GUIDELINES FOR THE IMPLEMENTATION OF COOPERATIVE EDUCATION IN SOUTH AFRICAN TEACHING AND LEARNING ORGANISATIONS IN HIGHER EDUCATION

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DECLARATION

Opinions expressed in this work or conclusions made are those of the author and are not necessarily those of any entity of institution. Furthermore, I declare that the analysis and interpretations are my own work.

I would like to express my gratitude towards the Tshwane University of Technology for allowing me to do the research for this thesis at that institution[1].

Dedicated to my wife and family, who supported me irrespective of the difficult circumstances and who gave me their full support at all times, and to my late parents, who always motivated me to reach higher goals with limited resources.

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Dear Mr Wessels

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This is to confirm that I have edited your thesis, *Guidelines For The Implementation Of Cooperative Education In South African Teaching And Learning Organisations In Higher Education*, and that I have indicated the necessary grammatical corrections. Please check these suggested corrections before implementing them and contact me if there are any queries.

Regards

AM van der Merwe

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OPSOMMING

Hierdie studie fokus op die samestelling van riglyne vir die implementering van koöperatiewe onderwys in onderrig- en leerorganisasies in die Gautengstreek van Suid-Afrika. Aangesien daar tans beperkte riglyne in hierdie verband bestaan, was dit die oogmerk om te bepaal wat die teenswoordige posisie of status van koöperatiewe onderwys in sodanige organisasies is met die gesamentlike ontwikkeling van 'n konseptuele raamwerk en gevolglike riglyne wat rigtinggewendheid kan bied aan hoëronderwysinrigtings met betrekking tot koöperatiewe onderwys in Suid Afrika.

Eerstens is 'n literatuurondersoek onderneem rakende die basiese beginsels en aard van koöperatiewe onderwys, met 'n analise van die teenswoordige status daarvan plaaslik en oorsee. Spesiale klem is tydens die literatuurondersoek geplaas op een van die komponente van koöperatiewe onderwys, naamlik ervaringsleer met verskillende vorme van leer en in die besonder werkgeïntegreerde (werksgebaseerde) leer en diensleer.

'n Verskeidenheid terminologie word deur hoër onderwys in Suid-Afrika, veral in die omgewing van universiteite vir tegnologie en komprehensiewe universiteite, gebruik om die beginsels en praktyk van koöperatiewe onderwys te beskryf. Hierdie gebruik van ongestandaardiseerde terminologie kan groot verwarring onder akademici skep. 'n Behoefte vir die standaardisering van sodanige terminologieë is geïdentifiseer en daar is gepoog om koöperatiewe onderwys en verwante terme te herdefinieer.

'n Vergelykende studie is voorts onderneem ten opsigte van die beste praktyke van koöperatiewe onderwys op nasionale en internasionale vlak. Een van die belangrikste sake sedert die oorsprong van koöperatiewe onderwys in Suid-Afrika is die bestuur daarvan in die hoër onderwyssektor. Die verskeie rolle en verantwoordelikhede van die onderskeie rolspelers is nagevors in die literatuur en aangeteken, met latere aanbevelings. Met inagneming van die literatuur en na afhandeling van die empiriese navorsing is 'n geïntegreerde model aanbeveel vir die bestuur en administrasie van koöperatiewe onderwys in hoëronderwysinrigtings in Suid-Afrika.

Die befondsing van ervaringsleer in hoër onderwys in Suid-Afrika is tans 'n ernstige saak. Sonder behoorlike begrip en befondsing daarvan deur die Departemente van Onderwys sal niks daarvan kom nie. Volgens 'n verslag deur die vroeëre Komitee vir Technikonhoofde (KTH) in Suid-Afrika is daar onder andere aangetoon dat geld wat geoormerk is vir ervaringsleer in hoër onderwys nie daarvoor gebruik is nie en daarom nie die nodige uitkomste gelewer het nie, met die gevolg dat befondsing aan hoëronderwysinrigtings

gestaak is deur die onderwysdepartement, met ernstige gevolge vir die uitvoering daarvan op operasionele vlak. Die literatuur het ook soortgelyke verskynsels beskryf op internasionale vlak, veral in die Verenigde State van Amerika.

Vele ander uitdagings is geïdentifiseer in die literatuur rakende koöperatiewe onderwys, soos onder andere die inisiëring van nuwe strategieë en die behoefte om navorsing en ontwikkeling daarvan te bevorder. Toekomsperspektiewe is onder meer die bevestiging van die behoefte van innovering en kontinue ontwikkeling van koöperatiewe onderwys, plaaslik sowel as in die buiteland. Laastens bevestig die literatuur dat koöperatiewe onderwys die "cutting edge" of nismark skep vir hoër onderwys, plaaslik en oorsee.

'n Empiriese ondersoek het studente, akademiese departementshoofde in hoëronderwys-inrigtings asook toesighouers in die nywerheid betrek om die teenswoordige status van die basiese beginsels en aard, sowel die beste praktyke te bepaal van koöperatiewe onderwys. Hierna is daar 'n konseptuele raamwerk met gevolglike riglyne ontwikkel en saamgestel in koöperatiewe onderwys vir onderig- en leerorganisasies.

Literatuur het die belangrikheid van gehaltebeheer van ervaringsleer as komponent van koöperatiewe onderwys bevestig en daarom is daar gepoog om 'n konseptuele raamwerk te beskryf, sowel as daaropvolgende riglyne wat gebruik kan word vir gehaltebeheer van koöperatiewe onderwys in hoër onderwys.

Laastens is daar verskeie aanbevelings en riglyne saamgestel wat dien as voorstel vir die implementering van koöperatiewe onderwys in onderrig- en leerorganisasies in die Gautengstreek van Suid-Afrika.

Trefwoorde vir indeksering: koöperatiewe onderwys, werksgebaseerde leer, werks-geïntegreerde leer, ervaringsleer, ervaringsopleiding, diensleer, professionele praktyk, indiensopleiding, plasing van leerders in die nywerheid, voorbereiding van leerders vir ervaringsleer, monitering en mentor van leerders, assessering van leerders, refleksie van leer, navorsing in koöperatiewe onderwys, bestuursinligtingstelsels in koöperatiewe onderwys, bemarking van koöperatiewe onderwys, bestuursmodelle in koöperatiewe onderwys, modelle in koöperatiewe onderwys, werkgewers in koöperatiewe onderwys, beste praktyke in koöperatiewe onderwys, industriële skakeling, samewerking met die nywerheid, opleiding van leerders in die nywerheid, nasionale en internasionale plasing en uitruil van leerders, gehaltebeheer, vaardigheidsontwikkeling, leerderskap en vaardigheidsprogramme.

ABSTRACT

This study focuses on the compilation of guidelines for the implementation of cooperative education in teaching and learning organisations, in the Gauteng region in South Africa. Since no or limited guidelines exist in cooperative education in such organisations, it was intended to determine the present position or status of cooperative education in such organisations with the concomitant development of a conceptual framework and guidelines that could act as directive in higher education institutions and industry, with regard to cooperative education.

At first a literature review was undertaken on the basic principles and nature of cooperative education, with an analysis of the current status of cooperative education locally and abroad. Special emphasis was placed during the literature survey on one of the components of cooperative education, namely experiential learning, with its different forms of learning such as work-integrated learning and service learning.

Traditionally, higher education institutions in South Africa, and especially universities of technology and comprehensive universities, used a variety of terminology to describe the principles and practice of cooperative education. This created much confusion among academics in these institutions. A need for the standardisation of such terminology was identified and an attempt was made to redefine the concept of cooperative education and related terminology, to clarify this matter by defining cooperative education and related terminology.

Furthermore, a comparative literature survey was undertaken with regard to the best practices in cooperative education on a national and international level. One of the most important issues in higher education since the origin and implementation of cooperative education is the strategic management of cooperative education. The various roles and reponsibilities of the relevant role players involved in cooperative education were researched and recorded from literature. In consideration of the literature and on completion of the empirical study, an integrated (eclectic) management structure for the management and administration of cooperative education was proposed and described for higher education institutions.

Funding of experiential learning in higher education institutions in South Africa by the Department of Education (DoE) is presently a serious concern. Without the proper funding of the experiential learning endeavour, it would be rendered null and void. Literature, according to a survey by the Committee of Technikon Principals (CTP) in former technikons, among others, indicated that funds from the DoE allocated in the form of subsidy and earmarked for experiential learning were not used for its intended purpose, and that such institutions did not deliver satisfactorily with regard to experiential learning. The consequence was that government subsidy for experiential learning in universities of technologies (the former technikons) was ceased, with serious implications for its implementation on operational level. Literature revealed that similar experiences were encountered historically in the United States of America (USA).

Many challenges have been identified in the literature on cooperative education, such as the initiation of new strategies and the need to promote research and development in cooperative education. Future perspectives indicated a confirmation for the need for innovation and continuous improvement for cooperative education, locally and abroad. Finally, the literature review confirmed that cooperative education locally and abroad creates the "cutting edge" for higher education institutions.

An empirical study involved students, heads of academic departments in higher education institutions and supervisors in industry, to ascertain the current status with regard to the basic principles and nature of cooperative education as well as best practices in cooperative education. Thereafter, a conceptual framework with concomitant guidelines was developed and compiled for cooperative education for teaching and learning organisations.

Supported by a literature survey which highlighted the importance of quality assurance of experiential learning as one of the components of cooperative education, a quality assurance conceptual framework to be used in the quality management of experiential learning for learning programmes in higher education institutions was described.

Finally, various recommendations and guidelines have been proposed for the implementation of cooperative education in teaching and learning organisations in the Gauteng province in South Africa.

Keywords for indexing: cooperative education, work-based learning, work-integrated learning, experiential learning, experiential training, in-service training, placement of learners in industry, preparation of learners for experiential learning, placement of learners, monitoring/mentoring of learners, assessment of learners, debriefing of learners, research in

cooperative education, management information systems in cooperative education, marketing of cooperative education, management models, models of cooperative education, companies in cooperative education, best practices in cooperative education, industrial liaison, partnerships with industry, training of learners in industry, nationally and internationally exchange/placement of learners, quality management, skills development and literacy development, learnership and skills programmes.

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LIST OF ABEVIATIONS

CCPD	Centre for Continuous Professional Development
CECC	Cooperative Education Central Committee
CEL	Cooperative Education Lecturer
CHE	Council on Higher Education
CHIETA	Chemical Industries Education and Training Authority
CTM	Committee for Technikon Matters
CTP	Committee for Technikon Principals
ECSA	Engineering Council of South Africa
EL	Experiential Learning
FET	Further Education and Training
FCEC	Faculty Cooperative Education Committee
HEI	Higher Education Institution
HEQC	Higher Education Quality Committee
HESA	Higher Education South Africa
HOD	Head of Department
HPCSA	Health Professional Council of South Africa

IBL	Industry Based Learning
NAP	New Academic Policy
NQF	National Qualifications Framework
RPEL	Recognition of Prior Experiential Learning
RPL	Recognition of Prior Learning
SETA	Sectoral Education and Training Authority
SASCE	Southern African Society for Cooperative Education
SAQA	South African Qualifications Authority
SAICA	South African Institute for Chartered Accountants
SL	Service Learning
TQM	Total Quality Management
UoT	University of Technology
WACE	World Association for Cooperative Education
WIL	Work Integrated Learning

CHAPTER 1
ORIENTATION

1.1 INTRODUCTION

At present, there is a need to develop proper definitions and guidelines for cooperative education in higher education institutions (HEIs) in South Africa (SA). Furthermore, the current understanding and conceptualisation of cooperative education varies considerably in higher education institutions in SA. This ranges from the accepted definition of "a strategy of applied learning" (Baumgart *et al.,* 1994:107), to varying degrees of inclusion of different benefits of cooperative education to training institutions, such as technical colleges, universities of technology, comprehensive universities and traditional universities. According to the quality assurance policy[2] on cooperative education (SASCE, 2003:5), cooperative education is a teaching and learning strategy involving several methodologies and approaches.

Most universities of technology such as the Vaal University of Technology (2007:2), Durban University of Technology (2006:1) Tshwane University of Technology (2005:14) and Central University of Technology (2007:2), refer to career focussed education, confirmed through cooperative education in their vision, mission and value statements, but few have established formal structures and strategies that give credibility to cooperative education as a strategy for teaching and learning. This can be attributed to the lack of generic guidelines and a generic comprehensive model. The concept of cooperative education has recently been documented by the quality assurance committee of SASCE with the compilation of a quality assurance policy on cooperative education, clarifying the various components and holistic nature of cooperative education in higher education in South Africa (SASCE, 2003:19). It would, however, be recommended that traditional universities should investigate cooperative education as a teaching and learning strategy especially within the context of the HEQC (Higher Education Quality Committee) audit criteria.

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[2] The Quality Assurance Policy with audit measurement criteria for the operational and strategic management of experiential learning programmes as part of cooperative education was fully endorsed by the CHE, March 2003.

Cooperative education in South Africa developed from the former technical colleges where programmes of study had a requirement for periods of in-service training/apprenticeships. Groenewald *et al.* (2001:1) describe how technikons started as colleges for advanced technical education in 1967. The transition from technical colleges to institutions of higher education (technikons and later to universities of technology) resulted in the inclusion of cooperative education (experiential learning; work integrated learning, service learning and even learnerships) (compare Figure 2.4) as a compulsory component in various learning programmes[3].

This transition was never complete, as cooperative education was not accorded its rightful place in the curriculum as a strategy of learning, albeit off-campus learning. In many instances it is still an "add-on" to the curriculum.

There has been an inherent assumption that all academics in the former technikons, now universities of technology (UoT), have a clear knowledge and understanding of cooperative education, but lack clear guidelines about its what, where and the how. This is evidenced by the fact that universities of technology only attain successful placement of all learners for compulsory experiential learning as component[4] of cooperative education, (compare Figure 2.4 and 2.5 and 2.8) or individual departments with a well-established structured cooperative education programme. Furthermore, although the Committee of Technikon Principals (CTP) has committed itself to the development of basic principles of cooperative education (CTP, 2000a:1), these principles were not forged into an approved unitary model.

Engelbrecht (2003a:2) argues that the cooperative education principle, by whichever name it might be referred to, is well established and might have different focal points for different practitioners. In some instances the principle is applied for reasons other than programme-focused education and training, such as to render community services.

According to a report by the Southern African Society for Cooperative Education (SASCE 2003:6), an integral aspect of cooperative education is the establishment of approved and accredited partnerships with the relevant role-players for the implementation of the cooperative education programme.

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[3] The purpose of this study was not to compare cooperative education with learnerships.
[4] Component of cooperative education; cooperative education consisting of various components i.e. experiential learning, liaison etc.

According to Serfontein (2004), industry has little or no idea of what cooperative education is and such guidelines would be helpful. This obscure situation of cooperative education in industry[5] is exacerbated by the fact that there is no clarity on what a company's commitment is to education (FRD, 1993). Companies were taking part in the cooperative education venture without prior knowledge of what the requirements were and how it might fulfil their requirements or needs. A much greater interaction is needed between higher education institutions and industry.

In an international comparative study conducted by the World Association of Cooperative Education (WACE, 1997:9), South African companies commented that "The standards at various cooperative education institutions vary considerably. Their standards need to be more transparent." This highlights the urgency of a need for guidelines in cooperative education.

- It is important to take cognizance of the fact that cooperative education as applied in the South African context differs from its application in other countries, e.g. the United States of America (USA), Canada (Engelbrecht, 2003a:43).

1.2 PROBLEM STATEMENT

There is a great degree of variation in the uniformity of cooperative education practices and its implementation. This is evidenced by the fact that the principles, nature and practice in cooperative education differs considerably in traditional universities, comprehensive universities and universities of technologies. There is no common understanding of cooperative education in these higher education institutions, with a consequent impact on the implementation of experiential learning in such institutions.

The problem is that no clear guidelines exist in HEIs in Southern Africa to standardise, implement and manage cooperative education practices from which the complete range of operational components, requirements and needs of the major role players, namely learners, HEIs and industry in cooperative education may be planned and managed. The result is that different standards and practices were being applied to most cooperative education programmes in higher education institutions. This problem will be addressed once guidelines

[5] Industry; defined in the context of this study as the public and private sectors and include commerce and industry and the local community.

have been developed which is the aim of this study. Furthermore, the Council on Higher Education give direction with regard to work based learning on institutional as well as programme level for higher education institutions (HEIs) in South Africa (CHE, 2004a:11).

The development of multidisciplinary guidelines to standardise the implementation in cooperative education has only been handled superficially and has not been thoroughly and scientifically researched. This impacts negatively on operational activities in cooperative education in higher education institutions in South Africa.

1.3 OBJECTIVES OF THE STUDY

It is intended with this research to :

1. determine the present status of cooperative education in specific targeted study population in teaching and learning organisations (traditional universities, universities of technology and comprehensive institutions known as comprehensive universities, as well as companies[6] involved in higher education and training), in the Gauteng region (compare 4.2.1, 4.12.2, and 7.3) in South Africa,
2. propose guidelines as to give direction with regard to cooperative education in not only higher education institutions in South Africa but also serve as directive to commerce and industry in this regard (compare 6.7 and 7.3).

A national and an international survey of best practices in cooperative education have been done. A comparison of best practices in the mentioned groups in cooperative education was done in the Gauteng region. Multidisciplinary issues, relevant to cooperative education were brought in relation to the mentioned matters. It was intended to propose guidelines for the implementation of cooperative education in relation to commerce and industry in the Gauteng province in South Africa, since it is the strongest economic empowerment in South Africa. A proposed conceptual framework resulted from the study. Validity and reliability of this study were tested by using a quantitative instrument of measure in relation to the specific groups mentioned in the Gauteng province.

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[6] Companies; refers to company and employer organizations in the private and public sectors providing workplace opportunities for students for experiential learning to complete their qualifications in higher education institutions locally and abroad.

The objectives of this study were tabulated according to the sequence of followed in this study (compare Table 1.1).

TABLE 1.1 Study objectives

OBJECTIVES	CHAPTER	QUESTIONNAIRE
1. To compare the basic principles and nature as well as best practices in cooperative education, nationally and internationally by means of available literature.	3	Section C & D
2. To determine multidisciplinary issues relevant to cooperative education in industry in South Africa.	4 and 5	Section A, B, C and D.
3. To determine the status of cooperative education in government subsidized HEI and industry in South Africa.	2, 3, 4 and 5	Section A, B, C and D
4. To develop guidelines for the standardization of cooperative education in higher education institutions and industry.	5, 6 and 7.	Section A, B, C and D.

1.4 METHOD OF RESEARCH

The research methodology used in this study involved two methods, namely a literature review and an empirical study. A quantitative approach with regard to the method of research was employed.

1.4.1 Literature study

A literature survey was conducted using the databases of ERIC, EBSCO Host and NEXUS, with the following keywords: cooperative education, work-based learning, work-integrated learning, experiential learning, experiential training, in-service training, placement of learners in industry, preparation of learners for experiential learning, placement of learners, monitoring/mentoring of learners, assessment of learners, debriefing of learners, research in cooperative education, management information systems in cooperative education, marketing of cooperative education, management models, models of cooperative education, companies in cooperative education, best practices in cooperative education, industrial liaison, partnerships with industry, training of learners in industry, nationally and internationally exchange/placement of learners, quality management, skills development and literacy development, learnership and skills programmes.

1.4.2 The empirical study

The main focus of this study was to determine the status of cooperative education and to propose guidelines for the practice of cooperative education in higher education institutions in the Gauteng province, in South Africa.

1.4.2.1 Research design

For the purpose of this study an ex-post-facto (non-experimental) research was undertaken within this field of study by using a questionnaire as instrument for research (Huysamen, 1976:96). A structured closed ended questionnaire was used (quantitative study) to collect data from government-subsidised higher education institutions and companies in the Gauteng region, by using a multidisciplinary approach in cooperative education (compare 1.4.2.2). The questionnaire consisted of biographical, demographical, the basic principles and nature of cooperative education and the best practices in cooperative education to be researched. The questionnaire was piloted and corrected, after which the questionnaires were distributed to and collected from respondents, mostly by hand. Data collected were then presented to the Statistical Consultation Services of the North-West University, for

processing. Various statistical tests were conducted and included tests on reliability (Cronbach Alpha), validity (factor analysis) and d-values (compare Chapter 5).

It must be noted that the research conducted was only limited to the Gauteng region, which limits the generalisability of this study (White,2003:64) (compare 4.12.3).

Lastly, the continuous interaction with cooperative education practitioners nationally and internationally, involved with daily operational and management activities in cooperative education, supported this study. Furthermore, this study was supported by existing local and international networks with other higher education institutions, companies, and societies such as the Southern African Society for Cooperative Education (SASCE) and the World Association for Cooperative Education (WACE). Established working relationships exist on a senior management level with such practitioners globally.

1.4.2.2 Population and sample

Research was carried out in the Gauteng province only, for the following reasons:

- 20% of the nation's population (8.8 million people) live in Gauteng.
- The province generates 34% of South Africa's GDP and 9% of the GDP of the entire African continent.
- Most of the country's major state, academic, research, mining, financial and commercial institutions are located in Gauteng.
- The manufacturing sector employs 600 000 people in 9 300 enterprises.
- 60% of South Africa's research and development takes place in Gauteng.

  (source: http://www.joburg.org.za/travel/gauteng.stm)

The following target populations were selected for the purpose of this study:

1.4.2.2.1 Government-subsidised higher education institutions

These included:

- Two universities: University of Pretoria and University of the Witwatersrand.

- Two comprehensive universities: University of Johannesburg (merger of former Technikon Witwatersrand and Rand Afrikaans University (RAU) and the University of South Africa (UNISA) (UNISA and Technikon Southern Africa).
- Two universities of technology: Tshwane University of Technology (merger of former Technikon Pretoria, Technikon North West and Technikon Northern Gauteng) and Vaal University of Technology.

Questionnaires were completed by heads of academic departments involved in this study within the mentioned HEIs. Using a multidisciplinary approach, the following disciplines[7] were selected for research in the above-mentioned higher education institutions, namely Engineering (Mechanical), Health Sciences (Nursing), Commerce (Accounting) (compare 4.12.3 and Table 4.4).

1.4.2.2.2 Learners of government-subsidised higher education institutions

- Learners of government-subsidised higher education institutions were targeted for this study and included those who completed their experiential learning (EL) as part of their undergraduate qualifications. Experiential learning programmes form part of the various undergraduate programmes for which learners have registered within higher education institutions in universities, universities of technology and comprehensive universities, in the same disciplines mentioned in 1.4.2.2.1.

1.4.2.2.3 Companies

For the purpose of this study, companies who complied with the following criteria were selected:

- Participated in cooperative education in the last 3 years and trained one or more students for experiential learning per annum.
- Companies located in the Gauteng region.

[7] Only three disciplines i.e. mechanical engineering, nursing and accounting, were selected for this study in six HEIs and fourteen companies, otherwise the study would become to extensive.

The questionnaires were distributed to and completed by supervisors involved in the training of learners in companies in the applicable discipline. Available samples were taken from each of the target populations (compare 4.12) from the selected companies.

Sampling sizes were determined according to the availability of persons in the respective target populations (compare 4.12 and Table 4.5).

1.4.2.3 Measuring instruments

Data were collected by using questionnaires. Based on literature, questionnaires were designed and administered to students and academic heads of departments in higher education institutions, namely universities, universities of technology and comprehensive universities as well as supervisors in companies.

The same questionnaire (compare Appendix B) was administered to all populations and sample groups. The questionnaires made provision for a multidisciplinary approach on the sampling populations.

1.4.2.4 Data collection procedure

Data collected from questionnaires were analysed according to descriptive analytical statistics, in collaboration with the Statistical Consultation Services of the North-West University, Potchefstroom campus. Frequency analysis of biographical (compare section A,, Appendix B) and demographical (compare section B, Appendix B) data were conducted. Tests on reliability (Cronbach Alpha) and validity (factor analysis) were done on the basic principles and the nature of cooperative education (compare section C, Appendix B) and the best practices in cooperative education (compare section D, Appendix B). D-values of Cohen (Ellis & Steyn, 2003) were used to indicate if there were any significant differences between the responses of the study populations. The study populations referred to in this study included the students and heads of departments at higher education institutions, and supervisors at companies (compare 4.12).

