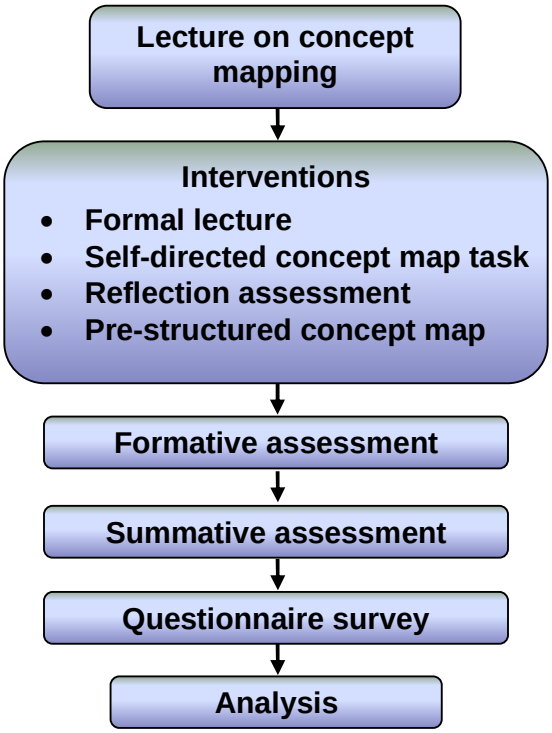

Figure 2: Arrangement of the various interventions in cycle 1

10.1 Procedure and interventions

All students participating in the investigation completed the following management learning units: Performance Evaluation, Management Decisions: Understanding and Coping with Them, Understanding Motivation, and Introduction to Stress. These were the learning units in which concept mapping was put to the test and the learning content was obtained from the prescribed source (Drafke 2002:95-139).

10.1.1 *Formal lecture*

The first learning unit, “Performance Evaluation”, was presented in the traditional lecture format by the researcher. The theme was covered in a one-and-a-half hour session. The lecture content obtained from Drafke (2002:95-107) was introduced by means of PowerPoint slides, which contained keywords of important facts. The students were passive observers and no interaction was pursued. The students were expected to memorise the content and to prepare for a formative assessment.

10.1.2 *Concept mapping task*

In the second learning unit, “Decisions”, the students were asked to draw a concept map using a list of terms taken from the chapter of “Managing Decisions” from the prescribed source. Students could not be told of the details of a scoring scheme or the assessment criteria in advance, because the scoring system was only developed as the research progressed. The first maps were returned to the class. The feedback on the initial maps was of a qualitative nature, while examples of a range of student maps were shown, and some particular faults and good features pointed out. Both good examples and those that demonstrated some misconceptions were displayed (without identification), as a basis for a class discussion. This was a valuable classroom exercise. The students received feedback on the ideal construction of a map as well as the content they displayed. The feedback also included an initial rubric with the following criteria, namely accuracy, utility, clarity, integration, organisation and creativity. The students were, however, assured that their performance on the mapping task did not form part of their assessment. The students were also expected to memorise the content and to prepare for a formative assessment.

These initial maps were used to investigate some of the concept map scoring schemes described in the literature and to develop a scheme which was suitable for this subject. Analysis of this first cycle of the action

research process was necessary to develop the later stages in which the scoring scheme was devised and refined. The scores on the concept maps were not included as part of the formal assessment for this unit.

10.1.3 *Concept mapping as assessment tool*

Two weeks later, there was an appropriate point in the learning unit sequence for a second concept map to be set. There had been time for reflection on the part of both the researcher and the students on the efficacy of concept maps. Both the list of terms and the lesson structure for the second map were developed, using experience gained from the first map. In the third learning unit under trial, “Understanding Motivation”, the students were again asked to draw a concept map using information from the source provided. These concept maps were intended to display the links between fundamental aspects of “Understanding Motivation”, and hence represented a deeper level of understanding. The scoring system could be explained before the maps were set; a rubric including the assessment criteria and standards was provided; and the scores obtained could then become part of a formal assessment.

The use of action research allowed the researcher to adjust and refine the process as it progressed in response to reflections on earlier stages. The rubric for scoring the maps was one aspect of the study which resulted in particular development as the project progressed. Different scoring systems used in the literature were explored because there was no specific format for scoring maps in management. The criteria set out in these systems were modified and included in the rubric (see Table 1) that was suitable for the specific module that was investigated as adapted from Kinchin *et al.* (2000:57).

Table 1: Scoring rubric

Criteria	Standards
Accuracy	• Content is factually correct
Utility	• Links are correct, complete or useful
Clarity	• The structure and the content knowledge are clear
Integration and complexity	• The quality of the map reflects the complexity of relationships
Organisation	• The map reflects the logic flow and relationship of concepts or ideas graphically and visually
Creativity and stability	• The extent to which creative ideas and creative structures to represent content is used
Hierarchy	• One level only • Several justifiable levels
Processes	• Simple association, no interactions • Complex interactions at different conceptual levels
Conceptual development	• A narrow holistic view • A holistic view
Represent	• Lesson sequence • Meaningful learning
Assessment criteria	3=Achieved, 2=Correct but limited, 1=Needs revision, 0=Not included

The maps that followed displayed a good outline of the basic concepts. The maps also portrayed creativity and the content was factually correct. The links, organisation and structure of the map in general were also clear.

10.1.4 *Pre-structured concept map*

Finally, in the last learning unit under trial, “Introduction to Stress”, a pre-structured concept map created by the researcher as part of the instruction process was provided to the students. Information was again obtained from the prescribed source and created by means of the computer-based concept map tool MindManager X5. The map was intended to emphasise the conceptual links that the students needed to build an integrated knowledge structure (see Figure 3: Pre-structured concept map).

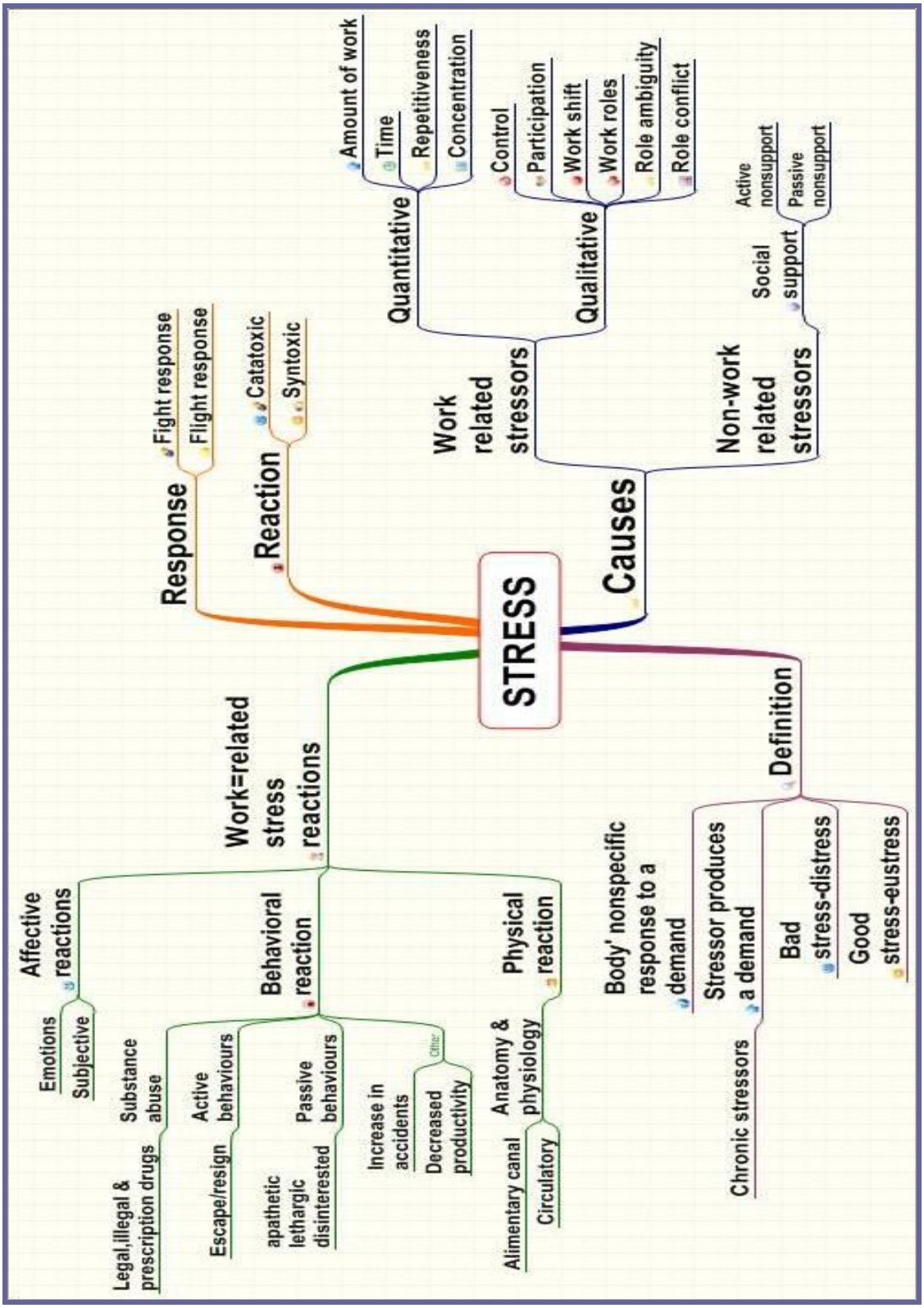

Figure 3: Pre-structured concept map

It was once again expected from the students to memorise the content and to prepare for a formative assessment.

10.2 Achievement measurements

The two achievement measures are explained in the following paragraphs.

10.2.1 *Formative assessment*

At the end of each learning unit the students wrote a formative assessment test to evaluate their knowledge on Performance Appraisal, Decisions, Motivation and Stress. The tests consisted of a collection of questions that asked students to outline, list, define and specify the information from these learning units.

10.2.2 *Formal summative assessment*

At the end of the semester the students wrote a paper on all the learning units. The question on Performance Appraisal asked the students to outline certain advantages; the question on Decisions involved the drawing of a concept map; while in the Motivation learning unit it was expected from the students to reflect on and apply the motivational theories to their own experiential learning environments. Finally, in the last unit, Stress, the question was based on the differentiation of two aspects.

10.3 Questionnaire survey

The questionnaire was designed to evaluate the students' perception of the effectiveness of concept mapping. Questions and measures of individual preferences were included in the questionnaire. The students were asked to indicate their perceptions regarding how successful or effective the concept mapping was in their own learning. The questions, to which the only answers were "Yes" or "No", provided information about students' perceptions, reactions, attitudes, feelings, and experiences. The use of a "yes/no" answer was decided upon in order to encourage a more objective approach to assessing the effectiveness of the intervention.

10.4 Analysis

All statistical analysis was conducted by the researcher, using Microsoft Office Excel 2003 and SAS 9.1. All numerical variables were presented as a mean with standard deviation. Categorical variables were summarised using frequencies and percentages. Significant differences in test and exam scores between the different learning units were measured by means of the paired Student t-test.

11. RESULTS OF THE INTERVENTIONS

Results will be reported in two different sections, namely assesment results, that is test (formative assessment) and exam (summative assessment) scores, and questionnaire results. The absolute and relative data and the statistical significance between comparisons of the various interventions are presented by means of tables and figures and discussed accordingly.

11.1 Assessment results

The formative (test) and summative (exam) assessment scores for the formal lecture, the pre-structured map, the self-directed concept map task, and the reflection assessment interventions are reported in Table 2 and graphed in Figure 4.

Table 3 indicates the statistical significance when several of the formative test) and summative (exam) assessment scores are compared.

Table 2: Assessment scores of the various interventions in cycle 1

	Formal Lecture		Pre-structured map		Self-directed concept map task		Reflection assessment	
Student	**Test (%)**	**Exam (%)**	**Test (%)**	**Exam (%)**	**Test (%)**	**Exam (%)**	**Test (%)**	**Exam (%)**
1	94	40	80	53	78	78	80	44
2	50	73	33	80	72	84	50	24
3	100	80	20	100	100	78	80	36
4	88	80	87	73	100	96	90	56
5	58	86	73	66	95	90	90	72
6	86	66	43	86	88	90	95	76
7	73	40	73	100	99	88	75	76
8	91	86	63	86	81	66	70	48
9	63	46	40	100	93	74	70	92
10	82	80	47	100	70	54	60	52
11	94	66	53	93	93	86	60	92
12	83	70	60	60	88	88	100	96
13	100	100	100	100	100	76	90	92
14	95	70	56	60	83	78	70	40
15	99	60	100	100	88	92	80	48
16	76	53	73	60	76	54	70	32
17	73	53	63	53	86	74	85	36
18	72	86	44	33	81	88	80	56
19	79	20	80	40	61	66	45	38
20	91	86	76	93	91	88	60	100
21	87	73	97	80	95	100	100	48
22	14	73	77	86	39	16	100	40
23	81	73	53	66	100	100	75	44
24	73	50	87	93	93	100	60	52
25	60	33	63	66	93	80	80	44
26	46	26	73	53	64	92	60	60
27	96	53	80	26	98	84	100	40
Average Score	**78**	**64**	**66**	**74**	**85**	**80**	**77**	**57**
±SD	**19.74**	**20.38**	**20.49**	**22.26**	**14.51**	**17.77**	**15.76**	**22.04**

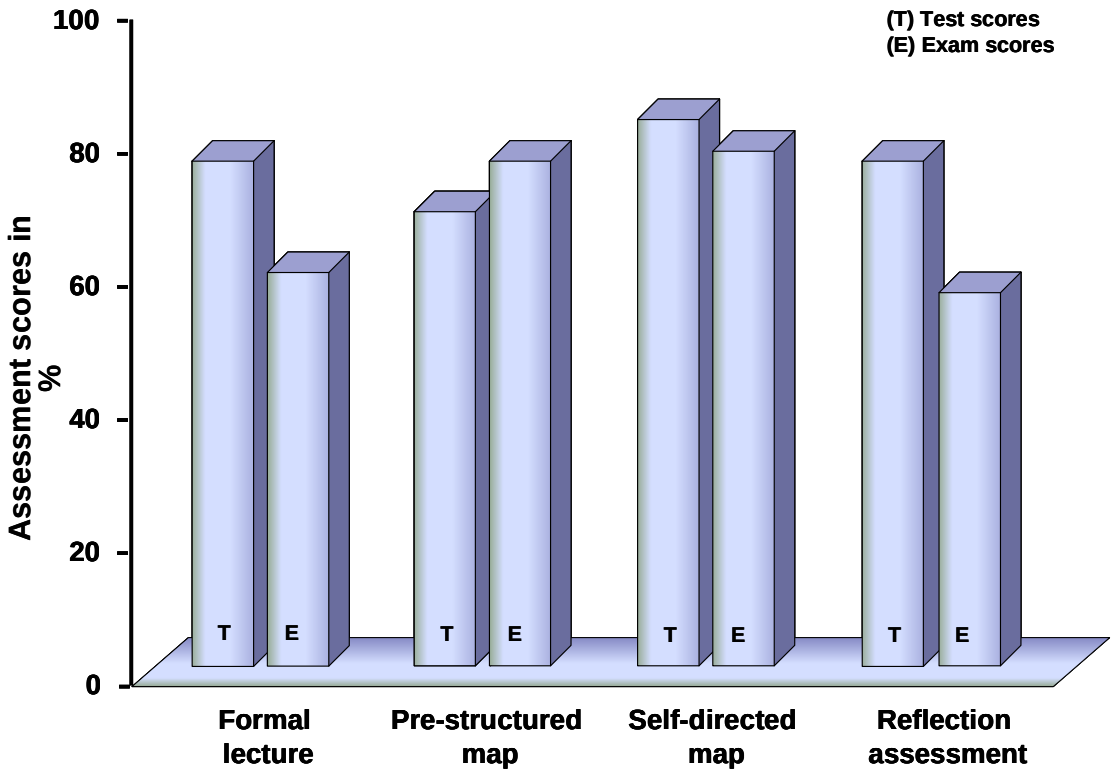

Figure 4: Assessment scores of the various interventions in cycle 1

Table 3: Statistical significance between various test and exam scores

Method	Test Score (%)	p-value	Exam Score (%)	p-value
Formal lectures vs. pre-structured concept mapping	78 66	0.0356*	64 74	0.0361*
Formal lectures vs. self directed concept mapping	78 85	0.0198*	64 80	0.0046*
Pre-structured concept mapping vs. self directed concept mapping	66 85	0.0005*	74 80	0.3208
Self directed concept mapping in Surface learning and Deep learning	77 57	0.0004		

* Statistical significant difference

The average formal lecture test score (78±19.74%) was significantly higher (p-value = 0.0356) than the pre-structured map test score (66±20.49%) and significantly lower (p-value = 0.0198) when compared to the self directed concept mapping test scores (85±14.51%).

The average formal lecture exam scores (64±20.38%) were significantly lower (p-value = 0.0361 and 0.0046 respectively) than the pre-structured map exam (74±22.26%) or the self directed concept mapping exam scores (80±17.77%).

In addition, self directed concept mapping (85%±14.51) showed a significant increase (p-value 0.0005) in the grading/marks obtained during the tests when compared to pre-structured concept mapping (66±20.49). A trend towards an increase during exams [74±22.26 vs.80±17.77; (p-value 0.3208)] exists for these two interventions.

The aforementioned results imply that the two teacher-centred approaches (i.e. formal lectures and pre-structured concept mapping) render inferior grading/marks when compared to learner-centred self-directed concept mapping during exams. These results also support the notion that when students are active in the learning process, academic performance increases. Another noteworthy finding is the increase in long-term retention among the students when they designed and constructed their own maps compared to when they were passive in the learning process - a finding supported by the work of Novak and Cañas (2006:7).

A statistical significant difference (p-value=0.0004) was evident when the average test scores (77±15.76) were compared to the average exam scores (57±22.04) for the reflection intervention (see Table 3).

Concept maps have the ability to reveal a complex structure of ideas or multiple links among concepts (Lim *et al.* 2003:57), structures the learning

process more effectively (Laight 2004:232), and enhance higher-quality learning by acting as an instrument to stimulate students for demonstrating knowledge to explore their conception of key ideas and assist them in making significant patterns of their knowledge (Lim *et al.* 2003:55) – see section 6. Furthermore, although concept maps promote creative thinking (Novak & Cañas 2006:2) by helping students to generate ideas; to see logical association; and to view issues from a holistic perspective (Peterson & Snyder 1998:12; Quinn *et al*. 2004:15), their unique patterns make memory and recall easier (Farrand *et al.* 2002:427; Russel 2004:2), but the ability to conceptualise is not addressed because students are often unable to transfer acquired concepts to new situations (Kelly, Berry & Battersby 2007:42). The present findings, however, indicate that when it was expected from the students to reflect on and apply the self directed map content, students experienced difficulty in extracting relevant information from their maps and integrating concepts to form a logical solution to the proposed problem over the long-term. These findings suggest that individual concept map tasks can improve academic performance but it does not guarantee that conceptual change will take place. The students had difficulty in extracting mapping content to apply and/or reflect on the theories. These findings relate to the present protocol design and do not reflect any outcomes in the populations since all types of concept mapping strategies are not equally effective for different educational outcomes (Lee 2004:112; Xiaoxue 2004:371).

11.2 Questionnaire results

The self developed questionnaire consisted of eight items, both open and closed questions and provided valuable information about students' experiences with concept maps. To increase the reliability of the questionnaire, the following aspects received attention; the questionnaire was piloted and the content refined, ease of completion and length of the questionnaire was taken into consideration and anonymity was ensured to increase greater honesty. Students were asked in the questionnaire in

both cycles one and two to choose the teaching method that would improve their marks the most (see Figure 5).

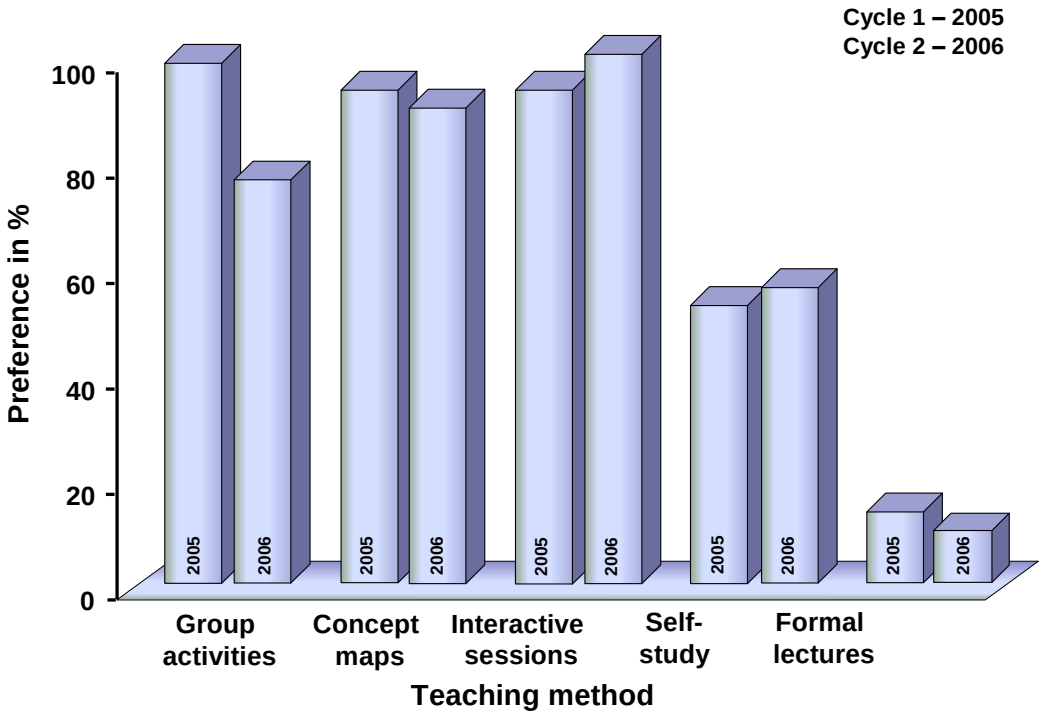

Figure 5: Teaching methods preferred by students

The majority of the students regarded group activities, structured interactive sessions and concept mapping as teaching strategies from which they could benefit. Most of the students mentioned that formal lectures (with no student participation) were not a teaching method that would improve their academic performance. These findings were in line with the test and exam scores previously reported on.

The usefulness of concept mapping was positively acknowledged by most of the students and the following is a summary of the students' remarks. Students were asked to respond to the following question: Can a concept map increase your marks? The majority of the students (97% in cycle one and 84% in cycle two) reported that concept mapping would improve their marks. The reasons given for improved marks were that concept maps

displayed important information in a concise manner and that information became easier to remember. The following remarks were made:
“When I am writing a test I can imagine the mind map in front of me“
“It is easy to study and hard to forget.”
“Study becomes less but remember more.”
“It is short and descriptive.”
“It gives you a mental picture of the work.”
“It is a fresh approach to learning.”
“It represents knowledge in a logical way” (Afrikaans).

In reply to the question: *Do you find it difficult to construct a concept map?* one-third (34%) of the respondents in the first cycle and half (52%) in the second cycle mentioned that they found it difficult to determine the key concepts and they were also afraid that they would miss important information. The rest of the students indicated that they did not find the task difficult. They reported that they took the headings and subheadings of the content to be learned and then filled in the rest.

When asked if a concept map could improve memory, a total of 91% of the students in the first cycle and the whole group in the second cycle answered positively. Most of the students found the use of colour and pictures the most valuable. Some of their comments are listed below:
“It gives the whole lesson in a picture.”
“Remember longer and it is easier to recall.”
“Makes a big job small and my brain can grab the whole information.”
“A picture is worth a thousand words.”

These comments mirror those of Wandersee in Kinchin *et al.* (2000:44) who claims that “to map is to know”. When asked if they preferred to draw their own maps, almost half of the students in both cycles preferred to construct their own maps, because they learned while creating their maps.

The other half found it a time-consuming task and expressed uncertainty that they would be able to include all the information.

In the questionnaire items that examined the importance of educator input as constituent to increased marks, 41% of the students in the first cycle responded by pointing out that the educator's role was to indicate the most important work to be learned. In the second cycle the group as a whole pointed out that the educator should be active in the learning process, provide the information and knowledge, as well as supply notes. Sixty eight percent and 64% respectively needed support from the educator to help them study and stated that a map structured by the educator would make learning easier.

These last-mentioned items of the questionnaire provided evidence that the students were not self-directed, because they saw the higher education educator as the main constructer of the learning process. Moreover, since students in the study indicated that their preferred method of teaching included interaction, group work and concept mapping, these should be pursued. This collaborative approach could guide and scaffold students to eventually reach conceptual change.

12. FINDINGS FROM CYCLE ONE

The first cycle in this action research inquiry fits the description of Biggs's explanation of the learning process seen from a constructivist point of view. According to Biggs (1999:12), learning is enforced by active engagement in learning tasks and not through direct teaching. This active selection and construction of knowledge (the individual process of creating concept maps) thus explain the differences in test scores and concept map quality which draw attention to the relationship between effort (map quality) and achievement (assessment scores).

This generative learning strategy could increase test and exam performances. However, the fact that conceptual change did not occur can be linked to the lack of social interaction between and collaboration with co-learners and researcher. According to Gravett (2005:21), this social constructivism leads to “shared meaning or the co-construction of knowledge”. Biggs (1999:13) emphasises that learning takes place through the construction of knowledge and eventually meaning by both peer and educator social actions. This statement adds to the view of Gravett (2005:21) that, in order to make meaning of knowledge, learning should be an interactive process – thus part of collaborative teaching-learning situations. Van Huizen, Van Oers and Wubbels (2005:271-272) support this notion based on their perspectives on the Vygotskian theory which implies that both the course of action and the person taking part are crucial in any developmental process. Kinchin and Hay (2005:186) as well as Birenbaum (2007:749) view social dialogue as a crucial part of knowledge formation and suggest that it upholds a “sociocultural” view of learning. The potential of collaborative learning to encourage conceptual development as a result of the shared perspectives during social interactions recognised by Kinchin *et al.* (2000:54), Quinn *et al*. (2004:15), and Vosniadou (2007:47) thus determined the actions in the second cycle.

13. AN OUTLINE OF THE SECOND CYCLE

The role of social action and interaction in developing conceptual change was recognised in the concept map tasks of the following year (2006). It is within this framework that the second cycle of the action research inquiry was planned. Thus, to facilitate the process of conceptualisation, collaborative group work was included during the construction of maps. Figure 6 displays the arrangement and format of cycle 2 of the action research process:

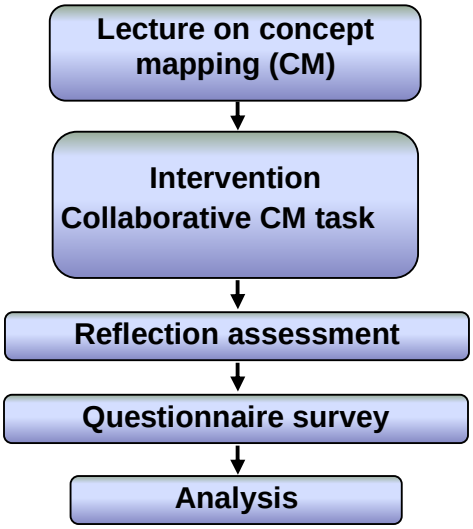

Figure 6: Arrangement of the various interventions in cycle 2

In the learning unit "Understanding Motivation" with a new group of students in 2006, the students were again prepared for concept mapping tasks by means of an information lecture. The students were asked to draw a concept map of the various motivational theories while interacting with co-learners in a small group. In addition, they had to use their maps as a basis for a group discussion on the application of the different motivational theories in their own experiential work environment. The small group interaction was followed up by asking students to share the results of the interaction with a larger group. Inputs and feedback from the groups then led to a class discussion, after which each student added further perspectives to their own maps gained through the interaction with the group members and input from the researcher. This approach served as a vehicle for reasoning and a starting point for conceptual development, since the students in the group brought different perspectives to the shared construction of a map. Kinchin (1998:2 of 9) describes this progression towards conceptual change as a process of building collective meaning, while Gravett and Swart (1997:123) maintain that if this process adds up to "true learning", conceptual change will take place.

During the formative assessment on the “Understanding Motivation” learning unit it was once again expected of the students to apply the motivational theories to their own experiential learning environments. The test scores showed a remarkable increase from the previous scores obtained in cycle one when no interaction took place. The average assessment score for cycle one was 57%, while the score in cycle two increased to 74%. This direct quantitative comparison of assessment scores can be contested because of a number of variables enacting on the process. However, the researcher draws on the quality of responses to the question that varied considerably from the attempts in the first cycle. The students extracted relevant information from their group concept maps and integrated the concepts into solving the proposed problem. The students previously only referred to the different motivational theories without linking related concepts. During this second cycle, they brought their own experiences gained through the social interaction construction of maps into answering the question. Theories were also transformed to fit the experiential environment and their individual perspectives.

These findings indicated that the students had acquired the ability to construct and transform knowledge through this dialogical task. This collaborative approach to concept mapping thus led to conceptual change. When introducing concept mapping as an instructional or learning scaffold with the aim of ultimately developing it into a generative learning strategy, its implementation should therefore take place in a collaborative learning environment. This social interaction supports students within a group to capture their developing ideas, transforming them, and making new associations (Marchinko 2004:1) in order to develop conceptual change.

14. SUMMARY

The investigation into concept mapping as a generative learning strategy included both the researcher and the students in a process to improve learning, a strategy aimed at changing teaching from teacher-centred practices to “learning-centred dialogic teaching” (Gravett 2005:41). This process can be described as transformational learning, which is the development from existing beliefs towards more justifiable beliefs through a process in which alternatives are considered (Gravett 2004:260). The researcher places this investigation within this perspective and sees the “existing beliefs” as teacher- and learner-centred learning, while the “justifiable beliefs” are seen as learning-centredness and concept-mapping in tandem with collaboration as the “alternative” to be considered. The difference between learner- and learning-centred teaching is that the latter involve learning activities that encourage students to improve their learning.

The benefits of concept mapping were realised through both quantitative and qualitative observation techniques. The quantitative and qualitative data presented indicate that concept mapping contributes not only to achieving efficacy, but also to conceptual development. The researcher sees these positive outcomes as effects of both the active generation of knowledge through the act of mapping and the social interaction during the collaborative concept map task in cycle two. The majority of the students in both cycles one and two positively acknowledged the use of concept mapping and they saw it as an adjunct to their learning. The findings of this investigation confirm works by others that indicate that the use of concept mapping as a teaching/learning tool can lead to achievement gain, meaningful learning and ultimately conceptual change (Chastonay *et al*. 1999:25; Chularut & DeBacker 2004:259; Quinn *et al*. 2004:15; Clayton 2006:202; Hauser *et al*. 2006:248). Furthermore, since empirical research indicates that during the process of learning concept

mapping also encourages self-regulation and self-efficacy (Chularut & DeBacker 2004:260), a deep approach to learning (Laight 2006:66; Birenbaum 2007:750) and motivation (Laight 2004:229) are, among other factors, associated with academic achievement. Academic success can therefore be placed within reach of higher education students by nurturing these factors through concept mapping. Moreover, this increase in self-regulation, self-efficacy, a deep learning orientation, and motivation emphasises the value of this investigation in the thesis as a whole.

15. CONCLUDING THOUGHT

The report, *Accountability for Better Results: A National Imperative for Higher Education*, presented by the National Commission on Accountability in Higher Education in Manzo (2005:2) states that "…universities must create new and more responsive ways to hold themselves accountable for student success…" The researcher sees this accountability as primarily nestled in the promotion of effective learning and helping students to be academically successful. A method of supporting such learning might, in fact, be self-directed collaborative concept mapping.

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REFLECTIVE TEACHING: PERSPECTIVES GAINED IN AN ACTION INQUIRY

Reflective teaching encourages teachers to be students of teaching
(Cruickshank & Applegate 1981:553).

Abstract

This article describes an action inquiry into reflective teaching in the radiography learning programme at the Central University of Technology, Free State (CUT) in the module Radiographic Practice II. The article outlines the role that reflective teaching plays in the professional development of educators. The concept of reflective teaching is described with a focus on the scholars of reflective teaching as well as the different reflective models widely used in higher education. The educational research approach includes the four data sources used, namely the Learning Preference Inventory (LPI), the Critical Incident Questionnaire (CIQ), the Teaching Assessment Poll (TAP) and the one-minute test. The article discusses some of the findings identified by the action inquiry and their value for building a culture of inquiry through reflection to improve both effective teaching and learning as well as professional development. Since reflective practices have the potential to improve teaching competence, the improvement will ultimately lead to improved student learning. For this reason educators need to explore aspects involved in teaching through inquiry and reflection to reach higher levels of professional effectiveness and proficiency in teaching. Through this awareness educators can scaffold students to become more effective learners.

1. INTRODUCTION

Higher education institutions (HEIs) aim to provide the best possible learning environment to support students to perform to their full potential. By paying attention to students' concerns and responding to them, educators show dedication to these aims. Effective classroom practice can thus be pursued through the interpretation of feedback on instructional events, a skill that can be developed through reflective teaching.

Reflective teaching has become a widely used approach in professional development for educators throughout various HEIs (Fendler 2003:23; Hoffman-Kipp, Artiles & López-Torres 2003:248; Atherton 2005a:1 of 2; Korthagen & Vasalos 2005:47-48; Green 2006:7). Reflective teaching entails "thinking about one's teaching" (Parker 1997:8) and involves classroom observation and reflection aimed at refining teaching theories and adjusting teaching practices (Ferraro 2000:4 of 6). Reflective teaching approaches based on students' feedback create a platform for both students and educators to reflect on learning as well as the quality of teaching. To improve the quality of teaching and learning in South Africa it has become crucial to act in accordance with the demands of the Higher Education Quality Committee (HEQC) and the national goals set for higher education. These demands are, among others, to teach students how to learn; how to become reflective; and how to become lifelong learners. Over and above these demands an increasing emphasis on accountability and throughput rates confronts educators in the country, not only to convey knowledge, but also to support students in the learning process to be able to reach academic competency and, ultimately, academic success.

To provide the necessary support, educators should be knowledgeable about effective teaching methods and strategies. However, many educators teach the way they were taught, since it is only in recent years

that it has become compulsory for educators at HEIs to obtain an additional qualification or credits in higher education studies. The biggest challenge that higher education educators and specifically health educators therefore face is to change roles from health professionals to health educators. Over and above the fact that it is the responsibility of the higher education educator to create and structure a learning environment conducive to learning, sensitivity towards student diversity and students' academic needs should also be developed. For this reason higher education educators need to explore aspects involved in teaching through inquiry and reflection to reach higher levels of professional effectiveness and proficiency in teaching.

By gaining a better understanding through inquiry of the complex ways in which students learn, the teaching and learning styles or the impact that teaching has on students' learning will ultimately result in improved teaching. Through this awareness educators can, as a result, scaffold students to become more effective learners. Since inquiry, reflection, and continuous professional growth are, according to Harris (1998:179), characteristics of effective teaching practices, reflective teaching can thus be a valuable form of professional development (Cruickshank & Applegate 1981:554) at both theoretical and clinical levels of teaching in higher and/or health education.

2. BACKGROUND TO THE STUDY

In this study, the researcher's initial pedagogy for teaching was based on the traditions and practices of direct instruction. Challenged by student-centred teaching, a need arose to investigate the effectiveness of student-centred approaches in the researcher's own teaching situation. In striving to support underprepared students to become academically skilled, the researcher made use of reflective teaching practices to explore students'

feedback to identify changes that need to be made in teaching. The researcher focused the feedback on academic instruction because contact time with students lends itself to the development of academic skills. Acting on the following two questions helped the researcher to adapt and correct instructional practices:

- What did the students perceive as positive or negative actions or interactions in class?
- How did these actions or interactions influence their learning?

This type of reflection on how students perceive teaching is the basic philosophy behind reflective teaching; it assumes that students and their perspectives play integral parts in choosing educational approaches. Reflective teaching thus presents valuable ways to capture the positive or negative learning experiences of students, since it provides an opportunity for both student and educator to reflect.

3. RESEARCH QUESTIONS

A number of issues raised in the orientation to the study framed the research problem, namely poor throughput rates and retention in South African higher education. It is worthwhile to restate the questions that arose from this problem in order to recap the driving force of the action inquiry into reflective teaching. In brief, the questions look into factors that obstruct student learning, teaching and learning strategies that advance academic performance and actions that support underprepared students to become academically skilled. Goff, Colton and Sparks-Langer (2000:46) advise that if students' academic success needs to be improved, it is essential to improve educators' professional development, since teaching competency would transpire into more effective learning. Sandars (2006:6) proposes that reflective practice has the potential, if used appropriately, to lead to professional growth.

The answers sought in this action inquiry are thus related to and initiated by the following questions:

- Does reflective teaching facilitate recognition and proof of what comprises good teaching?
- How does reflective teaching contribute to professional development?

As such the purpose of this inquiry was threefold, namely to look into academic instruction practices by means of reflective teaching to identify negative or positive actions that advance or obstruct learning; to make academic instruction more responsive to students' preferences and/or needs; and to evaluate if this action inquiry allowed the researcher to grow professionally. The objectives were thus:

- to identify shortcomings encountered during academic instruction;
- to reach high levels of professional effectiveness and proficiency through inquiry and reflection; and
- to encourage best teaching practices during academic instruction that enhance the quality of learning.

The purpose of this article is consequently to identify and discuss the key issues of reflective teaching as a premise for advancing teaching practices and, as a result, professional development. The article first outlines the concept and the principles of reflective teaching. It then explains the benefits that inform teaching practices in the context of the purposes and goals that have been defined for higher education and, in the third place, discusses the action inquiry findings in the researcher's own educational environment. As a final point, the philosophy underpinning reflective teaching and its contribution to teaching effectiveness and professional development will be discussed.

4. THE EDUCATIONAL RESEARCH APPROACH

The researcher wanted to understand how to improve teaching practices and encourage students to reflect on the effect that certain teaching and learning practices have on learning. Both quantitative and qualitative research methods were used. On the one hand, qualitative research was used since the inquiry was conducted in a natural setting, namely the researcher's own educational environment. In addition, because the feedback on learning experiences during academic instruction points towards interpreting the phenomenon of learning to create or build new theory, the focus was thus on interpretation rather than quantification. The educational research approach used in this study is therefore based on the paradigm of interpretive research described by Pollard (2006). The purpose of this kind of research is to inform decisions as a basis for improvement.

The researcher validates the methodology used on the principles of reflective practices developed by Bartlett (1990:208). The author proposed that, in order to reflect, the educator should perform the following actions:

- Test ideas through the practice of teaching.
- Be part of the social environment where teaching occurs.
- Be interested in the problem to be solved.
- Base reflection on own experiences in his/her teaching situation.
- Act on the issues investigated through reflective teaching.
- Transform the reflective action into improved teaching practices.

The function of any form of reflection is therefore that it leads to understanding. It structures thoughts, ideas, and beliefs, as they become known, which enables the reflective practitioner to develop teaching practices, since successes as well as failures direct this development (Han 1995:229). Kember and Kelly (1993:1) propose that if the educator's teaching practice becomes the subject of research, it can be critically

looked at and adapted. Reflective teaching also makes certain that teaching continues to be a dynamic process since the continuous reassessment of teaching practices, taking into account new evidence, allows an educator to query and change teaching and learning theories (Han 1995:228).

This inquiry examines the researcher's own instruction practice with the intention of improving student learning. In reviewing the extent to which students judge the effectiveness of instruction through various data sources, the researcher seeks not only to improve teaching practices, but also to create her own educational theory. The researcher used insights from the theories and models of well-known reflective practice researchers to establish the appropriate actions and behaviour of an effective educator in order to guide herself in developing such traits.

Both reflective teaching and action research are processes in which educators investigate teaching and learning to improve their own and their students' learning through self-reflective practices. The course of action generally associated with action research is a reiterate cyclical process of different phases that pass through planning, action, observation, and reflection and back to planning and action (Zuber-Skerritt 2001:19; Tripp 1990:159), a process that inevitably entails a more extended approach. Reflective teaching, on the other hand, can be a single action (Bailey 1997:8 of 14), an inquiry that places emphasis on a constructivist approach to teaching which brings theory and practice together (Kuit, Reay & Freeman 2001:130). The current study can best be described by Tripp's explanation of the term "action inquiry". Tripp (2003:3 of 19) describes it as an umbrella term that encompasses any investigation that purposefully takes a cyclical approach that includes planning, acting, describing and reflecting. According to Tripp's action inquiry continuum an additional difference between reflective teaching and action research is that reflective teaching is more personally focused, while action research

to some extent includes a broader public involvement (Tripp 2003:5 of 19). Different types of action inquiry exist that include – among others – thoughtful action, reflective practice and action learning. Since this study embarked on action and reflection as a means to improve teaching, reflective practice was regarded as the most appropriate.

5. THE CONCEPT OF REFLECTIVE TEACHING

The researcher gained a better understanding of the term “reflective teaching” by first looking at the meaning of “reflection”. Bailey (1997:2 of 14) defines reflection, among others, as “a thought occupying the mind”, while Birmingham (2004:321) sees reflection as an image that implies a “personal inspection of oneself”. Both the concepts of “thought occupying the mind” and “personal inspection” have been influential in not only individualising the process of reflective teaching, but also in providing the researcher with a frame within which to situate “thinking about one’s teaching” put forward by Parker (1997:8) in his book about reflective teaching in the post-modern world. To better understand reflective teaching as such, the researcher reviewed the literature on reflective teaching to gain insight into perspectives on reflection in teaching and to become acquainted with models of reflection used in educational environments. This literature review on the discourse of reflective teaching also guided the research design.

Reflective teaching differs from everyday teaching practices, described by Tripp as thoughtful action, in that reflective teaching implies a more systematic process of collecting, recording and analysing information in order to direct change that will ultimately lead to the improvement of teaching (Tripp 2003:16 of 19). To further explain reflective teaching, the difference between action research and reflective teaching needs to be made clear. Action research and reflective teaching are both elements of

an action inquiry, thus strongly related but not identical concepts (Hall 1997:126-129). The author further refines the term “reflective teaching” by calling it “pedagogical reflective practice” which, according to her, is in effect a teaching practice where the educator reflects and acts to improve teaching.

Although “reflective teaching” is a concept that has various meanings (Adler 1991:139), the general opinion is that a problem sets in motion the process of reflection, which steers the development and understanding of teaching and learning practices (Loughran 2002:9 of 18). Reflective teaching, also called inquiry-oriented teaching, is seen by Green (2006:7) as a process that provides structure in which insight into the complex nature of teaching is improved. Black (2005:110) encourages educators to make use of reflective teaching in an attempt to advance their own teaching and to explore new teaching strategies. She further points out that critical reflection upon practice leads to educators taking responsibility for their own professional development. The main advantage of reflective teaching practices is that a better understanding of one’s teaching style ultimately leads to greater efficiency in teaching (Dirkx 2006:286; Ferraro 2000:2 of 6). The exploratory nature of reflective practices enhances teaching and, in addition, integrates research and teaching (Yim Ping Chuk 2004:1).

Reflective teaching is important for the development of learning content and instruction skills (Hoffman-Kipp *et al.* 2003), as well as shaping an environment which encourages learning (Green 2006:1). Green further notes that it is not only important that educators investigate their teaching practice through reflection, but also that a structure to guide the process is needed. Reflective teaching involves different processes and should not be seen as a single action but rather a continuous course of action to improve one’s own teaching practices.

5.1 Scholars in reflective teaching

In an effort to explain the cognitive side of reflective teaching, present-day research on reflection has mainly explored the knowledge and thoughts of educators and the early theoretical work on reflection of Dewey, Schön and Van Manen, which to a great extent still underpin the more current research into reflective practices (Birmingham 2004:313-324). The following section of the article describes a number of different reflective models widely used in educational environments. Reviewing these reflective models, the significance of this action enquiry into reflective teaching will become clear.

5.2 Reflective models

The reflective models that will receive attention include those of Dewey, Schön, Korthagen and Vasalos, Birmingham, and Colton and Sparks-Langer. Each of these models shaped this action inquiry in some way or another. The principle on which each model is based will briefly be touched on, while its contribution to this study will be explained in the ensuing paragraphs.

5.2.1 *Dewey's reflective action*

With regard to the topic of reflection John Dewey (1859-1952) wrote a book, entitled *How We Think.* It was published in 1909. In the chapter on "What is thought?" he defined reflective thought as:

> *Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends* (Dewey 1909:6).

Dewey's interest in reflection shaped an educational paradigm widely used in current educational approaches (Center for Dewey Studies 2003). Reflection is intended to discover knowledge; moreover, reflective thought

can lead to appropriate action in the form of inquiry into the nature of knowledge (Dewey 1909:9).

The current study is embedded in Dewey's notion of thought where thinking is evoked by a problem which needs a solution (Dewey 1909:12). This idea is echoed by Hatton and Smith (1994:4) who state that reflection is a unique type of thinking aimed at solving problems. If the process of finding a solution involves searching for further confirmation through inquiry, reflective thinking occurs (Dewey 1909:13). According to Han (1995:228), Dewey believed that – to better understand reflection – the process and the content of reflective thinking should be seen as one. Han (1995:228) explains this union by pointing out that the process refers to how decisions are made, while the force driving the thoughts is the content. This content represents not only students' views, but also that of society and the educational context, a notion supported and more widely explained by Goff *et al.* (2000:46) (see paragraph 5.2.6). To situate Dewey's thoughts within this action inquiry, the researcher focuses on Dewey's statement that reflection is a deliberative process of seeking answers. According to him it is a process that has educational value (Dewey 1909:2) since it involves past experience and prior knowledge, to support underlying beliefs and knowledge.

5.2.2 *Schön's reflection model*

The term "reflective practice" was devised by Schön (1990:31). In his reflection model the author also strongly linked knowledge, thought and action. He described reflective practice as skills development through reflection and action. Schön initiated the idea of *reflection-in-action*, *reflection-on-action,* and *reflection-for-action*. Reflection-on-action occurs when the educator mentally analyses actions and events (Schön 1990:26) without immediate action. On the other hand, reflection-in-action was described by Schön (1990:26) as: "…our thinking serves to reshape what we are doing while we are doing it". Giovannelli (2003:293) explained this

in-action reflection as the reviewing of one's primary understanding of a phenomenon followed by the forming of a new perspective and immediate experimentation. And finally, *reflection-for-action* that guides our future actions (Yost, Sentener & Sally 2000).

Green (2006:6) clarifies *reflection-for-action* as the type of reflection that is used by the educator with no prior experience to reflect on prior knowledge. Green (2006:6) explains these processes as reflection-for-action, a process that starts to happen when planning a teaching event; reflection-in-action during the teaching act; and reflection-on-action when evaluating the event. Green (2006:3) recommends that, for reflective practices to be effective, not only the educator's own perspective should be considered, but also those of students and the teaching profession as such. These perspectives are described by the author as egocentric, which is the educator's own point of view; allocentric which is the student's viewpoint; and macrocentric which is the depiction of professional standards in general. These multiple perspectives can assist educators to understand the influence and the intricacy of making decisions about teaching (Green 2006:7).

The researcher puts the current action inquiry within the context of reflection-in-action as an exploratory probing intended to improve teaching practices, but not by means of scientific theories and concepts (Schön 1990:64-70). Whitehead (1989:45) also draws attention to the fact that during the "reflection-in-action" process the practitioner does not rely on traditional theory, but creates a new theory of the distinctive set of circumstances in answering the question: "How do I improve what I am doing?" (De Long & Whitehead 2006:1 of 22). This notion is supported by the works of Sparks-Langer (Goff *et al.* 2000:46) who created a reflective model that includes both the "beliefs" and "knowledge" dimensions of reflection as premises to advance teaching practices.

5.2.3 *Korthagen and Vasalos's ALACT model*

Korthagen and Vasalos combined three models to develop a structured reflection process. The first model is the ALACT model which is the acronym of the first letters of the five phases of the reflection process in teacher education. The phases are action, reflect on the action, awareness of critical parts, formulate different methods of action, and a trial period (Korthagen & Vasalos 2005:49). The second model that enhances the first is the "onion model" (Korthagen & Vasalos 2005:53), which deals with the contents of the reflection process (Korthagen & Vasalos 2005:67).

The onion model portrays the different levels that direct the way educators conduct themselves during a reflection process. From the outside to the inside the levels move from environmental to the levels of behaviour, proficiency, attitude, identity, and mission. This arrangement proposes that the inside levels determine the way an educator performs in the outside levels as well as the other way around (Korthagen & Vasalos 2005:53).

According to Korthagen and Vasalos (2005:54), the third model, namely the core reflection model, occurs if the educator enters the inner levels of mission and identity in seeking answers to the questions of what the ideal situation in education is and what prevents the attainment of such an ideal situation. This core reflection combines all the levels of reflection and forms the foundation for professional growth.

The phases mentioned as well as the search for the ideal situation in education were also taken up in this action inquiry. The main difference between Korthagen and Vasalos's model and the previous ones is that it focuses not only on thinking and acting, but also on feeling and wanting which does not necessarily entail analysis based on reason. Korthagen and Vasalos (2005:68) consider the emotional side of human behaviour an important part of reflection and decision processes in educational

environments. This emotional side of reflection forms the core of the phronesis model described in the following paragraph.

5.2.4 *Birmingham's phronesis model*

The phronesis model of Birmingham (2004:313) is based on the very old idea of virtue and blends wide-ranging perspectives of reflection into a logical pattern. Birmingham mainly based her model on perspectives held by Aristotle (384-322 BC), namely that phronesis based on truth includes reason and action about what is agreeable to humankind. Her model links reflection to the old ethically desirable quality phronesis by including present-day work on reflection in teaching with theoretical work on phronesis. Birmingham explained the expression "phronesis" as the discretion to apply "general principles in particular situations". Birmingham (2004:317) claims that earlier ideas of reflection considered ethical connotations but have failed to claim that reflection is in essence of ethical value. The phronesis model mainly differs from the previous models in that it does not claim to be a "process of thinking or a way of knowing" but knowledge, based on educational theory. The author does not see this educational theory as simply applying an educational theory, but she acknowledges the intricacy of educational situations. The phronesis representation further places reflection in the context of a definite time and place connected to definite actions and people.

All previous models take account of thought, reflection and action, a process that ultimately leads to the creation of knowledge. In this action inquiry the reflection was deliberate, the content was the students' perspectives and action was taken to improve current teaching practices through the knowledge gained to meet the educational needs of the students. However, since the character or personality of an educator, the subject knowledge and teaching practices are also closely linked, the researcher finds the reflective teaching model adapted from the works of Colton and Sparks-Langer (1993:47-48) a useful frame to identify with

these interactions of practice (doing), disposition (being), and professional knowledge (knowing). A short description of the model will clarify its value in the study.

5.2.5 *Colton and Sparks-Langer's model*

Colton and Sparks-Langer's model focuses on teacher reflection (Colton & Sparks-Langer 1993:47; Goff *et al*. 2000:46) and consists of three dimensions, namely action, knowledge and disposition. The action dimension of the model includes the "doing" dimension of the educator. It is a cyclical process leading to the creation of meaning. According to Colton and Sparks-Langer (1993:49), meaning is created when the educator collects, analyses, reflects and acts on information gathered through inquiry. This part of the model shares the views of Dewey (1909:12) and also encompasses the four stages of experiential learning developed by Kolb, namely concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Colton & Sparks-Langer 1993:49; Kuit *et al.* 2001:132; Atherton 2005b:1 of 7). The researcher realised the value of Kolb's learning cycle in this model, since academic instruction was the concrete experience while reflecting on the experience led to transformation and at the end, knowledge construction.

Within the knowledge dimension, the model includes five types of knowledge, the supposed "knowing" dimension, concerning knowledge of self as educator; knowledge of content; knowledge of teaching and learning; knowledge of students; and knowledge of the context in which education takes place. The authors emphasised on the fact that these knowledge areas are crucial for a professional life as an educator (Colton & Sparks-Langer 1993:47). These dimensions also surfaced in this action inquiry, namely the area of knowledge of oneself as an educator, which is an awareness of one's strong and weak points. Knowledge of teaching and learning and knowledge of students are also seen as attributes important for educators. These knowledge areas address teaching and

learning theories in general and include, among others, the use of reflection to improve teaching and the knowledge of students' learning preferences or learning styles. Knowledge of higher education in societal contexts is the sixth knowledge area of importance to educators.

The disposition or the ''being'' dimension of Colton and Spark-Langer's model includes qualities believed critical to professional development (Goff *et al*. 2000:45). The model takes account of social responsibilities that include the moral and ethical side of teaching; caring which is the positive relationship with students; efficacy which refers to the belief that one's efforts will make a difference; while consciousness is the thinking about one's own thinking; and, lastly, flexibility is the ability to use a variety of teaching and learning activities to fit the diverse needs of students (Goff *et al.* 2000:46). This model also accentuates the complexity underlying teaching and learning in South African higher education because of our diverse student populations, an issue also addressed in the study as a whole.

6. RESEARCH DESIGN AND METHODOLOGY

The information needed to answer the research questions came from a number of data sources which all provided an insight into a way to continue improving teaching practices. The researcher realised that reflective practice could provide a great deal of information, but a good starting point was to reflect carefully on what information might enable the researcher to refine teaching theories and/or adjust teaching practices. Two issues determined the course of reflection, namely the various reflection models explored in the literature and the research questions. Restating the three research questions which directed the action inquiry, will both inform its value in explaining the research design and also support the reason for using a specific reflective qualitative data source.

The questions ask first if reflective practices can confirm effective teaching, second if they can improve awareness of students' needs, and third how reflective teaching can develop or contribute to professional growth.

There are various methods that can be used in reflective teaching, namely action learning, portfolios, questionnaires, journal keeping, and critical incident analysis (Hall 1997:3-4 of 9; Kuit *et al*. 2001:130). The data sources used in the study mainly focus on student feedback, since student responses that include opinions and perceptions about the impact of teaching and learning can add a significant perspective to teaching practices. The study was undertaken in the radiography learning programme at the Central University of Technology, Free State (CUT). The target group, a convenience sample, included 26 second-year students from the programme Diagnostic Radiography at the CUT in the learning unit Radiographic Practice II (RAD 20 at) in 2006. The group was composed of four males and 22 females with a mean age of 20 years. All students participating in the study gave informed consent and student anonymity was ensured. Each of the data sources used during the study is described and a justification provided for using each as part of the action inquiry. In addition, the linkage of each reflective data source to a reflective model described in previous paragraphs will be explained.

6.1 Data sources

The inquiry includes an LPI, a questionnaire survey, a TAP, a CIQ, and the one-minute test ("stop, start, and continue") to formally investigate students' experience with the modules that the researcher teaches. The comments and findings about these tools are based on the researcher's own experiences and understanding of their use in the diagnostic radiographic learning programme at the CUT in 2006. Areas of concern were the students' learning preferences, factors that enhance or obstruct learning, academic skills development, and attitudes towards new teaching

and learning strategies during academic instruction. The purpose of the data sources was explained to the participants and anonymity assured throughout.

6.1.1 *Learning preference inventory*

Although the effect of the instructional environment to enhance or obstruct learning for students has received wide attention in educational research, no single teaching strategy or particular way of instruction was found to be optimal to improve learning for all students (Rollins & Scanlon 1991:48).

The manner in which students learn is varied and is related to differences in personality. It also changes in different situations and at different times. These patterns have been labelled as "Learning Styles", "Learning Strategies", "Learning Preferences" and "Approaches to Learning" (Wigen, Holen & Ellingsen 2003:32). As early as 1969, Cronbach and Snow (1969) in Keri (2002:433) proposed that differentiating or adjusting teaching to the needs of students improves students' academic achievement. They argue that teaching methods place varying demands on students and affect students' learning in many different ways. These findings strengthen those of Gully, Payne, Kiechel and Whiteman (2002:152) and of Johnson (2006:38), who found that failure to consider individual differences when designing education programmes may lead to less positive outcomes. To strengthen the possible approach to diverse students, Growe, Schmersahl, Perry and Henry (2002:206) call on higher education to build on and acknowledge cultural diversity and to make sure that educators accommodate the learning styles of diverse multicultural student populations.

Furthermore, since students have different learning styles, Vaughn, Del Rey and Baker (2001:40) state that educators must use a range of active learning strategies, because students need a variety of teaching methods to encourage learning and to address the different learning approaches.

The authors found in their survey at a medical school in Cincinnati that learning experiences, teaching styles, and the way in which information is managed determine the learning styles students use. Most important is the fact that the preferred style can change, especially when the student is exposed to changing teaching styles.

Research into learning preferences demonstrated that individuals differ in their preferences and approaches to learning. Knowledge of students' learning preferences informed the researcher about the effective use of teaching and learning strategies. This knowledge allowed adjustment of unproductive methods and the reinforcement of beneficial ones (Kelly 2005:2). Consequently, if academic instruction is tailored to complement students' learning preferences, learning could be more effective, a notion supported by Bohn, Rasmussen and Schmidt (2004:42) and Rollins and Scanlon (1991).

The importance of accommodating student diversity and differences in learning preferences urged the researcher to first of all determine the students' preference for instruction methods. The LPI developed by Rezler was used to identify preferences. The LPI reflects preferences for learning situations and conditions. Each item consists of six words or sentences to be ranked one to six. Each item contributed to different preferred learning situations and divided into contrasting scales on three dimensions, namely abstract/concrete, individual/interpersonal, and student-structured/teacher-structured (see Table 1).

Table 1: Learning preference characteristics

Learning situation	Characteristics
Abstract	Preference for learning theories, principles, and general concepts, hypothesis generation and testing.
Concrete	Preference for learning specific, tangible information and skills; practical application.
Individual	Preference for learning on one's own; emphasis on self-review and research.
Inter-personal	Preference for learning in groups and with others; values interaction with fellow students and with educators.
Student-structured	Preference for learning via student-organised and self-directed tasks; values autonomy and self-direction.
Teacher-structured	Preference for learning that is directed by the educator; learning goals that are directed by the educator.

Source: Steele, Johnson, Jodi, Thomas, Lacy and Duffy (2002:227)

All the students in the study completed Rezler's LPI (Rezler 1974). The LPI results demonstrated dominance in preference for a concrete as well as a teacher-structured learning environment.

6.1.2 *Questionnaire survey*

The questionnaires were distributed in class and the researcher was present to help clarify ambiguous questions. The students were asked to indicate their perceptions of how successful or effective various teaching methods were in respect of their own learning. The questions, which required "yes" or "no" answers only, provided information about participants' experiences related to learning. The use of a yes/no answer was decided upon in order to encourage a more objective approach to assessing the effectiveness of the different teaching strategies on the students' own learning. Although it was expected that the students should

refer to the effectiveness of the strategies, students' preferences could also have influenced their feedback. The possibility that underprepared students are not able to evaluate the effect of different teaching strategies should also be considered here. The responses to the closed questions were quantified and analysed by means of Microsoft Excel.

The questionnaire was designed to determine which factors could improve academic performance. The questionnaire contained a biographical section, eliciting responses regarding demographic variables such as gender, age, and home language. For the remainder of the questionnaire participants had to indicate the extent to which the educator played a role in increasing academic performance and how specific teaching and learning strategies influenced their learning. Results indicated that the factors contained in the questionnaire affected learning in one way or another. Table 2 provides a list of strategies that were reported that significantly improve academic performance.

Table 2: Strategies that improve academic performance

Questions	Yes	No
1. Formal lectures without student participation	5	21
2. Independent self-study	10	16
3. Lecture interactive activities in class	25	1
4. Group activities	20	6
5. Independent individual activities	20	6
6. Fellow student presentations	12	14
7. Individual assignments	22	4
8. Group assignments in class	19	7

It was clear that the majority of the students preferred an interactive education approach to formal lectures. The questionnaire results showed that students were receptive to this method of instruction and therefore found these interactions good at stimulating their learning interest. The

questionnaire also asked the students if they knew what learner-centred learning entailed. Ninety-two percent of the students indicated that they had no idea, while the 8% who indicated that they knew, saw self-study as an example of learner-centredness. In reply to questions about whether they were prepared to take responsibility for their own learning and to study independently, 85% responded positively. On the other hand, 81% of the students indicated that they would feel more comfortable if the educator guided self-study. Forty-six percent felt that the educator was responsible for their academic performance or success.

The questionnaire also prompted the group to reflect on the role the educator played in increasing their marks. The majority of the students, varying from 88% to 96%, specified that the educator could increase their academic performance by playing an active role in the learning process, providing information, supplying notes and guiding and structuring self-study. These factors that influence learning all share an active, interactive and teacher-centred perspective and decidedly support the use of interactive and educator-guided over passive, lecture-centred strategies. The findings were in agreement with the results of the LPI, which indicated that the students preferred a concrete to an abstract and a teacher-structured over a student-structured teaching strategy. These findings determined the way academic instruction was approached. The LPI and the above-mentioned questionnaire survey were done only once while the following three data sources were surveyed on an ongoing basis.

6.1.3 *The critical incident questionnaire*

The CIQ is seen by various researchers as a valuable tool to determine how students experience their learning and how they perceive teaching in general through "critical incidents" (Brookfield 1995:114). In addition, if students actively share perspectives and experiences they can build the educational environment to fit their needs (Adams 2001:1). The construction of knowledge that leads to learning is caused, among others,

by students asking questions. Thus the intention of using questions was to facilitate thinking – in this case, the thinking about academic instruction that enhances or obstructs learning. The CIQ, developed by Brookfield (1995:114), was used to incorporate these questions and perspectives into the module under investigation. The CIQs were used to provide frequent, anonymous chances for students to reflect on their experiences in class by means of critical incidents. The students had to respond on their reaction to classroom actions and/or activities or anything else that happened or occurred to them.

The CIQ consists of five open-ended questions that ask students to reflect on their experiences during academic instructions. The CIQ's questions were included after changing them to fit the needs of the module under investigation. The questions probed the students to respond to actions in class that most engaged, distanced, helped, confused or surprised them. The following questions, adapted from the CIQ of Brookfield (1995:115), were included:

- At what point in the lecture today/or any lecture did you feel most engaged with what was happening?
- At what point in the lecture today/or any lecture did you feel most distanced from what was happening?
- What action that the lecturer[11] took in this lecture did you find most affirming and helpful?
- What action that the lecturer took in this lecture did you find most puzzling or confusing?
- What about the lecture today/or any lecture surprised you most?

6.1.4 *Teaching assessment pole*

The third data source, namely the TAP, consists of only three questions. The TAP questions invited the students to reflect on either actions that most helped them to learn or which for the most part obstructed their

[11] Higher education educator.

learning. It was also expected from them to make suggestions for improvement.

- What most helped you to learn in this class?
- What impeded/obstructed/hampered your learning?
- What suggestions do you have for improvement?

6.1.5 *The one-minute test*

The one-minute test ("stop, start, continue") provided an opportunity for students to give their opinion on academic instruction on a regular basis. The purpose of the test was therefore to explore areas that were overlooked by the other data sources as possible teaching practices that could be adapted to fit the needs of the students. The responses were found very useful in helping the researcher to improve class understanding and, ultimately, the way she taught.

At the end of the class the purpose of the one-minute test was explained and anonymity was once again assured. Sheets of paper with a picture of a robot with the words "stop", "start" and "continue" were handed to each student. It was expected of the students to reflect on the actions in class and write a comment next to each word.

6.2 Analysis of the data sources

These collected TAPs, CIQs and one-minute tests were read and answers summarised under the different questions. These answers were then categorised according to similar responses and specific patterns were searched for. Since the feedback occurred on a two-weekly basis, the students tended to react and reflect on recent issues encountered during specific contact sessions. The feedback provided valuable insight into the students' preferences and needs and also emphasised that experiences differ from student to student.

The overlapping questions of the three surveys allowed the identification of specific areas of concern and also triangulation of the feedback to make it more reliable. The triangulation not only confirmed certain patterns, but also validated findings through revealing common issues which the students experienced as positive or negative actions in class. These data sources revealed that practical demonstration and examples, the visual images of PowerPoint shows and the provision of structured information, together with the use of concept maps, most helped the students to learn in class. Learning was mainly obstructed by long sessions because difficulty was experienced in keeping up concentration levels. Suggestions for improvement included that all lectures should include practical demonstrations and that regular mind breaks should be built in to improve concentration.

During the one-minute test survey most students commented in the “stop” area that too much knowledge or information was included in one contact session. The investigation into what should be continued correlated well with the findings of the CIQ and also revealed that practical demonstrations, PowerPoint visuals and structured handouts should be maintained. In the “start” area, the students suggested that more interaction should be pursued. This finding corresponds with that of the questionnaire survey in which the majority of the students indicated that they preferred an interactive education approach (see paragraph 6.1.2).

6.3 Reflection on feedback

The next phase in the process of reflective teaching was to reflect on the feedback. The researcher looked for specific reasons that caused students to feel distanced, for example going through the learning material too fast or providing information without interaction and not giving outcomes and learning tasks in advance. These findings led to changes to fit the needs of the students.

As certain patterns became obvious during the observation phase, the researcher became aware of aspects of her teaching that the students experienced as negative. The fact that the researcher took it for granted that all students prepared for class resulted in the fact that only key concepts were touched upon during academic instruction. The students perceived this as going too fast through the learning unit and conveying too much information. These findings led to changes to fit the needs of the students. The weekly outcomes of the CIQ, the TAP and one-minute test were discussed and corrective measures built into teaching actions in succeeding weeks. These measures include providing handouts two weeks in advance, making time for collaborative learning through group activities in class, providing guided self-study units and facilitated web-based activities as well as more structured group activities which encouraged everyone to participate equally.

6.4 Responding to feedback

The fourth phase in the “doing” dimension was to act upon students’ responses once the feedback was analysed and reflected on. At the start of the week students were informed about the most prominent issues that had emerged from the surveys the previous week. Teaching/pedagogy changes as a result were discussed and, where appropriate, motivated or negotiated. The researcher also used the feedback time to explain the use of certain non-traditional teaching strategies and the potential benefits they held for improved learning, for example self-directed activities and group work.