1.5 CHAPTER DIVISION

Chapter 1: Orientation

Chapter 2: Basic principles and nature of cooperative education

Chapter 3: Best practices in cooperative education, nationally and internationally.

Chapter 4: Research design and methodology.

Chapter 5: Research findings: analysis and interpretation and discussion of data and results.

Chapter 6: Guidelines for the implementation of cooperative education in higher education institutions in South Africa.

Chapter 7: Summary, findings, conclusions and recommendations.

1.6 CONTRIBUTION OF THE STUDY

This study contributed to:

- Clarifying the existing needs and status of cooperative education as a learning strategy in the Gauteng region in South African teaching and learning organisations in higher education.
- Providing guidance in higher education institutions with regard to the implementation of cooperative education as a teaching and learning strategy.
- The discipline of cooperative education in providing direction and guidance in higher education and companies on strategic and operational level.
- The research and development of cooperative education.
- Findings that contribute to the compilation of guidelines to be used in cooperative education in higher education institutions and industry. It may only serve as a directive nationally and internationally.
- Providing information on the relationship between higher education institutions and industry.

CHAPTER 2
BASIC PRINCIPLES AND THE NATURE OF COOPERATIVE EDUCATION

2.1 INTRODUCTION

To achieve objective 1 (compare Table 1.1), the purpose of this chapter is to compare the basic principles and nature of cooperative education in the literature, nationally and internationally.

The aim of this chapter is to present a general introduction of cooperative education with regard to:

- Current status of cooperative education;
- Origin and history of cooperative education, nationally and internationally;
- The nature of cooperative education;
- The concept of cooperative education;
- The purpose and role of cooperative education;
- The aim of cooperative education;
- Experiential learning as component of cooperative education;
- Theories of learning in cooperative education;
- Research in cooperative education;
- Future perspectives on cooperative education;

The chapter is concluded with a short summary.

2.2 CURRENT STATUS OF COOPERATIVE EDUCATION

The current status of cooperative education in higher education institutions in South Africa varies considerably. Cooperative education in South Africa is mainly promoted by the Southern African Society for Cooperative Education (SASCE) and internationally by the World Association for Cooperative Education (WACE). Participation by higher education institutions in SASCE activities, nationally is dominated by universities of technology staff and industry. Most universities of

technology have some form of centralised management to coordinate and communicate cooperative education in such institutions. Recently, it has been observed that traditional universities have shown interest in participation and membership in such societies. The recent merger of higher education institutions has shown to have a significant impact on cooperative education (Van Staden, 2005).

According to Reeve (2004:189), cooperative education is now practiced in over 60 countries on almost all the continents. According to Sovilla and Varty (2004:13) there has been a significant increase in the number of cooperative education programmes in the last three decades in the United States of America (USA). Sovilla and Varty (2004:13) point out that "despite somewhat limited expansion there were many positive signs that cooperative education continues to be a viable post secondary pedagogy". Fifteen world conferences since 1979 provide positive evidence that cooperative education is making significant progress in educational institutions worldwide. Another positive sign is the increasing numbers of cooperative education practitioners giving higher priorities to developing strategies for guiding and assessing student outcomes from cooperative education experiences. Many forms of experiential learning programmes were used throughout the world, which is a positive sign that at least a solid percentage of educators were aware of the values of applied education (Sovilla & Varty, 2004:13)

In the last number of years, considerable progress has been made in cooperative education in the higher education landscape in South Africa. This is especially true in the universities of technology (UoTs) (former technikons) and comprehensive universities (merged technikons and universities), with the focus on career education in higher education institutions.

As mentioned, cooperative education has been promoted with much success in South Africa, due to conferences held on a bi-annual basis by the Southern African Society for Cooperative Education (SASCE), resulting in discussion and research papers being published in accredited journals and conference proceedings (SASCE:2006). At present there is a strong drive to promote and stimulate research in cooperative education within universities of technology in South Africa. A number of postgraduate qualifications in cooperative education and related fields have been obtained, both locally and abroad.

As part of this study the current status of cooperative education in HEIs in the Gauteng province in South Africa was determined by using quantitative methods of inquiry (compare Chapter 5). Apart from the current position of cooperative education, it is also necessary to study the origin and history of cooperative education locally and abroad.

2.3 THE ORIGIN AND HISTORY OF COOPERATIVE EDUCATION NATIONALLY AND INTERNATIONALLY

2.3.1 The origin of cooperative education

Du Plessis (1993:53) and Bisschoff (1997:53) explain that the origin of cooperative education can be traced back as far as the early Roman empire after which it developed spontaneously, where it presently forms part of learning programmes in HEIs, nationally and internationally.

According to Reeve (2004:189), the concept of cooperative education (compare section C, question 1 to 7, Appendix B) began in the United Kingdom in the late 1800's, in the United States of America (USA) in 1906 and in Canada in 1957. Reeve (2004:189) points out that cooperative education is now practiced in more than 60 countries in the world, and operates on most continents in associations similar to those like the Southern African Society for Cooperative Education (SASCE). In Japan, it was not until the first half of 1990s that cooperative education programmes were formally recognised (Kato, 2005:1).

Carlson (1999) stresses that although the term *cooperative education* may have originated in the USA, the concept i.e the idea of an integrated curriculum that includes experiential learning, did not. Furthermore, the practice of cooperative education can be traced back to 1903 in Northern England where a sandwich education programme was introduced at Sunderland Technical College and even in other parts of the world such as Egypt, India and South Africa (Groenewald, 2004:18).

According to Sovilla and Varty (2004:3) cooperative education had its origins in the United States of America (USA), its history there is well documented and it is approaching its 100th year anniversary there: "the road today began with the conviction and tenacity of one man who designed a blue print and sold the concept of the values of integrating academic studies with practical experiences." Cooperative education weathered world wars, serious economic downturns, much experimentation, periodic shifts in public policy and even changing priorities in educational institutions. Cooperative education has progressed to a point of having many cooperative education programmes in countries throughout the world and due to modern technology cooperative education practitioners can now communicate around the globe, resulting in increasing opportunities for collaboration. Furthermore, cooperative education is beginning to move beyond energies heavily focussed on program structure and processes with the more important goal of enhancing learning outcomes for cooperative education. Modern technology has made it possible to enable frequent and personal interactions with students with the renewed focus

on cooperative education's primary purpose, education (Sovilla & Varty, 2004:3). Cooperative education survived these serious assaults on the practice of cooperative education, most programmes persevered and became stronger and the majority of coordinators made careers of being coordinators (Wilson, 2005:2).

Nationally, cooperative education started in technikons (now known as universities of technology and comprehensive institutions) with its origin as Colleges for Advanced Technical Education (CATEs) in 1967. The name, Technikon was introduced in 1979. Initially technikons were intended to focus on vocational training. It was observed that the difference between the roles of universities and technikons started fading since the sixties. It blurred even further in 1995 when technikons were authorised by law to issue degrees to doctoral levels. Universities and technikons gradually encroached on each other's market segments offering courses that were virtually the same (Groenewald *et al.*, 2001:1).

Today, cooperative education is a well-known concept and is a well-established practice in South African universities of technology and comprehensive universities (compare section C, question 1 to 7, Appendix B). The concept of cooperative education is not well known amongst South African traditional universities, but is practiced to varying degrees in faculties, since such universities offer many career-focused programmes.

Coll and Eames (2004:271) indicate that many authors have pointed out that cooperative education is now well established worldwide and in some countries it has a high profile and strong support at institutional, commercial and government levels. In some countries and in some disciplines, however, it is still at an embryonic stage, seeking to draw upon experiences of well-established programmes.

2.3.2 The history of cooperative education

The academic year of 2005-06 will mark the 100th anniversary of cooperative education, and educational institutions throughout the world now use this education strategy which started as an experiment in an engineering college in the United States of America (USA) (Sovilla & Varty, 2004:3). Bisschoff (1997:64) explains that the public vocational education in the USA started in 1906 and was first instituted in the USA at the University of Cincinnati in 1906 by Professor Herman Schneider.

Although the concept of cooperative education originated 100 years ago in the USA (compare 2.3.1) cooperative education did not flourish until the 1960s, when the federal government provided

funding for cooperative education (Keen & Howard, 2002:4). Today in South Africa, most universities of technology have established cooperative education departments and it is a well practiced teaching and learning strategy.

In the first 50 years in the USA, the cooperative education odyssey was launched by Herman Schneider in 1906, an engineering professor at the University of Cincinnati. He realised that many concepts and skills could not be acquired effectively in the classroom but required practical skills to be mastered. He proposed that a substantial component of the engineering curriculum should involve an alternation of on- and off campus real world experiences. As the USA moved towards a period of industrial expansion more and better educated workers were badly needed. In higher education institutions (HEIs) there were a gradual movement from the classical education focus to address the needs of industry and for specific skills. Many academics were sceptic about Schneider's plan, and never claimed to be the originator of this idea. He was later appointed as president at the University of Cincinnati and initiated a cooperative education division. Schneider found through cooperative education a way to satisfy student's financial needs as well as to provide them with meaningful experiences (Keen & Howard, 2002:4). The first cooperative education programme outside engineering was established in the business discipline in 1919 (Sovilla & Varty, 2004:3). After 50 years, approximately 60 colleges and universities in the USA had established cooperative education programmes. It must be noted that cooperative education survived business recessions, severe depression and even two world wars (Sovilla & Varty, 2004:4)

The second 50 years of cooperative education in the USA involved a period of great change and as funds became available, there was a tremendous increase in the number of cooperative education programmes and practitioners in the USA. Federal support for cooperative education was manifested by legislation through the higher education act of 1965, the first opportunity for direct federal funding for cooperative education, resulting in a major expansion of cooperative education programmes reaching its peak in 1986 in which one third of all secondary educational institutions reported having cooperative education programmes (Sovilla & Varty, 2004:3). Even though there was a decrease in the number cooperative education programmes in the USA after the elimination of federal funding, the number of students placed in cooperative education placements have not decreased (Keen & Howard, 2002:4).

Most countries, including the USA, were faced by the inherent difficulty by planners of new cooperative education programmes. Any change from a long-standing post secondary education practice is often met with either resistance or a passive response from faculty administrators. The academic culture of many colleges and universities nationally and internationally do not provide

fertile ground for cooperative education. Failure of cooperative education programmes was due to lack of sincere institutional commitment to fully integrate cooperative education in the curriculum in the long term (Sovilla & Varty, 2004:9).

The history of cooperative education in South Africa is interesting and sources in this regard were limited. According to Bisschoff (1997:54), as early as 1884 in Durban, 1890 in Salt River in the Cape, 1895 in Uitenhage and 1902 in East London forms of cooperative education were used to train artisans. Only in the 1950s well-structured cooperative education began at the so-called CATEs (colleges for advanced technical education), which were the forerunners of the then technikons and the present universities of technology and comprehensive institutions (Bisschoff, 1997:54).

Nationally, cooperative education is likely to advance through the same phases, as did the USA. Government funding of experiential learning (EL) for HEIs in South Africa (compare 3.11) would result in mayor expansion of cooperative education/experiential learning programmes. According to a Committee for Technikon Principles (CTP) report (2003) there was a misconception that the Department of Education (DoE) did not fund experiential learning. Costs ideally spent on Experiential learning (EL) were about triple their actual costs and additions to the universities of technology (UoT) coefficients to fund EL generated R33 million for the universities of technology sector in 2002/3 (CTP, 2003).

For cooperative education to be successful in HEIs, government, institutional and industry support would be necessary.

After studying the historical background of cooperative education, it is necessary to investigate the true nature of cooperative education.

2.4 THE NATURE OF COOPERATIVE EDUCATION

According to Coll and Eames (2004:271) many authors have pointed out that cooperative education is now well established worldwide (compare section C, question 8 to 10) and in some countries it has a high profile and strong support at institutional, commercial and government levels, but in many counties and in some disciplines it is still at an embryonic stage and seeks to draw upon experiences of well established programmes. Cannan and Ziming (2005:2) differentiate between career-orientated and industry-orientated cooperative education and they describe the former as being a methodology where the training programme is tailored towards meeting the job

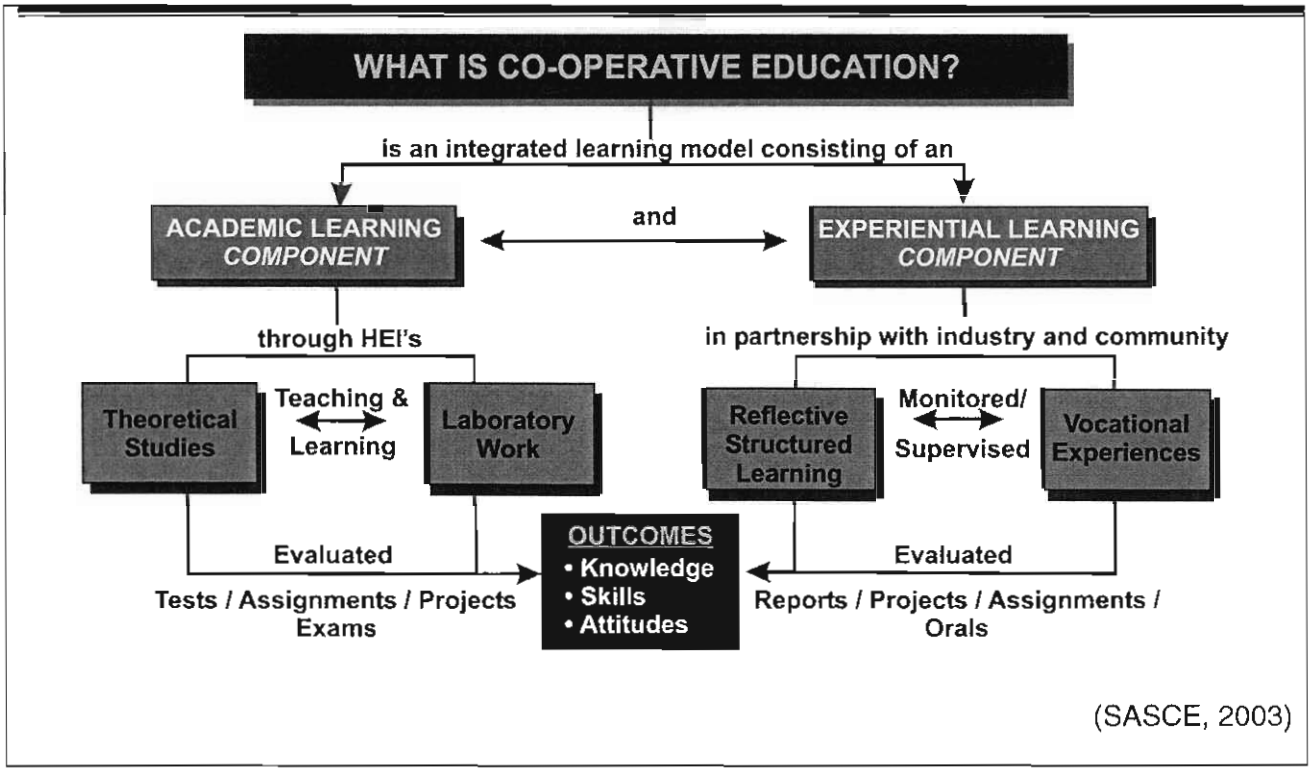
market and the latter pertains to the student's work, focused on project work, and closely related to the current industry practice.

Cooperative education consists in essence of an academic component offered by HEIs and an experiential learning component usually completed in industry, but both components were interdependent. The symbiotic unity of these two components is reflected in Figure 2.1. The experiential learning component should allow for career development with special focus on the current, short- and expected long-term needs of the student and the company (CTP, 2000a:3).

In South Africa, cooperative education is well established and has a high profile in most universities of technology (UoTs) and comprehensive universities, but there were considerable differences in the application thereof at program level. The Southern African Society for Cooperative Education (SASCE) has compiled a quality assurance policy document, in support by the Higher Education Quality Committee (HEQC), which will create uniformity in quality assurance in HEIs at all levels (SASCE, 2003).

The absence of traditional University involvement as higher education institutions, in cooperative education, is a concern, possibly because they do not know what the real nature and identity of cooperative education is as is the case in universities of technology and comprehensive universities in South Africa.

FIGURE 2.1 What is Cooperative Education ?



(SASCE, 2003)

2.4.1 The identity of cooperative education

Locally and internationally, many authors and cooperative education practitioners define cooperative education in terms of their understanding of cooperative education in their specific context. The challenge to the identity of cooperative education is reflected in the "branding" of cooperative education. Increasingly it is becoming more common for authors and professional organisations to talk about work-integrated learning (WIL). Many of the terminology used in cooperative education and WIL appears to be much the same. In principle, there needs to be distinguished between these terms and the cooperative education community needs to define itself – there needs to be some boundaries. The cooperative education community needs some common understanding of what they do and what they were (Coll & Eames, 2004:272). Locally, the identity of cooperative education is also experiencing a shift, in which cooperative education is recognised as the "umbrella" term. The term *experiential learning* is now gradually being substituted by *work-integrated learning* (WIL). Experiential learning is recognised as a component of cooperative education, whilst experiential learning consists of various forms of learning, namely work-integrated learning and service learning. Work-integrated learning could either be work based or non work based (simulated) (compare 2.8.4).

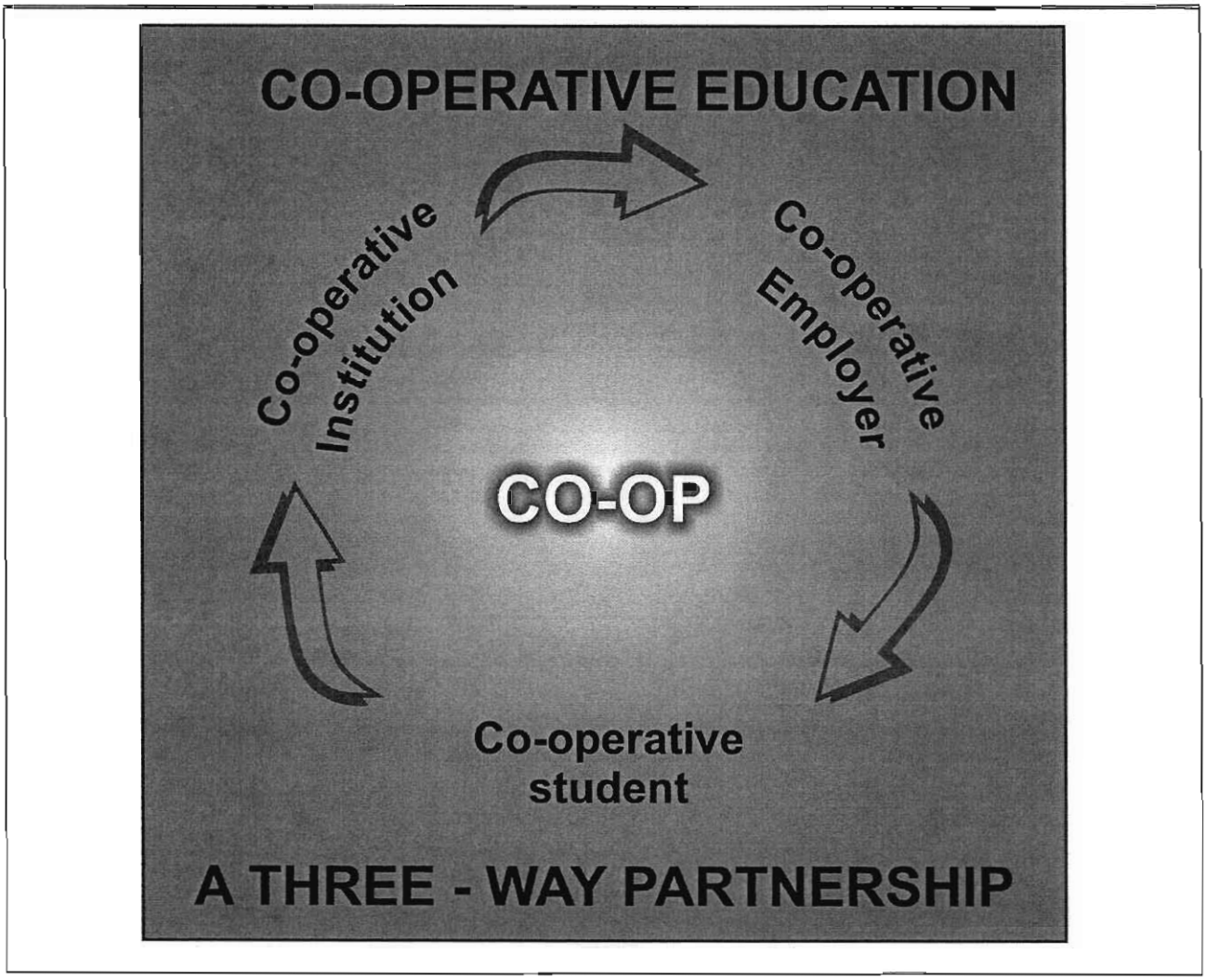
One core feature of cooperative education is that of integration, namely the integration of work and classroom learning (Coll & Eames, 2004:272) (compare section C, question 24, Appendix B). Groenewald *et al.*(2001:1) and Engelbrecht (2003a:6), emphasise that cooperative education is a structured educational strategy that progressively integrates academic study with learning through productive work experiences in a field related to a students academic or career goals (compare section C, question 11, Appendix B). There is, however, an international trend to refer to *work-integrated learning* (WIL) rather than *experiential learning* (EL). Cooperative education, and more specifically experiential learning, is a structured teaching and learning strategy. It is not an "add-on" to curricula, but is integrated in the learning program. This integration needs to be incorporated with the students learning from first year level, beyond to work based learning with a strong focus on career development.

Furthermore, there seems to be a considerable complexity and variation in the delivery of cooperative education e.g. the time difference existing in the application of EL – it is difficult to accept that one week of work experience is sufficient for experiential learning. It should preferably not be limited to "periods", but should be outcomes based and credit bearing.

An individual who gains work experience through cooperative education will result in lifelong learning and reflective practice which creates the opportunity for career clarification and socialisation, which were important for the development process of the student. Any work-based learning that supports this type of development may be referred to as cooperative education (Coll & Eames, 2004:272).

According to the Committee for Technikon Matters (CTM) (2000: 6) there were three major role players involved in cooperative education, the student, the educational institution and industry. (compare Figure 2.2).

FIGURE 2.2 Tripartite Model in Cooperative Education



This tripartite model (Figure 2.2) furthermore indicates a relationship between the three role players. Coll and Eames (2004:272) emphasise that there is some danger in this relationship and that one party should not dominate the cooperative education landscape with their views. One matter that needs to be investigated is the nature and form of relationships within this triangle. Relationships can only be established on a long-term basis, by continuous interaction. The initiative should come from cooperative education as initiator and facilitator. Relationships should be on ground level, for example in which cooperative education practitioners interact with companies, supervisors, advisory committees etc and on middle and senior management level with companies from the central cooperative education office.

The role of the university is to act, as provider of training for the student, whilst industry will provide curriculum inputs and workstations for experiential learning for students. All three were equal partners in the tri-partite relationship.

The cooperative education relationship informed in the tripartite relationship is only about one matter, namely learning by the learner.

2.4.2 Cooperative education and learning

Cooperative education conducted in higher education mainly involves two educational contexts, namely the classroom and the workplace. Furthermore, cooperative education needs multiple perspectives to understand the teaching and learning processes that occur (Coll & Eames, 2004:273) (compare section C, question 11, Appendix B). Coll and Eames (2004:273) argue "that whatever theoretical basis for learning is considered, it must underpin the curriculum and pedagogy of the coop program", while Gillin *et al.* (2005:1) describe learning as a discipline, a vocation and a holistic experience and involves the intellectual, emotional and spiritual dimensions of the human being.

Irrespective of the nature of the cooperative education programme all cooperative education professionals should agree that the work component must be "authentic" and "integrated" (CHE, 2004a:19) and that cooperative education needs to be a curriculum model and not an "add on" that involves both reflection and reflective practice (Coll & Eames, 2004:273). Thorne (1995:176) also emphasises the importance of the Kolb's (1984) learning cycle in which students need to reflect on experience and relate to general principles which in turn help us to plan future actions. Unless experience is examined and reflected on, it has no educative value (Petherbridge, 1996:255). The importance of debriefing (reflection) in the cooperative education learning process cannot be over emphasised (compare 2.8.3.6).

In the opinion of Coll and Eames (2004:273), cooperative education research is best developed within the perspective taking into account socio-cultural views of learning. One feature of the evolution of theories of learning is the increasing importance placed on socialisation factors, namely to help students understand aspects of the real world by exposure to the real world of work in relation to their career aims and objectives (Coll & Eames, 2004:273). The socialisation of students in a specific company environment, having a specific "culture" will impact on the students developmental and growth process. This factor has gone unnoticed in the past considering the learning process of the student.

The complexity of learning in cooperative education within disciplines has been observed. Education in itself is highly complex and cooperative education even more complex with significant implications for the entire purpose of cooperative education. The three partners (compare Figure 2.2) in the cooperative education tripartite model have different agendas and different expectations of the "outputs" of the various cooperative education programmes. By making provision for strong curricula supported by the necessary theory and objectives relevant to all role players involved, will sustain a successful program. There should not only be an entire focus on the student but a balance is necessary – a programme that is too vocationally focused may loose sight of the student. Students need to be equipped with skills and competencies that will enable them to find employment. If students and companies were satisfied it will suggest that it will be a successful cooperative education programme, which will be beneficial to the third role player, namely the educational institution (Coll & Eames, 2004:274).

According to the Council on Higher Education (CHE, 2000:7), the New Academic Policy (NAP) for programmes and qualifications in Higher Education, universities were to concentrate on teaching and learning and research of the basic fundamental principles of science, with the view to make provision for high level person power, whereas universities of technology were to concentrate on the application of scientific principles to practical problems and technology – preparing students for the practice, promotion and transfer of technology within a particular vocation or industry. Within the university environment there is a tendency to focus on holistic education and training, whilst in the University of Technology environment, with the thrust of cooperative education, one should not loose sight of the danger to become to vocationally focused, and loose sight of the holistic educational approach of the student.

After consideration of the essence of cooperative education, namely it is about learning, the concept and terminology related to cooperative education should be considered.

2.5 THE CONCEPT OF COOPERATIVE EDUCATION

2.5.1 Defining cooperative education

According to Engelbrecht (2003a:2), the cooperative education principle is well established and may have different focal points for different cooperative education practitioners. According to Cates & Jones (1999:23) the former Vice President of General Motors Corporation, Charles Kettering postulated that "co-op education is the education of the future. It doesn't dwell on reporting the learning of the past." Kerka (1999:1) described various problems related to cooperative education

due to a lack of clear or consistent definition of cooperative education. According to Wilson (2005:5), having debates to find the "proper" definition in cooperative education is a futile exercise. The adoption of the term *work-integrated learning* or *work-integrated education* has been suggested by the World Association for Cooperative Education (Wilson, 2005:5)

The following were some definitions presented from the literature:

- According to Baumgart *et al.* (1994:107), the Canadian Association of Cooperative Education defines cooperative education as a process, which formally integrates the student's academic study with work experience in cooperating company organisations.
- Garavan and Murphy (2001:281) defines cooperative education as a unique form of education which integrates classroom study with paid, planned and supervised work experience in the private and public sectors.
- Cooperative education, also known and generally referred to as "co-op", is a broad concept used globally which includes components, such as experiential learning, advisory committees, curriculum development, exposure of staff to industry, international exchange of students, research, skills development such as learnerships, service learning, marketing and quality management (SASCE, 2003).
- The Cooperative Education Association, Inc. (1988:10) defines cooperative education as a structured educational strategy integrating classroom studies with learning through productive work experiences in a field related to a student's academic or career goals. It provides progressive experiences in integrating theory and practice. Co-op is a partnership among students, educational institutions and companies, with specific responsibilities for each party.
- According to Ryder & Wilson (1987:1), "cooperative education is an instructional method that links classroom instruction and work for the purpose of enhancing the total educational programme of students".
- Bisschoff (1997:53) defines cooperative education as "the integration of classroom theory with practical experience under which students have specific periods of attendance at the college and specific periods of employment".
- Groenewald *et al.* (2001:1) refers to cooperative education as a structured educational strategy that progressively integrates academic study with learning through productive work experiences.

- According to Engelbrecht (2003a:6), cooperative education refers to an educational system in which commerce and industry cooperate with educational institutions to educate and train students who can satisfy the work force requirements of a country.
- Cooperative education may be defined as the educational model that combines classroom theory with actual work-based practice (Taylor, 2005:83).

Cooperative education is a teaching and learning strategy involving several methodologies and approaches. More specifically, it involves a structured, integrated learning programme, developed and supervised by the higher education institutions in collaboration with their primary and secondary partners (SASCE, 2003:2). Primary partners include companies, students and HEIs and secondary partners include inter alia parents of students, accreditation boards/councils, professional bodies institutes and councils community organisations, relevant government departments such as the Department of Labour (DoL) and Education (DoE), the South African Qualifications Authority (SAQA) etc.

- According to Engelbrecht (2003a:6), cooperative education may be defined as a structured educational strategy integrating classroom studies with learning through productive work experiences in a field related to a students academic or career goals. It provides progressive experiences in integrating theory and practice. Cooperative education is a partnership among students, educational institutions and companies, with specified responsibilities for each party.

  This definition provides a clear and concise understanding of the essence of what cooperative education is.

- Cooperative education is a culmination of a series of experiential learning opportunities that include; job shadowing, job twining and work experience and is often an integral part of the curriculum. It also involves a partnership between education, industry students and business, community organisations, parents, companies and supervisors (Ontario Ministry of Education, 2000).

  The concept of cooperative education implies that there must be a partnership in respect of education involving the three partners or role-players (compare Figure 2.2) (compare section C, question 15-17, Appendix B). Various other terms related to cooperative education also needs to be explored.

2.5.2 Other terminology used in relation to cooperative education

- According to Heinemann (2005:6), work-integrated learning programmes have various names but found that all these programmes were quite similar regardless of the label attached.

- Engelbrecht (2003a:14) defines in-service training as "non-formal transfer of knowledge and the acquisition of skills with the objective of producing a more useful employee who may be utilized in a particular practice/profession for broader applications than his/her present knowledge/experience of a particular occupation permits; also training for a specific placement within the organisation, systematically planned and provided by a trainer on the staff internally or by acting on behalf of the organisation externally".

- Garavan & Murphy (2001:282) defines experiential learning as "learning that occurs when changes in judgement, feelings, knowledge or skills results, for a particular person from living through an event".

- Engelbrecht (2003a:14), defines experiential instruction/ learning/ training as "an extension to the formal educational component of the tuition normally provided by the educational institution and may assume various forms with the objective of facilitating learning in the real world of work and/or extending the candidate the opportunity for experiential performance within this environment; purposeful monitoring is implicit and it is preferable to include or reflect in the candidates final performance evaluation any achievements during experiential instruction/learning/training; the objective is also guided exploration of an occupation, irrespective of the frequency or duration of the interval in order to allow the candidate first hand experience of the demands of immediate usefulness".

- Experiential learning (EL) may be defined as the work based component of the co-op model (Taylor, 2005:83).

- Work-integrated learning (WIL) refers to *"specific skills* acquired through work and directly related to classroom teaching. It implies a concurrent process. It may be defined as a form of education that integrates periods of academic study with periods of work experience in positions relating to the students studies" (Engelbrecht, 2003a:24).

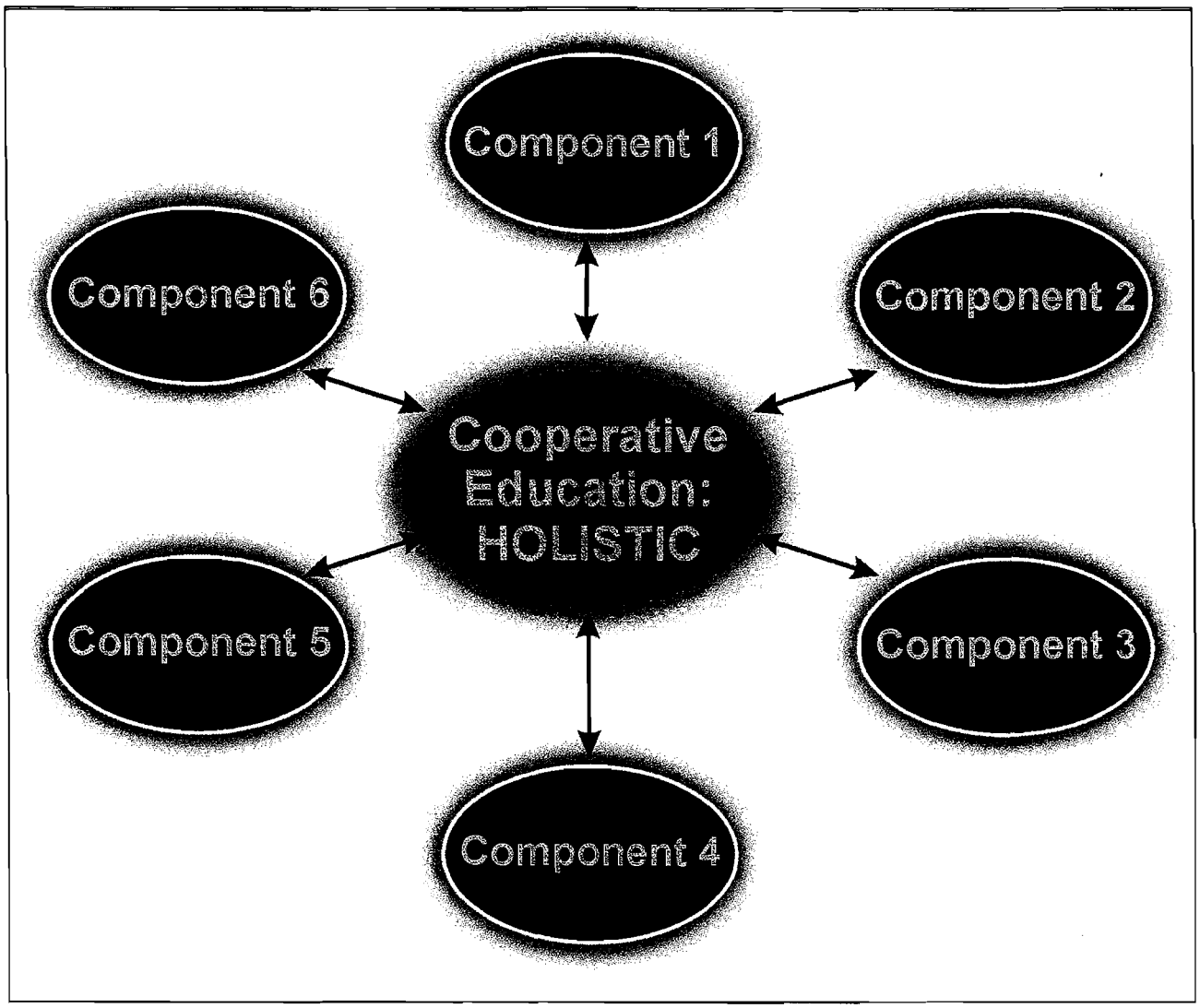
- The term *work-based learning* synonymously used with cooperative education, refers to the *linking of learning to the work role*, provided by appropriate on- and off- job opportunities for training and learning, also referred to as a formalised educational programme supervised by

the educational institution that takes place mainly in a work based environment. (Engelbrecht, 2003a:24).

- Service learning is applied learning which is directed at specific community needs and is integrated into the curriculum and learning program. It could be credit bearing and assessed and may take place in a work environment (CHE, 2006:24)
- Learnership is a qualification that includes a practical work based component. A learnership has to be aligned with a registered NQF qualification (CHE, 2004b:1).
- Job shadowing, which allows the student to spend one half to one day (even up to three days) with a worker in a specific occupation (Ontario Ministry of Education, 2000).
- Job twinning, which provides opportunities for the student to accompany a cooperative education student to his/her placement for half to one day (Ontario Ministry of Education, 2000).

There has been a national and international trend to move away from the usage of *experiential learning* to *work-integrated learning* (WIL) in relation to cooperative education (Du Pré, 2004a:15) (compare section C, questions 5 to 7, Appendix B). Other terms used in relation to cooperative education include *professional practice*, *apprenticeship*, *articles*, *candidature*, *co-op*, *field-based learning*, *internships* or *interns*, *project-based learning*, *school-to work*, etc (Groenewald, 2004:19). Following the above-mentioned definitions and the mere fact that many components of cooperative education have been identified (SASCE, 2003), cooperative education can be diagrammatically represented as consisting of various components (compare Figure 2.3).

FIGURE 2.3 Cooperative education consisting of various components

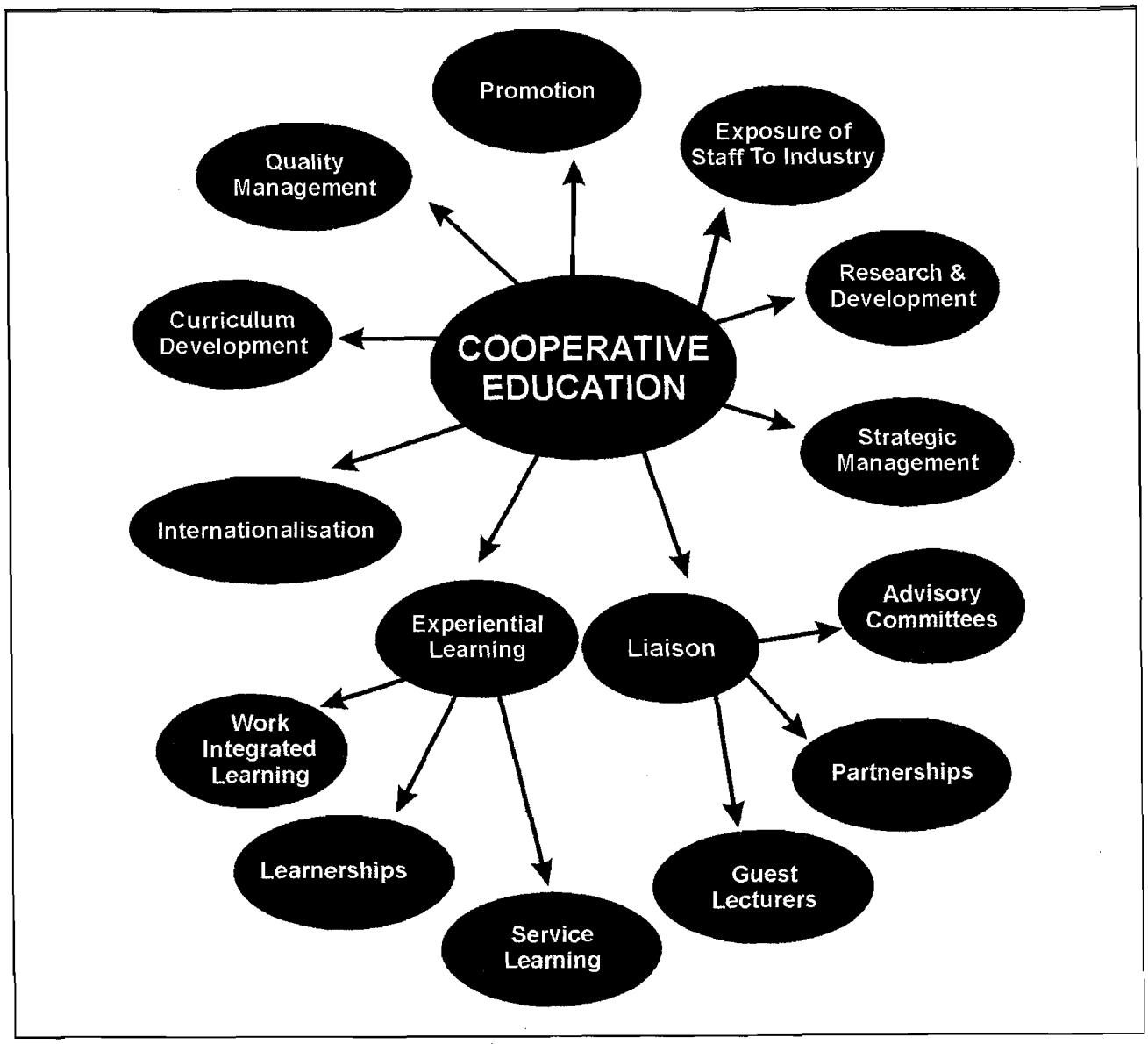


According to Figure 2.2 and 2.3 cooperative education is an umbrella term used to describe the collaboration of the various role players in the cooperative education venture, consisting of various components. Components of cooperative education identified (SASCE, 2003) may include, among others, experiential learning, liaison, internationalisation, curriculum development, quality management, promotion, exposure of staff to industry and research and development.

The Tshwane University of Technology (2005a) identified two major components of cooperative education. Experiential learning, as learning by doing, consists of various forms of learning, namely work-integrated learning, service learning and learnerships (compare Figure 2.4). Liaison, on the other hand, consists of three types of liaison, namely advisory committees, partnerships and guest

lectures. Based on the above information and Figure 2.3 the following diagrammatic representation of cooperative education may be made (compare Figure 2.4):

FIGURE 2.4 Defining cooperative education in terms of the components thereof



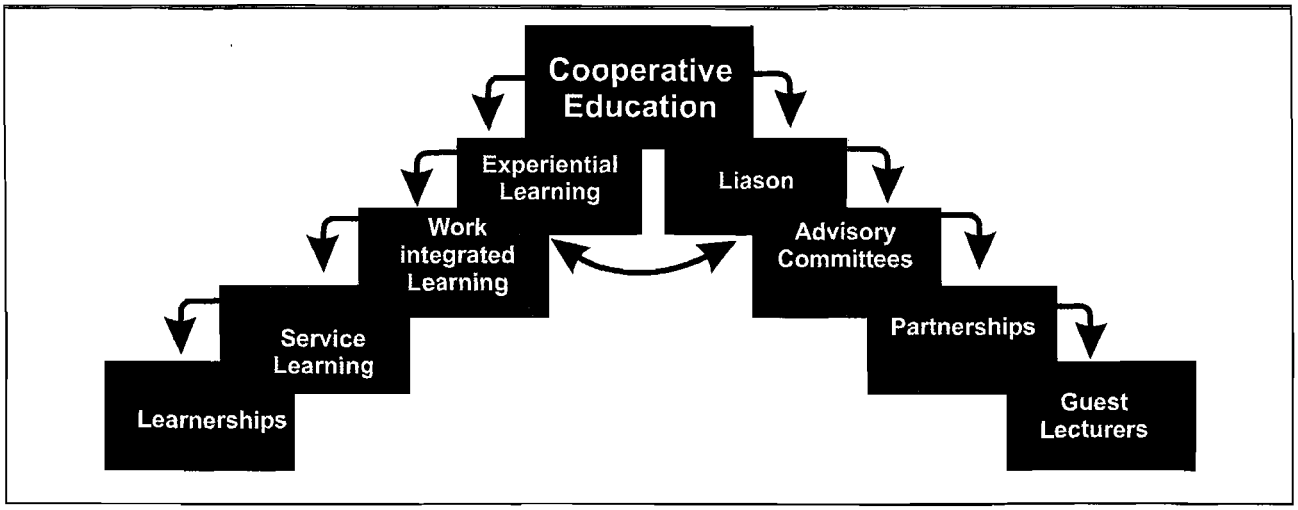
2.5.3 Formulation of the concept cooperative education

It must be noted that the concept *cooperative education* is an umbrella term consisting of various components (compare Figure 2.3 and 2.4). In the South African context the concept of cooperative education is no more limited to only one of the components of cooperative education, namely experiential learning (EL) but is extended towards an inclusive understanding.

As experiential learning is an integral aspect of the curriculum, and since experiential learning is one component of cooperative education, it may be concluded that the cooperative education venture thus forms part of an integral aspect of curriculum development and implementation and informs the teaching and learning strategy of a university.

A building block synthesis can be used to illustrate the two mentioned components of cooperative education, namely experiential learning and liaison (TUT, 2005a). This can also be extrapolated to the other components of cooperative education mentioned in Figure 2.4.

FIGURE 2.5 Building block synthesis of cooperative education with two components



Considering the abovementioned in relation to cooperative education the following definition is proposed for cooperative education, namely

Co-operative education is the umbrella concept used to describe the cooperation between the university, industry, commerce and the public sector, to enhance learning. It comprises a number of components, namely, various forms of experiential learning such as work-based/work-integrated learning, learnerships, service learning, as well as the various forms of liaison with industry such as partnerships, advisory committees, and exchange of knowledge and technology through guest lectures by industry for the university or by the university for industry. It also includes partnerships for the research, development and dissemination of new technologies and their applications. Cooperative education is therefore an integral aspect of curriculum development and implementation and informs the teaching and learning strategy of the University (TUT, 2005a) (compare Figure 2.4).

After the clarification and formulation of the concept of, and terminology related to cooperative education it is important to consider the purpose and role of cooperative education.

2.6 THE PURPOSE AND ROLE OF COOPERATIVE EDUCATION

2.6.1 Introduction

The purpose and role of cooperative education is multifaceted considering the complexity of cooperative education and the various role-players involved. It must be remembered that from the student's point of view career clarification is the most important (Coll & Eames, 2004:274).

One of the purposes of higher education is to prepare people for work, but perhaps a better definition would be that its purpose is to give people the tools with which to reflect and learn from experience (Thorne, 1995:184). According to Coll & Eames (2004:274) students want well paying jobs soon after graduation. Cooperative education's main aim is to educate students. The purpose to prepare students in HEIs for experiential learning and the workplace has become the main objective of cooperative education in such institutions (compare section D, question 5, Appendix B). Cooperative education must not loose sight of this, otherwise it may loose its purpose in higher education.

Companies (employers) were regarded as the key role player in the cooperative education triangle (Figure 2.2), since if companies do not create opportunities for students for work experience and EL, the purpose of HEIs becomes insignificant. All cooperative education practitioners acknowledge the fact that ongoing company support is essential (compare section D, question 23, 25, Appendix B). Coll and Eames (2004:274) express the opinion that cooperative education professionals need to conduct research to prove to companies that it is of benefit to them and that there is "good empirical evidence" that it is beneficial to them (compare section C, question 12, 13 & 14, Appendix B).

Coll and Eames (2004:274) and Weisz and Chapman (2004:24) indicate that useful company input can help make curricula more relevant for students, meaning strongly vocationally focused. Advisory committee meetings for programmes in universities of technology fulfil this purpose by providing a forum for company inputs, making curricula more relevant.

Given the worldwide reduction in government funding for education and cooperative education we need industry to become more involved and not only to support cooperative education. This could potentially produce graduates that meet industries need better, but introduces the risk of cooperative education programmes becoming to reliant on industry and sometimes on specific companies. We cannot allow industry to influence too strongly what the "product" of our cooperative education programmes must be. Creative thinkers are needed as well, and there is a broader objective for education, namely to produce a literate society not just employee's for industry (Coll & Eames, 2004:275).

Cooperative education does not bring education and industry together in a mutual beneficial way, but is positioned to facilitate communication between industry and education. The facilitation of communication between the various role players in the tripartite model (compare Figure 2.2) is essential, since higher education institutions (HEIs) in South Africa have traditionally been in "isolation" from industry and the community they serve. Cooperative education is in the unique position to restore such communication break by establishing a relationship, which has been absent for many years.

Clear educational goals need to be maintained in cooperative education. The objectives set for cooperative education programmes (compare section C, question 20, Appendix B) and the work component should allow the student to engage in critical thinking and transformative learning. We must recognise the tension that exists between the primary goals of academia (education) and industry (productivity), but education must remain the predominant. According to Coll and Eames (2004:275), "bringing industry and education together will be a fine balancing act as we seek to maintain the critical relationship with the company".

The function and benefits related to the various role players in the cooperative education venture also need to be considered. This aspect will be addressed below.

2.6.2 The function of cooperative education

According to Wilson (1997:14) the function of cooperative education is to enlarge and enrich the learning environment for students. For a cooperative education programme to remain viable its principal objectives must address student learning. It must be noted that other components in cooperative education also contribute to student learning (compare Figure 2.4).