It was not possible for the researcher to react on all issues raised, but the opportunity to give feedback provided a chance to explain the reasons for not being able to react or change. These feedback sessions also offered time for discussion which facilitated the reinforcement of certain teaching strategies the students perceived negatively.

The academic instruction changes that flowed from perspectives gained from the action inquiry included a more pragmatic application of learning strategies during academic instruction. Teaching strategies were developed to include the proactive use of practical demonstrations and application, tangible information and skills, as well as learning tasks and learning goals that were guided by the educator. A more interactive way of learning through collaborative learning was also pursued.

The students' responses not only provided an insight into what they perceived as constructive to their learning, but also that their perceptions were diverse. The researcher realised, in accordance with Adams (2001:2), that the CIQ provided for the most part an opportunity for students not only to construct knowledge, but also to actively shape the education environment to fit their needs. The advantages the researcher experienced in using these data sources were that they provided first of all a platform for both the researcher and the students to reflect; the students used the data sources to convey their point of view and express their needs, while the researcher used the opportunity to reflect on the feedback and acted in response in an effort to improve teaching and learning during instruction. Second, the data sources offered confirmation that specific teaching and learning strategies were positively perceived, for example the practical demonstration, structured interactive activities and the use of tables and concept mapping as note-taking techniques. Third, after communicating measures of improvement as a consequence of the students' responses, a positive attitude developed which became evident in the students' responses in later surveys. The initial CIQs included some critical and offensive answers, while later responses included mostly personal reflection on how learning could be improved through collaboration.

7. DISCUSSION

This action inquiry allowed the students to communicate their perspectives and needs with regard to teaching events and their resulting impact on their learning. Reflective teaching provided valuable information on constructive classroom conduct. It caused a better understanding of the learning process and, in addition, contributed to the fact that the researcher could shape teaching and learning to the students' requirements. This process not only allowed informed choices to be made, but also enabled the justification of teaching and learning alternatives. In relating teaching theory to teaching practice and the feedback from students, the researcher also realised during the reflective practice cycle that students are diverse in their expectations or perceptions of what comprise good teaching; good teaching in the sense of instruction actions that enhance or impede learning.

In building a culture of inquiry through reflection to increase the probability of successful teaching and learning[12], reflective teaching was also found worth doing because it forced the students to become active participants in the learning process. The reason for this is that inquiry is at all times an active course and is seen by Tripp (2003:15 of 19) as action learning, a process he explains as "…doing something one wouldn't otherwise do in order to learn from doing it". The students were engaged as collaborators in the action inquiry into reflective teaching and were thus encouraged to think for themselves about their own learning. Increased motivation on the part of the students was also a positive experience. Considering their views and involving them in decisions caused this increased motivation as well as an improved level of conversation between the researcher and the students. These increased levels of motivation and conversation led to a more positive attitude towards student-centred learning education practices.

[12] Successful learning refers to the achievement of expected outcomes.

The researcher is aware that using an action inquiry into reflective teaching as a means for improving teaching practices and, ultimately, professional growth relies to a great extent on identifying the quality of the inquiry as well as the desired end. To validate the quality of the inquiry the researcher looked into the three levels of reflection presented by Van Manen (1977:226). Van Manen's levels of reflection are a technical, practical and critical level. The critical level entails justice and equity as ethical standards of education practices and determines the quality of the inquiry (Hatton & Smith 1994:5). Van Manen (1995:33) proposes that teaching is not only directed by effectiveness but also by ethical or affective disposition. The critical level is linked to the reflective model of Colton and Sparks-Langer (Goff *et al.* 2000:46) that forms the basis of this action inquiry. The disposition dimension of the model, which includes the social responsibility that embraces the moral and ethical side of teaching, thus confirms the quality of the inquiry because this action inquiry into reflective teaching is fundamental to the inclusion of student diversity and embraces a willingness to adjust instruction practice in the pursuit of individual learning.

Valuable insights were gained through this action inquiry. Perspectives gained could be used to support students during academic instruction to learn better – in other words, to become academically skilled. In answering the two research questions, namely whether reflective teaching can improve teaching practices and contribute to professional growth the researcher investigated instruction practices aimed at supporting learning and developing academic proficiency, a knowledge base that is formed because of reflection.

To claim that professional development took place as a result of the action inquiry the researcher had to validate the claim by using the criteria put forward by Whitehead (1989:44). These criteria require that:

- the action inquiry is performed systematically;

- the claim that knowledge is constructed is evidently justified; and
- proof of a critical approach to an educational problem exists.

The three criteria used as benchmarks for professional development are further supported by Henderson's claim (1996) that reflective teaching brings out an ethic of caring, directs constructivist teaching, and resolves problems. Validation of these criteria receives attention in the ensuing paragraphs.

8. PERSPECTIVES ON REFLECTIVE TEACHING

The researcher embarked on reflective teaching as an action inquiry because Richards and Lockhart (1994:4) claim that experience in teaching is not enough for professional development to take place, since most educators teach the way they were taught. The authors claim that when information about teaching is used as a foundation for critical reflection, this critical element leads to professional development. Richards and Lockhart (1994:202) further suggest that professional development will take place if the educator learns through self-inquiry and that critical reflection on attitudes, beliefs, assumptions and teaching practices will lead to a better understanding of teaching. This better understanding of teaching inevitably leads to professional growth. Swain (1998:30) supports this notion in stating that reflection advances professional development, since the reflection determines our thoughts, ideas, and beliefs, shaped by our experiences in making mistakes or reaching success.

Reflective teaching is seen by the researcher as the process in which thought determines change – the intended change in the current action inquiry is to improve the quality of teaching along the shortest possible route from the ineffective to the effective or preferred end. Parker (1997:10) points out that the process of acting on information received to

reach specific teaching outcomes is depicted as well-judged behaviour, which he calls rational teaching. Parker explained rational teaching as a quantitative process that involves observation, data gathering, analysis and the intention to reach a desired end. This course of action was also followed in this action inquiry with the desired end result of effective teaching and professional development, a process that adheres to the criteria that require that the action inquiry be performed systematically and based on reason.

In validating the claim that knowledge should be constructed and justified, the researcher depended on the experience gained by this action inquiry which falls within the "pedagogical tact" described by Van Manen (1995:39), who states that reflective teaching allows an understanding of “the nature of the experienced reality of teaching” when interacting with students, which does not necessarily entail the development of a new knowledge base. However, this action inquiry contributed to developing a metacognitive awareness within the researcher’s own educational environment, since the feedback on the success or failure of teaching methods and strategies led to the gaining of knowledge about the students’ perception of what instruction methods or actions most facilitated or impeded their learning. The researcher thus developed a knowledge base in two areas, namely how students learn and how to assess educational events. This substantiates the construction of knowledge required by the criteria for professional development put forward in the previous paragraph.

To prove that a critical approach to an educational problem exists, the researcher relies on the purpose of this action inquiry, which was to look into academic instruction practices by means of reflective teaching to identify negative or positive actions that advance or obstruct learning. The purpose was therefore not necessarily to address a specific problem but to observe and refine instruction practice in general. It may be argued that a

professional in education implies specialist tuition in how to produce learning (Parker 1997:11); however, since not al educators in higher education have undergone this special training, reflective teaching can assist in reaching the overall goal of the study, namely effective teaching and the development of professional teaching skills. Thus it may be argued that proof of a critical approach to an educational problem does exist.

9. CONCLUDING THOUGHTS

This action inquiry into reflective teaching allowed the researcher to realise the power of reflection, because the process of learning through experience enabled her to first of all make informed decisions about appropriate instructional practices. Reflective teaching also allowed her to take both the needs of students and those of herself as educator into consideration, since the reflection took part in both the researcher and the students. In addition, by exploring, evaluating and modifying teaching practices as well as seeking reasons for specific behaviour she was able to establish a practice of reflective teaching and also to discover her own teaching philosophy.

The researcher started with an initial theory of teaching and learning, based on personal experiences as a student, reading educational material, and formal educational training. This theory entailed the perception that all students in higher education know how to learn, are motivated, self-regulated, use specific study skills and learn independently. During the process of the action inquiry into reflective teaching the researcher applied this theory during academic instruction, observed and reflected on the results, and ultimately had to change the theory.

The aim of this action inquiry was first and foremost to improve the researcher's own teaching practice and to advance professional development. Although both these aims were met, the researcher was also able to create her own living educational theory. To better understand the concept of living theory, the researcher identifies with the explanation provided by De Long and Whitehead (2006:19 of 22), namely that a living educational theory is an account of one's educational influence on one's own learning and the learning of others. As a result the theory born from the perspectives gained is that any action taken during academic instruction, to be of normative significance, should have productive pedagogical value and positive consequences for learning. To situate this action inquiry into reflective practice within the study as a whole the researcher claims that reflective practices have the potential to improve teaching competence, a gain that will ultimately lead to improved student learning.

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THE PHENOMENON OF UNDERPREPAREDNESS: SHARED PERSPECTIVES

Higher education can do nothing more important and more difficult than helping the underprepared achieve educational parity

(McCabe 1999:8).

Abstract

The research presented in this article is concerned with understanding underpreparedness, a phenomenon which is inextricably intertwined with the current South African higher education dilemma of poor throughput and high attrition rates. This article, based on descriptive-exploratory research, aims to disclose perspectives on underpreparedness experienced by higher education institutions in South Africa and in other countries. The article focuses on what is meant by underpreparedness, factors contributing to underpreparedness, the domains of underpreparedness, and conditions intensifying underpreparedness. These four focus areas were in the first place investigated by means of a literature review to capture existing knowledge and research and, in the second place, by a questionnaire survey and structured interviews. This empirical investigation represents the opinions of 41 (nine international) experienced higher education practitioners from various relevant disciplines. Thirty-two completed an extensive questionnaire and nine participated in in-depth interviews. The responses and interpretations of the participants on the phenomenon and domains of underpreparedness provide an opportunity for diverse perspectives to be captured. These perspectives could become a basis not only for the intended learning facilitation framework (the study as a whole), but also for future research or initiatives to improve teaching and learning.

1. INTRODUCTION

An increase in the number of students enrolled in remedial, developmental and extended curriculum programmes and the rising dropout rates worldwide are signs that a growing number of underprepared students are entering higher education. In South Africa these phenomena could be ascribed to the implementation of open access admissions policies over the last decade in an effort to address past inequalities related to the apartheid regime. In addition, the Education Minister, Naledi Pandor, in briefing the media in April 2006 indicated that it was expected of higher education institutions (HEIs) to admit more students in science programmes in an effort to bridge the skills gap in South Africa and contribute to the Accelerated and Shared Growth Initiative for South Africa (ASGISA) (Pandor 2006:1 of 1). This open or increased access resulted in student populations with more diverse socio-economic backgrounds, demographic characteristics, academic skills, and academic preparedness.

1.1 South African underpreparedness in context

The joint SAUVCA-CTP Higher Education Admissions Project (SAUVCA 2003:3) by the South African Universities' Vice-Chancellors' Association (SAUVCA) emphasises the necessity of HEIs to respond to this increase in heterogeneous student populations, especially since the majority of South African students are underprepared for higher education. This project reported on the extent of underpreparedness revealed by the 1999 Third International Mathematics and Science Study (TIMSS) and the National Assessment of Educational Progress (NAEP). These tests, which grade ability levels in mathematics, science, reading and writing, indicated that – of the 38 countries that took part – South Africa attained the lowest proficiency scores. To draw attention to the seriousness of underpreparedness, these tests predicted that 69% of the students entering HEIs in South Africa would not be prepared to successfully cope

with the academic demands of higher education studies (SAUVCA 2003:25). Although underpreparedness is recognised, the extent thereof is not understood well enough to enable higher education educators to counteract it (Wood in SAUVCA 2003:25; Paredes 2007:2 of 3). Low levels of academic performance and unsatisfactory throughput rates suggest that the responses to the teaching and learning needs of the underprepared student are not sufficient.

HEIs, specifically in South Africa, thus face unique challenges to identify initiatives to support students underprepared for higher education. In addition, HEIs have to provide evidence of these initiatives to comply with institutional audits of the Higher Education Quality Committee (HEQC). The HEQC is authorised by legislation to not only advance quality and quality assurance (QA), but also to improve teaching and learning in higher education. In addition to its aim to improve teaching and learning, the HEQC recognises the multifaceted association that exists between improvement and accountability (CHE 2004:6).

Moreover, in commenting on the report *Accountability for Better Results: A National Imperative for Higher Education*, presented by the National Commission on Accountability in Higher Education, Manzo (2005:2) states that "…universities must create new and more responsive ways to hold themselves accountable for student success…". The researcher, a higher education educator at an HEI, responds to this statement by conducting an empirical survey that discloses factors associated with underpreparedness. By recognising these factors, an attempt to mitigate factors contributing to academic failure as a result of underpreparedness can be made and therefore be seen as an initiative towards accountability. The researcher realises that underpreparedness as a contributory factor of the high failure and dropout rates in higher education is complex. For this reason, the investigation aims to look at underpreparedness from multiple viewpoints, reflecting the perspectives of educators and practitioners in

higher education on a national and an international level. Looking at the perspectives on both these levels could establish the South African debate on underpreparedness within a broader context.

1.2 Orientation to the investigation

This article is based on descriptive-exploratory research and aims to disclose perspectives on underpreparedness experienced by HEIs in South Africa and in other countries. The various interpretations, dimensions, and perspectives derived from the research form the foundation of a broader study, which is to develop a learning facilitation framework to scaffold underprepared students' academic skills development. The attempt to develop a better understanding of the complexity of underpreparedness will also form a starting point for planning and applying academic interventions in the classroom to change teaching for the better, and – in the end – to improve effective learning (the focus of Articles 4 and 5). The research thus provides an opportunity for capturing diverse perspectives on underpreparedness. These could become a basis for not only the intended framework, but also for future research or initiatives to improve teaching and learning effectiveness when dealing with underprepared students.

The purpose of this article is therefore to present the shared perspectives of a target group of higher education educators and practitioners on underpreparedness. Exploring these perspectives creates an awareness and understanding of how these educators perceive underpreparedness and how to take advantage thereof to attend to the academic needs of the underprepared student. Underpreparedness and academic failure are terms that are often encountered together in higher education discourse. The focus of this article, however, is on underpreparedness, which will receive wide attention in the ensuing paragraphs.

Within the scope of this article, the researcher presents the findings of four focus areas related to underpreparedness. These areas are:

1. What is meant by underpreparedness?
2. Domains of underpreparedness.
3. Factors contributing to underpreparedness.
4. Conditions intensifying underpreparedness.

The next section details the research methodology employed. The findings are then discussed and presented in juxtaposition with the literature on underpreparedness. The article concludes by considering the possible implications and applications of the investigation.

2. RESEARCH METHODOLOGY

In this investigation a survey comprising a questionnaire in conjunction with semi-structured interviews was used. The reasons for using both methods were first to delve more deeply into the understanding of underpreparedness and, second, to validate the findings through triangulation.

2.1 The questionnaire survey

The questionnaire focused on key issues pertaining to student underpreparedness identified in the literature and supported by the responses to a pilot questionnaire. All questions prompted respondents to share their perspectives and experiences concerning students' underpreparedness for higher education (see Appendix A).

The target group (a purposeful sample) was identified during the period of 2003 to 2006 on local, national, and international educational conferences attended by the researcher. This included the South African Association for Research and Development in Higher Education (SAARDHE), the

South African Association of Health Educationalists (SAAHE), the American Association for Higher Education (AAHE) and the Higher Education Research and Development Society of Australasia (HERDSA) conferences. Inclusion was based on the field of interest and the expertise of the presenters revealed by the focus and content of their research papers presented during the above-mentioned conferences. Where possible, the researcher personally recruited these presenters to participate in the study. The e-mail addresses of additional participants on the distribution list were obtained from the registrants' list provided during the conferences.

The e-mail message contained basic information, for example the reason why the participant had been selected; a reminder where appropriate of being recruited; and the value that the researcher placed on the participants' contribution. Ultimately, 32 questionnaires were completed by experienced higher education educators and practitioners. Of the 32 respondents, 23 (71.8%) were employed by South African HEIs – for example the Universities of Stellenbosch, Witwatersrand, Cape Town, Free State, Johannesburg, Rhodes, Nelson Mandela Metropolitan and South Africa (UNISA). Universities of technology included the Central University of Technology, Free State, and the Tshwane University of Technology. Five (15.6%) responses were received from Australia, two (6.25%) from institutions in America, and another two (6.25%) from institutions in Europe.

The respondents represented a wide range of educators and practitioners from various HEIs both nationally and internationally in terms of position in the academic community, the location of the HEIs, and the number of years' work experience in an academic environment. Disciplines and fields of specialty included education management, teacher training, educational psychology, curriculum policy development and management, academic

leadership development, educational research, rehabilitation psychology and learning support networking in academic staff development.

Although the questionnaire included a wide variety of issues pertaining to underpreparedness, this article focuses on the findings related to the four focus areas mentioned earlier. In order to find answers to these areas the following sections of the questionnaire are reported on:

- In the first section, namely what is meant by underpreparedness, respondents had to indicate the extent to which they agreed with the description/explanation provided for factors that could impede students' academic skills development and, ultimately, academic proficiency that might lead to underpreparedness for higher education.
- In the next section a response to the domains of underpreparedness was required.
- Factors contributing to underpreparedness were addressed next.
- The last section on conditions intensifying underpreparedness, prompted the respondents to indicate to what extent they agreed with statements that described conditions perpetuating or strengthening underpreparedness.

Since the questionnaire included closed as well as open-ended questions, both quantitative and qualitative methods to analyse the responses were used. The closed questions were analysed and summarised quantitatively by means of rate of recurrences (frequencies) and percentages. All numerical variables were summarised by mean and standard deviations. The responses to the open-ended questions were interpreted and condensed in order to categorise the most important themes. Certain issues were identified in the questionnaire as needing further qualitative exploration. The interview as research tool was therefore used to elucidate the qualitative feedback received.

2.2 The interview survey

The interview questions focused on specific issues identified by means of the feedback received from the questionnaire survey that qualitatively needed further exploration. The following open-ended questions captured these issues and provided the intended perspectives that were lacking in the questionnaire:

- What do you understand by underpreparedness?
- Which factors contribute to underpreparedness?
- What is the extent of underpreparedness at your institution?
- Can you distinguish types of underpreparedness at your institution?

The interviewees were chosen based on their involvement and expertise in specific levels of the educational environment which focused on dealing with the underprepared. Respondents selected represented educators and practitioners at two local HEIs from student counselling, remedial and developmental programmes, educators and practitioners whose educational research or expertise included the psychology of education or the improvement of teaching and learning practices. The number of interviews was not planned in advance; after conducting the interviews the researcher transcribed the feedback and evaluated if the desired aim had been reached, namely to obtain additional qualitative responses to the above-mentioned issues. After nine interviews, each approximately 40-60 minutes in duration, no additional information was gained, since the interviewees revealed largely similar perspectives on the specified issues.

To capture both the phenomenon and the dimensions of underpreparedness, perspectives associated with underpreparedness as experienced by the respondents of the two surveys were reported on and discussed. The findings from the two surveys were juxtaposed with a review of the relevant literature to situate the perspectives gained with

findings supported by research on underpreparedness covered in the literature.

3. DISCUSSION OF FINDINGS

Although responses to the open-ended questions were disappointing in terms of quantity, the quality of responses by those who provided additional feedback was particularly informative given the fact that the aim of the investigation was not generalisation, but gaining shared perspectives. Findings from both the surveys and the literature review are discussed according to the four focus areas that form the foundation of this investigation. This section mainly shares perspectives gained from the literature with an indication of the level of agreement from the respondents. These perspectives are then illuminated by opinions from the interviews.

3.1 Focus area one: What is meant by underpreparedness?

Although the student increase in remedial and developmental programmes might indicate an increase in underpreparedness, it is not a new phenomenon (Byrd & MacDonald 2005:22). The term "underpreparedness" is widely used in educational literature and represents a distinct group of students (Miller, Bradbury & Pedley 1998:104). In addition, Dzubak (2005:1) describes the "underprepared" as a diverse group of students with different levels of aptitude, and different educational and socio-economic backgrounds. The higher education underprepared student is delineated as the student who enrols with considerable academic and societal difficulty associated with academic failure (TSTC 2004:10) and weak academic skills (Anderson 2004:3).

Academic preparedness, which goes hand in hand with academic proficiency, entails a multidimensional concept that includes skills such as

the ability to read, write, take notes and take exams (Alliance for Excellent Education 2006:1 of 8), a notion supported by the findings of both surveys. In addition, it seems that academic achievement and academic competence are interwoven, since the possible attributes reported in the literature are similar (DiPerna & Elliott 2002:293). "Academic competence" is defined as a multidimensional concept consisting of learners' skills, attitudes, and behaviour contributing to academic success (DiPerna & Elliott 2002:293).

Miller *et al.* (1998:104) describe underpreparedness as the after-effects of a problematic educational past which is characterised by learning environments that inadequately prepared students to deal with the demands of higher education. It is thus evident that students start their studies academically unprepared for higher education for various reasons. The interviews relate underpreparedness to not coping in general. However, language proficiency and reading ability are especially problematic areas which frequently emerged during the interviews. These problem areas translate into an inability to understand complex text. A counselling psychologist interviewed was of the opinion that underpreparedness is twofold: first, in terms of lacking theoretical knowledge on what higher education expects from students to know at a certain level and, second, that these students lack certain basic skills because of environmental aspects and that, according to her, "they had fallen through the system and got where they are without the loopholes [having] been picked up".

Typical underprepared student groups are those students who enter HEIs directly after matriculation but lack, as previously mentioned, reading, writing, and mathematics skills. A second group is made up of re-enrolling students, a group that consists mainly of adult students who need to relearn academic skills. A third group reported on by the literature and most relevant to the South African higher education environment, includes

those students with inadequate English proficiency because English is their second and even third language, an issue that notably emerged as problematic during the interviews.

Different perspectives and experiences surround the phenomenon of underpreparedness within HEIs, which makes it a complex issue to investigate. Of the 32 respondents who had completed the questionnaire, 28 (87.5%) agreed or strongly agreed that the academic underpreparedness of students who enter HEIs is among the most troublesome problems in higher education. This viewpoint was supported by the 2003 SAUVCA-CTP Higher Education Admissions Project that estimated that 69% of students entering HEIs in South Africa are underprepared (see paragraph 1.1). Findings from the interviews conducted on the extent of underpreparedness varied from 40% to an indication that the majority of students were underprepared, especially on first-year level and in the natural sciences and mathematics. However, a value of only 10% was placed on underpreparedness in courses who dealt with students that underwent rigorous selection tests to gain access.

3.1.1 *Factors contributing to academic failure in underprepared students*

In this section of the questionnaire respondents had to indicate the extent to which certain factors contribute to academic failure. These results point to a number of key issues that emerged as significant contributors to academic failure in the underprepared. It is also worth noting that the standard deviations are fairly consistent throughout.

These results are dealt with quantitatively (most significant contributors to less significant) in Table 1 (1=no contribution to minor contribution, 2=average contribution, 3=major contribution, n=total number of responses, Mean=M, and s=Standard deviation).

Table 1: Responses on factors contributing to academic failure

Factors contributing to academic failure	Responses (%)			
	1	2	3	n
a. A lack of reading and writing skills.	3.3	23.3	73.4	30
b. Language barriers.	16.1	19.4	64.5	31
c. Employing a surface learning approach.	12.9	22.6	64.5	31
d. Lack of effective study skills.	-	41.9	58.1	31
e. Lack of intrinsic motivation.	20.0	23.3	56.5	30
f. Unable to understand complex material.	-	45.1	54.9	31
g. A lack of self-efficacy.	9.7	35.5	54.8	31
h. Dependence on teacher support.	16.7	33.3	50.0	30
i. A weakness in specific academic skills.	9.7	41.8	48.3	31
j. Ineffective management of study time.	6.4	51.6	41.9	31
k. Academic work overload.	30.0	30.0	40.0	30
l. A lack in behavioural self-control skills.	12.9	48.4	38.7	31
m. General aptitude (i.e. cognitive ability).	25.8	38.7	35.5	31
n. Lack of remediation opportunities.	23.3	43.3	33.4	30
o. Different learning styles not addressed.	33.3	33.3	33.4	30
p. Focus more on cultural/social activities.	10.0	63.3	26.7	30
q. Too large class size at HEIs.	20.0	53.4	26.6	30
r. Anxiousness in academic environment.	9.7	67.7	22.6	31
s. Circumstantial factors.	22.6	54.8	22.6	31
t. Psychological instability.	30.0	50.0	20.0	30
u. Lack of extrinsic motivation.	43.3	36.7	20.0	30
v. No guidance in academic proficiency.	28.2	83.1	18.7	32
w. Unrealistic future expectations.	36.7	50.0	13.3	30
x. Dissatisfaction with academic course.	45.2	45.1	9.7	31

The following factors were seen by the respondents as making a major contribution to the failure of the underprepared:

A lack of reading and writing skills (73.4%): Hardman and Ng'ambi (2003:140) and Miller *et al.* (1998:105) echo the potential negative effect on academic performance. This contributing factor as part of the academic domain was raised during the interviews as being especially problematic, since the lack of competency in the foundation skills of reading and writing also translates into inadequacies on post-graduate level. This underpreparedness reveals itself in the inability to work independently and the inadequate use of academic language.

Language barriers (64.5%): The group of respondents as a whole from South African HEIs saw the lack of language proficiency as a major contributor to the academic domain of underpreparedness. The majority of Australian respondents were of the same opinion, while the respondents from the USA saw language as playing only a minor role.

Employing a surface learning approach (64.5%): Although a two-thirds majority of the respondents quantitatively responded on learning approaches as a contributory factor, no additional qualitative feedback was received.

Lack of effective study skills (58.1%): The majority of the interviewees were of the opinion that study skills training early in the first year would support the underprepared to become academically better prepared. An interviewee from student counselling suggested that study skills should be integrated into mainstream courses, since the students were sometimes not willing to undergo study skills training because of the stigma attached to counselling. The other side of the coin is that educators lack the time and are not always knowledgeable enough to address the issue during academic instruction.

Lack of intrinsic motivation (56.5%): The effect of motivation as part of the emotionally underprepared domain was also identified by an

interviewee from the psychology education discipline. She indicated that survival, owing to unemployment and poverty, might become a higher priority than education, thus instilling in many students a lack in intrinsic motivation in general to achieve educational excellence. An American respondent (see paragraph 3.2.2) agreed with this statement and also indicated that the presence or absence of motivation could be cultural and/or socio-economically based. This notion is confirmed by Hebel (2007:A20) who stated that low socio-economic students in general are less expected to persist and succeed in higher education.

A lack of self-efficacy (54.8%): Lacking self-efficacy was not only seen as a concern leading to academic failure, but also as a major contributor to emotional underpreparedness (see paragraph 3.2.3). Self-efficacy was also considered by an interviewee in didactics as being self-disseminating, since students with high levels of self-efficacy perform better which, in turn, increases their level of self-efficaciousness, based on the notion that success breeds success.

An additional issue emerged from a different section of the questionnaire. The absence of supportive structures at HEIs often leads to academic failure in students underprepared for higher education. The respondents agreed/strongly agreed (77.4%) that this matter contributed to the problem in dealing with this phenomenon. Slonimsky and Shalem (2004:96) point towards the fact that many underprepared students in South Africa lack financial support and are thus burdened with social responsibilities disallowing them to make use of available support systems. The interview feedback on the other hand revealed that, although the benefits of referral for counselling are realised, educators in higher education are not always aware of the extent of support systems that exist.

The previous section was devoted to developing an understanding of underpreparedness in general. In considering the range of factors

contributing to underpreparedness and what was presented in earlier paragraphs, the above-mentioned factors emerged repeatedly in the literature as well as in the feedback from the two surveys. It also became obvious that there are specific domains of underpreparedness. In the next section, namely the second focus area, these domains will receive attention.

3.2 Focus area two: Domains of underpreparedness

The literature differentiates between three domains of underpreparedness (Robinson 1996:1 of 7). The questionnaire prompted respondents to indicate their agreement with these domains while, during the interviews, interviewees were specifically asked if they could distinguish types of underpreparedness at their institutions. Respondents in general agreed or strongly agreed with these three domains identified by Robinson, namely academic (89.7%), cultural (93.1%), and emotional (82.8%) underpreparedness.

3.2.1 *Academic underpreparedness*

Literature indicates that the academic domain of underpreparedness entails a combination of a lack in English proficiency, mathematical ability, and effective study skills (Robinson 1996:1 of 7). Moore (2004:1) confirms that underpreparedness in mathematics is a contributing factor in students' dropping out of HEIs. According to Miller *et al.* (1998:105), students adequately prepared for higher education show at least a basic mathematical ability. The authors also emphasise that mathematical competency is important in both the natural and social sciences, a skill that facilitates the understanding of key concepts.

Hardman and Ng'ambi (2003:140) put forward that students entering higher education do so with different levels of preparedness for engaging in academic text. Students who are underprepared for engaging in academic text are also not fully capable of engaging in academic tasks.

According to the authors (2003:145), these tasks entail, among others, the ability to construct meaning from text. The reason for this “textual” underpreparedness or inability to meet the linguistic demands of higher education is ascribed to a lack of opportunities or intervention on school level to develop such abilities (Hardman & Ng'ambi 2003:140). Miller *et al.* (1998:105) echo this textual underpreparedness and predict that underprepared students facing tasks in higher education that mainly involve text will experience immense difficulties in reaching the intended outcome. Miller *et al*. (1998:108) compared the academic performance of students in mathematics and English. Their findings revealed that English as a second language is not a direct causal factor of underpreparedness, but that it hinders the understanding of mathematical concepts, since these concepts are acquired through language.

Slonimsky and Shalem (2004:86) take the argument of textual underpreparedness beyond only identifying the problem, and point towards a developing tendency in the way that these students approach academic practice. The implications for this textual inability are that students present text assignments in a word for word manner without dealing with arguments. They describe rather that analyse and, in addition, these presentations are poorly structured and disorganised. These notions confirm the feedback during the interviews that postgraduate students also reveal a certain level of underpreparedness in dealing with academic text.

The results of a study done by Amey and Long (1998:3) verified the important role that English proficiency plays in the academic success rate of underprepared students. These results revealed that underprepared students who took part in developmental programmes that include English, reading, and mathematics courses reached higher levels of academic achievement than the students who directly entered main course programmes. In another section of the questionnaire, 90.3% of the group either agreed or strongly agreed that the language factor (that is,

reading/understanding complex academic material on a cognitive basis) could differentiate between students who are prepared for higher education and those who are not. This lack in language proficiency emerged several times during the interviews and is ascribed to the fact that in South Africa the educational system struggles with the many languages that are spoken and with English being the second language, as well as the fact that students find themselves in an electronic age where the reading and writing of text are becoming less important.

Study skills as part of the academic underprepared domain include the ability to acquire, record, remember, and use information. Raab and Adam (2005:93) put forward that underprepared and first generation students often lack effective study skills. The knowledge and use of effective study skills were seen by the group as a whole as contributing to academic proficiency and as being an important factor contributing to success among the academically underprepared.

3.2.2 *Cultural underpreparedness*

Students who enter university from a cultural environment that differs from that of a typical higher education institution are distinguished as the culturally underprepared (Robinson 1996:2). Cultural underpreparedness, as revealed by the two surveys, can be intensified if cultural differences are denied (i.e. cultural deprivation). Cloete and Moja (2005:708) state that it was found that especially black students find HEIs alienating. A different opinion was expressed by an interviewee within the discipline of psychology counselling, namely that white students tend to be more emotionally underprepared, since they are unable to cope away from home, which could also account for cultural underpreparedness. An interesting reaction from the same interviewee was that she had experienced that black students in some instances were intrinsically extremely highly motivated to excel, sometimes more so than their white

peers – a motivation that surpassed the effect of their emotional or cultural underpreparedness.

The majority of the interviewees was of the opinion that students' awareness of how they did or did not fit into the existing culture was alienated by the Western culture prevailing in higher education in which they experienced educators in higher education as unapproachable. A comment of one of the respondents captures the possible implication that such an approach might have if a deficient understanding of diversity prevailed: "The various cultural and linguistic capitals in the classroom need to be recognised as potential 'resources' … rather than 'problems'. If not, students are continually in a learning environment that is both alienating, as well as not engaging with various points of references".

According to Machet in Miller *et al*. (1998:104), a distinct correlation also exists between language and culture in the sense that an important setback for underprepared students in South Africa is that their cultural outlook, does not prepare them for the Western outlook generally prevailing in the academic environment. The reason for this is that any given information is placed in context with the known, which is the student's own experience placed in context of his/her own culture (Machet in Miller *et al*. 1998:104). According to an interviewee with experience in in-service teacher training, this lack of cultural preparedness is also exaggerated because students from a different cultural environment are forced into an academically Western-dominant culture where the curriculum is skewed towards a more Western approach.

Adding to the cultural underpreparedness is the fact that not all cultures value education as important (Torres 2006). An Australian respondent supported this opinion in commenting that Australian research has found that family/parental aspirations to study are the main factor that affects student desire to participate at university. Students may come from

middle to high-income families (for example parents who work in trades) who do not have high aspirations and it is these aspirations rather than income that influence students' decision to study. The following extract from a respondent from the Oklahoma State University in the United States of America not only echoes the aforementioned, but also captures the complexity of cultural underpreparedness:

> *The word that sums the lack of interest in their education by most students is "value". Education is not truly valued by students or society for the difference it can make in the lives of individuals and the community. Until a society places education in high esteem, it will not be a high priority for students and if it is not a high priority for students then most will not be motivated.*

This remark emphasises the multifaceted problem underlying cultural underpreparedness in a South African context as well. In agreement with the feedback from Australia and the USA, respondents during the interviews reported that not only the school system contributes to underpreparedness, but also socio-economic circumstances, which include parents who have no post-school qualification and do not value further education. The questionnaire responses supported this thought, since 61.3% agreed or strongly agreed that low socio-economic status/level, based on parents' income and education, tends to be an indicator for underpreparedness (see Table 3). This notion is supported by Tinto (2004:6) who reports that only 13% of low-income students are well prepared for higher education.

3.2.3 *Emotional underpreparedness*

The third domain relates to the emotional side of underpreparedness, which involves those students portraying, among others, a lack of self-efficacy and self-regulation. Santiago and Einarson (1998:178) explored potential predictors of academic self-efficacy during a graduate experience

project among science and engineering students and found that students who felt well prepared academically had significantly higher levels of self-efficacy than those who felt underprepared. The authors reflect on the seriousness of this finding by emphasising that HEIs should keep in mind that the academic environment that exists on programme level might impact heavily on the success of these students.

Respondents agreed that a lack of self-efficacy leads to emotional underpreparedness, which is in line with Santiago and Einarson (1998:163), who posit that self-efficacy emerged as a major predictor of preparedness in their research. These authors define self-efficacy as the students' beliefs about their performance capabilities and expound on self-efficacy by stating that outcome expectations are a typical part of self-efficacy (1998:166). Self-efficacy is further regarded as learners' beliefs about their performance capabilities in a specific context, task or domain (Gully, Payne, Kiechel & Whiteman 2002:147; Kitsantas 2002:103; Linnenbrink & Pintrich 2003:120; Dunlap 2005:65). In addition, higher levels of self-efficacy correlate with higher levels of cognitive strategy, together with higher levels of self-regulation and hence academic achievement (Cavallo, Rozman & Potter 2004:289; Kitsantas, Reiser & Doster 2004:270,284; Kitsantas & Chow 2007:383).

Helms (2005:7), in focusing on the academic experience of first-year students, suggests that if knowledge is structured by means of direct instruction, observing and exploring, it serves as a forerunner to the development of self-efficacy and ultimately leads to higher levels of preparedness. This approach was also proposed by some respondents in the questionnaire survey who suggested that initiatives that dealt specifically and rigorously with first-year students would better prepare students to cope with the academic environment. An interviewee experienced in student counselling revealed that academic underpreparedness on first-year level in some cases could also develop

into an emotional underpreparedness on second- and third-year levels. She ascribed this to the fact that the students' inability to cope academically in their first year, transpired into an emotional underpreparedness in later years of study.

Looking into self-regulation as part of emotional underpreparedness seemed relevant, since higher education forces students to take responsibility for their own success. Self-regulation is thus an indicator of preparedness (Byrd & MacDonald 2005:25). Self-regulation can be defined as "self-generated thoughts, feelings and actions for attaining academic goals" (Zimmerman 1998:73). Self-regulation relates to a process in which learners master their own acquisition of knowledge (Gettinger & Seibert 2002:350; Kitsantas 2002:109; Ruban, McCoach, McGuire & Reis 2003:270). Self-regulation is also characterised by the use of self-regulated learning strategies, motivation, and the reflection on learning effectiveness by the learners themselves (Vermunt & Vermetten 2004:359; Heikkila & Lonka 2006:101).

All the respondents in the questionnaire survey indicated that self-regulation was important for academic success among academically underprepared students. This emphasises the possible inadequacy of student-centred approaches for addressing the educational needs of academically underprepared students because of the heavy reliance on teacher support. McCabe (2000) made the following statement in support of this belief: "…teaching less-prepared students is hard and often frustrating work, for they need more personal attention and support". This notion was agreed/strongly agreed with by 78.6% of the group in the questionnaire survey as well as being considered extensively during the interviews. The reason for this belief is that student-centred learning provides less structure and guidance and demands high levels of self-regulation. Beckenstein in Robinson (1996:3) supports this notion in

stating that the unstructured higher education environment contributes to both an academic and a cultural underpreparedness.

3.3 Focus area three: Factors contributing to underpreparedness

The majority (93.8%) of the respondents indicated agreement with the statement that a range of environmental factors exists that influences the development of academic skills and, ultimately, academic proficiency which results in academic preparedness. Since the lack of academic proficiency is an important determinant of academic underpreparedness, a number of aspects as contributing factors to academic proficiency and, ultimately, the level of academic preparedness were explored. Participants were asked to indicate to what extent they agreed with certain factors contributing to academic proficiency. The results are dealt with quantitatively in order of priority in Table 2 (1=strongly disagree, 2=disagree, 3=slightly disagree, 4=slightly agree, 5=agree, 6=strongly agree, n=total number of responses, Mean=M, and s=Standard deviation).

Table 2: Factors contributing to academic proficiency

Factors contributing to academic proficiency	Responses (%)						
	1	**2**	**3**	**4**	**5**	**6**	**n**
a. Reading ability.	-	-	-	-	68.8	31.2	32
b. Writing skills.	-	3.1	-	-	65.6	31.3	32
c. Mathematical aptitude.	-	6.5	3.2	3.2	74.2	12.9	31
d. Technology experience.	-	9.3	6.3	12.5	56.3	15.6	32
e. Communication skills.	-	3.1	-	3.1	75.0	18.8	32
f. Study skills.	-	-	-	-	71.9	28.1	32
g. Motivation.	-	-	-	-	70.0	30.0	30
h. Management of self.	-	-	-	-	70.0	30.0	30
i. Emotional intelligence.	-	3.7	3.7	11.1	59.3	22.2	27

The findings from this section are generally consistent with prior research on underpreparedness and are strongly linked to the perspectives shared

during the interviews. That the sources of academic underpreparedness are diverse (96.9%) and that the reasons are not always academically based (93.8%) were agreed/strongly agreed with. The statement by the Office of District Research (ODR) Report (ODR 2001:2) from a community college in California supports these findings in mentioning that students underprepared for higher education are not only diverse, but are disadvantaged by an array of factors. All these aspects were in agreement with the questionnaire survey and were raised as contributory factors to underpreparedness during the interviews. The percentages provided below represent the extent to which the respondents agreed to strongly agreed with these factors, which are:

- A lack of study skills (100%).
- Low levels of self-efficacy (82.8%).
- Deficient reading (100%), writing (96.8%), and mathematical ability (87.1%).
- Anxiousness when subjected to an academic environment (average 67.7% and major 22.6% contribution).
- Difficult socio-economic conditions (68.8%).
- A lack of knowledge of supportive structures at HEIs.

Negative educational experiences such as poor academic performance, inadequate preparation, and low expectations contribute to underpreparedness (Miller & Murray 2005). In the questionnaire survey 93.8% of the respondents agreed or strongly agreed that the current school system influences students' preparedness for higher education in a positive or negative direction (that is, act as either a barrier or an enabler of academic proficiency). The majority of the interviewees emphasised that the inequalities of the past school system, especially in rural areas where there were no resources, were seen as a major contributor. Historically disadvantaged communities were seen as lying at the root of this problem. In addition, the interviewees put forward that in some instances educators lacked the necessary training, motivation and commitment. Spann

(2000:6) and Dzubak (2005:6) substantiate the opinion that the school system contributes to underpreparedness in stating that the inadequate preparation at school level and the academic success expectations disparity between schools and HEIs lead to higher education underpreparedness.

Teachers' educational level and educational methodological approach were issues brought forward during the interviews as a school-related factor influencing academic proficiency, which determines students' preparedness for higher education. Questionnaire survey respondents agreed or strongly agreed that inadequate teaching and learning standards on school level obstructed the development of academic proficiency (78.1%), while a lack of alignment between secondary school content and the expectations of higher education (100%) contributed to underpreparedness. This misalignment is addressed by Karpov (2006:20), who regards it as necessary to ensure that higher, secondary, and elementary education are all links in one chain. Spann (2000:6) also emphasises the need for an ongoing dialogue between HEIs and the school system that will eventually lead to students being better prepared for higher education.

Since the South African Human Rights Council (SAHRC) reported in June 2006 that recent research pointed towards negative outcomes in terms of quality education (GCIS 2006) in schools, underpreparedness could indeed be a result. However, adding to this dilemma is the two-way blame. On the one hand the school system causes the problem while, on the other hand, the higher education system is unable to support these underprepared students (Miller *et al.* 1998:104). This opinion is echoed by Slonimsky and Shalem (2004:3), who note that "…learners may be under-prepared for university study, and universities may be under-prepared for such students". Additional to the above the respondents indicated that family aspirations, a positive image of self, a deficit to diversity, the ability

to critically analyse, and emotional and developmental maturity are also factors to be considered.

3.4 Focus area four: Conditions intensifying underpreparedness

one of the focus areas pursued was the conditions intensifying underpreparedness. participants were asked to indicate to what extent they agreed with a description of the typical higher education environment perpetuating or strengthening underpreparedness. these results are again dealt with quantitatively in order of priority in table 3 (1=strongly disagree to disagree, 2=neither agree nor disagree, 3=agree to strongly agree, n=total number of responses, mean=m and s=standard deviation).

Table 3: Conditions intensifying underpreparedness

Intensifying conditions	Responses (%)			
	1	2	3	n
a. A lack of appropriate teaching-learning interventions.	-	3.1	96.9	32
b. Unidentified or unattended learning problems.	3.1	-	96.9	32
c. Inadequate support to improve academic skills.	-	6.2	93.8	32
d. Inadequacy of student-centred approaches.	10.7	10.7	78.6	28
e. Low socio-economic levels.	9.4	21.9	68.7	32
f. Inadequate higher education access criteria.	19.3	12.9	67.8	31
g. Negative impact of political factors.	12.9	22.6	64.5	31
h. Ineffective learning strategies.	19.4	16.1	64.5	31
i. Absence of role models in specific cultures.	9.7	29.0	61.3	31
j. Insufficient support from school teachers.	3.3	36.7	60.0	30
k. Inadequate handling of social/cultural diversity.	28.1	18.8	53.1	32

Responses to the statements that a lack of appropriate teaching and learning interventions and that learning problems are not always identified or attended to, reached an overall 96.9% agreement. In addition, it was agreed by 93.8% of the respondents that underprepared students would

continue to be low achievers without support to improve their academic skills (for example teaching of note-taking techniques and study skills). This notion calls attention to the need to identify teaching and learning strategies that will scaffold these students (focus of Article 4).

Since educational literature has for some time recognised the value of student-centred teaching and learning (NQF 2000; Baxter & Gray 2001:396), the implementation thereof is widely employed in HEIs. However, these student-centred approaches were agreed/strongly agreed with by 78.6% of the respondents as inadequate for addressing the educational needs of academically underprepared students because of their heavy reliance on group interaction and educator support. A comment offered in the questionnaire feedback by a respondent from the USA was: “Certain teaching and learning approaches lead to the disempowerment of underprepared students. Rather than learning becoming the tool for validating them and changing their realities, the educational system/process tends to negate and constraint the range of possibilities for underrepresented populations. This even happens in the most well meaning environments”.

Socio-economic levels were agreed/strongly agreed with by 68.7% of the respondents as contributing towards the academic underpreparedness among students (also see the ODR Report 2001 and Dzubak 2005). This statement is, however, put too simplistically to capture the vastness of socio-economic effects on education in general in South Africa as touched on in the orientation to the study. A two-thirds majority (64.5%) agreed/strongly agreed that political factors (for example past inequalities leading to disadvantaged communities) influenced how underprepared students performed in a given situation. This performance is, however, seen by the researcher as also contributing to the dilemma of cultural underpreparedness. An additional after-effect of disadvantaged communities is that a number of students in South Africa enter higher

education as first-generation students and are not adequately preprared. Cushman (2007:44) confirms this notion by stating "…first-in-the-family students are often taken aback by the social and academic climate" of HEIs.

Two-thirds (65%) of the respondents agreed to strongly agreed that learning facilitation methods currently in use did not scaffold academically underprepared students at risk of failing (for example by creating an environment that enhances student retention and achievement). The lack of time and large classes also negatively impact on creating optimal learning environments for the underprepared, since the focus is on the dissemination of knowledge and not the development of academic skills. Large classes at HEIs marginalise the influence educators can have on students, lessening their contribution. However, since the education sector was under pressure to remain cost-effective despite drops in subsidies from government, no alternative was offered.

It is generally agreed (61.3%) that the lack of role models in disadvantaged communities contributes towards academic underpreparedness among students. Underprepared students as part of a first-generation university-going student group emerge from a society which has had little exposure to role models in higher education (Samuel & Pillay 2002:11; Cushman 2007:47). The questionnaire feedback indicated that teachers at school level could, in most cases, not be seen as the ideal role models. This argument also emerged in a newspaper article in which Vakalisa, a professor of curriculum studies at UNISA, stated that many black students come from "a culture of not learning", a culture that was shaped in the school system by teachers who formed part of a lack of learning environment (*The Mercury* 2005). Walton (1979:124) puts another perspective on the positive effect that a role model can play in a higher education setting by suggesting that students from different ethnic groups can benefit if exposed to academically successful role models. The author

posited in his study regarding role modelling and academic readiness that a role model might be the solution to the attrition problem of these students. A questionnaire response also mentioned the effect of role modelling in underpreparedness in proposing that it could be addressed by developing a mentoring relationship with a faculty member who offered support, encouragement, and guidance.

Another indication of a condition that intensifies underpreparedness is the possibility that social/cultural diversity is not adequately addressed in the classroom in general. Fifty-three percent of the respondents agreed on this matter. This is an important issue, since Robinson (1996:2 of 7) emphasises the fact that cultural deprivation leads to cultural underpreparedness.

A questionnaire finding was that deficient understanding of diversity augments the already existing cultural underpreparedness if not addressed. It was suggested that socio-cultural diversity should be addressed and that a climate of cultural respect should be encouraged. To strengthen the possible approach to diverse students, Growe, Schmersahl, Perry and Henry (2002:206) call on HEIs to build on and acknowledge cultural diversity and to make sure that educators accommodate the diverse multicultural student populations.

The preceding paragraphs attempted to present their case based on data collected during the questionnaire survey and the structured interviews. These findings were discussed and juxtaposed with the relevant literature.

3.5 Summary of findings

At the outset of this article four focus areas related to underpreparedness were identified. This section will synthesise the findings related to each of these areas. The focus areas that received attention were:

- What is meant by underpreparedness?

- Domains of underpreparedness.
- Factors contributing to underpreparedness.
- Conditions intensifying underpreparedness.

In summary, as anticipated, these shared perspectives yielded findings in which the quantitative feedback in comparison with the qualitative feedback revealed relatively few differences. The results of the survey also dovetail with those from several other recently published studies showing that underpreparedness is indeed a multifaceted and intricate concern experienced worldwide. The first focus area, namely what is meant by underpreparedness, attempted to answer the question: Who are the academically underprepared? The higher education underprepared student is delineated as the student who enrols with considerable academic and societal difficulty associated with academic failure. These barriers translate into the second focus area, namely the domains or types of underpreparedness, which are academic, cultural and emotional underpreparedness. These three domains of underpreparedness emerged throughout all the focus areas. In the third focus area, the findings of both the two surveys as well as the literature review emphasise the fact that students underprepared for higher education are not only diverse, but are also disadvantaged as a result of a range of factors. Although various factors emerged as contributing to underpreparedness, the school system, as major contributor, was identified in the feedback on both national and international level. In the fourth focus area, conditions intensifying underpreparedness identified by the respondents as most evident are:

- Underprepared students' learning problems are not always identified or attended to.
- Without intervention (for example guidance and support) underprepared students frequently continue to be low achievers.
- Without support to improve academic skills (for example, teaching note-taking techniques and study skills) underprepared students will continue to lack academic proficiency.

During the interviews two concerns also emerged. The first was that the high number of underprepared students entering higher education might lead to the lowering of standards to address the low throughput rate problem that exists. This concern is echoed by mccabe (2000:1 of 1), a well-known specialist in remedial programmes and writer of the book *no one to waste* who revealed the following in a published interview: "…quality will suffer because faculty will be forced to lower their expectations to meet the competencies of the unprepared, or too many will fail".

Although the major force of this study was to investigate different perspectives on underpreparedness in the above-mentioned focus areas, three additional dominant and recurring themes emerged in the interviews. The first one is that the extent of underpreparedness is not realised. In the second place, a lack of knowledge exists regarding how to deal with the underprepared student in mainstream courses, while in the third place a need exists for professional development initiatives in how to improve the in-class experience of these students. Also prominently mentioned during the interviews was that the underprepared student is dependent on guidance and structure in the learning process. These findings underline the need for additional perspectives on teaching and learning strategies that impact on both the academic and social skills of the underprepared (the focus of Article 4).

Each focus area discussed directed attention to some major issue in underpreparedness, opening a dialogue from which implications and applications that are specific to underpreparedness emerged.

4. IMPLICATION OF PERSPECTIVES GAINED

Although the aim of this investigation was to gain perspectives on underpreparedness, major inhibitors to academic success were also revealed. It became evident that underprepared students must be challenged and supported to develop academic and social skills associated with academic success. The following issues emerged as most prominent and will therefore additionally receive attention:

Access versus success: The higher education transformation process in South Africa aimed at equity and redress that necessitated increased access to previously disadvantaged groups. Admission to higher education in South Africa is based on end-of-school results. However, the most important problem that exists, as suggested by the research, is that potential at-risk students vary extensively because of differences in opportunity on school level. Since these differences in opportunities translate into different levels of preparedness, the complexity of access versus success is intensified. This complexity is further captured in the following statement by an interviewee from a distance university: “There is a tension between the vision of the University to grant open access to almost everybody and that of the CHE (Council on Higher Education) who is interested in high throughput rates. The latter implies strict selection criteria”. For this reason the researcher strongly agrees with Moore (2004:3), who suggests that a wide-ranging investigative approach to preparedness as an access factor should be followed by HEIs if they aim to improve retention and throughput rates.

Over and above looking into access criteria, support initiatives should be in place to identify the underprepared student at risk at a very early stage. It is important that efforts are made to ensure that these students do not become isolated and/or disillusioned. Nurturing persistence through

intrusive learning environments could scaffold the underprepared and eventually lead to positive outcomes.

Although the poor basic and secondary education mentioned, combined with a lack of selection in the academic system, lies at the root of poor throughput and high attrition rates of underprepared students, neither of these problems has a short-term solution. To exclude the underprepared from entering HEIs would narrow life opportunities in general. Rather than excluding the underprepared from higher education, educators should capitalise on the understanding of underpreparedness (the intention of this article) in shaping the learning experiences of these students (focus of Article 2). A learning environment conducive to meeting the needs of the underprepared might set the stage for these students to have an even handed opportunity to achieve academic success. The implication of this investigation is thus situated in the fact that the results obtained could inform academic support activities, instructional approaches, and targeted retention initiatives that will ultimately improve underprepared students' learning and, in the end, academic performance (the purpose of the study as a whole).

Secondary school educational experience: Since underpreparedness is closely connected to the quality of the secondary school educational experience (Burley & Butner 2005:4), it is recommended that a partnership (Adelman 1998:1 of 1) be formed or an alignment be reached between secondary education and higher education to smooth the transition from high school to higher education. In addition, secondary schools should promote an awareness of the level of preparation required to succeed in higher education.

Self-efficacy: Since self-efficacy emerged repeatedly, alternative instructional methodologies should be explored to scaffold underprepared students to reach high levels of self-efficacy. To sustain self-efficacy and

also self-regulation, underpreparedness should not only be addressed on remedial or developmental level, but also during academic instruction in mainstream courses. The nature of this support should not only be focused on gaining knowledge, but should also be motivational, since underpreparedness is associated with low levels of self-efficacy and self-regulation.

Study skills: Teaching of study skills should be integrated in mainstream teaching, since students are sometimes not willing to undergo study skills training because of the stigma attached to counselling (opinion of expert in student counselling). In addition, if the underprepared students underwent remediation which included study skills training, the skill should be sustained through an environment in which they learn how to learn.

Cultural underpreparedness: To address the issue of cultural underpreparedness, a more diverse educator corps should be considered, first of all to act as role models and, second, to alleviate feelings of alienation through being exposed to a different culture. A second application is to integrate equity and diversity in teaching and to develop an academic environment in which cultural and social diversity is valued and experienced. Positive efforts should also be made to engage the culturally underprepared in a non-threatening learning environment in which students are encouraged to enter into active dialogue. This freedom to raise their “voice” will deal with anxiety and build on feelings of caring and trust. Collaborative learning should be encouraged through academic and social engagement events, since it provides opportunities for students to both share and construct knowledge in a safe environment, addressing the alienation often experienced by students from a culture different to that of higher education.

Supportive learning practices: Support to underprepared students should be based on interactive engagement. This requires the educator

and the learner to become partners in learning; solely student-centred teaching is not appropriate for underprepared students who need structure and guidance to overcome academic hurdles. With support, guidance and technology integration, underprepared students could be guided and directed towards student-centred learning to overcome the inability to learn independently. Since these students need more support and guidance, structured teaching and learning events as well as frequent feedback on progress should be provided. A constructivist style of teaching would also encourage these students to actively participate in the learning process. In addition, if the process includes self-paced learning, these students could better control their own acquisition of knowledge and not be discouraged by the high demands set in mainstream programmes.

A variety in teaching as well as assessment approaches will more effectively accommodate students' different levels of preparedness. To address the writing and reading deficit of the underprepared, forms of instruction and regular formative feedback on writing and reading tasks should be an integral part of learning events in order to improve writing and reading skills. Positive efforts should be made to enforce the gaining of academic proficiency by creating educational events through which students gain the ability to take notes, write exams, condense and summarise text, and are also given opportunities provided to apply and practise these skills.

Supportive teaching practices: Positive efforts should be made to improve collaboration among experts in the remedial and developmental fields, student counselling and educators in mainstream courses. This collaboration would open avenues for all role-players to gain knowledge and experience through sharing. In addition, if this collaboration could not only be ongoing but also structured in the form of an advisory committee, both the student and the institution could benefit. Professional

development events should be provided to support academic staff in dealing with underpreparedness.

5. CONCLUSION

The research presented in this article is concerned with understanding underpreparedness, a phenomenon which is inextricably intertwined with the current South African higher education dilemma of poor throughput and high attrition rates. South Africa's commitment to open access brings with it the challenge of educating the underprepared. This article sought to identify by means of both a questionnaire and an interview survey the elemental perspectives related to underpreparedness. These perspectives provided a valuable tool for arriving at a deepened understanding of underpreparedness. Because of the heightened emphasis on accountability, it could be used in an effort to scaffold the underprepared student. Until the school system better prepares students for higher education, SAUVCA has urged that it is crucial that HEIs should deal responsibly with the needs of students.

The researcher, by gathering and disseminating the findings of this investigation, hopes that this empirical survey offers educators and practitioners in higher education a perspective on underpreparedness and an insight into dealing with these students' needs, which underscores SAUVCA's appeal regarding how to deal with these students. In many respects, the findings of this investigation bring together and strengthen what the literature in the field of underpreparedness has already suggested. This study has, however, taken previous notions a step further. It has attempted to identify deficits in the underprepared student based on both national and international perspectives. This collaborative approach, involving representatives from across a wide range of the educational environment, could provide an empirical map to shape the underprepared

students' learning environment and, in addition, draw attention to the cultural and emotional domains of underpreparedness which are not widely enough recognised.

The preceding paragraphs have made two central points: If a goal of higher education is to successfully support underprepared students in their pursuit of academic success, all aspects of the academic environment should aim to reduce the risk of failure. Preventing or alleviating the effect of underpreparedness is a great challenge for higher education and South African HEIs in particular. Nevertheless, we must meet this challenge, since the extent to which we do will better prepare our students for a future of achievement and independence.

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ENGAGED LEARNING: A PATHWAY TO BETTER TEACHING

Good teaching is open to change; it involves constantly trying to find out what the effects of instruction are on learning, and modifying that instruction in the light of evidence collected

(Ramsden 1992:102).

Abstract

Compelled by increasing access to higher education and the gravity of underpreparedness, educators are challenged to respond to the teaching and learning needs of students underprepared for higher education. In a search for educational approaches considered effective in dealing with these students, this empirical investigation represents the perspectives and opinions of 39 experienced higher education educators and practitioners from various disciplines on both national and international level. The findings are based on descriptive-exploratory research and mainly focus on three key facets, namely general perspectives on the existing constraints of facilitating the learning of the underprepared; the perceived educational effectiveness of different educational approaches; and the significance that these educators couple to interactive engagement. The overarching aim of this investigation was the identification of educational approaches that lessen the impact of underpreparedness on student learning. The different perspectives of the respondents provide a springboard for capturing the most commonly selected educational approaches to develop a learning facilitation framework that sufficiently equips educators in higher education to facilitate the process of learning in academically underprepared students.

1. INTRODUCTION

The need to identify teaching and learning initiatives or efforts to support the underprepared is more urgent now than ever before. Compelled by increasing access to higher education and the gravity of underpreparedness, educators are challenged to respond to the teaching and learning needs of these students within their own educational environments. Only with a clear understanding of who is underprepared for higher education and what underpreparedness is (the focus of Article 3) can educational decisions be made to develop effective teaching strategies to improve the learning environment of the underprepared. However, because of the complexity of human behaviour, it is not easy to detect the underprepared student. In addition, the ability to predict exact reasons why academically underprepared at-risk students continue or drop out of university are multifaceted and indefinable (Veldhuizen Wassenaar 1994:1). Thus, by shifting the focus from the reasons why underprepared students fail to the reasons how and why current educational approaches fail to support these students to learn effectively, a further dimension could be added to the phenomenon of underpreparedness.

Articulating student underpreparedness and connecting it to learning experiences and teaching requirements are two foundational steps in scaffolding the underprepared student in higher education (the focus of the study in a broader context). As yet, little discussion has focused on the critical question: Which pathways in the form of teaching and learning strategies (educational approaches) are perceived by educators as effective in helping underprepared students to learn more effectively? Under teaching and learning strategies, the researcher does not include remedial or developmental courses, but rather strategies that can be employed during academic instruction in mainstream courses. This article therefore does not deal with remedial, basic skills or developmental programmes as such, but focuses mainly on the phenomenon of

underpreparedness and how effective learning can be encouraged in these students.

The reason for focusing on underprepared students in mainstream courses is embedded in the reality that the challenge of scaffolding underprepared students often goes further than just improving reading, writing, and mathematics skills. One of the notions is based on an observation by Boylan (2005:1 of 5), who aptly remarks that academic underpreparedness is "a complex phenomenon without simple solutions". Perin (2004:560) reports on a qualitative case study in 15 higher education institutions (HEIs) and states that the most evident form of remediation is developmental education which entails reading, writing, and math courses. She also provides evidence that not all HEIs require underprepared students to enrol in these programmes and adds that these courses are not always successful, a notion that is echoed by Burley, Butner and Cejda (2001:769). In contrast Byrd and MacDonald (2005:23) argue that remedial and developmental programmes which support underprepared students in English, mathematics, reading, writing and study skills mostly have a positive impact. Hoyt (1999:68), on the other hand, because of the complexity involved in underpreparedness, expresses doubts as to whether these programmes could do away with underpreparedness altogether or whether these programmes are able to predict retention of these students.

According to Boylan (2001:2 of 9), various factors exist that contribute to academic performance. The author sees lacking reading, writing, and mathematical skills as only one of them. Boylan indicates that not only underpreparedness, but also self-efficacy, independence, study skills, and social ability have an effect on academic success. These notions underscore the intricacy of addressing underpreparedness by means of remedial and developmental programmes only.

A further obstacle facing underpreparedness and developmental education is that only a small percentage of students enrol in these courses (Maxwell, Hagedorn, Cypers, Moon, Brocato, Wahl & Prather 2003). In further support of the notion of the complex nature of underpreparedness, Perin (2005:28) remarks that, although various efforts both on organisational and instructional level are embarked on, a lack of consensus on the specific solution for underpreparedness exists. Adding to the problem is the fact that decisions to allow students to enter HEIs are generally based on standardised tests. In the debate on access versus preparedness it is worth noting that an array of factors, for example students' socioeconomic status, cultural background, and underpreparedness determine students' performance on these tests, thus casting doubt on their value in predicting academic preparedness and, for that matter, academic success (Mathews 2007:647-648). Byrd and MacDonald (2005:22) agree and suggest that these tests might overlook the effect of certain deficits related to underpreparedness. Their validity as predictors of academic success in the underprepared is thus questionable.

It could be argued that, if learning support is the main aim in this article, that alternative efforts to scaffold the underprepared be explored. These interventions could include supplementary instruction, tutor systems, specific remedial courses, student seminars, and mentoring initiatives. However, these interventions necessitate additional human and financial resources, both of which are becoming scarcer at HEIs. The reason for this scarcity is ascribed to the fact that, although the South African government admits to the gravity of underpreparedness, it only funds remedial efforts to some degree in the new funding formula (Cloete & Moja 2005:708).

1.1 Orientation to the investigation

As a result of the difficulties described the possibility exists that a considerable number of students in mainstream degree courses are

underprepared. These and related concerns, namely that neither entry tests nor foundational programmes prevent underprepared students from entering mainstream courses, emphasise the need to understand and support these students. Although institution-wide dedication and participation have the greatest effect on lessening underpreparedness (Parker 1997a:120), an important aspect in efforts to support underprepared students is the classroom environment. If the knowledge and experience of academic staff are not utilised to create optimal in-class experiences or events, efforts to alleviate underpreparedness will not be successful. It is for this reason that the researcher considered it important to explore perspectives on the teaching and learning of the underprepared based on the experience of educators in mainstream programmes. Initiatives to provide a supportive learning environment for students who are underprepared for higher education are critical, not only to improve throughput rates but also to instil in these students the will to learn and develop the way to learn.

To develop “the way to learn”, the researcher decided to focus this investigation on engaged learning (EL). The reason why EL became the focus of this research is first that EL is increasingly cited as a distinctive feature of the best way to learn in higher education. Student engagement and the positive results that this approach has on the performance of underprepared students have received wide attention in the United States of America (USA) and Australia (see Krause 2005:1-10; Kuh, Kinzie, Cruce, Shoup & Gonyea 2007:1-98). Second, these authors as well as Lederman (2006:1 of 1) propose that EL supports the underprepared student and even makes a more significant contribution to these students’ learning and academic achievement than to those of students in general. Wasley (2006:A39) echoes these propositions when reporting on the findings of the latest annual National Survey of Student Engagement (NSSE), stating that the academic performance of underprepared as well

as racially and ethnically underrepresented students improved through being “engaged” academically and socially.

With these theoretical perspectives in mind, the researcher was interested in eliciting actual educational approaches regarding EL drawn from how educators perceive and experience EL as being effective in teaching the underprepared (the purpose of this article). The researcher did not attempt to assess the average effectiveness of EL. Instead, she sought to answer a question of considerable practical interest for teaching the underprepared: Do higher education educators perceive that EL deepens the in-class experience of underprepared students in increasing learning effectiveness? The researcher realises that learning is a complex social action and, in addition, that underpreparedness as put forward in Article 3, is multifaceted concerning various domains and contributing factors. To realise the value of EL more fully, the objective of this investigation was to look into perspectives on EL in its broadest sense through the lenses of experienced educators in, among others, learning facilitation on both national and international level. This article thus presents these perspectives on EL and the value thereof to support the underprepared as seen from these educators’ experiences and opinions.

1.2 Clarification of key concepts

In fulfilling the purpose of the study as a whole, the researcher therefore decided to focus on the following three key facets:

- General perspectives on the existing constraints of facilitating the learning of the underprepared.
- The perceived educational effectiveness of different educational approaches.
- The significance that educators assign to interactive engagement.

These three facets are explored and elucidated in terms of how they were perceived as important based on a questionnaire survey. To be able to

consider EL as a means to assist underprepared students, it is necessary to briefly look into the concept first.

2. ENGAGED LEARNING

The term “engagement” has been used to express a myriad of student actions and thoughts which are believed vital to a high quality undergraduate learning experience (Krause 2005:1 of 10). Learners learn more effectively when they are actively engaged in the learning process (Gettinger & Seibert 2002:353; Mattson 2005:23-26; Teixeira-Dias, Pedrosa de Jesus, Neri de Souza & Watts 2005:1123; Yoder & Hochevar 2005:91). Kuh (2002:1 of 26) emphasises that who the student is or which HEIs he/she attends is less important than what the student does, which is the cornerstone of a meaningful learning experience contributing to academic performance. Moreover, Pascarella and Terenzini (1991:101-102) put forward the notion that active participation in learning events positively contributes to an array of outcomes which include satisfaction, persistence, achievement and, eventually, academic success. Nagda, Gurin and Lopez (2003:165) define EL as using knowledge gained during class contact in real-life situations. Working in a two-way manner, the experience enhances the learning whilst the learning enhances the experience.