A cooperative education programme is multi-functional in that it yields many and differing benefits (compare section C, question 12 to 14, Appendix B) to the various role players, namely students,

educational institutions and industry. Garavan and Murphy (2001:282) mentioned a number of reasons why companies wish to participate in experiential learning/cooperative education programmes, which include:

- the development of an improved company image and achieve greater awareness of the company amongst the community; and
- increased employee productivity by employing students who were fresh and eager to learn and achieve, and to supply the company with "new blood" and fresh ideas.

According to Garavan and Murphy (2001:282), companies seek to recruit individuals who were capable of more than simple response to change. They rather want adaptive, adaptable and transformative employees who will aid the organisation in the maintenance, development and transformation of the organisation, anticipating change. It is the responsibility of higher education institutions to address this need and produce suitable graduates who have a realistic expectation of the workplace (Garavan & Murphy, 2001:282). The role of higher education institutions is to provide such graduates through the practice of cooperative education education, by preparing students for experiential learning and the workplace (compare 2.6.1).

According to the World Association for Cooperative Education, cooperative education allows students to experience the connection between education and work and may result in increased interest in class work. Furthermore, it aids in the development of the students cognitive skills, self-confidence and personal and work-related knowledge (Garavan & Murphy, 2001:282).

Cooperative education affords a pathway for dialogue between education and industry and gives companies the opportunity to inform the educational institutions of the skills and knowledge which future graduates ought to possess, thus provide industry with more suitable potential employees and aiding the educational institution to remain at the forefront of innovation and creativity (Garavan & Murphy, 2001:282).

The benefits of cooperative education (compare section C, question 12 to 14, Appendix B) to the three major role players may be described as follows:

2.6.3 Benefits to role players

Compare Figure 2.2.

2.6.3.1 Benefits to companies

According to the Quality Assurance Policy of the Southern African Society for Cooperative Education (SASCE, 2003:6), benefits to companies may among others include the company benefits from having access to a regular supply of trained and highly motivated student employees who want to work and learn; in the short term, cooperative education students provide the opportunity for companies to initiate projects not funded in the normal budget and to undertake short-term endeavours; it also allows for the organisations more skilled, permanently staffed professionals to perform other tasks and to act in supervisory roles; in the longer term, companies have a cost-effective means of evaluating the potential of future employees without making a long term hiring commitment; if a co-operative education graduate is recruited to a permanent position, significantly less training time is needed, due to their active involvement with the students education and training and companies were co-educators. Companies also have the opportunity for the exchange of ideas and new developments; curriculum review and joint research with the HEIs and FETs; cooperative education creates opportunities for the implementation of skills development programmes for industry.

Breen and Hing (2002:58) identify the benefits of cooperative education to industry as being industry legitimacy through enhanced professionalism, professional status for the industry and its participants, improved public perception of the industry, maintenance of an advantageous position through controlling abstract knowledge and improving industry competitiveness through enhanced professional standards.

2.6.3.2 Benefits to students

According to the Quality Assurance Policy of the Southern African Society for Cooperative Education (SASCE, 2003:6), the benefits for students include cooperative education students receive well-rounded relevant education that is enriched by practical application of academic knowledge while they accumulate valuable and varied work experience; it enables students to realistically evaluate their interests, aptitudes and to make adjustments in their career directions; students develop confidence and skills in working with people and directly improve their employment opportunities upon graduation; they may receive remuneration that could help to defray educational expenses; they learn in the world of work, they get exposed to and learn about the professional and work ethics connected to a specific career or a group of careers.

Garavan and Murphy (2001:282), summarise the value of cooperative education to the student as being enhanced student's confidence, self-concept and improved social skills, enhanced practical

knowledge and skills, enhanced employment opportunities, attainment of the necessary skills to supplement theoretical training, and enhancement of the induction process when the student joins the labour market.

Dressler and Keeling (2004:217) report that Dewey (1916) suggested that learning occurs as a result of problem solving in the real world of work environment as experienced by the student resulting in the change of behaviour through experience. Dewey (1916) believed that education requires thinking and reflection guided by educators.

2.6.3.3 Benefits to higher education institutions (HEIs)

According to the Quality Assurance Policy of the Southern African Society for Cooperative Education (SASCE, 2003:6) cooperative education is beneficial to HEIs because through liaison with industry, business, government and communities, education institutions receive feedback on the quality and relevance of its educational programmes and service delivery; it enables the Institutions to form partnerships with industry, business, government and communities and in this way cooperative education contributes to the development of communities and the economy, regionally and nationally; it creates research opportunities and innovative partnerships; it creates opportunities for industry-based sabbatical opportunities for academic staff; and if students perform well at a workstation, companies will be motivated to taking more students for experiential learning. According to Micetic-Turk *et al.*(2005:5), workplace experience serves to build the students confidence and maturity and increase the motivation to learn.

Breen and Hing (2002:59) conclude that cooperative education partnerships benefit universities because it enhances the range and quality of educational offerings; it enhances university status and reputation in the discipline through teaching scholarship and research opportunities; it enhances the university status and reputation for cooperative education partnerships generally; it attracts additional student fees, it attracts additional student numbers, which leads to economies of scale, and it attracts funds for discipline development.

Above, consideration has been given to the various functions and benefits of cooperative education. Next, it is of importance to describe the aim of cooperative education.

2.7 THE AIM OF COOPERATIVE EDUCATION

According to Groenewald (2003:1), the original aim of cooperative education is to enhance student learning (compare section C, question 25, Appendix B). Sovilla (1998) remarked that "the leaders

of academic institutions do not seem to appreciate the mission of cooperative education or else choose to ignore it". Senior- and faculty managers within HEIs should support the main aim of cooperative education in higher education institutions. It should not be seen as a "support" function but rather to enhance the student learning process.

According to the Quality Assurance Policy of the Southern African Society for Cooperative Education (SASCE, 2003), other aims for cooperative education in HEIs include, among others, to:

- promote cooperative education as a strategy of applied learning;
- engage in partnership agreements with stakeholders in commerce and industry, statutory, parastatal organisations and communities in striving to meet the education and skills development needs for a developing economy;
- implement and coordinate the formal integration of academic studies with structured and supervised productive work experience within participating organisations and communities,
- ensure that the quality of service delivery is assured by a management structure which recognises and is responsive to legislation pertaining to educational and labour reform and the Human Resource Development Strategy;
- ensure cost-effectiveness and accountability in resourcing of needs and reporting structures without compromising the educational and training ideals of cooperative education as an institutional educational delivery model;
- ensure that experiential learning (EL) and the academic component of each programme is assessed in line with outcomes based on educational principles; and to
- promote closer collaboration with the workplace to further the aims of skills development and training.

As the aim of cooperative education is to enhance learning, it is necessary to pay special attention to one of the most important components of cooperative education, namely experiential learning, which forms part of the core of the academic learning programme.

2.8 EXPERIENTIAL LEARNING (EL) AS A COMPONENT OF COOPERATIVE EDUCATION

2.8.1 Introduction

Experiential learning can be regarded as the core component of cooperative education (compare Figure 2.4, Chapter 2). Nationally and internationally in higher education institutions (HEIs), the term *Work-Integrated Learning* (WIL) is now more frequently used in association with cooperative education. It is important to differentiate between the various concepts related to cooperative education, namely cooperative education, experiential learning and work-integrated learning (WIL) (compare 2.5 and Figure 2.4 Chapter 2 for a clear understanding). The practice of cooperative education is locally well established in HEIs, mainly in universities of technology and comprehensive universities, as well as in most HEIs internationally, such as the Polytechnics, Hogescholen (Netherlands), Fachhochule (Germany), universities and universities of technology.

2.8.2 Definition of experiential learning (EL) (compare 2.5.2)

According to Mok (1999:57), the term *experiential learning* has broad and loose boundaries. Mok (1999:58) mentions that there were many interpretations in the literature on what experiential learning really is, and the major constructs of experiential learning include experience, reflection and self-planning. Furthermore, experiential learning promotes "an awareness of how personal values and meanings influence our perceptions and choices of action" and "provides opportunities to experience different kinds of values and assumptions in the social world" (Mok, 1999:58) (compare section C, question 5-7, Appendix B).

Experiential learning refers to specific skills acquired through "work-based" and "non-work-based" environments and is directly related to classroom learning. If experiential learning is done in a work based environment and it may be referred to as work-based learning or work-integrated learning (WIL), whereas experiential learning done in a "non-work-based" or simulated environment is normally referred to as "in-house" training (CTP, 2000a:85) (compare section C, question 11). Experiential learning implies a concurrent process. Some educational institutions (e.g. in Canada) define experiential learning as a form of education that integrates periods of academic study with periods of work experience in jobs relating to the students studies (Engelbrecht, 2003a:24).

Definitions of terms related to cooperative education have been discussed above (compare 2.5). According to Forbes (2004) the quality assurance of experiential learning is seen as a process, namely (compare Figure 2.6):

1. Preparation of the student
2. Placement of the student
3. Monitoring and visitation of the student
4. Mentoring by the mentor of the student
5. Assessment and
6. Debriefing of the student.

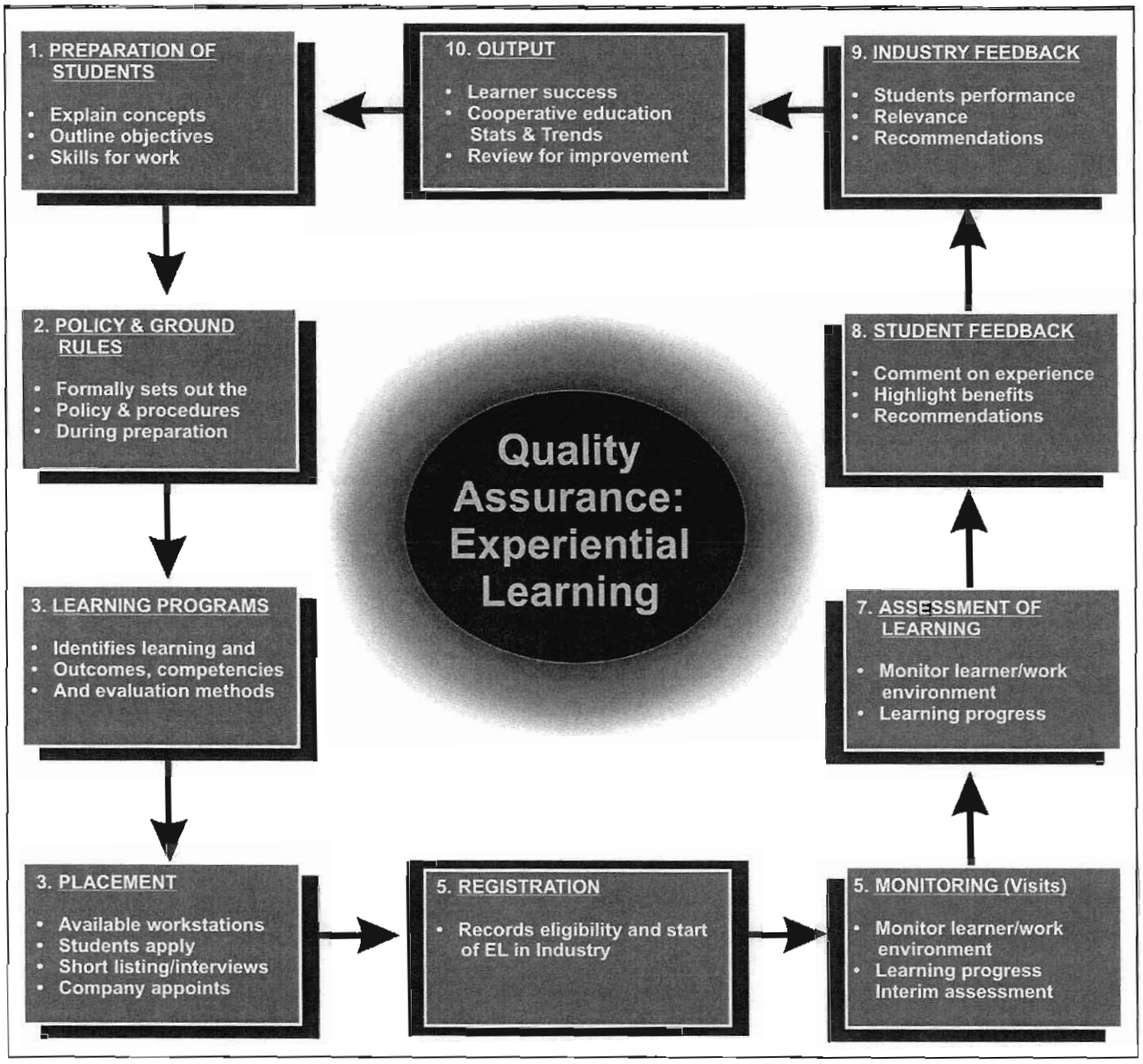
For the purpose of this study experiential learning (EL) consists of three forms of learning, namely work-integrated learning, service learning and learnerships, if applicable (compare Figure 2.4).

2.8.3 The experiential learning process

Telepak (1995:61) emphasises the importance of the experiential learning process, which includes student preparation and student visits which involves monitoring and assessment of student learners. The NAP document for South African higher education institutions also emphasises the importance of placement, monitoring and assessment of students in HEIs (CHE, 2001:110).

According to Bitzer *et al.* (1999:7), experiential learning in HEIs is a serious business, because of its potentially important role in the new South African education and training dispensation. Forbes (2004:173) offers the following grammatical presentation of the quality assurance of experiential learning:

FIGURE 2.6 Experiential learning quality assurance cycle (Forbes, 2004)



Accordingly, the various stages of the experiential learning process will be discussed. The first stage involves the preparation of the student prior to the experiential learning placement.

2.8.3.1 Preparation of the student for experiential learning and the workplace

According to Ellis (2001:34), for experiential learning to succeed students need to be carefully prepared in the pre-placement period of study and to clarify the expectations of all role players before starting to place students (compare section D, question 5, Appendix B). According to research by Mc Rae (2005:16), students want to be well prepared, understand expectations, the

purpose of procedures and want to have helpful feedback. Du Preez (1996:9) emphasises the importance of communication skills, computer skills, CV preparation and interviewing during student preparation for employment. Student learners were normally technically well prepared during their studies in HEIs, but a great need exists to prepare student learners for the "non-technical" skills (critical cross-field outcomes) during the experiential learning period and the workplace. De Lange (2000:29) identified non-technical skills clusters, which include functional and adaptive skills for engineering students at the workplace. Furthermore, it is important to prepare students how to prepare a resume, interview skills, orientation for the workplace either during or after hour's on/off campus (Wilson, 1997:42). A student preparation programme should be prepared for students for all academic programmes for HEIs. Preparation of students for work, EL and the workplace will contribute to a successful career advancement of students (Engelbrecht, 2003b:33). The use of an "on-line" method to prepare students for the workplace will ensure that student preparation will always remain current (McRae, 1995:49). The latter method has many advantages over the conventional "hard copy" method of student preparation, making it more easily accessible to student's on/off campus.

A comprehensive guide for student preparation for experiential learning and the workplace has been prepared by Engelbrecht and Wessels (2005) for South African HEIs.

The next stage involves the placement of the student at the workplace for experiential learning

2.8.3.2 Placement of students

Many academics, and even some cooperative education practitioners have traditionally associated placement of students for experiential learning as the core feature of cooperative education (compare section D, question 6, Appendix B). According to Chapman & Coll (1999:26), matching of students to company needs is the core business of a cooperative education practitioner. Although placement is regarded as one of the most important activities in cooperative education/experiential learning, it is not the only activity in cooperative education, since the latter consist of various components (compare Chapter 2, Figure 2.4). Placement makes out only one component of the experiential learning process (compare Chapter 2, Figure 2.6). It is important to establish guidelines applied for the specific model of cooperative education (generic) and experiential learning (programme specific) to be followed. This may among others include description of skills, new technological developments on which information should be gathered during EL, practical examination and qualitative feedback with regard to EL.

Before placement of students is undertaken in the workplace, the student should do a self-assessment and profile analysis. It is important that all stakeholders involved should participate in this process to ascertain the profile match of the students with the needs of the company.

According to Bitzer *et al.* (1999:11), placement of students in higher education institutions becomes easier as relationships amongst companies, professionals and students as prospective employees and institutions develop through the cooperative education model. Pre-requisites for successful cooperative education programme include a proper design as integral part of the academic learning program, co-operative education should be planned, guided and controlled by anticipating and assessing learning outcomes, a cooperative education programme must be developed according to programme planning guidelines, which include inputs from companies in the specific field of study, that credit be awarded to the experiential learning component of academic programmes and that the outcomes should be properly assessed. It is recommended by Bitzer *et al.* (1999:11) that only placements, which have the capability of producing learning outcomes at a particular level of learning should be awarded credit. It is clear that cooperative education programmes were not only limited to a placement activity of the student, and since it is a structured teaching and learning strategy, it requires much mechanisms and processes that need to comply with the minimum standards of quality assurance. In South Africa, most programmes in HEIs with a compulsory EL component for their qualification were credit bearing and have been funded by the Department of Education.

Telepak (1995:60) found that the principal reason why people with disabilities fail vocationally is a lack of exposure to natural job environments. Cooperative education creates the opportunity at an early stage of career preparation for students to get exposed to the work environment and thus creates the opportunity to become employed. If students were not placed for EL, students may lose career opportunities forever.

According to Martin (1997:06) the outreach and recruitment programme of a HEI is helped by the existence of a co-operative education programme and a mandatory programme that requires additional time for completion is not a deterrent. Cooperative education through its activities in industry will complement the HEIs recruitment and marketing activities.

According to Coll *et al.* (1997:37), the vast majority of students in the BSc (Technology) degree offered at the University of Waikato reported that their placement helped in clarifying their choice of scientific career and that they have gained real benefits from being involved with a cooperative education programme. This is confirmed by (Engelbrecht, 2003a:32), who indicates that the quality

of EL influences initial career advancement, and that 86% of career objectives can be achieved by being placed in a company.

Apostolides and Looye (1997:27) reported that nearly 80% of architectural students in cooperative education rated their overall cooperative education experience as excellent or very good at the early and late stages, with the middle stage almost ten points lower. Nevertheless there is a high degree of satisfaction and fulfilment. The cooperative education experience, preceded by the placement activity, is supported by the other components of the experiential learning process mentioned (compare Figure 2.6).

According to the CTP report (CTP, 2003:2) on technikons in South Africa, the number of students who have not graduated – awaiting placements amounts to 9,701 of the total of 137,623 for compulsory EL students (7,05%) and about 40% of students whose programmes have a compulsory EL – were not employed and generally experience difficulty in finding placement.

The tragedy is that most universities of technology and comprehensive institutions in South Africa recognise through their policies (Maphosa, 2005) that placement for experiential learning is the student's own responsibility. These policies have resulted that such institutions have taken a relaxed position concerning placement responsibilities, with the result that low mean figures were recorded in the mentioned CTP report. Some universities of technology and comprehensive universities have been very successful and have attained high placement figures for all their EL students (Forbes, 2004b). In such cases, dedicated staff, known as coordinators, were responsible for placement of students for experiential learning. Since students register and pay for EL, HEIs remain "jointly-responsible" for placement opportunities.

The next stage involves the monitoring and mentoring of students at the workplace.

2.8.3.3 Monitoring of students

According to Ellis (2001:38), one of the responsibilities of the placement officer is to monitor the progress of the placement period using many visiting tutors. Research by McRae (1995:16) indicates that coordinators need to have regular contact with their students.

According to Best Practices in Cooperative Education (CTP, 2000a:43), it is essential to monitor the process of experiential learning (EL) in order to develop an effective EL system. Academic staff from the relevant HEIs should monitor the EL process by regular visits to the company where students were placed (compare section C, question 21 to 23 and section D, question 7, Appendix

B). Lecturing staff need to be responsible to visit students, to monitor and assess students' progress during EL. Monitoring includes a facilitation, promotion and assessment role of students during the work experience. Facilitation involves the collaboration role between the HEI and companies and the promotion role reinforces the objectives of cooperative education. The role of the mentor as the educationist "promotes" and strengthens the relationship between all role players (compare section D, question 8, Appendix B). Page (1997:55) explains the visit to the placement venue as an occasion in which the faculty cooperative education lecturer (CEL) travels to the placement site for a face-to-face meeting with the student placed for experiential learning and the mentor at the company. The purpose of the visit during EL includes among others, the discussion of students performance against student outcomes, review of the total educational progress, assisting in resolving problems at the worksite, obtain written and verbal assessment of students performance, determine the suitability of the placement situation for future placements and acquire inputs for changes to the academic and EL programmes.

The HEI and the participating companies represented the delivery of the total learning experience. The presence of mentors at the workplace and their availability to students provide a vital channel of communication (Davies & Hase, 1994:42).

Industrial visits should be seen in a holistic way with the focal point being the monitoring process, but the opportunity exists to canvass for more workstations. The functions of the industrial visit can be divided into the following categories, namely new companies, existing non-participating companies and existing participating companies. Reeve (1994:189) identifies three common objectives of the site visits, namely assessment, facilitation and promotion. Research by Page (1997:55) concluded that eighty percent of respondents viewed site visits as either important or very important. When HEIs and business work together to meet each other's needs, often with the help of the state and local governments the benefits include; increased financial support for HEIs, better-trained workers for the companies and more job opportunities for the community (McCullough, 1998). It can therefore be concluded that apart from the functions and purposes mentioned for the monitoring of the worksite, the cooperative education lecturer (CEL) bears the responsibility to promote the HEI as well.

It is preferred that the monitoring process be carried out by academic staff qualified in the field of study, having the appropriate experience and skills. It is recommended that CELs monitor students at the workplace. Lecturers and other academic staff should participate in the monitoring process.

Monitoring of staff, locally and internationally, could be done in collaboration with other HEIs in which CELs of other HEIs could support staff from distant countries in the monitoring process. It is

always a first choice to have a personal visit from an academic staff member/CEL, but since it becomes too costly when students were placed over large distances, other methods of monitoring may be used. These includes electronic communication, by telephone, fax, e-mail and even more so video conferencing, which could be just as effective, saving costs. Approval of the work site for placement of students is normally preceded by discussions and site visits (CTP, 2000b:33).

The New Academic Policy for Programmes and Qualifications in Higher Education (NAP) (CHE, 2001:110), emphasises the importance of mentors in supporting students at the work site, liaise with academic staff and provide role models for students, impart local and practical knowledge and skills, and assist in the assessment of students. Furthermore, the CHE (2004a:11) requires that both the educational institution and the workplace have a system in place to record and monitor the content and progress of the students learning experience.

2.8.3.4 Mentoring of students

Thuynsma (1997:307) defines mentoring as a relationship between another or more senior person who has experience and specific skills, and a younger person who seeks or requires developing the skills and expertise portrayed by the other person (compare section D, question 8, Appendix B). Mentoring involves the establishment of a helping relationship, formal or informal, in an employment situation between two or more individuals for the purpose of fully developing the knowledge, skills and attitudes of the mentoree. According to Ricks & van Gyn (1997:41), literature on mentoring revealed mentoring has been limited by focusing on mentor roles, mentor and protégé characteristics, academic success, career development and work satisfaction, rather on the development and characteristics of the relationship. Ricks and Van Gyn (1997:41) identify three types of mentoring relationships, namely transmission, which goes one way and involves activities where the mentor models or simply gives to or informs the protégé of knowledge, values, and skills, transaction, which is a two-way relationship, is interactional and focuses on developing independent problem solving through dialogue and problem solving, closely representing the cooperative education mentoring experience. The transformational relationship is one that is more visionary, a relationship that opens new horizons for the protégé, assists in the realisation of the vision or dream, and involves a collaborative interaction of each other and results in personal and social exchange.

According to Loken and Stull (1993), selection of the mentor is the most important component of the mentoring model. Industry must play an active role not only in the education process of a nation but should exercise some influence in curriculum design (Hassan,1997:12). The major

responsibilities of the mentor include induction, training by coaching, evaluation, career counselling and advocacy.

One of the major concerns when learning is shifted from the classroom to workplace, according to Thorne (1995:180), is that students will have no one to support them in the process. It is preferred to use the term 'coach' rather than 'mentor' since it requires people having specific skills to help students in the working roles.