On all levels of higher education every effort “to create engaged learning and engaged learners” is pursued (Bowen 2005:4). Bowen (2005:7) proposes that educators in general understand EL in four interrelated but dissimilar ways. These different ways distinguish between students’ active involvement in the learning process (active learning); the purpose of study, namely the object (experiential learning); the context in which knowledge is situated (multidisciplinary learning); and the societal framework or the social domain (service learning).

EL entails the use of interactive engagement methods. These methods aim to support conceptual understanding and involve heads-on and hands-on actions that provide direct feedback (Hake 1998:65). Tanner and Jones (2007:37) further contrast traditional teaching methods by putting forward that these approaches are less successful than interactive teaching because of the passive role that students play during formal lecturing with no interaction. Methods that facilitate interactive engagement suggested in the literature include, among others, case studies; demonstrations; peer engagement; simulations; peer instruction and presentations; reflective teaching; problem-solving; discovery; inquiry and on-line learning.

Much has been written about the advantages of EL in higher education at various levels and in various disciplines. Higher education instructional research clearly reveals that students' engagement in the learning process leads to improved learning (Pascarella & Terenzini 1991:98; Cahyadi 2004:456; Bowen 2005:4). In citing the success of educational interventions, Pascarella and Terenzini see the engagement of students during academic instruction as the most important challenge facing contemporary teaching and learning practices in higher education today.

Although educational researchers have been exploring empirical and practical issues related to academic underpreparedness and EL, the perspectives of educators on both national and international level dealing with these students in mainstream courses have not been reported on. Increased access to HEIs has increased demands for student success, since open access has increased the numbers of academically underprepared students. The biggest challenge that higher education faces in an effort to be accountable is to function proactively rather than reactively – a reason why the researcher conducted this research.

3. RESEARCH METHODOLOGY

The investigation took the form of an exploratory, descriptive, and quantitative study. The data source, a questionnaire survey, was used both to compare responses and to illuminate issues concerning underpreparedness and engaged teaching and learning practices.

3.1 The questionnaire survey

In compiling the list of potential participants, the researcher primarily followed three approaches. First, participants were identified during the period of 2003 to 2006 at local, national, and international educational conferences, which included the South African Association for Research and Development In Higher Education (SAARDHE), the South African Association of Health Educationalists (SAAHE), the American Association for Higher Education (AAHE) and the Higher Education Research and Development Society of Australasia (HERDSA) conferences. Inclusion was based on the field of interest and expertise of the presenters, revealed by the focus and content of their research papers presented on the above-mentioned conferences. Where possible, the researcher personally recruited these presenters to participate in the study. Second, the e-mail addresses of additional participants on the distribution list were obtained by consulting the registrants list provided on the conferences mentioned. Third, the researcher did an *Academic Premier* search on engaged learning to identify possible participants who had experience in either teaching the underprepared or engaged learning. Fewer questionnaires were sent to Australia because a survey in a previous study revealed that underpreparedness was experienced as less of a problem there than in South Africa and the USA.

The e-mail message contained basic information, for example the reason why the participant had been selected, a reminder where appropriate of being recruited, and the value that the researcher placed on the

participants' contribution. Thirty-nine higher education educators and practitioners responded. The respondents' profile will be briefly discussed in the next paragraph.

3.1.1 *Respondent profile*

Thirty-eight percent (15) of the respondents were from HEIs in South Africa; 46% (18) from the USA; 8% (3) from Australia; and the "other" three represented the Netherlands, Namibia and Malaysia (see Figure 1).

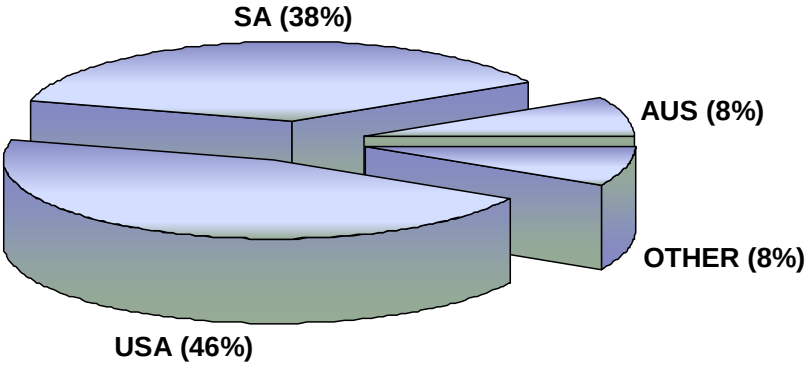

Figure 1: Countries of the respondents

HEIs in South Africa included the universities of Stellenbosch, Cape Town, Free State, Kwazulu-Natal, UNISA, WITS, and Rhodes. Universities of Technology were in Tshwane, the Vaal Triangle and the Free State. The American respondents were from universities in various states of the USA, namely Michigan, Washington, Texas, Colorado, Florida, Indiana, California, Iowa, Massachusetts, Ohio and North Carolina. The Australian universities included Tasmania and two from Western Australia.

Figure 2 provides a graphic representation of the different professional roles the respondents fulfilled. Of the 39 respondents, 13% indicated that they were at that stage in managing positions, while 21% indicated that some of their responsibility in the higher education environment also involved administrative tasks. Higher education educators represented the

highest percentage, namely 41%, while 31% indicated that they were involved in academic development and 18% in research. The “other” roles represented curriculum design and development and library services. Nine of the respondents also indicated that they performed tasks that involved more than one of the roles specified in the questionnaire.

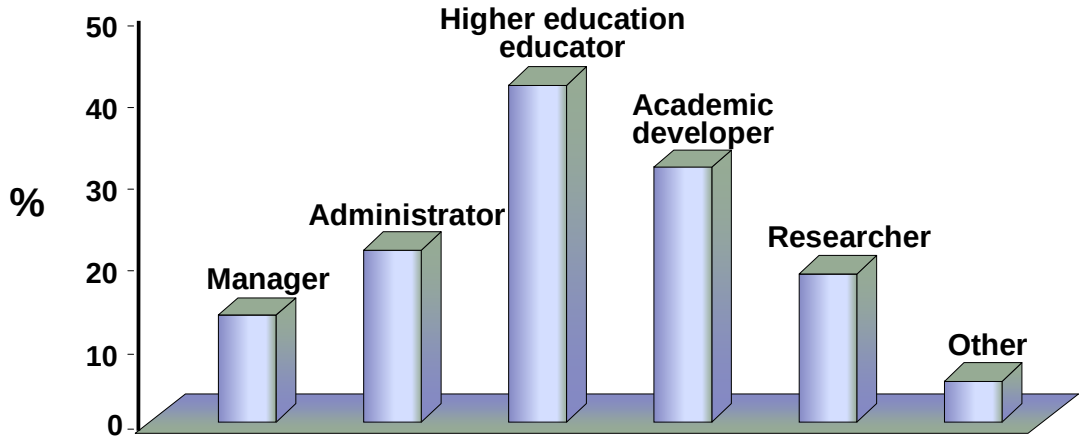

Figure 2: Professional roles of the respondents

4. DISCUSSION OF PERSPECTIVES GAINED ON THE THREE KEY FACETS

It should be noted at the outset of this discussion that the methods employed in the investigation do not permit the researcher to imply that the use of a particular educational approach *causes* student success. The researcher could only report on the three facets explored in terms of how they were perceived by higher education educators as effective through the feedback from the questionnaires. Nevertheless, the fact that these perspectives are correlated with educational research, the importance of these approaches indicates, at least, that they contribute in some way to improve effective learning in the underprepared student.

The discussion of the results and findings is grouped according to the key facets. Where appropriate, the results are presented in table format. The tables indicate the percentage of respondents who chose responses varying from “not at all effective”, “not too effective”, ”somewhat effective” and ”very effective” in Table 1, while Table 2 required responses varying from “strongly disagree“ to “disagree“, “neither agree nor disagree” and “agree” to “strongly agree“. The total number of responses (n), the mean (M) and standard deviation (s) for each statement are also indicated. Respondents’ quotes in this paper stem from the qualitative feedback offered in the questionnaire.

4.1 Key facet one: Existing constraints of facilitating the learning of the underprepared

This section looks at some aspects of the existing educational climate that might hinder facilitating the learning of the underprepared. Finding the reason for such hindrances could form the foundation for developing targeted initiatives to overcome them. Respondents had to indicate to what extent they agreed with the following statements that describe some constraints of facilitating the learning of the underprepared. The next paragraphs summarise these statements:

There is a lack of research evidence to validate the extent and effectiveness of learning facilitation that encourages academically underprepared students to master self-directed learning: This statement was agreed/strongly agreed with by fewer than 47.4% of the respondents. Although any search of the literature reveals an abundance of research over the last several decades regarding the effectiveness of certain learning or teaching approaches or strategies, the results of this statement were inconclusive.

Owing to the complex nature of academic competence, the influence that teachers could have on the whole continuum of academically

underprepared students' academic achievement is limited: In responding to this statement, the respondents had contrasting views. A slight tendency towards agreement was reached, since a percentage of 43.6% agreed/strongly agreed, while an almost equal percentage of respondents disagreed/strongly disagreed (38.5%) with the statement.

The time constraint of academic schedules hinders teachers to support academically underprepared students: Twenty-seven respondents (69.2%) agreed/strongly agreed with this statement. The lack of time was also seen as negatively affecting optimal learning environments for the underprepared, since the time available was spent on the dissemination of knowledge and not on the development of academic skills.

Learning facilitation strategies do not always address the inability of underprepared students to learn independently: An agreement of 60.5% (agree to strongly agree) was reached in this statement. A respondent from Western Australia, a specialist in commercial training and development, suggested that, although learning facilitation strategies existed, "There is a lack of strategy in its implementation". This finding might underscore the significance of looking at strategies and their implementation that encourage learner independency.

Teachers play a critical role in the early identification of underprepared students at risk of academic failure: There was a relatively strong agreement (76.3%) among the respondents with regard to this statement.

The need exists for research initiatives (example: action research) to improve teaching that will result in effective learning in academically underprepared students: Two-thirds (60.5%) of the respondents agreed/strongly agreed with this statement. It was, however, interesting to

note that there was some naivety about the potential of action research in this regard. A further consideration should be, as raised by an American respondent, that:

> *So often it (i.e. action research) is used for purposes of publication and to advance careers – it does not necessarily bring about change (worth looking at Kemmis's thoughts about his own naivety in this regard). What lecturers really need to do is think deeply and critically about what they are doing, get to know their students better, understand them as human beings. The whole direction of universities currently (instrumentalism) works against this*.

This excerpt clearly illustrates the value that reflective teaching (investigated in Article 2) might hold. Reflective teaching entails "thinking about one's teaching" (Parker 1997b:8) and involves classroom observation and reflection aimed at refining teaching theories and adjusting teaching practices (Ferraro 2000). Reflective teaching strategies based on students' feedback create a platform for both students and teachers to reflect on learning as well as the quality of teaching.

4.2 Key facet two: The perceived educational effectiveness of educational approaches

Some facets of student learning remain vague. For this reason, the researcher recognises that educational approaches are only one aspect contributing to the academic performance of underprepared students. However, looking into educational approaches to enhance learning could provide the backdrop against which other aspects can be situated and could thus form the foundation for effectively teaching the underprepared. The purpose of this section of the questionnaire was to determine which educational approaches the respondents considered effective for enhancing learning in general.

The respondents were asked to reflect on their experiences as far as the different educational approaches were concerned. In these specific items, respondents were requested to rank the effectiveness thereof to enhance learning, using (1) as not at all effective; (2) as not too effective; (3) as somewhat effective; and (4) as very effective. Table 1 quantitatively represents the results of the importance that respondents attached to the effectiveness of the different educational approaches in general.

Table 1: The importance assigned to the education approaches

Education approach	Responses (%)				
	1	**2**	**3**	**4**	**n**
a. Experience-based learning.	-	-	21.0	79.0	38
b. Active learning.	-	5.3	26.3	68.4	38
c. Reflective learning.	-	-	34.2	65.8	38
d. Conceptual learning.	-	5.3	31.6	63.1	38
e. Reflective teaching.	2.7	2.7	32.4	62.2	37
f. Interactive engagement.	-	2.6	36.8	60.6	38
g. Problem-based learning.	-	-	42.1	57.9	38
h. Learner-centredness.	2.7	8.1	35.1	54.1	37
i. Collaborative learning.	-	2.6	47.4	50.0	38
j. Constructivist learning.	-	8.1	43.2	48.7	37
k. Blended learning.	-	-	52.6	47.4	38
l. Concept mapping.	5.6	2.8	47.2	44.4	36
m. Self-directed learning.	-	18.4	39.5	42.1	38
n. Service learning.	2.7	13.5	46.0	37.8	37
o. Resource-based learning.	-	13.2	55.2	31.6	38
p. Individual research.	-	5.3	71.0	23.7	38
q. E-learning.	-	30.6	61.1	8.3	36

From Table 1 it is evident that of all the educational approaches investigated, experience-based learning, active learning and reflective

learning emerged as strategies being regarded the most effective in advancing student learning. The use of these strategies was not only positively associated with enhanced learning in general, but also linked to success in initial developmental courses involving the underprepared. The lowest agreement was reached on resource-based learning, individual research and E-learning.

The questionnaire results of each approach will be reported on; the findings will be discussed; and the relevance thereof will be supported by the literature. In addition, the possible significance of the approach as being effective in teaching the underprepared will be highlighted and juxtaposed to research findings in both this study (Articles 1, 2, 3, and 5) as well as the literature on EL and underpreparedness.

Experience-based learning: Experienced-based learning, also called experiential learning, entails that the student is directly in touch with the realities being studied. The distinctive feature of experience-based learning is that all aspects of teaching and learning pivot on the experience of the student (Andresen, Boud & Cohen 2000:1). Literally, “learning from experience” involves learning that is unplanned and occurs in day-to-day life from a variety of experiences (D’Eon 2004:607).

Learning from experience received the highest preference as an effective strategy, that is, somewhat effective (21.0%) and very effective (79.0%). This tendency might serve as an indication that learning from experience could offer numerous advantages, a notion that supports Kolb’s (1984:41) concept of active experimentation, a learning model identified as highly effective in educational environments. The following quote from the feedback received underscores the value thereof:

> *Students need to experience the subject matter (at the university) from an advanced viewpoint, where algorithmic*

> *thinking and technical details make sense as opposed to things to be memorized. For example, they need to experience the connectedness of ideas and how truths are established in particular disciplines.*

Active learning: Active involvement in which students take more responsibility for their own learning was also highly perceived as effective, namely as somewhat and very effective (26.3% and 68.4% respectively). Active learning is posited as the core of effective studying (Gettinger & Seibert 2002:353; Speziale & Jacobson 2005:234). Active learning, according to Boyer (2002:51), could include many "avenues" of education and allow learners to become lively participants who can direct their own learning. The value of active learning has been highlighted (Gettinger & Seibert 2002:353; McDonough & Osterbrink 2005:89) and, building on this important fact, Kumar (2003:25) and Van den Berg (2004:381) emphasise that the formal lecture creates a passive or superficial approach to learning. Barr and Tagg (1995:23) also alert us that the traditional "Instructional Paradigm", which consists of formal lectures, is increasingly recognised as ineffective. The authors recommend that an effective learning theory is based on an active and learner-centred approach and that the learning environment should support the fact that both the lecturer and the learner take responsibility for the same outcome, namely academic success. An American respondent further saw accelerated delivery of content and the continual playing with learning exercises as an effective form of active learning.

Reflective learning: During reflection students are given time to both process learning and reflect on their learning experience. In this regard, reflection was given the third highest preference as an effective teaching-learning strategy, perceived by 34.2% of the respondents as somewhat effective, while 65.8% indicated that this teaching-learning strategy was very effective. Two respondents from the USA, of whom one is a

researcher in Innovations in Learning at an HEI in California, confirmed the value of reflective learning in commenting that:

> *Providing students with tools/technologies to help them integrate and reflect upon their learning from inside/outside the classroom comprise their positive experience in higher education.*

The second respondent's perspective on reflection as a learning facilitation strategy that will enhance academic performance in underprepared students was:

> *Given constant formative and summative feedback, the students have many opportunities to reflect on how they have constructed meaning and how their thoughts relate to those of their classmates.*

This comment in fact include various educational approaches deemed successful in teaching the underprepared, namely active participation through learning exercises; regular feedback acting as motivation; reflection on constructed meaning; and collaborative learning. The advantages of "experience" and "reflection" support the benefits that this educational approach might hold for the underprepared student. Reflection on experience is also closely linked to the experienced-based learning approach that was found the most effective approach in dealing with the underprepared.

Conceptual learning: During conceptual learning understanding rather than memorisation is encouraged. A two-thirds majority (63.2%) indicated that this approach was very effective and 31.6% indicated that it was somewhat effective (see Article 1). A researcher in academic development at a South Africa HEI captured the essence of conceptual

learning while also referring to the importance of this teaching-learning strategy in dealing with the underprepared:

> *One cannot teach students fragmented computations that do [not] make a point, i.e. that do not lead to conceptual understanding, of (a) particular mathematical idea(s). Otherwise, we repeat the impoverished experiences they had with school subjects (mathematics). In mathematics education, we refer to what is called "didactical inversion," i.e. teaching that in no ways takes into account students' prior knowledge as a springboard or stepping stone for new knowledge!*

The aforementioned assertion claims that meaningful learning involves a process of making connections between old and new knowledge to form a cognitive structure. This claim is widely supported by the literature (see Kinchin & Hay 2005:182; Fraser 2006:6). Gravett and Swart (1997:122) expanded on this theory in proposing that understanding should be an integral part of this cognitive structure. They refer to this structure as an *integrated conceptual framework* and put forward that if the process of developing such structures leads to altered ideas, meaningful learning and, ultimately, conceptual change take place.

Reflective teaching: A two-thirds majority (62.2%) saw the importance that students and their perspectives play in choosing educational approaches as very effective and by 32.4% as effective. Only 5.4% perceived it as having no effect on learning efficiency. Providing opportunities for students to reveal their perception of what effective teaching entails is the basic philosophy behind reflective teaching. This approach could support underprepared students to become academically skilled, since reflective teaching presents valuable ways of capturing the needs and the positive or negative learning experiences of students. In addition, Goff, Colton and Langer (2000:46) advise that if students'

academic success needs to be improved, it is essential to improve educators' professional development, since teaching competency would translate into more effective learning (see Article 2).

Interactive engagement: The construction of knowledge through active involvement is the foundation of engaged learning as indicated earlier. This teaching-learning strategy also revealed a relatively high measure of agreement among respondents in Table 1 as being somewhat to very effective (36.8% and 60.5% respectively). Interactive learning means that the facilitator, through interaction, includes opportunities in a class for learners to talk, write or be engaged in activities in which they use new knowledge or skills. Knowledge is thus reinforced by adding an interactive component to academic instruction and learning, a notion also closely related to conceptual and cooperative learning. This expert facilitator-guided approach has the potential to scaffold underprepared students towards active and self-directed learning.

Since learners in higher education are often not ready to take control of their learning (Morris & Turnbull 2004:143), structuring and guiding the learning process through interaction provide learners with the foundation to effectively take part in learner-centred learning events. The fact that underprepared students are more dependent on active facilitator guidance sustains the importance of an interactive rather than only an active or learner-centred educational strategy. A respondent from the USA in a community college setting commented on the important role that the facilitator plays, not only in structuring the learning environment, but also through one-on-one interaction to develop in students "a good sense of purpose". A South African respondent echoed this sense of purpose in commenting:

> *It is important that students always understand why they have to learn something and that they truly understand what they are*

> *learning. It must make sense to them, otherwise they will use rote learning that does not have any meaning.*

Thus, the focus of any educational approach should be on what the students should know, understand, do and apply at the end of the learning experience. In further support of the effectiveness of interactive engagement, respondents suggested that intrusive advising, learning/study groups and course redesign that engage students more deeply should be considered.

Problem-based learning (PBL): The respondents (42.1-57.9%) saw PBL, an instructional method that challenges students to seek solutions to real world problems, as effective in general. A respondent with 30 years' experience in higher education in Washington, USA, who had also been part of a project to improve college readiness in Washington, stated that high school graduates emphasised the value of problem-posing pedagogy related to problem-based learning. This respondent also revealed that engaged learning experiences that are based on teachers and students posing problems, framing questions, and exploring existing knowledge promote critical thinking.

Learner-centredness: Learner-centred learning was perceived as somewhat to very effective (35% and 52% respectively). Even though many advantages of learner-centred learning exist, strong evidence is also provided that many learners need the security of a structured educational environment because they feel lost when forced into a self-directed environment that is unstructured (Chung & Chow 2004:158). Moreover, since the major intent of learner-centred learning is for learners to take responsibility for their own learning, this approach might fail with the underprepared. The student with little prior knowledge on which to build, needs guidance and relies on the facilitator to construct the learning process (Kember, Jenkins & Chi Ng 2004:86).

New trends in higher education encourage various learner-centred teaching and learning strategies which lead to self-directed learning and, ultimately, independent learning. The researcher realises that it remains a challenge to identify the focus of academic instruction to support learners to reach this level of self-directed and independent learning. To identify educational strategies that will support learners to take control of their learning should thus be a major target in teaching the underprepared.

Cooperative learning: The respondents found cooperative learning, which entails different degrees of teamwork rather than solitary efforts, somewhat effective (47%) to very effective (50%). This finding was expected, as students underprepared for higher education benefit from substantial support not only from facilitators, as previously mentioned, but also from their peers. The assertion by Jong, Wu and Chan (2006:738) that underprepared students can benefit from two-way learning supports this finding. The authors found that large classes negatively impacted on the underprepared students, since they became discouraged by the high demands in mainstream programmes. This observation also emerged in Article 3, namely that large classes at HEIs marginalise the influence/contribution facilitators can have on students. According to Jong *et al.* (2006:739), this can be counteracted by learning processes that adopt cooperative learning where the students who struggle to keep up are supported by their peers, through interaction, in a less threatening way so that they can also reach higher levels of academic performance.

Constructivist learning: Constructivist learning involves learners' discovering and constructing knowledge for themselves (Karadağ 2007:167). It is an active and social educational approach which is encouraged by, among others, problem-based and exploratory learning. The value coupled to this approach was a 43% as effective, while 49% perceived it as very effective. Bitzer in Gravett and Geyser (2004:46) places cooperative and constructivist learning in close proximity and also

maintains that both cooperative and constructivist learning accommodate the Vygotskian paradigm of cognitive development within a social setting. Vygotsky's social development theory, cited in Riddle (1999), claims that social interaction or "social learning" contributes largely to the cognitive development of students. Vygotsky's social development theory claims that social interaction is not only central to cognitive development, but also that what the student can achieve in contrast to what he/she is capable of when learning in a social educational environment is enhanced. This assistance could have a beneficial effect on students who are not only academically but also culturally underprepared for higher education. An additional benefit of such an approach was put forward by a respondent, namely that it might "…stimulate students' mental faculties strongly to reinforce understanding and retain knowledge generated, thus leading to a deep learning approach".

E-learning and blended learning: It seems appropriate to juxtapose these two learning approaches, since the findings revealed a tendency also published in the literature. E-learning or online learning was seen by only 8.3% as very effective. Although the result was unexpected, this replicates findings reported on by McGee (2002:5 of 15), who found that culturally diverse student populations tend to find web-based instruction alienating, since it characterises a typical Westernised transfer of knowledge, while certain cultures have a preference for active knowledge construction in a social environment. McGee (2002:9 of 15) also affirms that computer-based training in some cases allows only limited interaction and is thus deficient in supporting all learning needs. In support of this belief, combinations of face-to-face and online collaboration and group work (namely blended learning) were distinguished as somewhat effective (53%) and very effective (47%) in the questionnaire responses. Apart from the previously mentioned negative attitude towards online learning, the inclination of underprepared students "to function socially" positively reinforces the value of blended learning.

Concept mapping: Concept-mapping as a recognised form of structuring knowledge was found by the majority, namely 47.2%, as somewhat and by 44.4% as very effective. Only 9% of the respondents found this strategy not effective at all or not too effective. This provides support for the notion that the use thereof could support current teaching and learning practices (Teo & Gay 2006). As mentioned previously, articulating, reflective and problem-based learning require students to be self-directed and have a tendency to be without structure in general (Farrand, Hussain & Hennessy 2002:427). Concept mapping can be applied to give structure to the knowledge obtained during these educational approaches (Russel 2004:1). Steyn and De Boer (1998:125) are in agreement with these views. The authors identified a need among the underachieving students in the BSc Extended Programme in the Faculty of Science at the University of Pretoria for learning methods in mathematics and science. The authors introduced mind mapping as a learning strategy and found that the strategy led to an increase in academic performance. They commented: "Studying became an interactive stimulating experience for these students."

The researcher in her own learning environment experienced similar benefits (the findings are reported on in Article 1). The basic concept behind concept mapping as a constructivist teaching and learning strategy is that learning takes place through the formation and development of an individual's intellectual construction of information (Ritchie & Volkl 2000:83). In other words, what students do and generate during instruction are of the utmost importance in facilitating the learning process (Wittrock 1991:169). It is within this context that the researcher sees the benefits of concept mapping based on theoretical and empirical support, not only for learning in general, but also as a scaffold for the underprepared.

Self-directed learning: This educational approach represents a decreased emphasis on lectures and an increase in self-directed

teaching/learning strategies. Although it is widely accepted that learning is primarily the responsibility of the student, McMillan, Parke and Lanning (1997:26) indicate that underprepared students are in general not equipped to deal with self-directed approaches. This explains the relatively low value of 42% placed on this approach being very effective. Previous discussions on learner-centred learning might also be relevant here.

Service learning: Wells and Grabert (2004:573) claim that service learning is effective since it also shares all the advantages of active and engaged learning. In the survey, an agreement of 46% as somewhat effective and 37.8% as very effective was linked to service or community learning. This type of learning is applied learning directed at specific community needs integrated into an academic programme. The lower than expected value allocated to this approach might be ascribed to the fact that it is a novel educational approach that is not yet widely regarded as effective.

Individual research and discovery: This educational approach in which it is expected from students to construct their own knowledge through discovery, to a great extent requires students to be self-regulated and experienced in working independently. Only 23.7% of the respondents perceived individual research and discovery as very effective. What was surprising, however, was the relatively high agreement of 71% to the approach being somewhat effective. As revealed in Article 3, emotionally underprepared students portray, among others, a lack of self-regulation and independency. The previous account of McMillan *et al*. (1997:26) that underprepared students lack the ability to manage self-directed approaches is also relevant here. These last two statements might explain the low importance ascribed to this approach as being very effective. On the contrary, the high value attached to it being somewhat effective might be linked to the effectiveness assigned to EL. The action of exploring and discovering, leading to the construction of knowledge, entails an

interaction with the learning material, an activity that might be seen as meaningful (Dickey 2005:70).

Additional educational approaches suggested by the respondents that could contribute to the learning effectiveness of underprepared students include:

- Self-paced learning (learning at a pace that suits the abilities of the individual learner).
- Needs-based learning (learning that is responsive to learner needs).
- Differentiated instruction (instruction that make the most of learning for all students, despite their background).
- Evidence-based practice (Evidence based practice is an approach in which the higher education educator is aware of the evidence that bears on his/her practice, and the strength of that evidence).
- Competence-based learning (learning that involves knowledge, skills, and attitudes that affects performance of the intended profession).

The respondents in general had a greater tendency to agree on statements or approaches that involved engaged forms of teaching and learning. To explore the significance that they ascribed to statements implicating engagement could thus not only confirm preferences but also allow for triangulation to validate the findings.

4.3 Key facet three: The significance that educators ascribe to interactive engagement

This part of the questionnaire survey explored interactive engagement as a learning facilitation strategy to support students who are underprepared for higher education. “Interactive engagement”, also called engaged learning, entails – among others – students’ participation in certain kinds of educational activities, collaboration with peers and significant teacher-

student contact. The investigation of this key facet provided remarkable and interesting results that, in some cases, run parallel with or confirm either the findings of the other two key facets, the study as a whole, and/or the literature on EL. The results are dealt with quantitatively (highest to lowest agreement) in Table 2 (1=strongly disagree to disagree; 2=neither agree nor disagree; 3=agree to strongly agree; n=total number of responses; M=Mean; and s=standard deviation).

Table 2: Views on interactive engagement

Interactive engagement statements	Responses (%)			
	1	**2**	**3**	**n**
a. Experiential learning is seen as an effective form of EL.	-	12.8	87.2	39
b. Academic performance in general increases at higher levels of student engagement.	2.6	10.2	87.2	39
c. Engaging students in the learning process could improve the quality of learning of underprepared students.	-	12.8	87.2	39
d. Interactive engagement could have a significant positive impact on the cognitive development of underprepared students.	-	17.9	82.1	39
e. The effectiveness of EL is ascribed to the fact that students' active involvement in the learning process leads to meaningful learning.	-	20.5	79.5	39
f. Service learning is seen as an effective form of engaged learning.	2.6	21.1	76.3	38
g. Students' poor academic achievement could be a product, not of their own weak intellectual skills, but of teaching that had not been engaging.	2.6	25.6	71.8	39
h. EL is believed to be an effective remedy for retention and overall student success, especially the success of underprepared students.	-	33.3	66.7	39
i. Multidisciplinary learning is seen as an effective form of EL.	2.7	35.1	62.2	37
j. Students' academic as well as social integration into higher education could alleviate the effects of underpreparedness.	2.5	43.6	53.9	39
k. Increased student-lecturer and student-student interaction (i.e. collaborative learning) ensures the social construction of knowledge.	10.2	35.9	53.9	39

Substantial positive agreement was reached in the first three statements. The majority of the respondents (87.2%) agreed/strongly agreed that experiential learning is seen as an effective form of engaged learning. This finding corresponds with the highest prevalence coupled to experience-based learning in the previous section. It is thus worth noting that "experience" in two different sections of the questionnaire was considered effective; first as an educational approach and, second, as a form of EL.

The next three statements probe different outcomes of student engagement, namely academic performance in general; the quality of learning; and the cognitive development of the underprepared student. Student engagement was perceived as having a positive impact, ranging from 82% to 87.2% on all three of these important concerns in higher education teaching and learning. Johnson, Johnson and Smith (1998:29) together with Malmgren (1998:3) confirm that the development of cognitive ability is encouraged by cooperative learning as a form of engagement. The statement on interactive engagement leading to meaningful learning also showed a relatively high measure of agreement (79.5%). Kuh (2002:1 of 26) provides conformity on this in stating that it is what the student does that determines meaningful learning, a notion also closely connected to a constructivist learning approach. Moreover, Gravett (2005:21) puts forward that social constructivism leads to "shared meaning or the co-construction of knowledge".

Biggs (1999:13) emphasises that learning takes place through the construction of knowledge and eventually meaning by both peer and educator social interactions. This statement adds to the view of Gravett (2005:21) that, in order to make meaning of knowledge, learning should be an interactive process – thus part of collaborative teaching-learning situations. Van Huizen, Van Oers and Wubbels (2005:271-272) support this notion based on their perspectives on the Vygotskian theory which implies that both the course of action and the person taking part are crucial

in any developmental process. A respondent from Western Australia remarked that peer mentoring opportunities as a form of social engagement to improve preparedness might also be relevant here. A respondent with more than 20 years' experience in faculty development for teaching and learning in Indianapolis echoed the value of mentoring, but also accentuated the value of learning communities, intrusive advising and the redesigning of classes with high failure rates to engage students more deeply. Based on the views of the respondents, the survey thus reveals that the quality of learning and academic performance in general increase at higher levels of student engagement.

Multidisciplinary learning was perceived by a two-thirds majority as somewhat effective, while 37% saw this approach as an effective form of EL. Learning communities as a facilitation strategy in addition to all of the above-mentioned for enhancing academic performance in underprepared students was proposed by a respondent, who suggested that course blocks that addressed a single topic from multiple disciplinary perspectives could add value to the learning effectiveness of the underprepared. Feedback on the last two statements, related to academic and social integration and student-teacher and student-student interaction, was inconclusive. These two statements, which in fact include a number of educational approaches considered effective in the literature and described in previous paragraphs, received an agreement of only 53.9%. This indicates that only half of the respondents valued students' academic as well as social integration into higher education as effectual for alleviating underpreparedness. A similar finding, namely that increased student-lecturer and student-student interaction (that is, collaborative learning) ensures the social construction of knowledge, also deviated from previous findings. It was consequently posited that this unexpected finding might be due to either ignorance or the unmeasured effect of academic and social integration on underpreparedness. It is

thus recommended that these be included as variables in future research on underpreparedness.

The respondents' personal views on the role of EL were mainly that it allowed students within a social environment to reach higher levels of academic proficiency. However, additional suggestions in helping the underprepared also emerged. Subsequently a few are quoted:

> *Staff development sessions that expose staff to pedagogic practices that assist equity group students and mature age learners.*
>
> *I would add that a combination of teaching/learning strategies that respond to the divergent needs, abilities, and learning styles of the students and the learning community dynamic works best.*
>
> *Integrate the whole nervous system via the senses, by incorporating the visual, auditory and kinesthetic senses during the learning experience.*
>
> *Hold students accountable. Don't let them move on until mastery of the content or skills has been achieved.*

The researcher recognises the fact that the different approaches have overlapping features and that the findings reported on in this investigation represent very broad views. These views portray the perceptions, personal experiences, and in some cases the sentiments of the respondents that they associate with specific teaching and learning practices. The researcher regards these views as laying the foundation for further consideration, since the perspectives disclosed are in many cases resonated by current research and based on an awareness of research

showing that these strategies might lead to more effective learning, comprehensive in-class practice and the lived-through experience of the respondents. In summary, the findings related to the key facets are consolidated and briefly reflected on in the following paragraph.

5. CONSOLIDATED FINDINGS AND REFLECTIONS

The investigation set out to determine the perspectives of educators on a national and international level regarding educational approaches deemed effective in teaching the underprepared. The findings are based on the three key facets briefly described as existing constraints; the effectiveness of different educational approaches; and the significance assigned to interactive engagement.

Existing constraints of facilitating the learning of the underprepared: The most dominant perspectives gained for key facet one showed that the majority of the respondents, varying from 60.5% to 76.3%, agreed with the following:

- Time constraint of academic schedules hinders teachers from supporting academically underprepared students.
- Learning facilitation strategies do not always address the inability of underprepared students to learn independently.
- Teachers play a critical role in the early identification of underprepared students at risk of academic failure.

It is thus recommended that an interactive educational approach be pursued. Interactive engagement emerged throughout the finding of this investigation as being valuable in supporting the underprepared student. In addressing the above-mentioned hindrances, the researcher implies by interactive that both cooperative in-class learning strategies and out-of-class learning events be employed. First, the in-class contact will give

teachers the opportunity to identify the at-risk student. Second, out-of-class cooperative learning communities (small group learning) as part of the learning process will address both the academic time constraints experienced and the learning facilitation strategies that are lacking, supporting the underprepared student. This notion is based on the Piagetian and Vygotskian theories of learning cited in Johnson *et al.* (1998:29) and Malmgren (1998:3). These theories posit that cooperative learning encourages both the construction of knowledge and the development of cognitive ability. The value of this approach in dealing with the underprepared is embedded in these authors' claim that Piaget's and Vygotsky's theories imply that, "working cooperatively with more capable peers and instructors results in cognitive development and intellectual growth".

Effectiveness of different educational approaches: An educational approach that is widely depicted to be highly predictive of academic achievement is learner-centred learning. This is maintained by a Draft Planning Document of the Academic Planning and Budgeting Committee (APBC) of the Central University of Technology (CUT) (CUT 2003:2). This document states that learner-centred learning is a milieu that assists the search for knowledge through personal and interpersonal discovery. The main advantage revealed in this document is that the proposed learner-centred education embraces individual differences, learning styles and abilities and encourages feelings of efficacy. Even though many advantages of learner-centred learning exist, many learners have a need for the security of a structured educational environment because they feel lost when forced into a self-directed environment that is unstructured (Chung & Chow 2004:158).

In addition, learner-centred learning places increased demands on learner independence where it is expected of the learner to direct his/her own learning through, among others, self-regulated actions. However, the

perspectives gained in Article 3 and in this investigation suggest that self-direction and independency in the learning process might be lacking in the underprepared. To develop and adopt a facilitator-guided approach to scaffold the learner to be active and independent might hold the potential to reach the benefits of learner-centred learning which entails, among others, more effective learning and, ultimately, academic success.

Productive interaction between learners and facilitators – which enhances educational events and promotes learning – thus seems ideal. To accelerate learners with academically deprived backgrounds requires substantial action from facilitators to scaffold learners to become self-directed. Since underprepared learners, as mentioned before, are often reluctant to take responsibility for their own learning as propagated in learner-centred learning, this approach *per se* should therefore not be the sole approach in educating the underprepared. In view of the fact that interaction between the facilitator and the learner is depicted as a positive encounter that contributes to effective teaching and learning, an active and interactive learning approach should be adopted.

The second aspect considered to support the underprepared is rooted in the engagement of learners in active and collaborative learning experiences (Winstead 2004:29; McDonough & Osterbrink 2005:89). Butler (2003:46) affirms that students with learning deficits develop self-regulated and independent traits when exposed to a social cultural environment in which they could experience the learning process in social context. Moreover, engaging students in collaborative or cooperative learning environments is more amenable to underprepared students; it provides social support and could also, to a certain extent, allow these students to acquire knowledge and construct knowledge in a non-threatening environment.

The data in this investigation can be interpreted in two ways. First, the use of learner-centred learning by itself to redress deficiencies in underprepared students and to foster the gaining of effective learning skills is not the only solution to address the problem in higher education. When dealing with the underprepared students' construction of knowledge through experience as well as reflection, interactive engagement (student and facilitator) and social interaction (student and peers) seemed to be key requirements for effective learning when dealing with the underprepared. Various other studies support this interpretation in drawing attention to the above-mentioned approaches as being effective. Second, it is evident that the solution to enhanced learning in the underprepared, revolves around the facilitator's ability to create an engaged educational environment. The aforementioned factors that influence learning all share an engaged perspective and markedly support the use of social constructive approaches over sole learner-centred or, for that matter, passive, lecture-centred strategies.

The significance of interactive engagement: The literature reveals that in the majority of instances EL has a beneficial impact on the learning of the underprepared. The most common characteristics apparent in the existing literature on EL suggest the importance of both teacher and student taking part in the learning process, thus depicting not active participation only, but rather "interactiveness". Moreover, interactive engagement reduces the prominence of the facilitator in the learning process. It thus holds the potential to redirect the focus to the student through active involvement.

EL, in accordance with the views of the respondents, reveals that as an educational approach, it has the potential to scaffold the underprepared to develop the academic skill of effective learning. Figure 3 presents a graphical representation of a potential EL structure. Experience, active/interactive, reflective, conceptual, cooperative/collaborative, and

constructive learning revolve around EL. These six teaching-learning approaches represented by the hexagon are overlapping and interconnected and reinforce one another, as illustrated by the web between them. The web further denotes the importance of a sustaining and involved learning environment that is needed to successfully scaffold the underprepared students in their progress through higher education. The fact that the inner octagon, that represents underpreparedness, has untenanted facets, illustrates the multifaceted involvedness of underpreparedness as well as the complexity of dealing with the underprepared student.

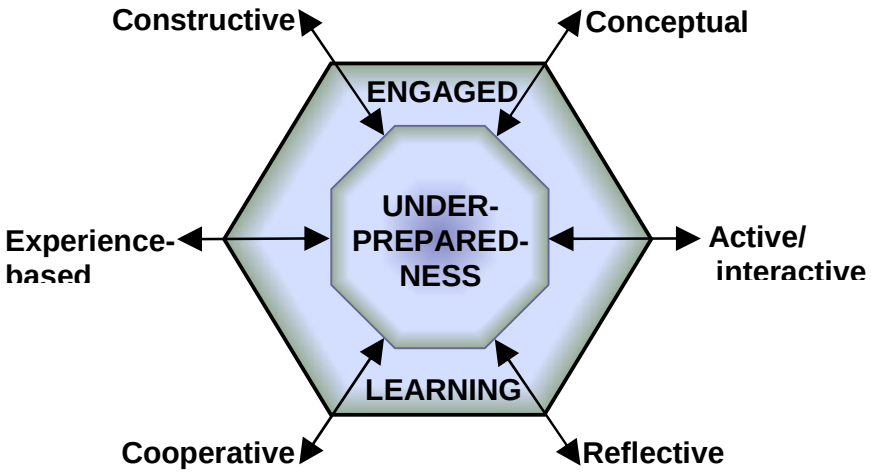

Figure 3: An engaged learning (EL) structure

The figure emphasises how important it is to create an educational environment that nurtures engagement as learning scaffold, since the learner, as mentioned previously, with little prior knowledge on which to build, needs guidance and relies on the facilitator to construct the learning process (Kember *et al.* 2004:86). The findings of the investigation, which include views from the literature, suggest that EL might be an effective educational approach to scaffold the underprepared. As illustrated in Figure 3, the blending of active and interactive learning, constructive and

cooperative learning, and extended peer and facilitator reinforcement might facilitate more effective learning in the underprepared and eventually result in better retention and throughput rates in HEIs in South Africa.

6. CONCLUSION

The emphasis of this investigation was on the identification of educational approaches that lessen the negative impact of underpreparedness on student learning. This investigation was intended to serve as a platform for higher education educators to share perspectives and experiences on teaching and learning practices that have produced positive results in general and specifically when dealing with the underprepared. As already intimated, an exploratory and descriptive approach was followed in the investigation, namely to explore and to describe learning facilitation in context to underpreparedness. Efforts were made to design a questionnaire that focused on higher education educators' approaches, experience, and perceptions of effective teaching and learning. This allowed the researcher to interpret the results of the questionnaire as indicators of teachers' experiences and not as "stable constructs within cognitive structure" as put forward by Prosser and Trigwell (1999:172). However, what has transpired is that many of the statements that reached high levels of agreement in the questionnaire survey have shown notable correspondence with the literature on EL and underpreparedness.

Giving this article the title *Engaged learning: A pathway to better teaching,* was not intended to suggest that one educational approach is better than another. This investigation showed that understanding the reinforcement value of EL as it relates to underpreparedness is important. The researcher does not idealise EL or regard it as the ultimate educational approach in dealing with the underprepared, but the ideal educational

approach might indeed be an integrated approach in which EL serves as an umbrella encompassing all the educational approaches considered effective. By “integrated” the researcher suggests that an educational approach that intentionally employs all approaches that emerge as being effective be developed to effectively scaffold the underprepared student to gain the academic skill of effective learning.

In South Africa, the search is on for effective educational approaches or, more specifically, learning or intervention strategies that could scaffold underprepared students. If successfully implemented, the plea of Education Minister Naledi Pandor (DoE 2005:1 of 1) for HEIs to develop educational approaches that "do not cause the opening of the doors of learning to become traps in an ever-revolving door of failure and despair", could indeed be adhered to. EL could thus be seen as a pathway to better teaching.

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PREFACE

Informed by the teaching and learning practices discussed in the previous articles, Article 5 addresses the design of the intended learning facilitation framework. This article is the last in a series of five exploring aspects on teaching and learning from practical and theoretical perspectives. The four previous articles have focused, among others, on the processes of conceptual change, the value of reflective teaching, the phenomenon of underpreparedness, and the potential benefits of engaged learning. Both higher education (HE) educators' and students' perspectives regarding these aspects were taken account of. All the previous research endeavours as well as the engaged learning structure that was formulated in Article 4, created a spiral effect in which a line of development systematically and progressively contributed to the learning facilitation framework that is presented in Article 5.

The orientation to the study acts as a theoretical background and rationale for Article 5. The research question and purpose related to the thesis as a whole demarcate the scope of the article. The question, "How can higher education facilitators apply learning facilitation strategies and methods to encourage self-directed and independent learning in learners that are inadequately prepared for higher education?" thus focuses the article once again on underpreparedness. The purpose of the thesis, which is the development of a leaning facilitation framework that can be used by HE educators for underprepared students at risk of academic failure, focuses the article on teaching and learning principles that should form the core of such a framework.

The repetition of certain information in Article 5 is unavoidable, since the processes of teaching and learning are entwined and the traits that lead to academic achievement interconnected. The researcher also recognises the challenges in concluding this thesis with the final article. The first

challenge was to consider, capture, integrate and reflect on the findings of all the various research endeavours in the previous four articles in this article. The second challenge was to convert the findings of the action research investigations into substantive theoretical text to be of use in forming part of the foundation of the intended framework; third, to validate the two empirical surveys that had been undertaken with a deeper and epistemological reasoning to support the development and design of the framework; and, fourth to bring together the strands of all the research findings to form a coherent whole on the one hand, and on the other hand to still ensure that the article is a complete, independent entity on its own.

A LEARNING FACILITATION FRAMEWORK TO SCAFFOLD UNDERPREPARED STUDENTS

The plan, in other words, is a co-operative enterprise, not a dictate. The development of a plan occurs through reciprocal give-and-take, the cooperating teacher taking but not being afraid also to give
(Nilssen 2007:167).

Abstract

Considering the increased access to higher education institutions a continuous need exists to devise ways to scaffold the underprepared student to succeed. This article presents a learning facilitation framework based on empirical research and current understanding about the potential benefits of engaged learning to mitigate the effects of underpreparedness. The framework includes learning facilitation strategies deemed effective in scaffolding the underprepared students' ability to learn in mainstream courses. A strategy is regarded as effective based on the research undertaken in the previous articles in which all the learning facilitation strategies seek to delineate teaching approaches that advance the learner's ability to learn more effectively. All the learning principles, theories and practices are divided into six clusters, namely conceptual, interactive, reflective, cooperative, experience-based and constructivist learning. Although the domains are unique, they are also interrelated: Reflection (reflective learning) stimulated by a learning event (experience-based learning) in a social context (cooperative learning) leads to the construction (constructive learning) of knowledge. The framework intends to act as guide or source for higher education educators who want to development the academics skills of the underprepared.

1. INTRODUCTION

The purpose of this article is to explain the development and design of a learning facilitation framework. The framework is intended to create an awareness and understanding of teaching and learning strategies that have the potential to support the underprepared student as well as the prepared but at-risk student. The particular question that provides the focus for the article is: Which teaching and learning enhancement strategies represent an efficient means of scaffolding the underprepared student in higher education to develop academic skills?

A learning facilitation framework that attempts to conceptualise and consolidate the potential benefits of engaged learning (EL) is presented. EL as an effective educational approach to scaffold students underprepared for higher education emerged from previous research. Since some interrelated concepts will be used in a new way, the article will also aim to explain the relationship of these concepts and their importance with regard to the purpose of the study as a whole. The article has two objectives, namely:

- To present a comprehensive view of EL and discuss possible dimensions, learning events, and outcome expectations of an EL environment.
- To present a learning facilitation framework to create an appropriate engaging environment by ensuring that each teaching-learning strategy individually or collectively supports academic skills development in the underprepared.

2.2 Context of the article

Education Minister Naledi Pandor told a conference of the Higher Education Learning and Teaching Association of Southern Africa (HELTASA) in November 2006 that the 50% drop-out rate experienced in higher education institutions (HEIs) and the racially one-sided education

success rates were, to a certain extent, the effect of the disparity that exists between teaching methods and the specific needs of students (Pandor 2006:1 of 1). Although a variety of factors existed that determined the throughput rates of students in HEIs, the minister pointed out that students' academic success depended on the extent to which schools prepared students for higher education. She further urged that teaching and learning enhancement initiatives to improve the retention rates and academic success of these students became crucial, since success or failure was situated within the higher education sector. It thus seemed essential to develop a learning facilitation framework that adequately equips higher education educators to facilitate the process of learning in academically underprepared learners in South African higher education (the purpose of the study in a broader context) more effectively.

2. THE EMPIRICAL AND THEORETICAL FOUNDATIONS OF THE FRAMEWORK

The proposed framework is focused on the perceptions and current understanding about learning facilitation practices related to underpreparedness. The underlying theory in this article could be seen as confirmatory. The reason for this claim is that existing teaching and learning strategies as theories of effective learning in all students, not only the underprepared, are well documented.

2.1 The empirical foundation of the framework

The framework is based on the findings of a four-tier investigation and a comprehensive literature review. The multi-method approach included two projects in the researcher's own teaching environment, namely an investigation into concept mapping as a generative learning strategy and an action inquiry into reflective teaching. The initial perspectives gained from these two endeavours and the evaluation of their success in certain

settings to promote academic proficiency laid the foundation for the empirical investigations into underpreparedness and EL. These two investigations were based on two different questionnaire surveys as well as a number of in-depth interviews. These multiple viewpoints, reflecting the perspectives of higher education educators on a national and an international level, established the South African debate on underpreparedness within a broader context as well as the potential benefits of EL in dealing with underprepared students. The nature of each investigation and its contribution in the development of the intended framework are briefly discussed.

2.1.1 *The investigation into concept mapping*

The first investigation, a two-cycle action research project, focused on concept mapping as a generative learning strategy and involved both quantitative and qualitative investigation techniques in the form of achievement scores and a questionnaire survey. This investigation was conducted in the radiography learning programme at the Central University of Technology, Free State (CUT). The significance of the investigation is rooted in the potential of concept maps to impose more effective learning. The first cycle in this investigation involved the active selecting and construction of knowledge – an individual process of creating concept maps. This generative learning strategy increased test and exam performances. However, conceptual change did not occur and was linked to the lack of social interaction between and collaboration with co-learners and the researcher.

The role of social action and interaction in developing conceptual change was recognised in the concept map tasks in the second cycle of the action research inquiry. To facilitate the process of conceptualisation, group work during the construction of maps was employed. The findings indicated that through the group effort the learners had acquired the ability to construct and transform knowledge that led to conceptual change. Thus, when

introducing concept mapping as an instructional or learning scaffold with the aim of ultimately developing it into a generative learning strategy, its implementation should take place in a collaborative learning environment. The quantitative and descriptive findings showed that concept mapping contributed not only to achieving efficacy, but also to conceptual development. The majority of the participants furthermore positively acknowledged its use in inducing more effective learning.

2.1.2 *The action inquiry into reflective teaching*

The second investigation explored the effectiveness of reflective teaching in the researcher's own teaching situation. In striving to support underprepared students to become academically skilled, the researcher made use of reflective teaching practices to investigate students' feedback to identify changes that need to be made in teaching. The researcher focused the feedback on academic instruction because contact time with students lends itself to the development of academic skills. Acting on the following two questions helped the researcher to adapt and correct teaching practices:

- What did the students perceive as positive or negative action or interactions in class?
- How did these actions or interactions influence their learning?

This type of reflection on how students perceive teaching is the basic philosophy behind reflective teaching; it assumes that students and their perspectives play integral parts in choosing educational approaches. The inquiry presented valuable ways to capture the positive or negative learning experiences of students, since it provides an opportunity for both student and teacher to reflect. In addition, this action inquiry into reflective teaching allowed the researcher to realise the power of reflection because the process of learning through experience enabled her to first of all make informed decisions about appropriate teaching practices. Reflective teaching also allowed her to take both the needs of students and her own

needs as educator into consideration, since the reflection took part in both the researcher and the students. In addition, in exploring, evaluating and modifying teaching practices as well as seeking reasons for specific behaviour, she was able to establish a practice of reflective teaching and also to discover her own teaching philosophy.

The findings of the action inquiry into reflective teaching revealed the value of building a culture of inquiry through reflection to improve both effective teaching and learning. The most prominent finding was that reflective practices have the potential to improve teaching competence, an improvement that ultimately leads to improved student learning. Through this awareness higher education educators can more successfully scaffold students to become more efficient learners.

2.1.3 *The empirical investigation into underpreparedness for higher education*

This investigation was of a different nature and included researchers, educators and experts in the field of teaching and learning in higher education on a local, national and an international level. The perspectives gained were concerned with understanding underpreparedness, a phenomenon that is inextricably intertwined with the current South African higher education dilemma of poor throughput and high attrition rates. The survey, based on descriptive-exploratory research, aimed to disclose perspectives on underpreparedness experienced by higher education in South Africa and in other countries. The focus was on what is meant by underpreparedness; factors contributing to underpreparedness; the domains of underpreparedness; and the conditions intensifying underpreparedness. These four focus areas were in the first place investigated by means of a comprehensive literature review to capture existing knowledge and research and, in the second place, by a questionnaire survey and in-depth interviews. This empirical investigation represents the opinions of 41 (nine international) experienced higher

education practitioners from various relevant disciplines identified at national and international educational conferences. Thirty-two completed an extensive questionnaire and nine took part in the interviews. These different interpretations and dimensions provided an opportunity for diverse perspectives on underpreparedness to be captured, which became a basis not only for the intended framework (the study as a whole), but also for future research or initiatives to improve teaching and learning.

Although the aim of this investigation was to gain perspectives on underpreparedness, major inhibitors to academic success were also revealed. There was consensus of opinion that underprepared students should be challenged and supported to develop academic and social skills associated with academic success. Positive efforts should also be made to engage the culturally underprepared in a non-threatening learning environment where they are encouraged to enter into active dialogue. In addition, it became clear that collaborative learning should be encouraged through academic and social engagement events, since it provides opportunities for students to both share and construct knowledge in a safe environment. This could address the alienation often experienced by students from a culture different to that of higher education. “Engagement” emerged as the most prominent enabler of academic success and was thus explored in the fourth investigation.

2.1.4 *The empirical investigation into engaged learning*

In a search for educational approaches in the form of learning strategies considered effective in dealing with underprepared students, the second survey explored EL with a totally different group of participants. The participants consisted of a group of 39 carefully selected higher education practitioners from various relevant disciplines on both national and international level [15 from South Africa; 18 from the United States of America (USA); and three from Australia]. The findings were based on

descriptive-exploratory research and mainly focused on three key concepts, namely general perspectives on the existing constraints of facilitating the learning of the underprepared; the perceived educational effectiveness of different educational approaches; and the significance that these practitioners assign to EL.

The overarching aim of this investigation was the identification of educational approaches that lessen the impact of underpreparedness on student learning. The perspectives gained therefore provided a springboard for capturing the most frequently selected educational approaches or learning strategies deemed effective. Six strategies emerged that held the potential to eliminate or significantly reduce the negative effect of underpreparedness on learning. The strategies encapsulated learning that is:

- Conceptual
- Active/interactive
- Reflective
- Cooperative
- Experience-based
- Constructive.

The perceived educational effectiveness of these different strategies explored in the survey all shared “engagement” as a frequent and prominent trait, a trait deemed effective in dealing with the underprepared student. Various statements that reached high levels of agreement in the questionnaire survey have also shown notable correspondence with the literature on the effectiveness of EL in dealing with the underprepared student. The investigation showed that understanding the reinforcement value of EL as it relates to underpreparedness is of major importance. It became evident that EL as an educational approach, in accordance with the views of the respondents, has the potential to scaffold the underprepared to develop the academic skill of effective learning. The

significance that the respondents coupled to the different engaging learning strategies thus motivated the use thereof in creating an EL structure (see Figure 1).

Figure 1 is a graphical illustration of the developed EL structure. Conceptual, active/interactive, reflective, cooperative, experience-based, and constructive learning represent the elements/strategies of EL. These six learning strategies represented by the hexagon are overlapping and interconnected and reinforce one another, as illustrated by the web between them. The web further denotes the importance of a sustaining and involved learning environment that is needed to successfully scaffold the underprepared students in their progress through higher education. The fact that the inner octagon that represents underpreparedness has untenanted facets, illustrates the multifaceted involvedness of underpreparedness as well as the complexity of dealing with the underprepared student.

The figure emphasises how important it is to create an educational environment that nurtures engagement as learning scaffold, since the learner, with little prior knowledge on which to build, needs guidance and relies on the higher education educator to construct the learning process. The findings of the investigation, which include views from the literature, suggest that EL (consisting of the six proposed learning strategies) might be an effective educational approach to scaffold the underprepared.

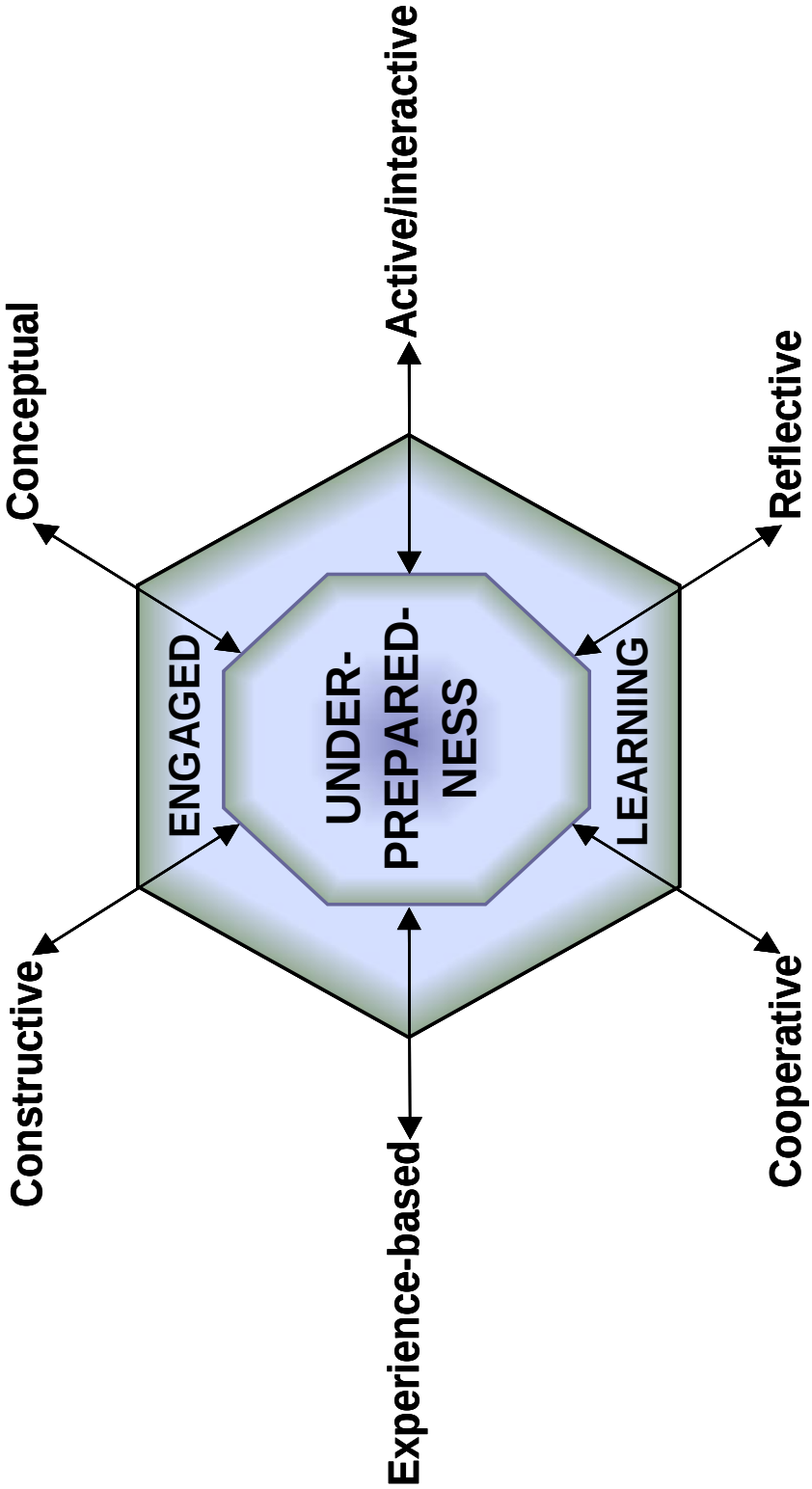

Figure 1: An engaged learning (EL) structure

As implicated by Figure 1, the blending of active and interactive learning, constructive and cooperative learning, and extended peer and facilitator reinforcement might facilitate more effective learning in the underprepared and eventually result in better retention and throughput rates in HEIs in South Africa. These notions are strongly supported by other research evidence as put forth in the literature.

2.2 The theoretical foundation of the framework

Research evidence supports the notion that student outcomes are likely to be enhanced if students are "engaged" both academically and socially (Tinto 1998:168). Student engagement and the positive outcome that this strategy has on the performance of underprepared students received attention in the USA and Australia (see Krause 2005:1-10; Kuh, Kinzie, Cruce, Shoup & Gonyea 2007:1-98). These authors as well as Lederman (2006:1 of 1) put forward that EL supports the underprepared student and even makes a more considerable contribution to these students' learning and academic achievement than to that of students in general. Wasley (2006:A39) echoed these propositions when reporting on the findings of the latest annual National Survey of Student Engagement (NSSE) among 260 000 students in 523 four-year colleges and universities in the USA. The report revealed that the academic performance of underprepared students as well as those from underrepresented racial and ethnic groups improved when they were "engaged" academically and socially.

Students' engagement in learning events and social interaction is the elemental concept underpinning EL (Kearsley & Shneiderman 1999:1 of 1). According to the authors, these engagements enforce learning that is more meaningful and meaningful learning is then again, because of the cooperation, consistent with constructivist learning (Altun & Büyükduman 2007:31). Ambrose (2001:1-15) agrees that EL events acknowledge the essence of constructive learning, namely collaboration during and active involvement in the learning process. The author sees problem-based,

inquiry-based, discovery and authentic learning as typical examples of teaching approaches that are engaging and centred on the student. According to Gravett (2005:21), this social constructivism leads to "shared meaning or the co-construction of knowledge". Biggs (1999:13) emphasises that learning takes place through the construction of knowledge and eventually meaning by both peer and educator social interactions. This statement adds to the view of Gravett (2005:21) that, in order to make meaning of knowledge, learning should be an interactive process – thus part of collaborative teaching-learning events.

Research on teaching and learning in higher education reveals that students' engagement in the learning process leads to improved learning (Pascarella & Terenzini 1991:101-102; Cahyadi 2004:456; Bowen 2005:4). In citing the success of educational interventions, Pascarella and Terenzini see the engagement of students during academic instruction as the most important challenge facing contemporary teaching and learning practices in higher education today. Effective learning facilitation should engage students and provide events in which students construct and transform knowledge through dialogical or cooperative tasks. An environment conducive to learning is thus created for all students despite the consequences of their prior experience, disposition or level of preparedness.

At this point, without a combined premise of how the different teaching-learning strategies interact to enhance effective learning, the researcher presents these different strategies independently and then progressively links them together into a learning facilitation framework. Although all of the above-mentioned teaching-learning strategies are well documented in the literature to enhance learning and contribute to academic success in general, an effort will be made to accentuate the relevance of each of these strategies in scaffolding the underprepared to overcome some of the

deficit resulting either from academic, cultural or emotional underpreparedness.

2.2.1 *Conceptual learning*

Conceptual learning is explained by Roussou (2004:1049) as a process in which conceptions are altered based on understanding rather than only the gathering of information. For conceptual learning to be effective it should be built on prior knowledge and bring about behavioural changes. According to this author (2004:1050), the change in behaviour is then an indication of internal understanding. The Chinese proverb: "By viewing the old we learn the new", captures the value of prior learning in inducing meaningful learning.

Since prior knowledge plays a major role in the development of conceptual change or conceptual learning, the possibility exists that the prior knowledge of the underprepared student might be lacking, since the development of prior knowledge relies heavily on previous social structures and instructional environments. The school system and socio-economic background, as mentioned in Article 3, are major contributing factors to the phenomenon of underpreparedness which leads to misconceptions based on inadequate development of prior knowledge. To provide initial context with which students are familiar therefore seems essential to improve conceptual learning in the underprepared. While augmenting the context, students should also be made aware of their own thoughts about the subject matter or phenomenon under study as the first and most important step in conceptual learning – thus creating an awareness that could eventually have a spiral effect in which knowledge is systematically and progressively built.

Rebich and Gautier (2005:364) used concept map learning events and assessment tasks to identify students' knowledge structures and, ultimately, their misconceptions. The findings of the investigation into

concept mapping as a generative learning strategy suggest that concept mapping, within a societal context, offers a unique chance to induce meaningful learning and promote conceptual change. However, the use of concept mapping as a learning strategy to bring about conceptual learning is not enough, since the conceptual change process also involves motivation and epistemological beliefs (Rebich & Gautier 2005:355). Motivation, based on reaching either performance (aimed at reaching high grades and acceptance by peers) or mastery goals (aimed at learning and understanding) is seen by Linnenbrink and Pintrich (2002:115) as the two goal-orientated dimensions of motivation. Pintrich (1999:35), however, puts forward that motivation based on mastery goals will facilitate conceptual learning, thus learning for understanding.

Epistemological beliefs include, among others, beliefs about the nature of knowledge and learning. These beliefs strongly influence a student's ability to achieve conceptual change (Gregoire 2003:169,172). Rebich and Gautier (2005:355) and Vosniadou (2007:47) suggest instructional interventions based on collaborative learning to support conceptual change which should be employed. In addition, Rebich and Gautier (2005:356) assert that low levels of emotional preparedness, for example in the area of self-efficacy, obstruct the development of conceptual change. In view of the fact that students who are emotionally underprepared most distinctively lack motivation and self-efficacy, these two concerns should receive high priority in teaching these students. The following two approaches might hold the potential to address these deficits: Encourage motivation based on mastery goals (learning for understanding rather than rote learning) to facilitate conceptual learning; and clarify epistemological beliefs (the nature of learning and knowledge), since they strongly influence students' ability to reach conceptual change.

Conceptual change requires instruction practices that advance conceptual learning. Maclellan (2005:143) proposes that these strategies include:

- An outline of appropriate questions in the absence of student queries.
- An educational emphasis on authentic tasks and problems that stimulate curiosity.
- An educational space in which students are encouraged to converse their thoughts.