The Council on Higher Education in South Africa (CHE, 2004b:11) requires a mentoring system, which will enable the student to recognise strengths and weaknesses in the student's own work to develop existing and new abilities to gain knowledge of work practices.

Assessment of experiential learning will be discussed below, since this process confirms whether the student achieved the required outcomes at the workplace, as part of the curriculum.

2.8.3.5 Assessment of experiential learning as a component of cooperative education

2.8.3.5.1 Introduction

Engelbrecht (2003a:4) defines assessment as "a process or processes by which the performance of a student may be identified and involves a process of collecting evidence of the students work to measure and make judgments about the achievements or non-achievements of specified National Qualifications Framework standards and/or qualifications" (compare section D, question 9, Appendix B). According to the policy on the assessment of learning of the Tshwane University of Technology (TUT, 2005b:5), assessment refers to "the process of identifying, gathering and interpreting information about a student's achievements in order to assist the student's development and improve the process of teaching and learning".

2.8.3.5.2 The purpose of assessment of experiential learning in cooperative education

According to Thorne (1995:182), the purpose of assessment is to maintain standards, whether it includes formative or summative assessment. Wilson (1997:61) distinguishes between formative and summative evaluation in cooperative education. Formative evaluation is assessment of the programme as it is being developed and is functional. It is a way to check if the programme is in relation to the strategic objectives, in other words to check whether the goals are met in respect of the number of students co-opting from each of the participating academic areas. It is normally an

ongoing process. Summative evaluation is normally conducted after a programme has been in existence for some time and is a more formal way of assessment. The purpose is to provide staff and institution with a comprehensive view of the programme. Furthermore, it provides the HEI and cooperative education staff an external view of how well the programme is doing and if warranted provide suggestion for improvement (Wilson, 1997:62).

It is important that all role players should know the objectives of experiential learning and more than one person needs to be involved in the assessment process. Carter (1997) emphasises the importance of a personal development plan, which is used to measure progress and to document achievement. Students need to provide evidence of achieving occupational and personal competencies. Each student is responsible for gathering evidence of his or her competence, normally organised in a form of a portfolio.

2.8.3.5.3 Types of assessment in cooperative education

Hodges *et al.* (2004:49) differentiate between two types of assessment of the cooperative education program, namely student and programme assessment. Student assessment refers to a process for and an outcome of student learning which motivated students' development and learning and provides feedback on the student's progress towards their learning goals. Programme assessment on the other hand can be described as the systematic collection, review and use of information about educational programmes used for the purpose of improving future student learning and development with simultaneous quality assurance for the HEI. Furthermore, these researchers (Hodges *et al.*, 2004:49) distinguish between two types of assessment, namely norm reference assessment which involves interpreting a score of an individual in comparison with others and criterion referenced assessment, which specifies expected learning criteria or student outcomes and uses evidential assessment to match such criteria.

Higher education institutions (HEIs) normally focus more on cognitive development at the expense of the practical application of theoretical principles and the student's behavioural development also known as the non-technical or soft skills (de Lange, 2000). Student learning involves more than skills acquisition and the development of workplace competencies. Assessment needs to include what students learn about the workplace culture, norms of practice and norms of behaviour as part of their assimilation into a new community of practice. Hodges *et al.* (2004) identify two assessment approaches, namely validity which is ensuring that the performance being assessed is in line with what is intended to be assessed, and reliability which refers to the consistency of the assessment methods to produce the same results.

2.8.3.5.4 The benefits of assessment in cooperative education

The benefits of assessment in cooperative education as described by Hodges *et al.* (2004) involve, among others, where it informs the HEI about how well prepared their graduates were for the workplace. If companies were involved in the assessment process it will build valuable bridges. Furthermore, it informs the student of their strengths and weaknesses by requiring them to apply in the workplace what they have learned. It must again be emphasised that assessment involves broader aspects of the student at the workplace, in particular the socio-cultural aspects and how it relates to prior knowledge and experiences. If a specific area of workplace learning is not assessed it may be seen as less important (Hodges *et al.* (2004).

Debriefing, also referred to as reflection of learning, will be discussed as last stage of the experiential learning process.

2.8.3.6 Debriefing of students

According to Petherbridge (1996:243), debriefing may be defined as a process of reflection which provides detail order and meaning to students experiences expected as they were developing records and achievement to alter significantly their role as subject specialist and to have an in-depth understanding of the purpose of the task. The effectiveness of experiential learning depends crucially on the quality of debriefing and on the pupil's reflection of learning. According to Fletcher and Pantalone (2005:4), the goal of reflection is to develop the ability by the student to analyse, synthesise and assess problems. Debriefing allows the pupil to go through the process of reflecting upon that experience and exploring it from their own point of view. It is the beginning of learning and not the end of it. The lecturer forms part of the process of learning and not simply carrying out its duty, namely placement, assessment visitation etc. Debriefing is a key process in taking the pupil through the stages of sharing the experience, reflecting upon feelings and actions, processing the reflections to relate to the existing conceptual frameworks, then making generalisations which can be tested in other situations. Reflection is pivotal for experiential learning, which draws heavily on Kolb's work (Maudsley & Strivens, 2000:530). Boud *et al.* (1985-36) postulate that "reflection consists of those processes in which students engage to recapture, notice and re-evaluate their experience to turn into learning" (compare section D, question 10, Appendix B). According to Hill (2005), intentional learning is impossible without concurrent and collective reflection of learning on out-of-class experience.

The main objective of the cooperative education experience is to change some aspect of behaviour (compare section C, question 25, Appendix B), after which time it has to be allowed for the

changed perspectives to emerge. Debriefing must be seen as part of the mentoring process and needs to be perceived as the starting point of learning from experience, enabling pupils to recognise their feelings vital to real personal change and that learning is neither objective nor passive. Lecturers need to decide for themselves what they think work experience is for. Unless experience is examined and reflected on, it has no educative value (Petherbridge, 1996:255). According to Merriam (2004:62) "effective learning does not follow from positive experience but from reflection".

Non-work-based experiential learning also referred to as simulated experiential learning will be discussed as follows:

2.8.4 Simulated experiential learning

Higher education institutions, locally and abroad, experience at some point in time a problem with training opportunities for students in industry. According to Best Practices in Cooperative Education (CTP, 2000a:85), this may be due to many reasons, such as a decline in the economy either locally or internationally. In such cases companies were then in no position to assist students to receive training and other options should be considered to train students. Students may then be enrolled in HEIs as "private" or non-sponsored students. This could be done in various ways, for instance in a simulated work environment within HEIs by using a special training centre or company "on-site" centres, usually part of the company, or as a centralised training centre, known as an institute, within or external to the HEI (CTP, 2000a:85).

Simulated experiential learning can therefore be utilised for many programmes, and need to be subjected to the same requirements as those work-integrated learning programmes done in industry. Such experiential learning workstations can be simulated with or without the support and collaboration of industry. It is recommended that an attempt be made first to place students in the real world of work (Ontario Ministry of Education, 2000). If all attempts have been made and no workstations could be found in industry, simulated or "in-house" training (CTP, 2000a:85) can be considered. In many instances such training may be preferred due to specific applications (compare section D, question 11, Appendix B). According to Pinon (2001:65), we should take simulations to a next level, namely from experiential simulations to experiencing the reality.

It is important to review the literature on theories of learning as they form the basis of experiential learning.

2.9 THEORIES OF LEARNING IN COOPERATIVE EDUCATION

2.9.1 Introduction

According to Dewey (1901:17), individuals can learn that which they perceive to be important to their lives; survival and success in social situations. When students can see the relationship between knowledge, cognitive skills, survival and success there will be a motivation to learn. Success is seen as empowering individuals to function to their maximum capacity in all areas of life.

According to Eames & Cates (2004:37), the principal goal of any educational programme is to facilitate student learning. In cooperative education, this learning takes place in two environments, namely the education and training as well as workplace environments. It is the task of the student to integrate learning between these environments. To facilitate such integration educators should assist in the creation of an environment conducive for learning.

Theories of learning were of value in thinking about learning in cooperative education programmes. It allows explanations of what students need to learn by using a curriculum in the classroom and workplace. This theoretical base permits the adoption of teaching and learning strategies, namely classroom instruction and workplace instruction and the integration of learning in these two environments. By understanding the theoretical basis of cooperative education, it will assist the various role players in justifying the incorporation of work placement experiences in the academic curriculum.

Most research completed in the past 30 years in cooperative education was predominantly applied descriptive and evaluative in scope – it has been largely pragmatic without a strong theoretical base. Eames and Cates (2004:37) explain that these research findings have helped to define what constitutes the operation of a successful cooperative education programme and have contributed much useful quantitative data to cooperative education field of study. Eames and Cates (2004:38) refer to a statement by Wilson (1973) that "we rely too much on student papers about their work experiences and on company ratings in order to reward credit and we spend to little effort finding out what the students were really learning so that we can effectively guide them in their further learning efforts". Our focus for future research and development in cooperative education should rather be on what students were really learning, instead of focussing on pragmatic and operational events.

For cooperative education to be credible as an educational practice it needs to be related to a theoretical framework of education and educational goals, grounded in learning theory.

The Cooperative Education Association of America (CEA) commissioned a report on the location of cooperative education within the mainstream of American higher education and despite the obvious growth and success of cooperative education; the discipline languished on the periphery of academic endeavour. The committee report suggested three main reasons for this, namely

- Faculties do not recognise work as a vehicle for learning and view coop as anti-intellectual;
- Cooperative education practitioners see themselves as operational people and not as educators and
- Cooperative education methodology for promoting learning is vague and underdeveloped (Eames & Cates, 2004:39).

Cooperative education practitioners should take note of the above findings and should correct perceptions viewed by faculties in HEIs. Furthermore, they should not only focus on the operational day-to-day activities but also rather develop research focus areas in the discipline on what students were really learning.

2.9.2 Theories of learning in cooperative education

According to van Gyn and Grove White (2004:27), cooperative education practitioners need to have theory to guide the practice in working with students to enhance learning. Furthermore, according to Eames and Cates (2004:37) these theories allow the explication of what a student should learn in the curriculum in the classroom and workplace and emphasise that a sound theoretical basis can assist the cooperative education practitioner in justifying the inclusion of work placement components in the learning programme.

Following the above, it is therefore necessary to review the following theories of learning as applicable to cooperative education.

2.9.2.1 Piaget's Cognitive Development theory

According to Kolb (1984:12), Piaget describes how intelligence is shaped by experience and states that intelligence arises as a product of the interaction between the person and his environment. Piaget (1952a and 1952b) formulated a comprehensive theory about how thinking develops and

believed that the human infant is born with both the need and ability to adapt to the environment. As the children interacted with the environment they learn to cope with its demands and develop mental capabilities, to which he refers as adaptation, which according to him consists of two sub-processes, namely assimilation and accommodation. Children assimilate (take in) information which is well within their mental grasp and categorise it in terms of what they know. On occasion children encounter problems that were beyond their reach and thus have to accommodate, in other words create, new strategies to handle the problem. Piaget and Inhelder (1969:4) believed that thinking develops in a sequence of 4 stages in all children, namely the sensory-motor stage; in which an infant develops important cognitive capabilities and learn to solve a variety of problems and so learn to imitate complex new responses; the preoperational stage; in which children become capable of thinking about their environment, the stage of concrete operations; during which the child learns to use logic and the stage of formal operations; during which children develops the ability to reason, and emerges from this stage with a set of adult thinking abilities.

Students in cooperative education develop reasoning strategies that were related to the classroom situation, but they also develop reasoning strategies related to training at the workplace. Piaget (1971:23) noted "since the essential function of knowledge is to make contact with environment", even more so the "social environment". According to Eames and Cates (2004:40), Piaget proposed that logical thinking occurs when the student simultaneously coordinates an operation and predicts the changes that will occur. Eames and Cates (2004:40) mention three processes of Piaget,, namely the development of logical thinking, consisting of assimilation, which refers to the integration of external elements into the students internal structures; accommodation, which refers to the student's adjustment in the students internal structures and transformations in thinking and equilibrium; and the set of processes that maintains cognitive organisation during the students changes in thinking.

In cooperative education, the area which is the most significantly affected is the area of equilibrium. The simultaneous development of reasoning strategies for both education and work enables students to maintain the organisation of their cognitive structure more easily and explains why a cooperative education student makes the transition to work immediately on graduation whereas the non-cooperative education student undergoes an adjustment period. The adjustment of the student's internal structure and subsequent change in thinking creates a state of disequilibrium, which explains the problems companies describe in students with no cooperative education experience. Therefore cooperative education students experience a less disequilibrium compared to non-cooperative education students during their transition (Eames & Cates, 2004:40) (Cates &

Jones, 2004:19). Cates & Jones (1999:18) stated "co-op practitioners have long advocated this educational methodology as the best way to ease students into the world of work".

Based on the above evidence, it is clear that students who have been exposed to a properly structured cooperative education programme in a work environment have many more advantages than a student having no cooperative education experience.

2.9.2.2 Gagne's conditions of learning

According to Gagne (1970:1) human skills, appreciations, reasoning, hopes, aspirations, attitudes, and values are dependent for their development on events known as learning. The events the individual will live through in his/her house and school and geographical and social environment, will determine what he/she will learn and what kind of person he will become. Gagne (1970:3) defines learning as "a change in human disposition or capability which can be retained and which is not simply ascribable to the process of growth".

Gagne (1970:5) describes the sequence of the learning event as follows; the stimulus situation affects the student in such a way that it changes his/her performance from the time being before being in that situation to a time after being in it. According to Gagne (1970:5) the change in performance is what leads to the conclusion that learning has taken place.

Through the cooperative education experience students develop a sense of what information will be most useful to them for their future and career path and devote more attention to that information. According to Eames and Cates (2004:40), Gagne's model of learning proposes several internal processes necessary for students to achieve successful learning and include attention, coding, memory storage, retrieval, transfer, responding reinforcement and retrieval.

Cates and Jones (1999:14) argue that Gagne's conditions of learning involves three critical components of learning to the learning process, namely internal conditions, external conditions and learning outcomes, which constantly interact and influence one another. Changes in the external conditions can be controlled by the teacher who modifies both the internal conditions of the learner and their learning outcomes. The external conditions in cooperative education normally refers to the student's work site, tasks and assignments given, preparation of the student before work, and activities following the work experience, involving all stimuli which create learning and influence the internal conditions of the learner (Cates & Jones, 1999:14). Cooperative education students who have been exposed to the realities of the world of work have a greater sense of purpose for the information they learn in the classroom (Cates & Jones, 1999:15).

By seeing how classroom taught theories were used at the worksite a cooperative education student could gain a more highly developed map than a non-cooperative education student. A cooperative education student with a well developed cognitive structure can more easily retrieve information and can use that information in the performance of an action that creates original knowledge and solutions to problems. A cooperative education student exposed to the realities of the field of which he/she is preparing may have a greater sense of purpose for classroom learning to guide the entire learning process (Eames & Cates, 2004:41).

The benefit of a student exposed to a cooperative education experience is again highlighted, in which the student develops a well developed cognitive structure that can more easily retrieve information and solve problems than a non cooperative education student.

2.9.2.3 Atkinson's model of achievement motivation

Cates and Jones (1999:17) conclude that cooperative education motivates students, but it needs to be established precisely what motivates students to learn.

According to Atkinson (1974:29), when an individual undertakes an activity and succeeds, there is an increase in the expectancy of success on doing the same or similar tasks and when he/she fails the expectancy of success of that or similar tasks, becomes decreased. The cognitive change produced by success or failure then also produces a change in the incentive values of future success or failure. The strength of the tendency to engage in the same or similar activities is therefore a motivational change (Atkinson, 1974:29). Atkinson and Birch (1974:307) differentiates between two different effects success or failure have for a given activity. Each effect has an influence on the motivation of an individual. The one is a cognitive learning effect, which is referred to as a change in the expectancy of success and the other is an immediate motivational effect assuming that success has a greater consummatory value than failure.

According to Eames and Cates (2004:41), the Atkinson's expectancy-value model of achievement motivation can be used to describe student's motivation. In this model expectancy in combination with task value leads to task involvement and subsequent achievement. Cates and Jones (1999:17) have found that expectancy is defined as the student's belief regarding his/her probability of success or failure.

Cooperative education has the potential to influence both sides of the expectancy value model of student motivation. The cooperative education process is a typical series of successes or failures

that build upon one another. From the first resume to the final job offer upon graduation, most students build upon previous successes or learn from previous failures (Eames & Cates, 2004:41)

The notion that "success breeds success" or "failure breeds failure" is also applicable in the cooperative education experience. HEIs should endeavour to make the students experience as positive as possible to create an environment that is conducive for learning. A lack of involvement and commitment of staff in higher education institutions in ensuring a "success story" in cooperative education, many a times contributed to student's experience of "failure".

2.9.2.4 Bandura's Social Learning Theory

The Social Learning Theory of Albert Bandura focuses on learning that occurs within a social context. He is considered to be the leading proponent of this theory.

According to Bandura (1977:16), experiential and physiological influences interact in subtle ways to determine behaviour, which is formed through the integration of many constituents' activities of differing origin. Bandura (1977:22) believes that most human behaviour is learned by observation through modelling in other words by observing others, new ideas were formed and on later occasions this coded information serves as a guide for further action. Bandura (1977:35) is of the opinion that behaviour is learned symbolically through central processing of response information before it is performed. By observing a model with the desired behaviour the individual forms an idea of how response components should be combined and sequenced to produce new behaviour. Bandura developed a framework of triadic reciprocality that considers the personality as an interaction between three things, namely the environment, behaviour and the person's psychological processes (De Beer, 2006).

Eames and Cates (2004:42) indicate that Bandura explored the theory of imitative learning, which maintains that a student imitates a modelled behaviour and if such behaviour is re-enforced will repeat that behaviour. Students can learn through vicarious consequences either by reinforcement or punishment. Eames and Cates (2004:42) also point out that "cooperative education students experience social learning as they observe the behaviours and consequences of those behaviours in their colleagues in the workplace". Students learn from their own successes and failures but also from other successes or failures (Eames & Cates, 2004:42; Cates & Jones, 1999:19).

The mere opportunity of the student to not only be exposed, but to be well trained and socialise in the work environment, creates the opportunity within the cooperative education milieu to learn from the failures or successes of others.

2.9.2.5 Kolb's Experiential Learning Model

According to Eames and Cates (2004:43), one of the most important theories in the cooperative education application is Kolb's Experiential Learning Model. Johnston *et al.* (2004:157) and Cates and Jones (1999:19) mention that Kolb's theory of learning is one of the most relevant theories of informing cooperative learning. The advocates of experiential learning relied heavily on the work of Kolb which described it as "a process whereby knowledge is created through the transformation of experience" (Maudsley & Strivens, 2000:538).

Kolb (1984:38) defines learning "as a process whereby knowledge is created through the transformation of experience". According to Mietten (2000:57), Kolb's theory is best known through the four stage model of experiential learning, often referred to as the Lewinian experiential learning model. The four stages include:

- Concrete experience abilities (CE)
- Reflective observation abilities (RO)
- Abstract conceptualising abilities (AC)
- Active experimentation abilities (AE).

According to Kolb *et al.* (1971:28) each phase of the model is a different form of adaptation to the reality or a learning mode. If students want to be effective they need four different kinds of abilities. The concrete experience (CE) involves that they must be able to involve themselves fully, openly and without bias in the new experiences; reflective observation abilities (RO) involve that they must be able to reflect on and observe their experiences from many perspectives; abstract conceptualising abilities (AC) involve that they must be able to create concepts that integrate their observations into logically sound theories; and active experimentation abilities (AE) involve that they must be able to use these theories to make decisions and solve problems (Kolb, 1984:30). Kolb (1984:22) also introduced John Dewey's model of experiential learning, which is remarkably similar to the Lewinian model. According to Kolb (1984:22), Dewey's (1925) studies in his model how learning transforms the impulses, feelings, and desires of concrete experience into higher order purposeful action. Dewey (1925) developed the conception of experience, and distinguishes between primary and secondary experience. Primary experience composed of material interaction between the physical and social environment and secondary experience being a reflective experience that makes the environment and its things as objects of reflection and knowledge.

Students have concrete experiences through their academic curriculum and their cooperative education experience at the workplace. During the latter and when they return to the classroom

they will be given the opportunity to observe and reflect upon those experiences. Both cooperative education experience in itself and on reflection thereof on completion of such experience will give the student the opportunity to form abstract concepts and generalisations that they then test in subsequent experiences. Students can start anywhere in the cycle. This model is particularly useful in explaining how learning can be integrated between the classroom and the workplace (Eames & Cates, 2004:43). According to Johnston *et al.* (2004:159), within this model, learning is continuous during the learning experience and is directed by the student's needs and goals with periods of reflection and observation.

Whether learning experiences, learned on campus as part of the classroom experience or as part of the cooperative education experience in the workplace occurred, reflection (debriefing) of the experience is essential. In cooperative education a special attempt must be made to have reflection as in classroom practice to ensure conceptualisation has taken place. Without reflection of learning experiences learning has not taken place (compare 2.8.3.6 and section D, question 10, Appendix B)).

2.9.2.6 Socio-cultural views of learning

Colliver (2000:50) argues that students should be made aware of the fact that the knowledge they were learning is a human social construction and within the curriculum constructivism should be the focus. Colliver (2000:49) refers to as the view that "knowledge is human, social invention – a construction" and that knowledge is determined by social and political factors, not only the logic and the reasons. Colliver (2000:51) does not recognise constructivism as a theory of learning. According to Hyslop-Margison (2004:1) Dewey's constructivism focuses primarily on means, and recognises the autonomous capacity of individuals to participate in the sociocultural experience and furthermore, promotes the principles of democratic learning by viewing the creation of knowledge as an interactive process in which students construct understanding based on their own experiences. Hyslop-Margison (2004:6) also noted that from Dewey's experience learning occurs through discovery, experience and modelling and meaning is negotiated democratically between learners having diverse perspectives.

An emerging set of ideas, known as sociocultural views of learning, proposes that learning can be seen as a social process within a culturally determined community of practice. According to Garavan & Murphy (2001:281), there is a considerable body of evidence to suggest that the socialisation process experienced by the student will significantly influence the overall quality of the cooperative education programme. Organisational socialisation can be defined as the process by

which newcomers come to understand and appreciate the values, abilities, expected behaviours and social knowledge essential for assuming a organisational role and for participating as an organisational member (Garavan & Murphy, 2001:281). Hall (2000:12) confirms that the workplace has been a social affair and the worker finds himself in social surroundings.

Learning occurs within a social situation and learning can thus not be dissociated from it – it can only be understood within the context in which it occurred. Cooperative education students therefore become legitimate participants in a community of practice during their workplace learning and engage in activities of that community such that they develop meaning for their practice and through their participation become enculturated into the community. Another socio-cultural view of learning is that learning is distributed across a community, suggesting that learning does not only involve the person, but the person and the environment, referred to as "person plus" (Eames & Cates, 2004:44)

Cooperative education students can be seen to gain access to that distributed learning through entering into that system and participating within it. A third socio-cultural view is that human action is mediated by tools and signs – known as mediated action. These tools were themselves situated in the social and cultural environment in which they exist. These tools refer to mediational means as may be referred to as technical tools such as instruments and computers and psychological tools e.g. language and counting systems. These tools were used in social interaction particularly in the case of language. They were products of the socio-cultural evolution and were situated in socio-cultural context. The belief that learning occurs through mediated action in social situations has relevance to cooperative education work experience (Eames & Cates, 2004:44)

Cooperative education work experience necessitates the opportunity for students to move towards increasing participation in their community. Cooperative education, within the higher education institution context, should facilitate this learning process and fulfil this mediation role in the community. Keen and Howard's (2002:130) study on academically gifted students found that experiential learning experiences stimulated a kind of social and emotional growth that rarely results from traditional education. Waryszak (1999:33) states that the benefits of cooperative education, among others, include improved self-confidence the self-concept and improved social skills with enhanced employability.

Garavan and Murhpy (2001:299) suggest a three-phase model of the cooperative education socialisation process. Phase one involves getting in to the organisation; phase two involves breaking into the organisation; and phase three involves settling into the organisation.