The above-mentioned strategies are put forward to promote conceptual change, but conceptual change also involves some of the other strategies propagated as being effective in scaffolding the underprepared. In recent years the basic concept of conceptual learning has been widely adopted in educational environments, particularly by constructivists, as a means to support better learning.

2.2.2 *Active/interactive learning*

Interactive learning is advocated by McQuoid-Mason (2006) as being far more effective than the traditional lecture which creates a passive and surface approach to learning. Baxter and Gray (2001:396) also emphasise the importance of active learner involvement that leads to a deep approach to learning in contrast with surface learning with learners who only memorise and reproduce information, a notion that is widely supported both theoretically and empirically.

"Active learning", according to Boyer (2002:51), could include many "avenues" of education and allow learners to become lively participants who can direct their own learning. "Active learning is the essence of effective studying. Good studiers are active learners, not passive recipients of fact and details" (Gettinger & Seibert 2002:353). Active learning is critical to assist underprepared students who lack the ability to study independently to become good studiers and students who can direct their own learning. Supportive interventions to counteract passive behaviour are thus important when dealing with the underprepared.

Barr and Tagg (1995:23) urge that the traditional "Instructional Paradigm" be replaced by a paradigm that produces learning. According to the authors, the learners are then responsible for their own learning and become "co-producers" of learning, since they discover and construct knowledge for themselves. The authors recommend that an effective learning theory be based on an active and learner-centred approach and that the learning environment should support the fact that both the higher education educator and the learner take responsibility for the same outcome, which is academic success. For this reason, interactive teaching was, among others, seen as a potential enhancer of academic performance.

The shift of responsibility from educator to learner goes hand in hand with nurturing a culture of learning in the underprepared. The fact that underprepared students are more dependent on active facilitator guidance sustains the importance of an interactive rather than only an active teaching-learning strategy. The belief that an interactive educational strategy could improve the marks of low academic achievers is confirmed by the study of Cleave-Hogg and Rothman (1991:456-474), in which learners were asked to indicate which factors supported and stimulated learning. The majority of the learners mentioned the relationship between the facilitator and the student as the main positive influence in enhancing learning. Harden and Crosby (s.a.:8) also indicate that learners "traditionally expect to be taught", an approach that leads to learner passivity. However, if educators are enthusiastic and use interactive methods, it motivates the students.

Kumar (2003:24) states that increased attention and motivation enhance memory and further claims that increased stimulation through interaction is critical for learning and is more important for retention than intelligence. To summarise, active involvement enhances the learner's understanding and capability to put together and synthesise information. It also increases

retention and a motivation to learn (Ames & Archer 1988:261; Davis & Harden 1999:133; Nasmith & Steinert 2001:48).

The value of interactive learning strategies is hence summarised as follows: First, an active learning process results in better mastering and a deeper understanding of subject content compared to simple memorisation (Davis & Harden 1999:130). Second, learners' critical thinking skills are enhanced when they are actively involved and they learn to be more effective learners (NQF 2000). Third, since learners differ in their preferred learning styles and abilities, the use of various learning activities could provide opportunities for learners to encounter some alternative way that could broaden their usual learning approach (Ferguson, James & Madeley 2002:953; Steele, Johnson, Jodi, Thomas, Lacy & Duffy 2002:225). Therefore, if educators can become skilful at using a variety of teaching approaches, the various learner needs and styles of the underprepared can be accommodated (Vaughn, Del Rey & Baker 2001:41).

2.2.3 *Reflective learning*

In stating the value of reflective learning in respect of underpreparedness, the researcher identifies with the notion of El-Dib (2007:27). The author advocates that the action of reflection includes three types of reflections. The first is content reflection which includes not only reflection on learning experiences, but also thoughts and feelings about the process. The second is process reflection, which involves investigating how thought and feelings are acted upon. This second type of reflection is indicative of metacognition development. The third type of reflection is referred to as premise reflection. Premise reflection is the understanding of the cause of feelings and the reason for acting in a specific way. The researcher sees these three types of reflection as necessary in dealing with underprepared students, since they need to develop a metacognitive awareness. This awareness will not only enforce a better understanding of the learning process, but also

develop thought processes that could overcome the resultant negative effects of emotional or cultural underpreparedness.

In building a culture of inquiry through reflection to increase the probability of successful learning, reflective learning forces students to become active participants in the learning process. The reason for this is that inquiry is at all times an active course and is seen by Tripp (2003:16) as action learning, a process he explains as "…doing something one wouldn't otherwise do in order to learn from doing it". Students taking part in reflective learning are thus encouraged to think for themselves about their own learning. In giving voice to the students, their insights could also be used to improve or alter teaching approaches during academic instruction to support students to learn better – in other words, to become academically skilled. Increased motivation on the part of the students could also be a positive experience. Considering their views and involving them in decisions will increase motivation and improve the level of conversation between the educator and the students. These increased levels of motivation and conversation could lead to a more positive attitude towards student-centred learning education practices.

2.2.4 *Cooperative learning*

Bitzer in Gravett and Geyser (2004:43) discloses the advantages of cooperative learning in higher education at various levels and various disciplines, while Van der Westhuizen (2004:173) in the same book elaborates on the advantages of collaborative learning. Although collaboration is seen by Panitz (1996) as a philosophy of interaction while cooperation is seen as a structure of interaction in this article, the terms "cooperative" or "collaborative" learning generally imply the interaction between educators-students and students-students that supports learners within a social structure. Cooperative and collaborative learning in this article are not regarded as separate, but rather entwined and synergetic with each other and are, for the purpose of this study, used

interchangeably. In addition, it seems that the possible attributes reported in the literature are similar. Cooperation is defined by Henderson (1996:249) as a form of social interchange in which the individuals exchange ideas, which is facilitative and supportive of the learning process. This social interaction captures the students' developing ideas and transforms them to make new associations in order to develop conceptual change (Marchinko 2004:1).

Social collaboration is seen by Smyth and Buckner (2004:383) as more educationally effective than events that are undertaken in isolation. The reason for this effectiveness is situated in constructivist environments over the use of only individual efforts. There is a moderate amount of research evidence to support each of the above. The value of this approach for students underprepared for higher education is to be found in the metacognitive strategies that students in cooperative groups employ more often than those working in individual situations.

Effective learning necessitates support and guidance from educators and/or peers, a process which – if scaffolded by an educator or a more advanced peer – offers support for students to understand and construct knowledge (Kim 2003). The value of such peer interaction is situated in the fact that if a less able or underprepared student works with an advanced peer, the underprepared student might construct his own perspectives based upon those of his peers. In addition, cognitive differences that arise during the interaction are very helpful to encourage engagement and advance the student's intellectual development (Kim 2003). Vygotsky expanded on this theory in affirming that "functions are first formed in the collective in the form of relations among children and then become mental functions for the individual" (Vygotsky 1978:47).

Both the supportive and the role model tasks that a member in a collaborative learning environment provides advance students' self-

efficacy beliefs and, in addition, present a model for learning (Kim 2003). The emotional needs of underprepared students can also be addressed in a collaborative environment since the presence of a peer could either encourage constructive emotions or ease unconstructive ones. Students may also develop positive opinions about their abilities when they experience the successful performance of a peer with the same background or race as themselves. This, in turn, inspires higher levels of self-efficacy beliefs as well as stronger efficiency beliefs to learn.

The Piagetian and Vygotskian theories of learning cited in Johnson, Johnson and Smith (1998:29) and Malmgren (1998:3) emphasise the advantage that cooperative learning holds for low achievers. A further benefit is that, when information is explained, knowledge retention is improved. The significance of this approach was realised through a statement made by the Roman philosopher, Seneca (4BC-65), “qui docet discet" (when you teach, you learn twice) and the beliefs of Johann Amos Comenius (1592-1679) that students equally benefit by teaching and being taught by other students (Johnson *et al.*1998:32).

The potential value that cooperative learning groups have for the underprepared student in addressing underpreparedness is that cooperative learning mitigates academic underpreparedness, since it develops academic skills through interaction that leads to social construction of concepts – that is, learning from one another. It also mitigates emotional underpreparedness through the promotion of social interaction to increase self-awareness and, as a result, self-efficacy and motivation. In addition, it mitigates cultural underpreparedness in fostering supportive interaction to increase the ability to work in a societal context that eventually enables cultural development (Cushman 2007:45-46).

Since students in cooperative learning environments reach higher levels of performance, use metacognitive strategies, and transfer learning to

situations where they have to work on their own, the value of cooperative learning is undeniable in assisting the underprepared.

2.2.5 *Experience-based learning*

The essence of experience-based learning is the personal engagement in authentic learning activities based on the context in which learning is relevant (Maclellan 2005). Kolb cited in D'Eon (2004:604) is the most prominent writer in the area of "learning from experience". D'Eon (2004:604) in building on Kolb's concept urges that, for learning to be effective, it should be based on an experiential learning framework which is progressing through the four stages of planning, doing, observing and reflecting. Learning from experience provides learning environments that represent multiple accounts of the real world. Thus, focusing on the construction of new knowledge from authentic experiences could enhance the learning experience for the academically underprepared. Since these students lack study skills and extensive prior knowledge on which to build, hands-on and heads-on experiences might assist and advance more effective learning.

There is a degree of overlap among the six strategies presented. Having expounded the most important views of EL, constructivism frequently emerged as tenet present in all these learning approaches.

2.2.6 *Constructivist learning*

There is reasonable consensus within the literature about the role that the deliberate construction of knowledge plays during the learning process as well as the effectiveness thereof to make learning more meaningful (Clayton 2006:197). Constructivist learning is described as "learning-for-understanding" (Henderson 1996:6). As a theory of learning, constructivism was already described as early as the eighteenth century in the work of the philosopher Giambattista Vico, who claims that

understanding can only be enforced if self-constructed (Thanasoulas 2001).

Constructivist learning is based on three principles, namely, first, that students construct understanding; second, that this understanding leads to the realisation and integration of related concepts; and, finally, that all learning relies on prior knowledge (Resnick in Henderson 1996:6). The reliance on prior knowledge is echoed by Clayton (2006:197) who posit that the construction of knowledge or learning is only meaningful if previous and new knowledge are part of the learning process. This is a view that is based on Ausubel's assimilation theory cited in Clayton (2006:197) and Novak and Cañas (2006:3). This theory claims that meaningful learning entails a course of action that connects old and new knowledge to form a cognitive structure (Kinchin & Hay 2005:182; Fraser 2006:6). Gravett and Swart (1997:122) extended on this theory in recommending that understanding should be an integral part of this cognitive structure, thus "learning-for-understanding". The goal of constructivist learning is hence embedded in students' active understanding of concepts based on past experience, their active understanding of themselves, as well as an understanding of social equality (Henderson 1996:8). These last three notions reinforce the propositions involving active, experience, and cooperative learning.

Four instructional steps described by Kaufman (2004:308-309) provide a framework within which constructivist teaching could lead to constructivism in learning. These steps and the intent or outcome of each step are seen by the researcher as the crux in alleviating the lack of self-direction existing in the underprepared student. The first step, which Kaufman calls *natural involvement*, entails the engagement of students in authentic or simulated meaningful learning events. In the next step, *mediated learning,* students are scaffolded to become self-directed. The third step, called *external activity*, is the involvement of students in self-directed and self-

regulating learning events. This step could involve peers with only sporadic instruction. Lastly, in the fourth step, *internal or independent activity*, students continue independently by means of reflection and inquiry. Although constructivist notions, in dealing with the underprepared have until now not been described specifically or explicitly, these gradual steps have the potential to foster underprepared students' independence and self-sufficiency, resulting in higher levels of self-direction and self-regulation. In addition, this initial educator-mediated approach has the potential to overcome underprepared students' dependence on educator support and guidance in the learning process.

The framework is intended to identify a range of constructivist learning events or activities. Reeves and Okey (1996:193,195) suggest that constructivist learning activities are most successful when it is expected of the student to construct knowledge and skills within learning tasks that imitate real-life situations. Constructivist academic instruction should thus be placed in context with real-life teaching and learning events. The value that the researcher places on constructivist learning in dealing with the underprepared student is captured in a statement made by Thanasoulas (2001:1 of 1): "The learner constructs his own conceptualisations and finds his own solutions to problems, mastering autonomy and independence". Underprepared students can thus be encouraged to act independently through constructivist teaching and learning strategies.

Additional aspects of constructivist learning that have the potential to mitigate deficiencies that underprepared students struggle with, is highlighted by Can (2007:2 of 10). In an attempt to answer the question: "What kind of a learner does constructivist theory promote?" Can (2007:3 of 10) presents an extensive list of performance accomplishments that includes: students start taking responsibility for their own learning; develop goals for learning; use learning strategies; have increased levels of self-regulation and autonomy; and are self-motivated. All these attributes

developed through constructivist learning and in some way or another address the different domains of underpreparedness.

The implication of EL for instructional design received wide attention in the previous paragraphs. All of the mentioned strategies contained in the EL structure thus have the potential to affect both the academic as well as social skills of the underprepared student. Moreover, EL through interactions with peers, creates opportunities for students to learn and practise new skills.

3. THE DEVELOPMENT OF THE PROPOSED FRAMEWORK

Little formal research exists on how to construct the most effective learning facilitation framework based on EL. However, the perspectives gained are that EL is more successful than formal lectures or individual efforts to enhance effective learning. The outcome of the research undertaken in the previous research endeavours gave the researcher the assurance that EL not only offers higher education educators the ability to be more efficient in teaching, but also to be more effective in imposing effective learning. The researcher realises that a variety of factors needs to be addressed to create a meaningful learning environment in which the ultimate outcome is effective learning and, ultimately, academic performance and success. However, to focus efforts to improve learning on academic instructional design might inadvertently also lessen the impact of other unidentified difficulties in dealing with factors that prevent underprepared students from learning effectively.

An overview of the progression of the proposed framework is presented in the ensuing paragraphs. Within the limits set by an article format as many aspects as possible will be outlined and discussed. Since the framework progressed through a reiterated cyclical process of different phases, the

researcher based these developing phases on a seven “P” approach, namely the Purpose, the Premiss, the Process, the Propositions, the Proposal, the Product, and the Prospect which is followed in outlining the framework.

3.1 The purpose

The purpose of the learning facilitation framework is first and foremost to structure and present learning facilitation strategies that allow students to progress from an initial state of underpreparedness to one of increasing preparedness. This is intended by providing a variety of teaching and learning experiences that aims to lessen the consequences of the different domains of underpreparedness. The purpose is thus to:

- take advantage of appropriate educational interventions to increase underprepared students’ capacity to learn;
- integrate learning activities/events into the learning process that explicitly contribute to personal development (mitigate emotional underpreparedness);
- reinforce learning processes that allow the transfer of academic skills (mitigate academic underpreparedness);
- increase cultural learning experiences that specifically foster the social-cultural development of students (mitigate cultural underpreparedness); and
- enable the coordination of learning strategies that foster educators’ awareness of learning events that facilitate effective learning in the underprepared.

In order to accomplish the purpose of the framework, its development went through an initiation stage, which the researcher calls the premiss phase.

3.2 The premiss

The initiation phase involved the construction of the framework based on the graphical representation of the EL structure that was developed and described previously (see Figure 1). The learning facilitation strategies included in the structure not only support EL, but also enforce student independence, motivation, self-efficacy and more effective learning – traits that are highly sought after to assure academic success in the underprepared student.

As previously described, these six learning strategies represented by the hexagon are overlapping and interconnected and reinforce one another, as illustrated by the web in between. The web further represents the importance of a supporting and involved learning environment that is needed to successfully scaffold the underprepared students to progress through higher education. The research findings on underpreparedness and EL informed the addition of a further dimension to the EL structure. Although underpreparedness exists in three domains, namely academic, cultural and emotional underpreparedness, the researcher initially focused this article on academic underpreparedness. However, the other two domains inadvertently also emerged recurrently and the researcher could, as a result, not overlook the intertwining of the three domains.

The framework thus encapsulates the academic, emotional and cultural domains of underpreparedness in the integrated triangle where EL is the core of the framework for addressing underpreparedness. The reason for placing these domains in particular corners of the triangle emerged from an extensive review of the literature on underpreparedness and the associated enhancement initiatives to alleviate certain deficits experienced by the underprepared student.

In an effort to purposely address the three domains, each domain is positioned between two specific learning strategies. This placement

implies the tendency of that strategy to lessen the impact of the most prominent deficiency, characterised by that specific domain (see Figure 2).

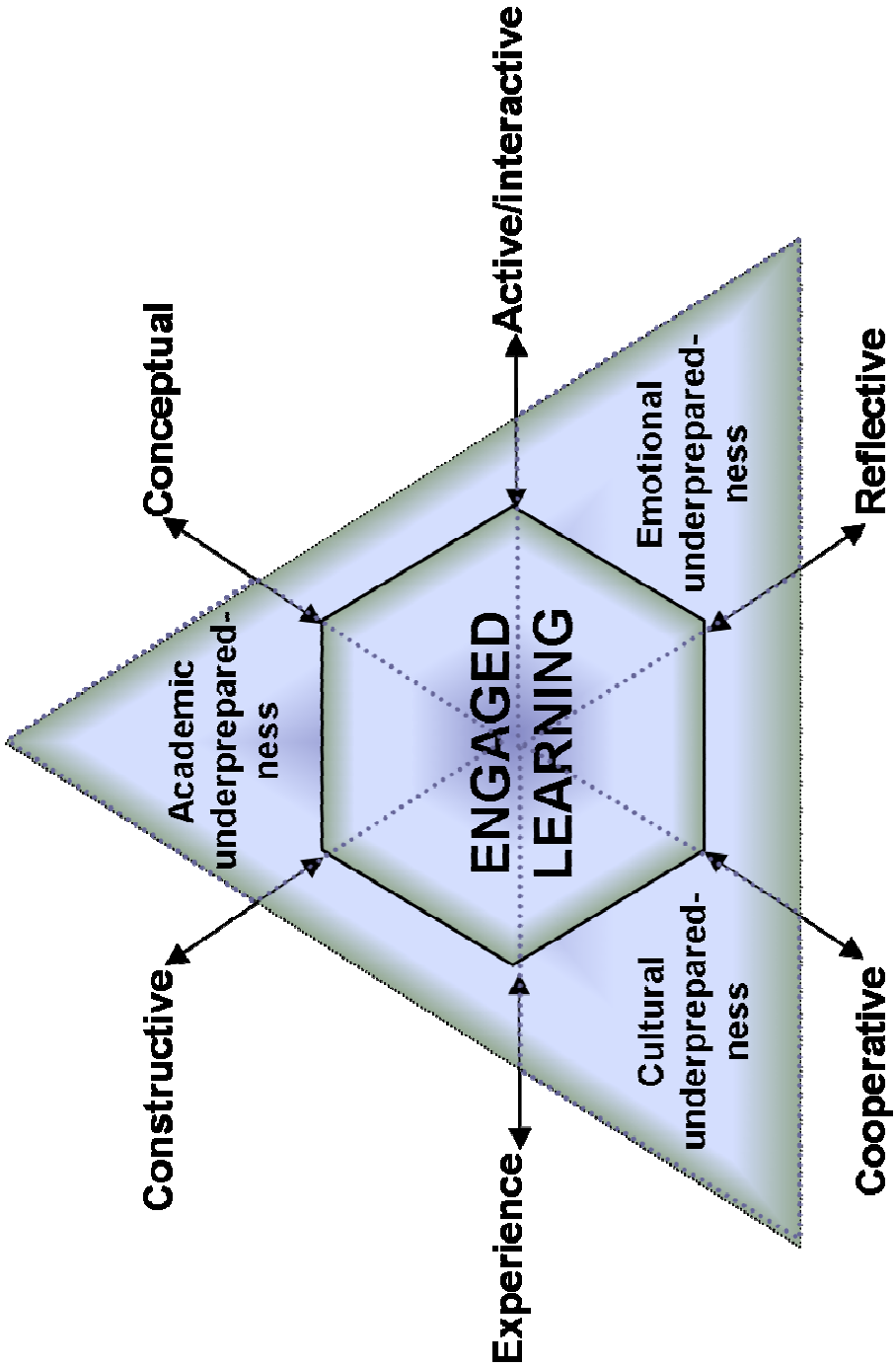

Figure 2: A learning facilitation framework for addressing underpreparedness

Academic underpreparedness, for example, is mainly alleviated by conceptual and constructivist learning since they enforce the development of academic skills. Culturally underprepared students, on the other hand, could benefit from cooperative and experience-based learning, since these two strategies not only provide a supportive social environment but also provide the necessary experience to build or increase prior knowledge. The possible advantage of cooperative and experience-based learning on cultural underpreparedness is situated in the fact that the experience and the social cooperation are relevant to everyday life.

Placing emotional underpreparedness between reflective and interactive learning is based on the belief that during reflection students are given time to both process learning and reflect on their learning experience. Reflection also presents valuable ways of capturing the needs and the positive or negative learning experiences of students that might have a negative effect on motivation and/or self-efficacy. Interactive learning further provides opportunities for intrusive support and advice to scaffold students that are emotionally not equipped to deal with higher education. However, to be of value in dealing with the underprepared, the process should further emanate in an awareness of progress in learning through self-reflection and metacognitive skills to address the lack of motivation and self-efficacy existing in the underprepared student. Low self-efficacy students frequently evade teaching or learning tasks because they believe they do not have the ability to succeed. These students then often quit, decreasing the chance of reaching academic success (Margolis 2005:221). Interactive learning, that is interaction between educator and student, provides an opportunity to raise self-efficacy by means of social support and constructive feedback on the learning progress.

3.3 The process

During the process phase the researcher drew from a comprehensive review of the national and international literature and the learning facilitation strategies deemed effective in scaffolding the underprepared students' ability to learn in mainstream courses. These learning facilitation strategies seek to delineate teaching approaches that advance learners' ability to learn more effectively. These learning principles, theories or practices are divided into the six EL clusters described in the previous paragraphs, namely conceptual, active/interactive, reflective, cooperative, experience-based, and constructivist learning.

Within each of these six clusters a set of guidelines which encapsulates the key features of EL is presented. These guiding principles assist students to form a deeper understanding of knowledge through either the construction or creation of knowledge. They also offer ways of socially supporting students and encouraging conceptual understanding. Since reflecting on the learning process also presents students with the opportunity to reach higher levels of engagement, five propositions were put forward. Together these propositions intend to provide higher education educators with a guideline to use in developing learning enhancement initiatives that help improve underprepared students' outcomes.

3.4 The propositions

A synopsis of the guidelines is provided in this phase (see Table 1). The researcher realises the general complexity that exists between what educators do and how students learn. However, the suggestion that EL has a positive impact on student academic performance cannot be overlooked. Since educators have the greatest impact on student learning (Naidoo 2006), the focus of these guidelines is therefore on the teaching level, also called the academic instruction level. The researcher devised these guidelines from the previously mentioned EL structure (see Figure 1)

and the learning facilitation framework (see Figure 2). The learning experiences are once again explicitly focused on the processes of conceptualisation, active/interactive involvement, experience, collaboration, and constructivism. The limited range of an article format does not provide enough scope to explore exhaustive underlying empirical confirmation in detail. In reaching EL, it is thus suggested that academic instruction should follow the guidelines depicted in Table 1:

Table 1: Guidelines for engaged learning (EL)

EL clusters	Guidelines
Conceptual	• Present initial contexts (background). • Make students aware of their own developing ideas. • Provide an appropriate question framework. • Place emphasis on authentic tasks. • Exploit concept mapping. • Promote learning for understanding. • Clarify epistemological beliefs.
Active/ interactive	• Promote a culture of active/interactive learning. • Design heads-on and hands-on learning events. • Support academic and social interaction. • Encourage interaction with more able peers.
Reflective	• Initiate the right to be heard in the learning process. • Use reflection as a component of instruction. • Encourage students to reflect on their learning progress. • Stimulate self-efficacy through reflective discussions. • Engage students in continuous formative assessment.
Cooperative	• Provide collaborative learning events and experiences. • Encourage cooperative learning groups. • Promote social interaction. • Support social construction of concepts. • Create academic learning communities. • Foster supportive interaction through tutoring/mentoring.
Experience	• Design authentic learning tasks or activities. • Provide real world learning environments. • Elicit prior knowledge. • Construct new knowledge from authentic experiences.
Constructive	• Promote construction of concepts. • Facilitate knowledge construction, not reproduction. • Focus academic instruction on constructivist learning. • Advance meta-adaptive skills. • Support collaborative construction of knowledge. • Engage students in active inquiry learning.

The propositions delineated are, as previously mentioned, informed by the findings of the preceding research endeavours or have an origin in previously published studies on either underpreparedness or the effective efforts in dealing with this phenomenon. Any one learning strategy may involve more than one proposition and any one proposition may involve more than one learning strategy. For this reason the researcher does not consider the strategies as separate, but rather as intertwined and synergistic. An EL programme may combine one or more of the above-mentioned learning strategies, although many of these have common characteristics. The literature shows that a range of factors relating to academic proficiency can have a positive or negative effect on student outcomes such as retention, persistence and throughput. A single learning facilitation strategy inevitably limits the effectiveness of a learning programme. The synthesis of different learning strategies thus has the potential to rule out a possible mismatch between a student's learning preference or need and that of the teaching approach.

3.5 The proposal

The reason for putting the propositions in Table 1 forward as potential actions to mitigate underpreparedness evolved from the fact that heads-on and hands-on learning events promote a culture of EL. Once the researcher identified the learning facilitation strategies that make up the learning facilitation framework, the learning tasks or events, the learning support and the outcome expectations were addressed. Concerns include creating a learning environment and the support to induce effective learning and also to ensure that all the strategies are supportive in mitigating underpreparedness.

The proposal phase is an extension of the learning facilitation framework. The concepts for operationalising the learning facilitation framework are captured in a learning web (see Figure 3).

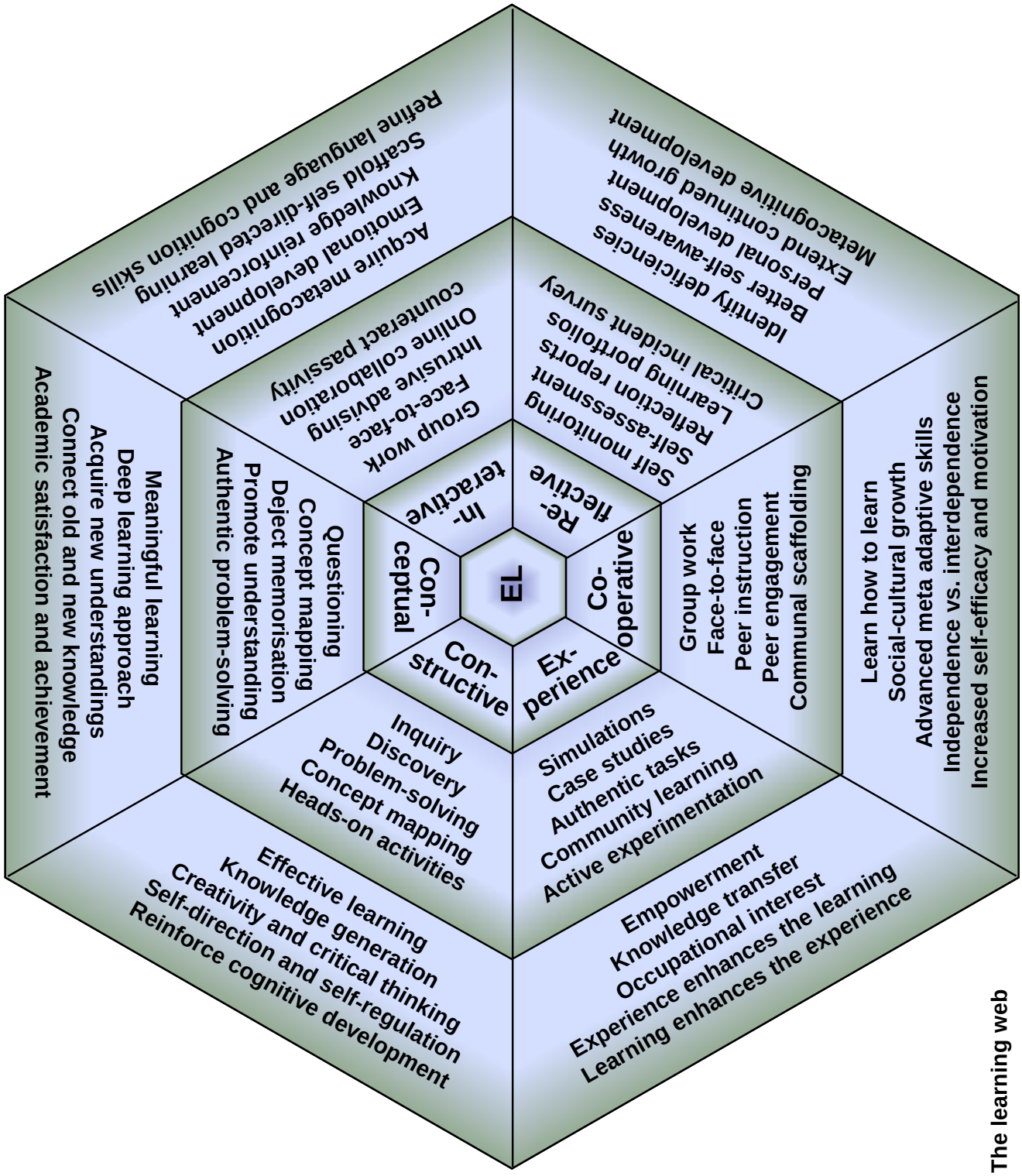

Figure 3: The learning web

The aim of the learning web is to advise the anticipated implementation of the framework. The web intends to:

- elicit once again the learning strategies most suitable to scaffold underprepared students' academic skills development;
- outline the teaching/learning events or interventions needed to effectively deploy the learning strategy; and
- record the envisaged performance accomplishment or expected outcomes.

The centre of the learning web once again represents EL, while the inner level of the web captures the six learning strategies. The next level of the web represents the learning events or interventions that will ensure the effective use of the proposed strategy, whereas the outer level of the web depicts the performance accomplishments foreseen to mitigate the effect of underpreparedness.

3.6 The product

The ultimate purpose of this learning facilitation framework from a teaching point of view is to develop academic skills in the underprepared. The envisaged outcome or product resulting from employing the learning facilitation framework is that it fulfils the following functions:

- Encouraging interracial engagement of students that develops an understanding of cultural diversity, reducing alienation caused by cultural underpreparedness.
- Preventing emotional marginalisation because interaction opportunities integrate students into peer social structures.
- Instilling effective learning traits through collaborative interaction of underprepared students with more able peers.
- Maximising underprepared students' academic achievement skills given that learning progress is supported through engagement.

- Informing deficiencies in both teaching practices and learning progress through the engagement of students in reflective learning events.
- Stimulating self-efficacy through discussions during which students reflect on the progress of their learning.
- Encouraging the development of academic skills, that is learning from one another in cooperative learning groups.
- Fostering supportive interaction to increase the ability to work in a societal context that eventually enables cultural and emotional development.

The key to the success of efforts to reduce the impact that underpreparedness has on student learning is a systematic relationship between teaching strategies, instruction design and learning events. The proposed framework should thus neither be seen in the sense of a step-by-step guide of instructions nor as a course of remedial actions. It should be seen in the sense of providing an awareness and understanding of specific teaching and learning strategies that can be used to enhance the learning experience of students in general, but expectantly that of the underprepared in particular. It is also proposed that the framework is generic and adaptable. A simple practical application of the propositions in the framework may be to act as a “checklist” for higher education educators as they reflect upon their own teaching practices and seek direction for potential teaching approaches that might translate into meaningful learning experiences for the underprepared.

3.7 The prospect

The proposed framework could direct the design of teaching and learning events during academic instruction. These events or activities, informed by the framework, may lead to the development of academic skills in underprepared students. Although underprepared students may lack academic proficiency, the engagement into interactive and collaborative

tasks could surpass existing deficiency in supporting and scaffolding the learning process more effectively. The final phase outlines the anticipated prospects or possibilities of the adoption of the proposed framework and includes:

- Effective or meaningful learning in the previously/otherwise underprepared.
- Increase students' self-regulatory and cooperative learning skills, where students take responsibility for their own learning.
- An increase in students' academic, emotional and/or cultural preparedness.
- The development of academic skills.

Although idealistic, the framework could be used as a guide to develop academic skills and increase academic performance. It could, in addition, be used to re-enforce evidence of good teaching practices. An additional prospect of the framework may be in the further exploring of identified learning strategies by means of research or the confirmation or explanation of research findings. The framework allows academics to more effectively address the lack of academic skills that cause learners' academic difficulty. Moreover, this framework can be used for conceptualising educational strategies during academic instruction to direct the learning problems that learners face in higher education with implications for both research and practice. The learning strategies which were mentioned can also be seen as teaching and learning enhancement initiatives aimed at facilitating effective learning, but also deliberately scaffolding independent learning in the underprepared. These critical reflections on learning can inform current teaching and learning practices, since the framework will identify the most prominent factors that affect competence or achievement in students underprepared for higher education.

The effort of the researcher to express what might be considered successful learning facilitation strategies in dealing with the underprepared student can be contested. The researcher is aware that the construction of the framework is based on the researcher's own perspectives and interpretations of how to blend the potential strategies in scaffolding some of the inabilities that underprepared students face. However, the value that is coupled to a specific strategy deemed effective in dealing with the underprepared is based on the perspectives of experienced educators and practitioners in higher education on both national and international level. In addition, the success of the strategies employed in the framework is derived from the literature in which the principles of EL learning as well as the benefits and outcome expectations have been broadened by many researchers.

4. CONCLUSION

The learning facilitation framework that aims to develop academic skills through EL has been presented. Since HEIs are increasingly pressured to be held accountable for student learning, empirical and practical issues regarding learning facilitation approaches that stimulate and nurture learning in order to deal with underpreparedness were addressed. With the HEQC's reflection on the poor pass rates of learners in higher education and the need for "systematic initiatives" to deal with teaching and learning in the South African higher education system in order to address successful completion of studies, it was evident that a need exists for initiatives to improve teaching that will result in improved learning. The learning facilitation framework could be seen as such an initiative. Thus, to explore perspectives on learning facilitation in higher education to scaffold the underprepared seemed meaningful.

Given the intricacy of underpreparedness, the challenge exists to provide sufficient scaffolding through EL strategies for the students for whom the university culture is often an unknown one. In an effort to donate to the body of knowledge regarding underpreparedness, the learning facilitation framework is neither planned to be rigid, nor is it all-inclusive or exhaustive. Owing to the multifaceted nature of teaching the underprepared, the framework does not claim to be directly applicable to a specific situation in dealing with these students. It is intended to serve as a guide to be contextualised and adapted to the specific learning needs of the underprepared. Most of the learning strategies are not new; these strategies are well described and widely used. It is the careful integration of these strategies in the design and development of learning events that represents a plausible approach to scaffolding students underprepared for higher education.

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To capture the essence of this thesis the researcher draws on the educational theories of Paulo Freire (1921-1997), the Brazilian educationalist, in Smith (2005:1 of 1). In Freire's book *Pedagogy of the Oppressed* (Freire 1972) five of his theories provided distinctive perspectives and, to a great extent, captured the fundamental nature of this study. These theories also largely influenced the researcher's beliefs about teaching and learning practices when dealing with the underprepared student.

The first of Freire's theories as cited in Smith (2005:1 of 1) focused on praxis, which is informed action – expressed as: "Reflection and action upon the world in order to transform it", a process that integrates interpretation, understanding, and application in a single act. The informed action in this thesis refers to the two-cycle action research process in Article 1, *A Generative Learning Strategy: An Investigation into Concept Mapping,* in which the benefits of concept mapping were realised through the reiterative cyclical process of planning, action, observation, and reflection. Through this cycle, it became evident that concept mapping has the potential to contribute not only to achieving efficacy, but also to conceptual development – the informed action.

The second theory of Freire influencing the thesis is the theory that is linked to the importance of *dialogue* as form of education. This dialogic approach implies that the teacher when teaching should not act *on* the students but work *with* the student – a theory applied in Article 2, *Reflective Teaching: Perspectives Gained in an Action Inquiry*. The students as collaborators in the action inquiry led to an improved level of conversation between the researcher and the students. The action inquiry in addition contributed to developing a metacognitive awareness within the researcher's own educational environment, since the "dialogue" on the success or failure of teaching methods and strategies led to the gaining of

knowledge about the students' perception of what instruction methods or actions most facilitated or impeded their learning.

Freire's third theory captures the aim of this thesis as a whole. Attention is focused on teaching to "those who do not have a voice" (the underprepared student in this case). The principle underlying this theory is the growing of an awareness, described by Freire in Smith (2005:1 of 1) as a consciousness, which could lead to change. This consciousness is enveloped in the research endeavours of Article 3, *The Phenomenon of Underpreparedness: Shared Perspectives,* and Article 4, *Engaged Learning: A Pathway to Better Teaching.* The prospective that consciousness could lead to change is the intent of these investigations. This consciousness and the change transpired into Freire's fourth theory, which addresses the importance of bringing theory and practice together, where education is then living the experience, which is the learning facilitation framework proposed in Article 5, *A Learning Facilitation Framework to Scaffold Underprepared Students.* The "living the experience" is the efforts that are made to ensure that underprepared students do not become isolated and/or disillusioned in the higher education environment and that all efforts should be made to scaffold these students to reach academic achievement.

The fifth of Freire's theories involves the researcher's own journey through this thesis. In reflecting on underpreparedness and the complexity inherent in scaffolding the underprepared, the researcher realises that all strategies deemed effective go beyond the distance that so often exists between educator and student. As Freire in Smith (2005:1 of 1) put it: "Through dialogue, the teacher-of-the-students and the student-of-the-teacher cease to exist and a new term emerges: teacher-student with students-teachers. The teacher is no longer merely the-one-who-teaches, but one who is himself taught in dialogue with the students, who in turn while being

taught, also teach. They become jointly responsible for a process in which all grow" (Freire 1972:80).

As far as I am concerned, the process of growth was the single most fulfilling experience in conducting this research and completing this thesis. Although I faced many challenges in overcoming my own deficits and underpreparedness to deal with the underprepared, there is no doubt that my personal experience has led to both personal and professional growth. Hence, I now have a great sense of commitment to “design for learning” (Falconer & Littlejohn 2007:42). Design, which entails the construction and implementation of learning events to induce effective learning in the pursuit of scaffolding the underprepared student to develop academic skills.

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SUMMARY

The research presented in this thesis is concerned with understanding underpreparedness, a phenomenon which is inextricably intertwined with the current South African higher education dilemma of poor throughput and high attrition rates. Considering the increased access to higher education institutions, a continuous need exists for ways to scaffold the underprepared student to succeed. For this reason a learning facilitation framework based on empirical research and current understanding about the potential benefits of engaged learning is presented. Based on descriptive-exploratory research, perspectives on underpreparedness experienced by higher education institutions in South Africa and in other countries are disclosed.

The thesis focuses on what is meant by underpreparedness; factors contributing to underpreparedness; the domains of underpreparedness; and the typical circumstances underprepared students find themselves in. These four focus areas were in the first place investigated by means of a literature review to capture existing knowledge and research and, in the second place, by a questionnaire survey and structured interviews. These different interpretations and dimensions provided an opportunity for diverse perspectives on underpreparedness to be encompassed and enveloped, thereby becoming a basis not only for the framework recommended, but also for future research or initiatives to improve teaching and learning.

In a search for educational approaches considered effective in dealing with underprepared students, research mainly focuses on three key concepts, namely general perspectives on the existing constraints of facilitating the learning of the underprepared; the perceived educational effectiveness of different educational approaches; and the significance that is coupled to interactive engagement. The overarching aim of this investigation was the identification of educational approaches that lessen the impact of underpreparedness on student learning.

The thesis also discusses some of the findings identified by an action inquiry into reflective teaching. Reflective practices have the potential to improve teaching competence, a gain that will ultimately lead to improved student learning. In addition, the benefits of concept mapping were investigated through both quantitative and qualitative observation techniques. The quantitative and descriptive data presented indicate that concept mapping contributed not only to achieving efficiency, but also to conceptual development. The researcher sees these positive outcomes as effects of both the active generation of knowledge through the act of mapping and the social interaction during the collaborative concept map task. The findings of this investigation confirm works by others that indicate that the use of concept mapping as a teaching/learning tool can lead to achievement gain, meaningful learning and, ultimately, conceptual change. Moreover, there may also be an increase in self-regulation, self-efficacy, a deep learning orientation, and motivation – traits that are highly sought after to assure academic success in the underprepared student.

The framework presented centres around learning facilitation strategies deemed effective in scaffolding the underprepared students' ability to learn in mainstream courses. These learning facilitation strategies seek to delineate teaching approaches that advance learners' ability to learn more effectively. These learning principles, theories or practices are divided into several elements clustered into six domains of learning facilitation strategies, namely cooperative, generative or constructive, reflective, experienced, interactive and conceptual learning. Although the domains are unique, they are also interrelated: Reflection (reflective learning) stimulated by a learning event (experience-based learning) in a social context (cooperative learning) which leads to the construction (constructive learning) of knowledge. The framework intends to act as a guide or source for higher education educators and practitioners who want to improve their teaching effectiveness in dealing with the underprepared.

Key terms: Academic, cultural and emotional underpreparedness; engaged learning; generative learning strategies; conceptual, interactive, experience-based, constructivist and reflective learning; learning facilitation framework.

Die navorsing wat in hierdie proefskrif aangebied word, het te doen met die begrip van ondervoorbereidheid (dit wil sê, swak voorbereide studente), ŉ verskynsel wat onlosmaaklik verstrengel is met die huidige Suid-Afrikaanse hoëronderwysdilemma van swak deurvloei- en hoë uitvalkoerse. Met inagneming van die verhoogde toeganklikheid tot hoëronderwysinstellings, bestaan daar ŉ voortdurende gebrek aan wyses waarop die ondervoorbereide student steiering gebied kan word om te slaag. Om hierdie rede word ŉ leerfasiliterings raamwerk gebaseer op empiriese navorsing en ŉ algemene begrip rakende die moontlike voordele van betrokke leer aangebied. Gebaseer op beskrywend-verkennende navorsing, word perspektiewe rakende ondervoorbereidheid wat deur hoëronderwysinstellings in Suid-Afrika en in ander lande ervaar word, openbaar.

Die fokus van die proefskrif is op wat onder ondervoorbereidheid verstaan word; faktore wat bydra tot ondervoorbereidheid; die domeine van ondervoorbereidheid; asook die tipiese omstandighede waarin ondervoorbereide studente hulself bevind. Hierdie vier fokusareas is in die eerste plek deur middel van ŉ literatuurstudie ondersoek om bestaande kennis en navorsing vas te vang en, in die tweede plek, deur ŉ vraelysondersoek en gestruktureerde onderhoude. Hierdie verskillende interpretasies en dimensies het ‘n geleentheid gebied vir die omvatting en insluiting van diverse perspektiewe rakende ondervoorbereidheid. Sodoende het dit ‘n basis geword nie alleen vir die raamwerk wat aanbeveel word nie, maar ook vir toekomstige navorsing of inisiatiewe om onderrig en leer te verbeter.

In ‘n soeke na opvoedkundige benaderinge wat as effektief beskou word in die omgaan met ondervoorbereide studente, fokus die navorsing hoofsaaklik op drie kernkonsepte, naamlik algemene perspektiewe betreffende die bestaande beperkinge in verband met die fasilitering van leer van ondervoorbereide individue; die opvoedkundige effektiwiteit van

verskillende opvoedkundige benaderinge soos waargeneem; asook die gewig en betekenis wat aan interaktiewe betrokkenheid gekoppel word. Die oorkoepelende doel van hierdie ondersoek was die identifikasie van opvoedkundige benaderinge wat die impak van ondervoorbereidheid op studenteleer verminder.

Die proefskrif bespreek ook enkele van die bevindinge soos deur middel van ‘n aksie-ondersoek oor reflektiewe onderrig geïdentifiseer is. Reflektiewe praktyke beskik oor die potensiaal om onderrigvaardigheid te verbeter – ’n voordeel wat uiteindelik tot verbeterde studenteleer sal lei. Verder is die voordele van die gebruik van konsepkaarte, beide deur middel van kwantitatiewe en kwalitatiewe waarnemingstegnieke, ondersoek. Die kwantitatiewe en beskrywende gegewens wat aangebied is, dui daarop dat konsepkaarte nie alleen bydra tot die bereiking van akademiese bevoegdheid nie, maar ook tot konseptuele ontwikkeling. Die navorser sien hierdie positiewe uitkomste as die gevolge en uitwerking van die aktiewe generering van kennis deur die sosiale interaksie gedurende die opstel van die samewerkende konsepkaarttaak. Die bevindinge van hierdie ondersoek bevestig die werk van andere wat aandui dat die gebruik van konsepkaarte as ‘n onderrig- of leerinstrument tot prestasieverkryging, betekenisvolle leer, en uiteindelik tot konseptuele verandering kan lei. Addisioneel mag daar ook ‘n verhoging in selfregulering, selfgeloofwaardigheid, ‘n diep leeroriëntering en motivering wees – karaktertrekke wat uiters gesog is en nagestreef behoort te word om die akademiese sukses van die ondervoorbereide student te verseker.

Die raamwerk wat aangebied word, sentreer rondom leerfasiliteringstrategieë wat as effektief beskou word in die ondersteuning van die ondervoorbereide studente se vermoë om in hoofstroomkursusse te presteer. Hierdie leerfasiliteringstrategieë poog om onderrigbenaderinge wat leerders se vermoë om meer effektief te studeer, te omskryf. Hierdie leerbeginsels, -teorieë of -praktyke word in verskeie elemente verdeel en

in ses domeine van leerfasiliteringstrategieë gegroepeer of saamgebondel. Hierdie domeine is naamlik, interaktiewe, reflektiewe, koöperatiewe, ervarings, skeppende of konstruktiewe en, konseptuele leer. Alhoewel die domeine uniek is, is hulle ook onderling verwant aan mekaar: Refleksie (reflektiewe leer) word gestimuleer deur ‘n leerervaring (ervaringsgebaseerde leer) in ‘n sosiale konteks (koöperatiewe leer) wat tot die konstruksie (konstruktiewe leer) van kennis lei. Die voorneme van die raamwerk is om as ‘n gids of bron vir hoëronderwys opvoedkundiges te dien wat hul onderrigeffektiwiteit in die hantering van ondervoorbereide individue wil verbeter.

Sleutelterme: Akademies, kulturele en emosionele ondervoorbereidheid (d.i. swak voorbereide); betrokke leer; skeppende leerstrategieë; konseptueel, interaktief, ervaringsgebaseer, konstruktivistiese en reflektiewe leer; leerfasiliteringsraamwerk.

APPENDIX A: QUESTIONNAIRE I - ACADEMIA PERSPECTIVES ON STUDENTS ACADEMICALLY UNDERPREPARED FOR HIGHER EDUCATION

QUESTIONNAIRE I

ACADEMIA PERSPECTIVES ON STUDENTS ACADEMICALLY UNDERPREPARED FOR HIGHER EDUCATION

- **This questionnaire is developed to gain perspectives concerning students academically underprepared for higher education (he).**
- **Academic underpreparedness refers to lacking the basic skills in at least one of the three basic areas of reading, writing, or mathematics.**
- **The questionnaire consists of nine sections that all address aspects associated with underpreparedness from different viewpoints.**
- **It will take you about 20 minutes to complete. Please provide your perspectives. Kindly answer all questions by indicating with an "x" in the yellow block next to the appropriate answer.**
- **Note: the general term "teacher" in this questionnaire represents the lecturer / academician / academic / faculty / he educator or facilitator that is interchangeably used in different countries in HE.**

1. DEMOGRAPHICS

1.1 What best describe(s) your current position(s) in the academic community?

Manager / academic programme director	
Administrator	
Facilitator/Lecturer	
Academic/education development	
Educational researcher:	
Other research disciplines	
Other (please specify):	

1.2 Name the higher education institution where you are currently employed

Institution:	Faculty:
Discipline:	Field of speciality:
Province/State:	Country:

1.3 Gender

Female		Male	

1.4 Educational experience (number of years working experience in higher education)

0-4		5-9		10-14	
15-19		20-24		25 years or more	

1.5 Briefly outline your teaching experience (e.g. formal qualification in education)

2. ACADEMIC UNDERPREPAREDNESS

Do you agree with the description/explanation provided for each of the following factors that could impede students' academic skills development and, ultimately, academic proficiency that leads to underpreparedness for HE? If you do not agree with the description/explanation please provide your personal perspective in the space provided.		**Strongly disagree**	**Disagree**	**Slightly disagree**	**Slightly agree**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**	**6**
2.1	Among the most troublesome problems in HE is the academic underpreparedness that exists under students who enter higher education institutions (HEIs).						
2.2	The causes of academic underpreparedness are diverse.						
2.3	The reasons for academic underpreparedness for HE are not always academically based.						
2.4	A range of environmental factors exists that influences the development of academic preparedness for HE.						
2.5	The language factor (i.e. reading/understanding complex academic material) could differentiate between students who are prepared for HE and those who are.						
2.6	The absence of supportive structures at HEIs often leads to academic failure in students underprepared for HE.						
2.7	A combination of a lack in English proficiency, mathematical ability and effective study skills leads to <u>academic</u> underpreparedness.						
2.8	A lack in self-efficacy leads to <u>emotional</u> underpreparedness.						
2.9	Students who enter HE from an environment different from that in HE could be <u>culturally</u> underprepared.						
2.10	The following aspects/factors contribute to academic proficiency and, ultimately, determine the level of academic preparedness for HE:						
	(a) reading ability						
	(b) writing skills						
	(c) mathematical aptitude						
	(d) technology experience						
	(e) communication proficiency						
	(f) study skills						
	(g) motivation						
	(h) management of self						
	(i) emotional intelligence						
	(j) other (please specify):						

3. FACTORS CONTRIBUTING TO ACADEMIC FAILURE IN UNDERPREPARED STUDENTS

	Would you say that the following factors make 1=no contribution, 2=minor contribution, 3=average contribution, 4=major contribution towards academic failure in students underprepared for HE?	**No contribution**	**Minor contribution**	**Average contribution**	**Major contribution**
		1	**2**	**3**	**4**
3.1	A lack of self-efficacy (i.e. students' beliefs about their performance capability).				
3.2	Anxiousness when subjected to an academic environment.				
3.3	Unrealistic future expectations with regard to work and social roles.				
3.4	Imbalance between academic efforts and cultural/social activities (spend more time on social activities and less time studying)				
3.5	Academic work overload.				
3.6	Psychological instability.				
3.7	Lack of effective study skills.				
3.8	Overall dependence on teacher guidance and support.				
3.9	Feelings of dissatisfaction with the academic course / programme.				
3.10	Employing a surface approach to learning.				
3.11	A weakness in specific academic skills (i.e. note-taking, studying and taking exams).				
3.12	Lack of intrinsic motivation.				
3.13	Lack of extrinsic motivation.				
3.14	A weakness in the ability to understand and manage complicated material.				
3.15	Lack of remediation opportunities for underprepared students.				
3.16	Non-accommodation of different learning styles.				
3.17	Too large class size at HEIs.				
3.18	Student general aptitude (i.e. cognitive ability).				
3.19	Language barriers (i.e. difficult to learn because English is not the students' 1st language).				
3.20	A lack of competency in the foundation skills of reading and writing.				
3.21	Circumstantial factors (e.g. finance, accommodation, transport, etc.).				
3.22	A lack in behavioural self-control skills such as self-monitoring.				
3.23	Ineffective management of study time.				
3.24	Lack of teacher guidance and support to reach academic proficiency.				

4. CONDITIONS INTENSIFYING UNDERPREPAREDNESS

	To what extent do you agree with the following statements that describe conditions intensifying underpreparedness: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5=strongly agree? If you do not agree with the description/explanation please provide your personal perspective in the space provided.	**Strongly disagree**	**Disagree**	**Neither agree/disagree**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
4.1	Without intervention (e.g. guidance and support) underprepared students frequently continue to be low achievers.					
4.2	Without support to improve academic skills (e.g. teaching of note-taking techniques and study skills) underprepared students will continue to be low achievers.					
4.3	Underprepared students' learning problems are not always identified or attended to.					
4.4	Political factors (e.g. past unequalities leading to disadvantaged communities) influence how underprepared students perform in a given situation.					
4.5	Social/cultural diversity is not adequately addressed in the classroom in general.					
4.6	An ongoing lack of substantial support from teachers on secondary school level in the classroom situation to address underpreparedness.					
4.7	The inadequacy of student-centred approaches to address the educational needs of academically underprepared students (e.g. heavy reliance on teacher support).					
4.8	Learning facilitation methods currently in use do not scaffold underprepared students at risk of failing (e.g. in creating an environment that enhances retention and achievement).					
4.9	Inadequate HE access criteria contribute towards academic failure in students underprepared for HE.					
4.10	Socio-economic levels contribute towards the academic underpreparedness among students.					
4.11	The lack of role models in disadvantage communities contributes towards academic underpreparedness among students.					

5. THE SCHOOL SYSTEM AS CONTRIBUTING FACTOR IN UNDERPREPAREDNESS

	Indicate your response to the following statements with regard to the effect of the school system on students' academic skills development and ultimately academic proficiency (i.e. preparedness for HE): 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5=strongly agree	**Strongly disagree**	**Disagree**	**Neither agree/disagree**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
5.1	The current school system influences students' preparedness for HE (i.e. act as either a barrier or an enabler of academic proficiency).					
5.2	The proposed national curriculum in the majority of school systems is driven by government standards that do not reflect the skills necessary for HE.					
5.3	Teacher's <u>educational level</u> is a school-related factor influencing academic proficiency, which determines students' preparedness for HE.					
5.4	Teacher's <u>methodological approach</u> is a school-related factor influencing academic proficiency, which determines students' preparedness for HE.					
5.5	A lack of alignment between secondary school content and the expectations of HE contribute to underpreparedness.					
5.6	Inadequate teaching and learning standards on school level obstruct the development of academic proficiency.					
5.7	Inadequate subject choices (students' tendency to select easier subjects) are a school-related factor influencing academic proficiency.					
5.8	The lack of resources (i.e. well trained subject experts) in schools is a stumbling-block contributing to underpreparedness.					
5.9	Ethnicity is often a key indicator for underpreparedness.					
5.10	Low socioeconomic status/level, based on parents' income and education, tends to be an indicator for underpreparedness.					

6. FACTORS IMPORTANT FOR ACADEMIC SUCCESS AMONG ACADEMIC UNDERPREPARED STUDENTS

Which of the undermentioned factors do you believe are important for the underprepared student to succeed academically in higher education: 1=no importance, 2=minor importance, 3=moderate importance, 4=major importance? (A brief definition of each concept is provided.)	**No importance**	**Minor importance**	**Moderate importance**	**Major importance**
	1	**2**	**3**	**4**
6.1 Academic proficiency:				
Academic proficiency entails a multidimensional concept that includes, among others, the skill to read, write, take notes and taking exams.				
6.2 Cognitive ability:				
Cognitive ability refers to the ability of the student to reach high levels of academic achievement.				
6.3 Self-regulation:				
Self-regulation is a process in which students master their own acquisition of knowledge.				
6.4 Self-efficacy:				
Self-efficacy is students' beliefs about their performance capabilities.				
6.5 Motivation:				
Motivation is the inner impulse of a student to act in a particular way.				
6.6 Deep approaches to learning:				
Deep approaches to learning refer to learning to understand and make meaning.				
6.7 Self-advocacy:				
Self-advocacy is the ability to seek help when necessary.				
6.8 Study skills:				
Study skills include the ability to record, remember and use information.				

7. ROLE OF THE TEACHER

According to your opinion, can the following factors be strengthened or manipulated by you as the teacher during academic instruction?	**Yes**	**No**
7.1 Academic proficiency.		
7.2 Cognitive ability.		
7.3 Self-regulation.		
7.4 Self-efficacy.		
7.5 Motivation.		
7.6 Deep approaches to learning.		
7.7 Self-advocacy.		
7.8 Study skills.		

8. OWN PERCEPTION

8.1 List factors in addition to all of the above-mentioned that obstruct/impede academic preparedness in your own specific environment.

Factors	Please elaborate

8.2 List factors in addition to all of the above-mentioned that will enhance/improve academic achievement in academically underprepared students in your own specific environment.

Factors	Please elaborate

9. ANY OTHER COMMENTS:

Please save this file.

By means of the reply function on your email, please mail this file as an attachment to sender.

Thank you for your participation.

APPENDIX B: QUESTIONNAIRE II - ACADEMIA PERSPECTIVES ON LEARNING FACILITATION IN UNDERPREPARED STUDENTS

QUESTIONNAIRE II

ACADEMIA PERSPECTIVES ON LEARNING FACILITATION IN UNDERPREPARED STUDENTS

- **This questionnaire is developed to determine the teaching/learning strategies that enhance academic achievement in students academically underprepared for higher education (he).**
- **Academic underpreparedness refers to lacking the basic skills in at least one of the three basic areas of reading, writing or mathematics.**
- **The questionnaire consists of 8 sections that all address these strategies from different viewpoints.**
- **It will take you about 20 minutes to complete. Please provide your perspectives. Kindly answer all questions by indicating with an "x" in the yellow block next to the appropriate answer.**
- **Note: the general term "teacher" in this questionnaire represents the lecturer / academician / academic / faculty / educator or facilitator that is interchangeably used in different countries in HE.**

1. DEMOGRAPHICS

1.1 What best describe(s) your current position(s) in the academic community?

Manager / academic programme director	
Administrator	
Facilitator/Lecturer	
Academic/education development	
Educational researcher:	
Other research disciplines	
Other (please specify):	

1.2 Name the higher education institution where you are currently employed

Institution:	Faculty:
Discipline:	Field of speciality:
Province/State:	Country:

1.3 Gender

Female		Male	

1.4 Educational experience (number of years working experience in higher education)

0-4		5-9		10-14	
15-19		20-24		25 years or more	

1.5 Briefly outline your teaching experience (e.g. formal qualification in education)

2. ACADEMIC UNDERPREPAREDNESS

	To what extent do you agree with the following statements that describe the typical HE environment perpetuating or strengthening underpreparedness: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5=strongly agree. If you do not agree with the description/explanation, please provide your personal perspective in the space provided.	**Strongly disagree**	**Disagree**	**Slightly disagree**	**Slightly agree**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**	**6**
2.1	There is a lack of research evidence to validate the extent and effectiveness of learning facilitation that encourages academically underprepared students to master self-directed learning.						
2.2	Owing to the complex nature of academic competence, the influence that teachers could have on the whole continuum of academically underprepared students' academic achievement is limited.						
2.3	The time constraint of academic schedules hinders teachers to support academically underprepared students.						
2.4	Learning facilitation strategies do not always address the inability of underprepared students to learn independently.						
2.5	Special retention needs of underprepared high-risk students are not identified early enough at first-year level.						
2.6	Performance standards for admission to HE do enable teachers to assess students' preparedness for HE.						
2.7	Teachers play a critical role in the early identification of underprepared students at risk of academic failure.						
2.8	The need that exists for research initiatives (example: action research) to improve teaching that will result in effective learning in academically underprepared students is not addressed.						

3. COUNTERACT THE NEGATIVE EFFECT OF THE SCHOOL SYSTEM

Indicate to what extent would you say, can the following possible negative effects of the school system on higher education preparedness/readiness be counteracted: 1=not at all important, 2=not too important, 3=somewhat important, 4=very important.		**Not at all important**	**Not too important**	**Somewhat important**	**very important**
		1	**2**	**3**	**4**
3.1	General access to a high-quality school system on all levels will better prepare students for HE.				
3.2	Establish high expectations on school level by identifying and communicating the need for students to meet HE preparedness.				
3.3	Mentoring in schools to prepare students for HE will improve more effective progress through higher education levels.				
3.4	An alignment in curricula between schools and universities would prepare students for HE.				
3.5	A school curriculum that includes English proficiency, reading, writing, and mathematical foundational skills will prepare students for HE.				

4.	CURRICULUM DEVELOPMENT AND RESPONSIVENESS TO UNDERPREPAREDNESS

	Indicate with an 'X' response to the following statements with regard to the curriculum: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5=strongly agree.	**Strongly disagree**	**Disagree**	**Neither agree/disagree**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
4.1	Curriculum interventions should address students' different levels of preparedness for higher education.					
4.2	Generic skills (i.e. addressing underpreparedness) should be taught in the HE curriculum as stand-alone entities.					
4.3	Academic as well as professional skills should be explicitly built into a HE curriculum.					
4.4	Curricular efforts to "engage" students - to involve them deeply in the process of learning -would address underpreparedness.					
4.5	Developmental education in HEIs (e.g. an extended curriculum) would improve academic success in students underprepared for HE.					
4.6	Remedial courses (e.g. courses in English proficiency, reading, writing, and mathematics) could teach underprepared students those skills necessary to perform at the level required for HE.					
4.7	HE preparatory courses (e.g. time management skills, collaborative problem-solving skills and effective study techniques) could promote students' preparedness for HE.					
4.8	Alignment of curriculum frameworks in language, mathematics, and science between schools and HEIs would ensure that the important HE readiness skills are developed.					

5. INTERACTIVE ENGAGEMENT

Indicate with an 'X' response to the following statements with regard to interactive engagement as a learning facilitation strategy to support students underprepared for HE: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5=strongly agree. "Interactive engagement", also called engaged learning entails among others students' participation in certain kinds of educational activities, collaboration with peers and significant teacher-student contact.		**Strongly disagree**	**Disagree**	**Neither agree/disagree**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
5.1	Academic performance in general increases at higher levels of student engagement.					
5.2	Engaging students in the learning process could improve the quality of learning of underprepared students.					
5.3	Interactive engagement could have a significant positive impact on the cognitive development of underprepared students.					
5.4	Students' poor academic achievement could be a product not of their own weak intellectual skills, but of teaching that had not been engaging.					
5.5	Students' academic as well as social integration into HE could alleviate the effects of underpreparedness.					
5.6	Increased student-lecturer and student-student interaction (i.e. collaborative learning) ensures the social construction of knowledge.					
5.7	Engaged learning is believed to be an effective remedy for retention and overall student success, especially the success of underprepared students.					
5.8	The effectiveness of engaged learning is ascribed to the fact that students' active involvement in the learning process (active learning) leads to meaningful learning.					
5.9	Experiential learning is seen as an effective form of engaged learning.					
5.10	Service learning is seen as an effective form of engaged learning.					
5.11	Multidisciplinary learning is seen as an effective form of engaged learning.					

6. EFFORTS TO OVERCOME ACADEMIC UNDERPREPAREDNESS

	Indicate the importance of the following efforts on HE level to counteract factors that cause academic failure in students' underprepared for HE: 1=not at all important, 2=not too important, 3=somewhat important, 4=very important.	**Not at all important**	**Not too important**	**Somewhat important**	**Very important**
		1	**2**	**3**	**4**
6.1	Introduce additional courses to increase reading/writing skills.				
6.2	Encourage students to reflect on their learning obstacles.				
6.3	Increase formative assessment events.				
6.4	Use various teaching methods to accommodate diverse learning styles.				
6.5	Use various assessment methods to address diversity among students.				
6.6	Challenge attrition high-risk underprepared students to develop academic and non-academic skills and competencies associated with success.				
6.7	Assist students with specific study problems.				
6.8	Provide support structures that address the personal and social needs of the students.				
6.9	Prevent attrition by following up non-class attendance.				
6.10	Advise students on vocational and further education opportunities to motivate persistence to degree completion.				
6.11	Encourage students to interact with supportive teachers.				
6.12	Encourage self-confidence and a sense of competency in learning.				
6.13	Instil positive but realistic future expectations with regard to work and social roles.				
6.14	Learning facilitation strategies should actively promote learning self-sufficiency and independence.				
6.15	A more culturally diverse pool of teachers can assist academic underpreparedness between various cultures.				
6.16	Teaching study skills could be a strategy to address underpreparedness.				
6.17	Teaching life orientation skills that are not only academic but also behavioural could address academic underpreparedness.				
6.18	Enrichment programmes in math, science, reading and technological literacy could address academic underpreparedness.				

7. EDUCATIONAL APPROACHES

How do you consider the effectiveness of the following educational approaches to enhance learning: 1=not at all effective, 2=not too effective, 3=somewhat effective, 4=very effective?		Not at all effective	Not too effective	Somewhat effective	Very effective
		1	2	3	4
7.1	**Collaborative learning:** Teamwork rather than solitary efforts.				
7.2	**E-learning:** Online learning (web-based) instruction.				
7.3	**Experience-based learning:** Learning in which the student is directly in touch with the realities being studied.				
7.4	**Reflective learning:** Reflection which gives time for the learner to process learning.				
7.5	**Concept-mapping:** A written representation that structures knowledge.				
7.6	**Self-directed learning:** A decreased emphasis on the use of lectures and an increase in the use of self-directed teaching/learning strategies.				
7.7	**Active learning:** Students take more responsibility for their own learning.				
7.8	**Conceptual learning:** Encourages understanding rather than memorisation.				
7.9	**Blended learning:** Combinations of face-to-face and online collaboration and group work.				
7.10	**Question-based learning:** Formulating questions to facilitate thinking.				
7.11	**Constructivist learning:** Learners discovering and constructing knowledge for themselves.				
7.12	**Interactive engagement:** Construction of knowledge through active involvement.				
7.13	**Learner-centredness:** Students take responsibility for their own learning.				
7.14	**Group learning:** Studying collaboratively.				
7.15	**Individual research and discovery:** Students construct their own knowledge through discovery.				
7.16	**Resource-based learning:** Learning through exposure to diverse resources.				
7.17	**Problem-based learning:** An instructional method that challenges students to seek solutions to real world problems.				
7.18	**Service-learning:** Applied learning directed at specific community needs integrated into an academic programme.				
7.19	**Reflective teaching:** Responding to students' feedback to improve teaching practices.				

8. OWN PERCEPTION

List teaching/learning facilitation strategies in addition to all of the abovementioned that will enhance academic performance in underprepared students in your own specific environment.

Teaching/learning strategies	Please elaborate

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Thank you for your participation.