As the theories of learning forms the basis of the cooperative education learning experiences, it is necessary to continuously improve on the learning programme and related cooperative education activities. For this reason it is necessary for HEIs to continually engage in research and development activities to improve cooperative education.

2.10 RESEARCH IN COOPERATIVE EDUCATION

2.10.1 Introduction

Ricks and Mark (1997:47) emphasise, "that knowing cannot be limited to the elite few, the researchers". For many years a model has been used that allowed for the integration of research and practice, called the research-practitioner or scientist practitioner model and another known as the reflective practice model. The different approaches for claiming knowledge is needed to achieve an integrated knowledge base. A "live and let live" philosophy must be used for both science and practice (Ricks & Mark, 1997:47).

Research practitioners were practitioners who bring a variety of research approaches to their work. For cooperative education the practitioner brings a set of knowledge-securing procedures, which is adequate for the needs of researchers to the academic environment. The foundation for thinking as researcher and practitioner originates from a place of inquiry and having the necessary skills of inquiry. Skills inquiry is thinking skills, which involves four different ways of thinking, namely divergent thinking, analytical thinking, critical thinking and integrative thinking. Research practitioners use these skills throughout the researching process and moves from one to the other as needed. Thinking and using data is another critical aspect used by the research practitioner for decision and problem solving and includes a quick review of literature. From data collected, the research practitioner generates solutions and alternatives that theoretically would work the best (Ricks & Mark, 1997:48). The above-mentioned principles and process forms part of any research practitioner's research process.

The researcher-practitioner engages in a process of learning, which requires staying in a state of inquiry collecting and analysing information, generating and testing solutions and ultimately integrating what was learned. The distinction in cooperative education between research and practice becomes artificial and falls away. Therefore, if one were practicing, one would be conducting research (Ricks & Mark, 1997:50). Cooperative education practitioners need to know to practice cooperative education does include conducting research. Research in cooperative education e.g. as in the case of action research and even post graduate research, becomes part of

daily operation activities since it requires staying in a state of inquiry, using thinking skills and data to generate solutions. According to Achtenhagen *et al.* (2005:2) "there needs to be more research on co-op and work-integrated learning, and new researchers want to know how to go about doing research from the start to finish". According to Daimon (2005:11), researchers in work-integrated learning were needed more than ever to provide the foundation for developing new curricula and new systems to support it.

Ricks and Mark (1997:51), refer to three research approaches that lend themselves to cooperative and experiential research. These are cooperative inquiry, participatory action research and action inquiry.

2.10.2 Status of research in cooperative education

According to Bartkus & Stull (2004:67) the status of cooperative education is described by cooperative education professionals as "limited", "uncertain", "sketchy" and "sparse" and that research in cooperative education has fallen short of the ideal of scientific enquiry. In many instances it is described as "inadequate" in comparison with the traditional academic disciplines. However, in comparison with non-academic activities the quantity and quality is quite good (Bartkus & Stull, 2004:67).

Bartkus and Stull (2004:67) refer to Wilson's estimation of research completed in cooperative education that more than 200 research projects have been completed in the past 25 years and 113 research articles had been published in the Journal of Cooperative Education in the same time. Since 1988 more than 50 additional research orientated articles have appeared in the same journal. Furthermore, between 1970 and 1988, 70 doctoral dissertations have been completed related to post secondary cooperative education – thus averaging approximately four doctoral graduates per annum. Since 1988 to 2002 another 56 doctoral dissertations were completed. An increase in the number of degrees awarded would result in an increase in the number of research projects (Bartkus & Stull, 2004:68). Most of the research completed over the last 30 years can be described as applied, descriptive and/or evaluative in nature and it seemed as if cooperative education research have had a "bumpy" ride in history (Bartkus & Stull, 2004:68).

According to Coll and Eames (2004:277), cooperative education practitioners need to be more involved in research. This could contribute to research that presents the students' view, which is the neglected side of cooperative education. Furthermore, irrespective of what we research in cooperative education, we need to involve cooperative education practitioners and experts from other disciplines. Graduate and postgraduate students should also be involved in such research.

Coll and Eames (2004:277) maintain that the "means need to be sought for empowering co-op practitioners to conduct research through professional development, enabling them to do so through recognition of their role in research by providing time and resources"

In conclusion, it is clear that the cooperative education field needs to move forward with a research agenda to achieve academic legitimacy in higher education and there is a need for a broader research involvement among cooperative education practitioners with support from professional organisations (Bartkus & Stull, 2004:78) (compare section C, question 18 and 19, Appendix B). Many suggestions for the advancement of research in cooperative education have been made on micro- and macro level, which is worthy to take note of (Bartkus & Stull, 2004:74)

The future position of cooperative education needs to be considered, and will be discussed in the next section.

2.11 FUTURE PERSPECTIVES ON COOPERATIVE EDUCATION

2.11.1 The need for new initiatives and transformation

Hall (2000:9) concludes that cooperative education requires significant reconceptualisation and transformation (compare section C, question 18 and 19, Appendix B). In the past cooperative education focused on the student's personal growth rather than career development. The capability of HEIs to create new initiatives and adjust internally towards the continued external changes mentioned, will determine whether they will survive the future. Frequent self-evaluation audits and frequent advisory committee meetings within HEIs will contribute to adjustment according to the needs of the ever-changing environment.

Hall (2000:13) identifies five characteristics that can assist in defining the future of cooperative education, namely interpenetration of both study and work, cooperative education projects, the faculties of universities need to be more responsible for creating opportunities for students, remuneration of students and further education of company staff in HEIs. Varty (2005:9) in turn identifies six characteristics and six competencies that business and industry will be expected from their future workforce. Varty (2005:11) argues that "we need to be the kind of people we hope to develop, we need to learn from the past, know the present, focus on the future. In that way we will intersect the future with appropriate experiential strategies that will prepare workers, indeed leaders, who will contribute to the social and economic well being of our world."

2.11.2 Involvement in service learning

The CHE (2004a:19) emphasises that quality-related arrangements for community engagement, for instance that service learning be formalised and integrated with teaching and learning in institutions and where appropriate be adequately resourced and monitored. According to Furco (2004:9), service learning activities were primarily intended to enhance the student's academic development as well as their civic responsibility and to help the student to become a productive, civic-minded citizen who actively contribute to improvement the society.

Hall (2000:10) points out that combining on- and off-campus learning as part of the undergraduate programme is becoming common practice. This may be seen in the case with service learning in which study is linked with community service. Taylor (2004:2) defines service learning as a form of experiential learning in which students engage in activities that address human and community needs. According to the Council on Higher Education (2006:16) Bringle and Hatcher (2004) defines service learning as a course based credit bearing educational experience in which students participate in an organised service activity that meets identified community goals and reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline and an enhanced sense of civic responsibility (compare section D, question 14 to 19, Appendix B). According to the CHE (2004a:37) service learning is defined "as applied learning which is directed at specific community needs and is integrated into an academic programme and curriculum. Furthermore, service learning could be credit bearing and assessed and may or may not take place in a work environment (CHE, 2004a:26). According to Kerrigan (2005:26), service learning is a powerful pedagogy capable of engaging students with the community and has the capability to create graduates able to solve interdisciplinary societal problems.

Service learning needs serious attention in HEIs in South Africa where there is a need to become more engaged in community service projects and ultimately make provision for the financial provision of such projects. HEIs should encourage academic staff to participate in service learning and create opportunities for community leaders to become involved in programme advisory committees. Through these forums, community leaders can then participate and present inputs with regard to the curriculum development process of academic- and community programmes, creating opportunities for students to do EL and service learning in communities. This will create the opportunity for students to become involved in innovation and technology in community and industry, creating business opportunities and employment.

Consideration for the remuneration for students for cooperative education and more specifically during the experiential learning period needs to be discussed.

2.11.3 Remuneration of students for cooperative education

Hall (2000:11) discusses the problem of remuneration of students by companies during cooperative education and explains that companies were expecting students to be trained for little or no remuneration and that students working with mentors became more of an exception rather than the rule (compare section D, question 36, Appendix B). The trend is that students participating in cooperative education programmes were privileged to be remunerated while doing their cooperative education. Many companies in South Africa expect students to pay for their cooperative education, for instance Volkswagen South Africa, due to the severe costs involved in cooperative education for companies. Since cooperative education may become more and more expensive for companies this could become the norm.

In the past two types of experiential learning programmes have been used in HEIs, namely mandatory and non-mandatory, and these will be discussed below.

2.11.4 Mandatory versus non-mandatory programmes

Engelbrecht (2003a:45) differentiates between mandatory as well as optional cooperative education programmes. Hall (2000:12) mentions that in the USA, cooperative education though widely practiced, is offered as option to a limited number of highly selected students found in pre-professional areas of study such as business, engineering and pre-law. Wilson (1997:18) recommends mandatory programmes – once established it is easier to manage and is beneficial for all students. According to Hall (2000:12) the radically changed university campus and the business work site needs to be revisited to know how and where to contribute to the new growth and transformation of co-operative education for the future. In HEIs in South Africa, experiential learning (EL) is either mandatory or non-mandatory. The choice of whether it is offered as mandatory or non-mandatory will be determined by HEIs in the future. For universities of technology and comprehensive institutions in South Africa, the NAP stipulates that "technikons were to concentrate on the application of scientific principles to practical problems and to technology, thus preparing students for the practice, promotion and transfer of technology within a particular vocation or industry".

The following section will discuss learning at the workplace, which is the purpose of the cooperative education venture, namely whereby classroom learning is integrated with work experience.

2.11.5 Learning at the workplace

The workplace is no longer a place at all but has become a social affair – it includes a team of people. Work in the twentieth century will be more fluid, less secure, less long term, entrepreneurial and less routine. Workers were moving from position to position and the workplace places a premium on short-term performance (Hall, 2000:12). Commerce and industry requires a multi- skilled person, not only having the necessary technical knowledge and skills but have the appropriate attitudes as well. Students should be technically proficient but should be equipped with the necessary non-technical skills such as communication skills, teamwork skills etc. (De Lange, 2000:21). The new HEI is slowly becoming less a place and more of a connection for teaching and learning (Hall, 2000:12). This connection is manifested by the facilitation by cooperative education within the HEI. Cooperative education has become the "channel" or the "connection" to the outside world.

Co-operative education embraced the notion that the campus is not the only place for learning. Students need not only to be trained for a qualification but should be prepared according to specified programme curriculum having specific and non specific learning outcomes for the world of work. It must be emphasised that this specific academic programme should be in line with the specific needs of industry, thus providing in the human resource needs of industry and the country. To achieve this, the student should not only be trained on-campus (compare section D, question 11, Appendix B) but should be offered an opportunity for training in the real world of work (compare section D, question 32, Appendix B). Opportunities should be created through cooperative education in HEIs for students to be exposed to the work environment, thus creating vast learning and career opportunities.

Furthermore, it is important for cooperative education to be improved since no teaching and learning strategy can remain static. The next section will pay special attention to the notion of innovation and continuous improvement of cooperative education.

2.11.6 Innovation and continuous improvement

Innovation is described by Atchison and Gotlieb (2004:262) as "a process which begins with two creative acts: idea generation and opportunity recognition". The conditions in which innovation will flourishes is dependent upon the role players involved in planning the content of future academic programmes, that will deliver graduates who will have the capacity to deal with the future. It is a given that the tri-partite role players must be involved in this planning and delivery of inputs on curricula of academic programmes.

The future of cooperative education is a key concern for educational institutions and cooperative education practitioners around the world. According to Atchison and Gotlieb (2004:261), "the need for innovation and continuous improvement has been a key driver throughout the history of co-op". The need for innovation and continuous improvement will be determined by the amount of research and development being done by a HEI in cooperative education. Cooperative education should not only limit itself to the daily operational matters but should ensure that measures were taken to promote and expand research in cooperative education on micro- and macro- levels (Bartkus & Stull, 2004:67).

Atchison and Gotlieb (2004:261) suggest that there were a number of "triggers" affecting educational innovation which include: cost pressures, competition, improvement in communication technologies, demands for accountability, changed attitudes of students, and new organisational and reward structures for academics that encourage innovation.

Innovation may be seen to occur in the development of educational product and in the management process supporting its delivery. This may be seen due to the introduction of cooperative education in many countries, educational institutions as well as in the variety of disciplines in the global cooperative education movement, integration of business management philosophies and practice into the educational model, mentoring in industry, community practice for staff and students, the promotion of debriefing practices for students, assessment of students during EL/WIL, the research in learning experiences during cooperative education and, the use of technology in the design and management of cooperative education (Atchison & Gotlieb, 2004:261). In South Africa this innovation in cooperative education has been manifested within especially the universities of technology and comprehensive university environment.

Finally, the question should be asked what can be done to enable cooperative education to survive the next century and whether it would be able to do so.

2.11.7 Survival of cooperative education

One of the great strengths of cooperative education is its flexibility in method of operation. Integrating work experience in an educational curriculum can be achieved in many ways. Cooperative education needs to plan to survive well into the twenty-first century, due to governments around the world that focuses on graduate skills and knowledge required for future labour markets (Atchison & Gotlieb, 2004:261). According to Atchison and Gotlieb (2004:262), "there is a need to seek new and innovative ways of enabling young people to gain work experience which is widely acknowledged to be the most important factor in improving employability". Various innovative ways could be developed to achieve cooperative education objectives in and outside HEIs. Cooperative education partnership with the business world is but one example.

Cooperative education has proved to be a survivor in the educational landscape since it addresses and delivers results on employment and employability. Educational institutions need to plan today to deal with the forces that affect cooperative education and other models of EL so as to ensure their continued viability and relevance to all the stakeholders in the future (Atchison & Gotlieb, 2004:262). This would require continuous interaction with the industry on their education, training and human resource needs to ensure such needs were addressed by HEIs. Advisory committee meetings, directed towards the provision of advice from industry to higher education institutions, would serve as forum to facilitate interaction between relevant stakeholders.

In our planning for the future we need to create the appropriate learning environments, considering the forces that will affect the markets. HEIs need to recognise and understand the various forces that will impact on the development and delivery of educational programmes, such as cooperative education (Atchison & Gotlieb, 2004:261). For these reasons it is recommended that HEIs should be an active partner in the cooperative education venture, and should become aware of the forces that may threaten the existence of cooperative education and HEIs.

2.12 SUMMARY

In this chapter a literature survey was done to achieve the stated objective to do a comparative literature survey on the basic principles and nature of cooperative education, nationally and internationally. From the most recent literature, an attempt was made to discuss the origin, nature, purpose and role of cooperative education. A literature review on the goals, current status, and the

theories of learning in cooperative education was presented. A special attempt was made to clarify the concept of cooperative education by using typical definitions from the literature.

It can be concluded that cooperative education being a structured and integrated teaching and leaning strategy has many challenges. HEIs need to become more aware of the threats of the changing society and need to adjust accordingly. Cooperative education has the responsibility to remain even more sensitive towards existing and changing needs of the broad community in order to survive within the higher education framework.

Many exciting future challenges have been identified in literature for cooperative education, such as the initiation of new innovation strategies, and the need to promote research and development in cooperative education.

In the next chapter a literature review on cooperative education best practices will be discussed.

CHAPTER 3
BEST PRACTICES IN COOPERATIVE EDUCATION

3.1 INTRODUCTION

To achieve objective 1 (compare Table 1.1), the purpose of this chapter is to do compare a literature survey on the best practices in cooperative education, nationally as well as internationally.

A comparative literature review will be conducted on the following related to best practices in cooperative education and include, among others:

- Management of cooperative education in higher education institutions
- Policies and procedures
- Administration and the utilisation of management information systems
- Recognition of Prior Learning (RPL)
- Roles and responsibilities of role players involved in cooperative education
- Skills development
- Community service and service learning
- Resource provision in cooperative education
- Funding and financial administration of cooperative education
- Exposure of staff to industry
- Liaison
- Partnerships
- Internationalisation of cooperative education
- Promotion of cooperative education

- Entrepreneurship and cooperative education
- Telematic applications in cooperative education
- Quality management of cooperative education.

3.2 MANAGEMENT OF COOPERATIVE EDUCATION IN HIGHER EDUCATION INSTITUTION (HEIs)

3.2.1 Roles, functions and responsibilities of role players at institutional level

There were three major role players involved in the cooperative education venture, namely the higher education institution (HEI), companies and the student (compare chapter 2, Figure 2.2). Each of these role players has their own functions, role and responsibilities within the cooperative education activity.

The role and function of cooperative education within the HEI will be determined by the design and structure agreed upon by all role players for the management of cooperative education.

According to De Lange and Gilbert (1994:1) and Jacobs (2000:2) most higher education institutions (HEIs) nationally and internationally, make use of a some form of a centralised management system to manage and administer cooperative education such a central office/unit which forms the link institutionally between the relevant role players involved in cooperative education. The specific role and functions of cooperative education in a HEI may include, among others, national and international networks, industry liaison, interaction with alumni, staff development and training, budgeting, direct involvement in curriculum development, partnerships with industry, research in cooperative education, promotion of cooperative education and the management and administration of cooperative education by using a data base (De Lange, 2004).

According to the strategy of the Tshwane University of Technology (2005a), the roles, functions and responsibilities of role players on institutional level in cooperative education within a HEIs among others include;

3.2.1.1 Strategic management of cooperative education (compare A, Figure 3.1)

The role, functions and responsibilities of role players with regard to the strategic management of cooperative education at institutional level include:

- Determine the strategic direction of cooperative education within the institution;
- Manage the cooperative education central office;
- Provide leadership with regards to cooperative education trends and approaches;
- Compile, review and maintain policy, strategy and procedures;
- Promote and market cooperative education on institutional, national and international levels;
- Serve as a central address/contact for industry on cooperative education for the university; and
- Advise senior management with regard to cooperative education matters.

3.2.1.2 Experiential learning (compare B, Figure 3.1)

The role, functions and responsibilities of role players at institutional level with regard to experiential learning are as follows:

- Identify, promote and communicate staff development in cooperative education;
- Manage financial resources allocated to the central office for cooperative education;
- Trend watch and communicate the latest cooperative education trends with relevant role players;
- Standardise, compile, update and maintain documentation for the experiential learning processes;
- Compile and present an institutional annual report on cooperative education to Senate; and
- Promote, encourage, stimulate and conduct research in cooperative education.

3.2.1.3 Liaison (compare C, Figure 3.1)

The role, functions and responsibilities of role players at institutional level with regard to liaison are as follows:

- **External**

  * Promote and monitor academic staff exposure to industry;
  * Liaise with industry/commerce (e.g. partnerships projects, etc.);
  * Liaise with higher education institutions with regards to cooperative education (e.g. collaboration agreements); and
  * Liaise with professional bodies, societies and associations (e.g. ECSA, HPCSA, SETAS, etc.);

- Maintain active participation in the relevant societies and associations such as SASCE, WACE, HESA; and
- Negotiate and establish partnerships with the community.

- **Internal**

  * Establish and chair the Cooperative Education Central Committee (CECC) meetings;
  * Representation on relevant institutional committees (e.g. Academic Committee); and
  * Serve as an address for internal contact on cooperative education issues (academic and administrative).

3.2.1.4 Support (compare D, Figure 3.1)

The role, functions and responsibilities of role players at institutional level with regard to support are as follows;

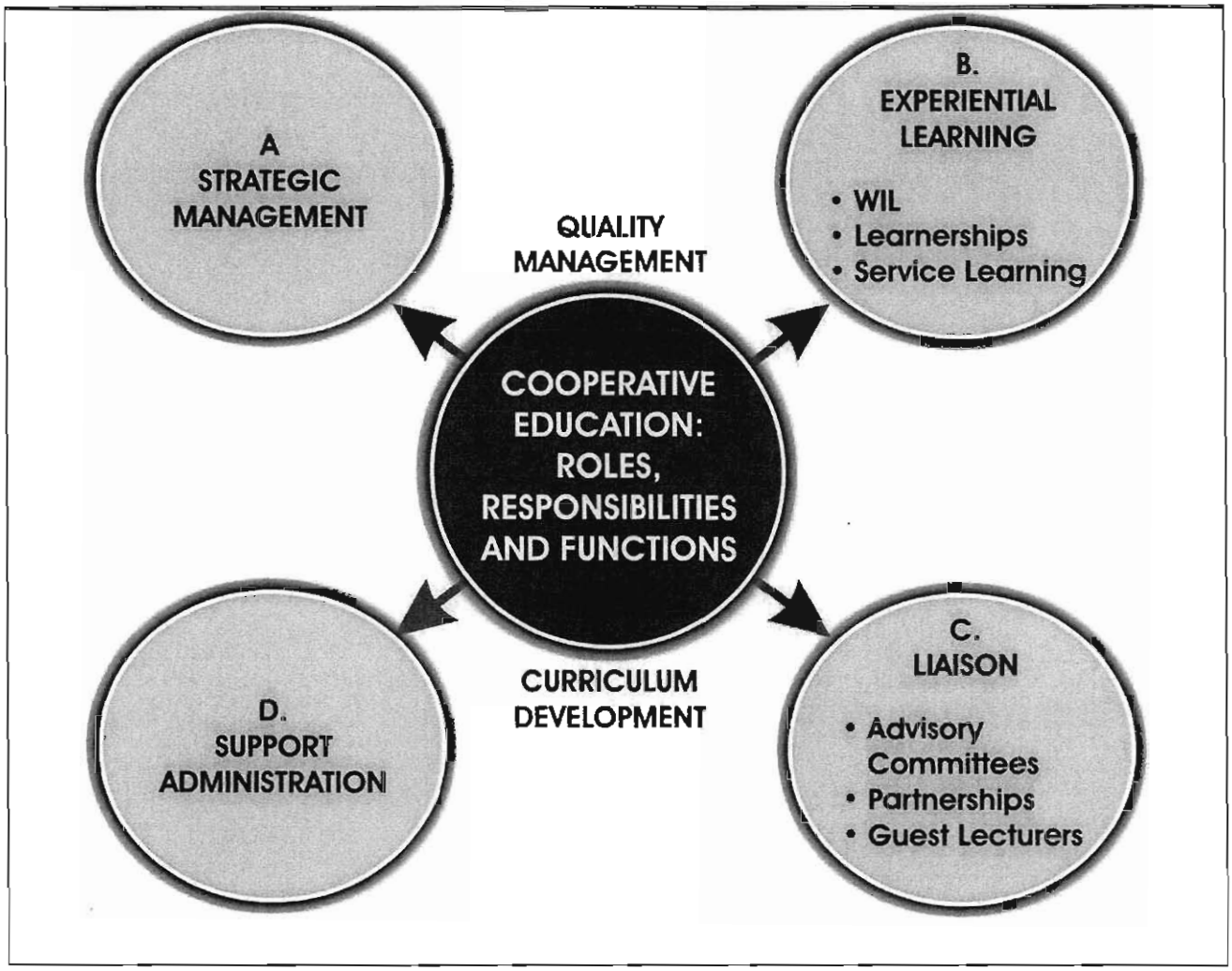
- Promote, implement, maintain and update the Cooperative Education Management Information System (records/data) for the university;
- Provide information with regard to cooperative education processes; and
- Promote staff development with regard to cooperative education (TUT, 2005a).

According to the University of Johannesburg (UJ)(2005:94), the main functions of the Central Cooperative Education Management Unit would include:

- Drawing up, publicising and maintaining policies and procedures applicable to co-operative education in accordance with the UJ quality policy;
- Management of cooperative education, graduate placement and international placement of UJ students;
- Partnership creation and fostering/ maintenance of links with commerce and industry and other higher education institutions, especially with their units of cooperative education;
- Establishment of and assisting in the running of the Faculty Cooperative Education Committees;
- Supporting the cooperative education coordinators, specifically by keeping up to date with trends, innovations and new legislation in the areas of cooperative education and the labour market;
- Information gathering, consolidation and dissemination of this to the coordinators for their own knowledge and to share it with commerce and industry;
- Maintain active membership in the relevant cooperative education societies, specifically WACE (World Association for cooperative education) and SASCE (Southern African Society for Cooperative Education) and to encourage participation in the conferences and related aspects by the cooperative education coordinators;
- Serve as a central information office, a first point of contact for requests for students,
- The unit will be a collection point for policies, procedures, agreements, contracts and other related documents. The aim will be to follow "best practices" principles;
- Ensuring that cooperative education and graduate placement information is available from the UJ web site;
- Reporting function;
- Assistance with all aspects of graduate placement, starting with facilitating the recruitment visits of companies (compare section D, question 24, Appendix B);
- "Reverse" cooperative education - placing adult students with practical experience but lacking the theoretical underpinning into the classroom; and
- Finding student bursaries for promising students to be placed within companies (UJ, 2005).

The roles, functions and responsibilities of role players in institutional cooperative education within HEIs may be illustrated as follows (compare Figure 3.1):

FIGURE 3.1 Roles, functions and responsibilities of the cooperative education unit



Similarly, the Tshwane University of Technology (2005a) identified the following roles, functions and responsibilities of role players in cooperative education within faculties:

3.2.2 Roles, functions and responsibilities of role players at faculty level

The following roles and functions have been identified for faculty cooperative education:

3.2.2.1 Experiential learning (compare , Figure 3.2)

Role players will have the following roles, functions and responsibilities regarding experiential learning towards students in faculties:

- Execute the experiential learning processes with regards to
  - student preparation;
  - placements;
  - monitoring;
  - assessment; and
  - debriefing/reflection on learning of students;
- Develop and review logbooks(compare section D, question 2 and 3);
- Source relevant projects for the faculty (both staff and students);
- Coordinate and chair cooperative education meetings within the faculty;
- Initiate and conduct research in cooperative education;
- Ensure and integration of experiential learning activities in curriculum;
- Operationalise the latest educational trends in cooperative education in the curriculum;
- Coordinate and execute mentors training;
- Convene Advisory Committees for cooperative education;
- Manage financial resources allocated for cooperative education;
- Organise exposure of academic staff to industry;
- Coordinate staff development in cooperative education with the relevant departments; and
- Manage the quality of cooperative education.

3.2.2.2 Liaison (compare 2, Figure 3.2)

Role players will have the following roles, functions and responsibilities regarding liaison with students in faculties:

- Maintain existing, negotiate and canvass for new work stations;

- Provide support to the relevant learnerships;
- Communicate feedback from the industry to the relevant departments and industry;
- Interact with professional bodies, societies and associations;
- Liaise with industry with regards to experiential learning; and
- Arrange guest lecturers.

3.2.2.3 Support (compare 3, Figure 3.2)

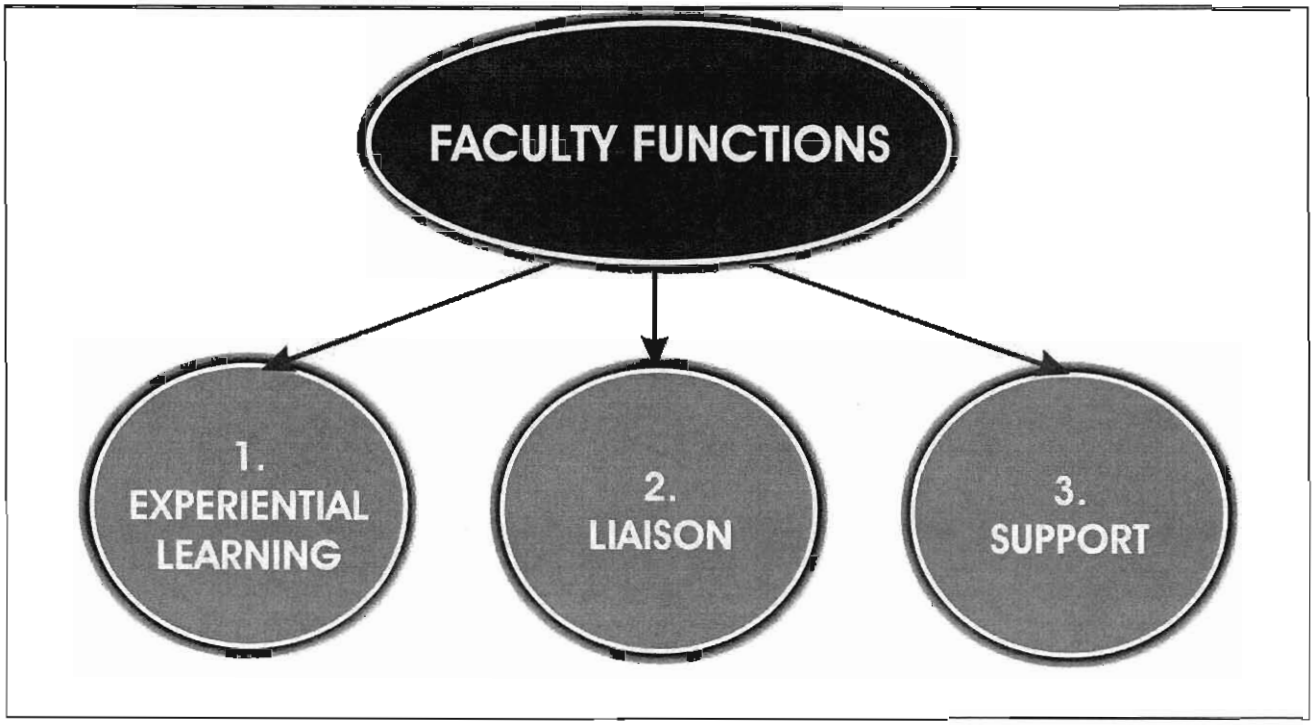
Role players will have the following roles, functions and responsibilities regarding support towards students in faculties:

- Manage and improve the ITS cooperative education subsystem in the faculty/departments (companies and student data);
- Manage and administer logbooks;
- Compile and issue applications for placement letters;
- Assist students in the compilation and structuring of CVs for relevant industries;
- Provide student resources for placements applications (e.g. fax); and
- Maintain records/documents on cooperative education.

(TUT, 2005a)

The faculty role, functions and responsibilities of role players can be illustrated diagrammatically in Figure 3.2.

FIGURE 3.2 **Roles, functions and responsibilities of cooperative education of role players for faculty cooperative education**



3.2.3 The management structure of cooperative education

It is imperative that HEIs selects the best management structure for cooperative education for its own uniqueness. According to a discussion with van Staden (2005), structure development normally follows strategy development. Irrespective which management structure/model is selected, it is crucial that a proper quality management system (QMS), be in place to ensure the intended outcomes were achieved (compare section D, question 31, Appendix B). The necessary policies, systems, strategies, procedures and resources should be in place for the quality management of cooperative education, as part of the core function of the teaching and learning strategy in HEIs in South Africa (CHE, 2004a:1) (compare section D, question 1, 2, 3 and 37, Appendix B).

International research done by De Lange and Gilbert (1994:1) and Jacobs (2000:1) in South Africa found that 62% of American programmes function on a combined, namely centralised/-decentralised basis which may be interpreted as an integrated approach. In the United States (USA), the advantages were predominantly in favour of a centralised administration compared with a decentralised administration (De Lange & Gilbert, 1994:1). Whatever management structure/model is chosen, all role players should participate in the choice of such model; with sensitive and careful guidance by the cooperative education manager or director to provide in all cooperative education needs of all role players. Taylor *et al.* (2005:10) indicated that the establishment of a cooperative education unit has a positive impact on work-integrated learning.

According to the CTM standing committee on cooperative education in South Africa (CTP, 2000:11), three management models were described. First, the centralised model consisting of a central unit having a full-time Manager and academic Coordinators with administrative support staff. Second, the decentralised model, having all the lecturers/Coordinators located in the academic departments, and finally, the integrated model consisting of a central department/unit having a manager and support administrative staff with academic coordinators/cooperative education lecturers (CELs), located in the various departments. There has been a tendency in HEIs in South Africa, to move towards the integrated management model, since all role players were involved in such model (Wessels, 2003:5). Lazarus and Oloroso (2004:181) refer to Boud and Solomon's statement in this regard that "the most common approach to date has been to locate the co-op administration as part of a program structure within existing schools or faculties, as the Anglia Polytechnic University, or within its own faculty structure as has occurred at the Middlesex Universities".

It was noted that there is a difference in the interpretation of the definition of an integrated management model at various HEIs in South Africa. Strong leadership is of importance in the latter management model to be successful (CTP, 2000a:6). According to Lazarus and Oloroso (2004:179) programme administrators use the term centralised and decentralised differently, meaning decentralisation could mean simple separation from the placement function or that each academic unit has an autonomous cooperative education programme with its own cooperative education staff reporting to different heads whereas centralisation could mean one unit responsible for the institutions programmes.

According to Wessels (2003:3) the successful management of cooperative education in HEIs in South Africa is dependent upon various factors which, among others, include size of the HEI,

nature of academic programmes, nature and composition of the faculties, culture of HEI and support from senior management.

3.2.4 Vertical line of report

Since cooperative education is a structured teaching and learning strategy, it is an academic matter. According to the definition of cooperative education by the Canadian Association for cooperative education it is a process, which formally integrates the students academic study with work experience in cooperating company organisations (Baumgart *et al.,* 1994:107) (compare, chapter 2, 2.5.1) (compare section C, question 24, Appendix B).

Cooperative education can be modelled as a three-phase process, involving preparation, activity and reflection (Engelbrecht, 2003a:60). It primarily focuses on the core business of academic programmes in which students are prepared and trained within the HEI and thereafter/simultaneously in the world of work.

Internationally, Wilson (1997:28) identified two principal offices to which cooperative education programmes should report, namely the chief academic officer or the chief student affairs office and recommends it to be the chief academic officer, since cooperative education is a curriculum matter. According to the Best Practices in Cooperative Education (CTP, 2000a:12), there were two principal offices to which cooperative education programmes report to in the USA, namely the chief academic officer (academic vice-rector) and the Dean, student affairs. If a centralised management structure is used, cooperative education should report to the academic head, whilst in a decentralised system cooperative education reports to the Head of Department and Dean (CTP, 2000a:12). Nationally, this trend has also been observed in HEIs, more specifically in the universities of technology and comprehensive universities in South Africa.

For this reason it is recommended that a "direct" line of vertical report/communication exists between the academic Head and the Manager of cooperative education.

Many problems may be experienced with an "indirect" line of vertical report by cooperative education managers, for instance where a cooperative education manager reports to a Director (Academic Support), which reports to the Academic Head. This may lead to limitation and even frustration of cooperative education managers, especially if such directors were not in full support or not clear on cooperative education principles and purposes and may discourage cooperative education managers. This may even results in the resignation of such managers. It is of critical

importance that cooperative education managers report directly to and remain in regular contact with the head of the academic institution to ascertain and keep in line with the strategic needs of the HEI (Wessels, 2003:3)

3.2.5 Staffing

Staffing for cooperative education depends on the type of management model used. If a centralised model is used, it may consist of a director, coordinator/s with administrative support staff. If a decentralised model is used, cooperative education lecturers (CELs) are used and are housed in their respective academic departments and report to the relevant Head/Dean of the Faculty (Engelbrecht, 2003a:61). For an integrated (eclectic) management model it would imply staffing as required for both a central office, for instance a director and secretary and coordinators/CELs located in faculties (De Lange & Gilbert, 1994:1). This trend has been observed both nationally (CTP, 2000a:13) and internationally (University of Waterloo, 1996:3).

The core business of cooperative education is dependent upon the commitment of the cooperative education lecturer (CEL) or coordinator. Lazarus and Oloroso (2004:183) refer to Nolan (1988), in which the role and responsibilities of the coordinator was published in *A Professional Inventory for Coordinators: Functions. Skills and Competencies*, which details the tasks, skills and competencies of Coordinators. This inventory was extended to a higher level of analysis which included the responsibilities of the cooperative education director (Lazarus & Oloroso, 2004:184). As the students academic studies were integrated with work experience gained at the workplace the major task of the coordinator is to collaborate with the appropriate lecturing staff and company to plan a total educational programme that may include both a theoretical and experiential learning component. Furthermore, it is important that coordinators/cooperative education lecturers (CELs) have the same qualifications in the specific field of study as the students they serve (CTP, 2000a:13) that will ensure a collegial relationship with academic staff in faculties (Wilson, 1997:29).

According to the best practice in cooperative education (CTP, 2000a:13) the number of coordinators per programme depends on various factors such as number of students, availability of employment opportunities and distribution of students among different curricula. According to an international study by Jacobs (2000:2), the ratios of experiential learning students to cooperative education staff (coordinators) were reported as follows:

International HEIs:	88:1
South African HEI (UoTs/technikons):	234:1
Mean for all 53 institutions:	101:1

For very large programmes, coordinators/CELs sometimes have assistants working with them. There must be support staff to handle the correspondence, appointments, travel arrangements, and records of the coordinators/CELs (CTP, 2000a:14).

In conclusion, irrespective of the management model implemented, sufficient resources must be made available by senior management of HEIs to support cooperative education staff to enable them to deliver the necessary output required.

3.3 POLICIES AND PROCEDURES

On institutional level, higher education institutions need to have policies and strategies in place if cooperative education will be practiced. Policies on cooperative education may vary from HEI to HEI, depending on the different needs and requirements, but should set out the principles and procedures applicable. The following were topics suggested by Essentials of Cooperative Education (CTP, 2000b:11) to be addressed in policies and strategies in HEIs and include among others:

- Mission statement of the HEI and cooperative education Department;
- Definition of cooperative education;
- Outcomes of cooperative education in each course;
- Principles, role and responsibilities of the HEI;
- Companies and students;
- Eligibility for experiential learning;
- Preparation, placement, registration, monitoring, assessment and debriefing;
- Management and control of EL;
- Record keeping;
- Unsuccessful students;

- Recognition of prior learning (RPL); and
- Costing and funding;

According to Engelbrecht (2003a:49), the vision, mission and goals of cooperative education in HEIs must be documented and the policies regarding student eligibility and company participation must be implemented. Furthermore, the policy should include an organisational chart indicating how cooperative education fits into the HEI structure. Lastly, the policy and strategy should meet the requirements for experiential learning as set by the New Academic Policy (NAP) for programmes and qualifications in Higher Education and the Higher Education Qualifications Framework (HEQF) in South Africa. Industry, professional bodies, academic staff and students must support this policy (CTP, 2000a:11). According to Engelbrecht (2003a:50), admission of students to the HEI is the co-responsibility of the admissions office and the Coordinators/CELs involved in cooperative education.

On faculty level, policies and guidelines should be in place to guide students and staff with regard to experiential learning (EL) (compare section D, question 1 and 3, Appendix B). This may include a code of conduct for students during EL at the workplace, compliance with all the requirements for admission to the EL programme, attendance or completion of a student preparation programme, regular attendance of student preparation programmes, completing an individual interview with the cooperative education lecturer (CEL), submission of a completed CV, signing an EL agreement and achieving the required academic standards. Students should be encouraged to find their own placements – this may be a requirement in the curriculum as a specific outcome, the student needs to achieve (Forbes, 2004b). This process must be facilitated by the Coordinator/CEL involved in the specific academic programme (Engelbrecht, 2003a:52).

3.4 ADMINISTRATION AND THE UTILISATION OF A MANAGEMENT INFORMATION SYSTEM (MIS)

According to Lazarus and Aloroso (2004:181) there is a serious void in the professional literature about cooperative education programme administration. Engelbrecht (2003a:59) refers to a cooperative education model that involves joint ownership of programmes between HEIs and the workplace, which should include all facets and role players of the total cooperative education process. Internationally, various systems were in use to administer and manage the complete

cooperative education activity, but differ largely from those in South Africa (Engelbrecht, 2003a:59) (compare section D, question 4, Appendix B).

According to Engelbrecht (2003a:62), technology is advancing and new possibilities to administer and manage cooperative education were being developed. Systems utilised should improve efficiency and reduces human resource requirements – since we were moving towards a paperless environment. Systems should be developed according to specific needs.

Systems used in South Africa for cooperative education was reported in 1995 to be outdated (Engelbrecht, 2003a:62). Various international systems to administer and manage cooperative education have been described by Engelbrecht (2003a:63), and include MaPPiT, developed by the Huddersfield University in the United Kingdom, the DREXEL CMC system, from the University of Drexel, Philadelphia, the system at the University of Waterloo (UW) and the George Washington University Career Centre (GW). Engelbrecht (2003a:79) suggested a template for the planning of a calendar for cooperative education lecturers (CELs) for HEIs.

In South African higher education institutions, limited management information systems (MIS) were available for managing cooperative education. Various local software packages have been developed, but the most commonly used system in South African HEIs is the Inter Tertiary Software (ITS) system. Apart from other subsystems contained within the ITS system, a cooperative education subsystem has been developed for the management of cooperative education in HEIs. Many HEIs have successfully implemented this system (ITS, 2005).

It is imperative that HEIs in South Africa need to do more research in this regard since MIS for cooperative education in South African HEIs were either outdated or doesn't exist.

3.5 RECOGNITION OF PRIOR LEARNING (RPL)

According to Engelbrecht (2003a:93), development of an individual is divided into phases: a phase of study and a phase of work which never stops – it is a reality of lifelong learning. Engelbrecht (2003a:93) claims that "it is a journey and not an event of transition between education – learning – developing knowledge and understanding; and work as part of a much larger, longer and more complex quest in search of an individualised vocational identity." America led the field in recognition of prior learning (RPL), which became part of the academia in the 1970s (Engelbrecht, 2003a:93).

According to SAQA (2005b:1) recognition of prior learning is "a process whereby people's prior learning can be formally recognised in terms of registered qualifications and unit standards, regardless of where and how the learning was attained. RPL acknowledges that people never stop learning whether it takes place formally at an educational institution or whether it happens informally". The process of RPL can be summarised as follows:

- Identifying what the person knows and do;
- Matching the persons knowledge, skills and experience to specific standards and associated assessment criteria of a qualification;
- Assessing the learning against those standards; and
- Crediting the person for skills, knowledge and experience built up through formal, informal and non-formal learning that occurred in the past.

This implies that a learner or an employee's non-traditional or non-formal experience and learning can be recognised (SAQA, 2005b:1).

Furthermore, recognition of prior learning applies to both educational and vocational contexts. The quality of recognition of prior learning lies with the assessment thereof. If the outcome of an assessment has met the requirements of a qualification the concept of accreditation may be applied in describing the process. Accreditation is defined by Best Practice in Cooperative Education (CTP, 2000a:75) as a dual process of assessment and certification – in which the candidate has the opportunity to obtain a certificate which confirms competence in specified occupations.

According to Harris (2000:21), recognition of prior learning (RPL) refers to practices developed within education and training to identify and recognize adult's previous learning. Previous learning acquired informally, non-formally, experientially or formally can and should be recognised and given currency within formal education and training. Previous learning refers to both prior learning (learning acquired formally or non-formally that is already certificated) and prior experiential learning (un-certificated learning often but not exclusively acquired informally).

Internationally, according to Best Practice in Cooperative Education (CTP, 2000a:76), countries like Australia and New Zealand have well established National Qualification Frameworks and accreditation of prior learning (APL) is done in a systematic way by means of established norms. In South Africa the white paper of 1995 states that a student should be able to articulate their level of learning with any entry point on the NQF. Furthermore, APL is set out as a cornerstone of the

reconstruction of learning pathways and HEIs were being subsidised by the state locally, on the basis of the number of students who complete their qualifications.

According to Best Practice in Cooperative Education (CTP, 2000a:77), the process of APL should start with a policy statement by the senior management of the HEI. This is also seen in the British and Australian systems for vocational education and training.

In New Zealand a national record of learning reflects lifelong achievements measured against the standards of national qualifications (CTP, 2000a:77). The lack of a system of national training qualifications is one of the main weaknesses of manpower training in South Africa (CTP, 2000a:77).

3.6 ROLES AND RESPONSIBILITIES OF ROLE PLAYERS INVOLVED IN COOPERATIVE EDUCATION

According to Randall (2002:2), cooperative education role players (compare Figure 2.2 and 2.6.3) should have the vision to strive to educate every individual in the country, to equip them with enough knowledge about the cooperative education business and its benefits – only then would cooperative education reach its true potential. According to Franks (2004:36) there must be a joint effort between the various role players in cooperative education in which everyone takes their role and responsibility serious by making the best possible effort towards being successful. Some roles may be joined and the responsibility shared in order to achieve the set goals.

The role and responsibilities of the three major role players (compare Figure 2.2 and 3.2) include industry (companies), students and HEIs involved in the cooperative education venture and have been discussed in Chapter 2.

3.6.1 The roles and responsibilities of the company (employer)

The company (employer) is one of the major role players in the tripartite relationship (compare Chapter 2, Figure 2.2). Without the cooperating company the student would not be exposed to the real world of work for the experiential learning period and in most programmes in HEIs would not be able to graduate. A cooperating relationship needs to be established by the HEI with companies. This relationship needs to be established over a period of time by regular interaction and communication. The student needs to be exposed according to set outcomes in programme

curricula in a preferred company environment. Learning by the student should preferably be work based.

According to Sheperd (1998:136) learning in the workplace is a highly effective method of enabling students to gain skills, highly valued by companies. Most students only develop about 10% of their skills within the scope of their academic study. Getting a degree does not necessarily help develop these skills. Experience in the world of work is the key way in which young people develop personal transferable skills (PTS). Companies do not necessarily see the link between graduate acquisition of PTS and work experience and many organisations were poor environments for developing PTS. Over 300 000 company directors in the UK have been associated with failure of one or more companies (Sheperd, 1998:136).

The company must be brought into the classroom. This can be achieved by inviting guest speakers from industry in the specialized field of study. Projects need to be devised according to the needs of external organisations. Curriculum development needs to be done in collaboration with companies through forums like advisory committees. Only work can prepare students for the world of work. The role of work experience is about work and not about personal development. The world of employment and learning were edging closer to one another (Sheperd, 1998:136).

According to Hurd and Hendy (1997:55), companies need data upon which to base their decisions, so that cooperative education educators could conduct their research regularly, that cooperative education programmes were in fact meeting company needs. Companies must not only be involved in responses but in the setting of the questions. Research conducted by Hurd and Hendy (1997:56) on a variety of businesses in 27 states and in the district of Columbia concluded that participation in experiential learning has many benefits. According to Braunstein and Loken (2004:237), a survey of studies completed in the USA and Canada identified 10 areas most often mentioned by companies as reasons to participate in cooperative education, namely company image, recruiting, savings in time and dollars, employee productivity, cost in time and dollars, retention rate, position level, career advancement, affirmative action and new ideas.

The company forms an integral part of the experiential learning process and shares the responsibility with the higher education institution (HEI) and student to ensure maximum benefit to all participants.

According to the policies and procedures for the Ontario Ministry of Education[8] (2000), the role of the community can be confirmed by the development of advisory committees, which involves the examining of the general provisions in the policy and making specific recommendations in this regard, involvement in the planning and designing of programmes and assessing their effectiveness.

According to the Tshwane University of Technology (2005a), the company forms an integral part of the experiential learning process and shares the responsibility with the HEI and student to ensure maximum benefit to all participants. The role and responsibilities of companies should, among others, include:

- The provision of experiential learning facilities;
- Training and supervisory staff (mentor) for the purposes of experiential learning;
- The exact nature of this experiential learning is based on collaboration between the company and the HEI in accordance with the requirements of the specific instructional program;
- The company informs the HEI of experiential learning opportunities offered;
- The company should conduct an orientation programme at the beginning of the work period to familiarise the student with the working environment and the company's expectations;
- The company and the HEI student agree as to when experiential learning is to commence. This depends on the nature of the academic curriculum. Academic staff/Co-coordinators/CELs will act as support in this regard, provide information to students about their organisation, conditions of employment etc. as required during the experiential learning period;
- In collaboration with the HEI, the company controls, monitors and evaluates the experiential learning program, a record of the student's experiential learning progress and evaluation must be maintained for monitoring and reference purposes, a logbook/workbook or alternative must be used for this purpose;
- On completion of the experiential learning, the logbook/ workbook/project/assignment must be signed/approved by the mentor/company and the company's official stamp placed on the document;

[8] Ontario Ministry of Education (2000): limited literature were available on best practices in cooperative education in higher education iinstitutions and for this reason this policy on secondary school level could also contribute to policies and guidelines in higher education institutions.

- Companies who have been approved by the HEI must notify the responsible academic staff member/ Co-ordinator / CEL in writing, that the student has met/not met the requirements for experiential learning; and
- To be considered/not considered for a diploma/degree, non-approved companies must hand in logbooks/ workbooks/ projects/ assignments to the academic staff member/ Co-ordinator/ CEL who will notify academic administration in writing, that the students have met/not met the requirements, the HEI may also provide a simulated environment for experiential learning often referred to as "in-house" training (TUT, 2005).

According to the policies and procedures for the Ontario Ministry of Education (2000), companies need to provide a safe working environment, appoint a supervisor for each student at the workplace (compare section D, question 8, Appendix B), provide students with a written/oral feedback after employment, help develop personalised placement learning plans, provide orientation and workplace health and safety training, help students to function as part of a team and provide challenging learning experiences.

According to the Swinburne University of Technology (2005:3) its aim is to provide the best possible experience for its students within the context of the educational and companies needs including the legislative framework provided. The Swinburne University of Technology recognises the responsibilities of the host company as being to provide the industry-based learning (IBL) coordinator with a position description for the job being offered; to confirm with the IBL coordinator all arrangements for those students selected to participate in the IBL programme, including interview procedures, salary details and conditions of employment, advise applicants in writing; to continue the employment placement according to the agreed upon time period for a minimum of 6-12 months unless otherwise negotiated; to confirm with the IBL coordinator that students are covered by insurance; to allocate a responsible staff member as industry supervisor to the IBL student; and to ensure that appropriate staff were briefed about IBL and its objectives as the job is assigned to the IBL student. Other duties also include to support workplace visits from university supervisors to discuss the progress of the placement of the student and industry supervisor; to ensure that students gain experience relevant to their studies; to provide and maintain a working environment that is safe and without risk to health in accordance with regulation; to maintain a good work environment free from discrimination, harassment and victimization; to provide opportunities for the student to gain an overview of the host organisation's operations including the business environment in which the organisation operates; to ensure appropriate assistance support and training were provided to the IBL student to enable the allocated job to be undertaken successfully and the aims of the IBL to be achieved; to notify the IBL coordinator of any problems

arising with the placement; and to provide placement report as agreed upon with the IBL coordinator.

3.6.2 The roles and responsibilities of the higher education institution (HEI)

The HEI, as one of the partners in the tripartite relationship (compare Chapter 2, Figure 2.2), plays the most important role to initiate and establish a cooperating relationship between the company and the HEI. According to Weisz and Chapman (2004:247), if HEIs do not offer curricula that meet the requirements of the workplace, they will find it difficult to survive in the competitive market place (compare section D, question 33 to 35, Appendix B). Weisz and Chapman (2004:247) furthermore describe many benefits of cooperative education for educational institutions.

3.6.2.1 The roles and responsibilities of the higher education institution (HEI)

The strategy of the Tshwane University of Technology (2005a) identifies the following roles and responsibilities for HEIs, to serve as a guide for HEIs in the tripartite relationship:

- Higher education institutions must develop and maintain a relevant curriculum that reflects the needs of companies;
- Higher education institutions must provide an effective mechanism to assist experiential learning in the search process for experiential learning opportunities;
- Higher education institutions must promote the cooperative education programme on the various campuses of the HEI;
- The private and public sectors, including the community, must develop a system that will maintain suitable cooperative education records;
- Higher education institutions must collaborate with companies, and assist in the development of suitable experiential learning programmes, student selection processes and evaluation techniques and instruments;
- Higher education institutions monitor the students' progress (compare section D, question 7, Appendix B) during experiential learning through personal visits, telephone calls or mail;
- Higher education institutions must prepare students during the semester prior to experiential learning, on all aspects of the proposed experiential learning programme;

- Higher education institutions will provide the general guidelines for experiential learning that relate to specific educational programmes;
- Higher education institutions should make provision to allow cooperative education staff to have limited lecturing contact;
- Experiential learning periods must be indicated on timetables of all coordinators/CELs;
- Higher education institutions must ratify experiential learning with reference to the applicability and acceptability of awarding a certificate, diploma or degree;
- Higher education institutions must monitor academic staff and evaluate experiential learning in collaboration with the mentors of the companies, and must approve companies to offer experiential learning. Certificates were issued to companies for specific training programmes. The accreditation will be valid for a specific period of time;
- Academic staff shall visit companies periodically to ensure that the experiential learning offered is of the required standard;
- Higher education institutions will request students to submit assignments/logbooks/-workbooks/projects during and/or after the period of experiential learning;
- Higher education institutions will consider recognising experiential learning which has been completed before (recognition of prior learning) the first academic programme registration (approval must to be granted by academic departments);
- Higher education institutions will consider recognising experiential learning that has been approved by other HEIs;
- Cooperative education staff will review all literature, advertising etc. containing reference to cooperative education/experiential learning of the HEI; and
- In consultation with the specific department, all academic programmes offered at the HEI must do experiential learning and will be specified as a subject on the qualification and/or academic record.

According to the policies and procedures for Ontario Ministry of Education (2000), successful practices dictate that placements for cooperative education are the responsibility of the education institution. Further responsibilities of the educational institution, among others, include:

- Provide cooperative education and other forms of experiential learning;
- Assign staff to ensure the ministry of the policies and effective programme administration;

- Strengthen partnerships with relevant role players, implement policies on cooperative education;
- Develop policies and procedures for cooperative education;
- Establish procedures to assess new placements;
- Allocate resources and staff to support the development and implementation of cooperative education programmes;
- Enable teachers to engage in professional development activities to ensure effective implementation of cooperative education;
- Develop a protocol to ensure regular and consistent cooperation and communication amongst cooperative education staff;
- Encourage the sharing of resources amongst educational institutions in the same region; and
- Develop a policy statement regarding students activities and ensure that appropriate support and resources were provided for students.

Within the higher education institution, dedicated staff known as cooperative education lecturers (CELs) or coordinators take responsibility for the cooperative education/experiential learning activities, to be discussed in the next section.

3.6.2.2 The roles and responsibilities of the cooperative education lecturer (CEL)

According to the quality assurance policy for cooperative education (SASCE, 2003:13), the CEL/coordinator plays an important role to liaise with students, academic staff and industry to plan a total educational experience that includes both academic and experiential learning (compare section D, questions 17 to 19, Appendix B). According to Wilson *et al.* (2004:158), coordinators, or whatever title may be used, are in principle educators, they were not placement officers, or career counsellors but should be members of the curriculum planning teams. Engelbrecht (2003a:262) identifies two broad roles of the CEL, namely they were responsible for finding companies who support the cooperative education concept and who were willing to provide placement opportunities for students and to serve as advisors to students.

The formalised link between the Coordinator/CEL, academic staff and industry is crucial to the success of the student experience. Two types of Coordinators were described by Best Practice in Cooperative Education (CTP, 2000a:25) as firstly being a fulltime staff member assigned to a central unit for cooperative education known as a coordinator and secondly as a lecturer with the

primary responsibility to lecture with an "add on" responsibility of experiential learning. The responsibilities of the specific coordinator will depend on the model implemented by the HEI. Smit (2002:91) defines the role of the CEL/coordinator as the part played by individuals in full-filling the job requirements and responsibilities as accountability for reaching objectives using resources properly and adhering to the organisational policy. If one accepts responsibility, one becomes obliged to perform the assigned work. Engelbrecht (2003a:260) describes the personal qualities of the CEL as a businesslike manner and dress to deal with the community, tact and patience with problems and unique situations, administrative ability, a self-starter and professional training.

According to Smit (2002:91), the cooperative education lecturer (CEL) plays an integral role in the total education process locally and abroad. Furthermore, there is no scientific model pertaining to the profile of the CEL and there is no set of guidelines for the appointment of such academics. Smit (2002:93) describes the coordinator's role and responsibilities towards the student, company and HEI, which also includes administrative duties. Coordinators or cooperative education lecturers, whether on a fulltime or part-time basis were responsible for the implementation of the experiential learning process for particular programme(s), which include preparation for the workplace, placement, monitoring and mentoring, assessment and debriefing of the students. Cerff (2002:189) emphasises the importance of the preparation of students for the workplace.

Depending on the management model for cooperative education, cooperative education lecturers (CELs), whether appointed on a fulltime or part-time basis, were the most important role players in determining the success of the cooperative education venture (CTP, 2000a:25) (compare section D, question 17 to 19, Appendix B). According to Smit (2002:91), coordinators were responsible for bridging the gap between the world of education and world of work and can make or break an academic programme. According to Daimon (2005:8), the cooperative education administrator is a specialised position which requires communication skills, understanding connecting, and convincing capabilities, counselling skills, experiences in business, and academic knowledge in the related field of study.

The success rate for the management of cooperative education in a higher education institution is directly related to the existence or absence of cooperative education lecturers (CELs) or coordinators. If coordinators were appointed on a fulltime basis, the success rate is much higher with regard to the experiential learning process as well as external relationships/partnerships with companies, than having part-time cooperative education lecturers (CEL) (Smit, 2002:91) (SASCE,2003).

Staff that have to ensure that the total learning experience meets the agreed learning outcomes, as specified in the qualification submissions to a qualifications authority, for example SAQA, manages experiential learning for students. The nature of that experience in terms of the operational elements has an academic and administrative dimension. Administrative staff would support the administrative dimension and cooperative education lecturers (CELs)/coordinators would manage the academic dimension.

For maximum effectiveness the key performance areas and duties of coordinators/ CELs were defined in terms of the contribution to the total learning experience of the student (compare Table 3.1 and Appendix C, p 376).

According to the cooperative education policies and procedures for the Ontario Ministry of Education (2000), the cooperative education lecturer is, among others, responsible to:

- promote cooperative education, work experience programmes to students, staff, academics and potential companies;
- develop pre-course and interviewing procedures for students who wish to participate;
- interview and select students for community based learning programmes, follow the educational institutions policy and procedures for cooperative education;
- identify secure placements in which students will be able to achieve course expectations;
- experience growth and develop career goals;
- assess placements for suitability, inform companies of their role and responsibilities;
- organise and conduct pre-placement orientation sessions to prepare students;
- develop an personalised placement plan for each student with all role players involved;
- consult regularly with relevant role players;
- make regular on-site learning assessments of students (3 times per student per credit at least twice through personal contact), assess and evaluate student performance;
- update and adjust student placement learning plans;
- assess whether placement supervision is appropriate;
- manage day to day administrative tasks associated with cooperative education;
- keep records on all related activities;

- offer support with regard to transportation;
- provide health and safety instruction; and
- liaise with all relevant role players, and to ensure problems were dealt with immediately.

According to Cates and Jones (1999:37), the role of the cooperative education supervisor/lecturer provides the students with opportunities for learning and skills development and maximises the student's ability to learn by assigning tasks to provide the student with the opportunity for challenge and growth. Cates and Jones (1999:37) also remark that the ideal supervisor is someone who; understands and respects the concept of cooperative education, has content knowledge that will be useful to the student, has a genuine interest in people and the ability to communicate effectively, is patient, empathetic and has a tolerance for mistakes, sets high expectations and provides frequent and constructive feedback.

The Swinburne University of Technology (2005) describes the responsibilities of coordinators as being to:

- promote the Industry Based Learning (IBL) programme to companies and provide opportunities for prospective companies to meet students interested in the IBL programme;
- provide students with information about companies;
- provide direction and guidance to IBL students in relation to IBL placement;
- assist IBL students in obtaining employment in an IBL placement;
- ensure academic programmes reflect contemporary workplace practices;
- administer all operational procedures in relation to the IBL programme;
- assign an academic supervisors to each IBL student where this is the usual practice;
- monitor and discuss student progress through regular communication, including industry visits (compare section D, question 7, Appendix B);
- help students maximise the benefits of undertaking IBL(compare section D, question 17 to 19, Appendix B);
- liaise with industry supervisors;
- ensure companies were aware of the students academic commitments concerning arrangements interview schedules;

- assist students to find workplace where students were not exposed to discrimination, harassment or health and safety risks arsing from IBL placement;
- ensure educational objectives of the placement were met;
- ensure that the student is performing the tasks required by the company and the university;
- ensure that the industry supervisor is familiar with objectives of IBL placement;
- ensure that the matters of concern to company or student is conveyed to the appropriated university staff and IBL coordinators;
- make regular contact with IBL student through site visits;
- assist students with the IBL assignments;
- carry out where required, assessment of the IBL workplace assignments; and
- submit site visit reports.

The student is the most important role player since the cooperative education exercise, which evolves around the learner and which will be discussed in the following section.

TABLE 3.1 Key performance areas and duties of the cooperative education lecturer / coordinator in cooperative education (SASCE, 2003).

KEY PERFORMANCE AREAS AND DUTIES OF A COOPERATIVE EDUCATION COORDINATOR/LECTURER	Academic Dimension	Admin. Dimension
Negotiate and identify placement opportunities	✓	
Ensure quality placement opportunities	✓	✓
Develop curriculum related community service for placement opportunities	✓	
Establish quality criteria for experiential learning outcomes	✓	
Ensure quality criteria and experience for orientation and placement	✓	✓
Monitor and assess student progress	✓	✓
Engage in career and personal counselling	✓	
Facilitate reflection of student's experience of experiential learning	✓	
Promote the cooperative education and manage administration	✓	✓
Professional Development	✓	
Duties of coordinator / lecturer in support of the student learning experience		
Preparation of students for experiential learning positions, preparing curriculum vitae and applying for placements.		
Liaison with industry and community to evaluate and canvas suitable training positions.		
Briefing students on what is expected of them during experiential learning.		
Briefing students on work ethics and interview skills.		
Conducting personal interviews with students, understanding their expectations and referring them on an individual basis to companies with suitable training positions.		
Visiting students at companies to monitor their progress and to give guidance and assistance.		
Recording and communicating inputs that companies want to make towards syllabuses outcomes to ensure relevance and a competitive edge.		
Identifying experienced people from industry and inviting them to serve on the Technikon advisory committees.		
Providing lists of students placed for experiential learning to all stakeholders.		
Conduct group session to facilitate reflection on experiential learning.		
Acting as a link between the university academic departments and companies.		
Establishing and maintaining student records for counselling and placement purposes.		
Developing documentation and other promotional materials.		
The formative and summative assessment of the student's progress and the evaluation of projects assignments and oral presentations.		

3.6.3 The role and responsibilities of the student

Wilson (1997:18), suggests that cooperative education participation helps the marginal student achieve better results because it helps the student to focus on career goals and appreciate more the need and relevancy of academic achievement. According to Burchell *et al.* (2000:11), the technically brilliant, but socially deficient graduate struggles to survive in the workplace in the millennium.

Research by Jackson and Wirt (1996:58) indicates that experiential learning excites and motivates most students and has a positive effect on the student's academic performance, graduation rates, and even leads to full-time job positions for students. Work-based learning can be a win-win situation for companies, HEIs and students but the outcomes need to be properly coordinated.

According to Du Plessis (1993:57), one of the most popular criticisms against formal education is that students are not properly prepared for effective economic defensibility. Cooperative education provides an alternative as educational strategy with the aim to prepare the student to occupational capability and economic independence (compare section D, question 5, Appendix B). Education should be combined with productive labour. During experiential learning at the company it is necessary that there should not only be training of the student, but education as well, namely "educational training". HEIs have the primary function to provide educational education. The student is delivered to the company in industry whilst personal development and character formation is suppressed (Du Plessis, 1993:58).

The main purpose of the cooperative educational venture is the total integration of all role players (compare Figure 2.2) in education. Sufficient well-trained cooperative education staff needs to be available in all HEIs to exert control of the student activities in the workplace. The cooperative educational model needs to develop a career mature personality student (Du Plessis, 1993:57).

Some universities of technology in South Africa assume the responsibility of placement for experiential learning to be that of the student, however assistance and support to such students by such HEIs are needed (Maphosa, 2005). Cooperative education staff will provide all the necessary support and assistance to students in this regard. The HEI and more specifically, cooperative education staff and/or academic department cannot guarantee suitable placement although every attempt will be made to assist students in finding suitable placement opportunities. The HEI has the responsibility of directing and assisting students to obtain experiential learning opportunities related to the job market. Given these opportunities, the student is the one responsible for procuring experiential learning placement.

According to the Tshwane University of Technology (2005a) the following specific responsibilities were necessary for students in cooperative education. Students:

- must register for all experiential learning programmes (as a subject), as soon as the company accepts them;
- should ensure that the experiential learning is acceptable to the HEI, show respect for and understanding of the goals, rules and philosophies of the company and the HEI;
- must take responsibility for own coordination, financing of transportation, accommodation and related expenses incurred in the experiential learning process;
- must notify the HEI of any change of address of the place where the experiential learning will be undertaken;
- must fulfil both experiential learning and academic education requirements before the student will be considered for the award of a diploma or degree;
- must ensure that the logbook/workbook/project/assignment is kept up to date and signed by the specific mentor of the company;
- must ensure that the experiential learning received is of the required standard and complies with the university guidelines;
- can undertake experiential learning with more than one company, as long as the coordinator/CEL/academic department is notified;
- may be requestéd to undergo an interview with a mentor and/or academic staff member/co-coordinator/CEL upon completion of the experiential learning period, and
- are personally responsible for registration with a respective professional body as a student in training is the responsibility of the student.

According to the cooperative education policies and procedures for the Ontario Ministry of Education (2000), students must:

- comply with all rules as to dress, safety codes, work schedule, work in a courteous responsible and business like manner and show appropriate initiative;
- comply to the rules and regulations of the education institution;
- comply with the school attendance policies;

- submit assignments/ projects as required, inform their supervisor/cooperative education teacher if they were unable to report for their training;,
- participate in their personal placements learning plans;
- participate in their own assessment with their supervisors and teachers; and
- complete their course requirements to obtain credits for their qualifications work with their teachers and supervisors to ensure problems were dealt with immediately.

According to the Swinburne University of Technology (2005:1), during experiential learning, the students must:

- conduct themselves professionally and responsibly as both an employee of the host organisation and a representative of the university;
- keep the IBL coordinator informed of issues of concern;
- attend information sessions, industry affairs, workshops and other activities related to the IBL program;
- keep themselves informed of IBL positions as they arise and respond to the relevant opportunities;
- prepare signed applications of a high standard;
- attend interviews as requested by companies to inform both companies and the IBL coordinator if unable to attend at an agreed time;
- consult with the IBL coordinator before independently pursuing any job opportunity with a potential company;
- notify the coordinator immediately upon accepting an IBL position and complete the required paperwork by the coordinator;
- formally reject any other offers of IBL employment subsequent acceptance of a position;
- seek the advice of the IBL coordinator should the students have any concerns about matters such as payment, working hours, job performance, and conditions, starting and finishing dates etc.;
- notify the coordinator of any concerns in relation to discrimination or harassment in the workplace;

- participate in all meetings arranged by industry supervisors for the student;
- undertake the placement in a professional and responsible manner in accordance with the practices of the host company;
- undertake not more than one subject part-time per semester during the placement;
- maintain a journal which records details of the placement experience;
- submit an appropriate assignment as determined by the course to ensure that the IBL assignment refers to the variety of problem activities encountered in the workplace and how they relate to the subjects studies;
- cooperate with the company with respect to the action taken to ensure the health, safety and welfare of any person at the workplace;
- remain in the placement position withdrawing only after consultation with or approval from the coordinator unless the issue involves an immediate threat to the students health and safety; and
- provide, when requested by the coordinator, a written evaluation of the placement.

Skills development, especially learnerships for students, should also be discussed in the context of cooperative education.

3.7 SKILLS DEVELOPMENT

3.7.1 Introduction

Skills development, and more specifically the role of learnerships, is becoming more and more important in relation to cooperative education in higher education institutions (HEIs) in South Africa.

3.7.2 Skills and literacy developments

HEIs continually need to examine what skills industry considers to be important with regard to the skills required by students on entering the workplace. Research by De Lange (2000:21) reveals a skills gap between the skills students acquire in their formal study and what companies require, and found that non technical skills were not adequately addressed. There is an expectation from

industry that HEIs should equip students with non-technical skills, since companies require workers with positive personal qualities and work attitudes in addition to academic qualifications. Skills acquired by students should meet the requirements of companies and customers. Consultation between educational and training institutions should occur on an ongoing basis. Non-technical skills can be seen as the "glue" that holds organisations together.

The essential element of a successful cooperative education programme is the adequate preparation of students before they start work-integrated learning (WIL). Work preparation programmes should therefore focus on the specific non-technical skills requirements for companies (De Lange, 2000:22). The need for skills that can be classified as non-technical is common to all organisations. De Lange (2000:23) differentiates between two categories of non-technical skills, namely functional skills and adaptive skills. Functional skills were those applied to tasks and were used to solve new problems and to go beyond one's training and past experience, such as questioning, analysing, communicating, listening and decision making. Adaptive skills describes the manner in which employees conduct themselves and interact with the environment, including relations, with people, organisations and physical conditions (De Lange, 2000:23).

According to Meyer (1999:22), the foundation of any skills strategy is basic education. This lays the basis for all future learning, inculcated in the values and skills needed for active participation in the social and political life, and enhances generic capabilities such as language, communication and problem solving skills.

According to Watters (1993:2), education and vocational training have undergone fairly dramatic reorganisation in most of the Western world with the notion of competency-based education gaining considerable credibility. This change has also been evidenced in South Africa and has been considered by many key stakeholders for adult and basic education provision. Watters (1993:4) indicated the world of work has changed significantly, particularly the manufacturing sector. These changes require a different workforce, which is multi-skilled both technically and socially; workers need to see themselves as team workers, be flexible, and should have a broad holistic understanding of the production process. There is also a greater emphasis on quality and efficiency of workers in an organisation, which thus requires an educated and trained workforce. Changes in the world of work require changes in education and training. Watters (1993:4) remarks that " current researchers describe a closer relationship between 'education and personal development' and 'education for employment' ".

Canter (2000:41) defines a skill as an attribute or ability to perform a task to acceptable or agreed level. According to Coll and Chapman (2000a:102), "soft" and "hard" skills are needed in today's

workplace and cooperative education helps students develop those skills. Chapman *et al.* (2000:26) have noted that companies place great importance on the so-called soft skills, like communication and interpersonal skills and less emphasis on technical skills, most probably because companies accept students possess the required technical skills.

Cates and Langford (1999:7) have demonstrated that communications and thinking skills needed by today's companies can be developed through cooperative education. Dean Schneider's cornerstone philosophies around cooperative education are "work, and you will reach a higher mental development ... thinking and working were reciprocal aids" (Cates and Langford, 1999:12).

3.7.3 The skills development act in South Africa

The importance of cooperative education in the provision of skilled human resources has been highlighted during the World Association for Cooperative Education at the University Suranaree, Thailand (WACE, 2001). As in South Africa, unemployment in Thailand is a major problem. Unemployment in South Africa is very high, 48% in the year 2000 for people under the age of 35 years. Unemployment results mainly from the lack of skills (Cosatu report, 2002:2). As in Thailand, cooperative education can also play a major role in minimising unemployment in South Africa. SASCE could play a major role in making government more aware of the importance of the role cooperative education could play in this regard.

According to the Organisation for Economic Co-operation and Development (1999:112), the South African (SA) government has launched an initiative aimed at promoting the quality and advancement of education and training in SA, through legislation with the intention to provide an institutional framework to develop and implement strategies that will improve the SA workforce skills.

According to Bird (1999:2) it is the intention of the government to create opportunities and challenges for the higher education community through the Skills Development Strategy by interactive dialogue between the world of work and the world of learning, for instance HEIs. This will also promote placement of students in the workplace for experiential learning. The Skills Development Act will address the many challenges facing industry and providers, while the Skills Development Levy Act has been designed as a catalyst to improve the relationship across all sectors and to support economic and employment growth and social development in a rapidly changing environment (Bird, 1999:9).

The South African government needs to become more involved in cooperative education endeavours in HEIs. Ongoing discussions take place between the South African Society for Cooperative Education (SASCE) Executive and the Department of Labour aimed at initiating financial incentives for companies willing to train cooperative education students.

If government could support cooperative education initiatives in HEIs in South Africa by legislation and funding initiatives as in the United States of America, it would impact positively on the successful implementation of both skills development initiatives such as learnerships as well as cooperative education initiatives (compare section D, question 13, Appendix B).

3.7.4 Learnerships

In terms of the Skills Development Act, all companies were required to pay a skills levy of 1% of the companies' payroll and by submitting a workplace skills plan companies were entitled to a grant of 15 % of the levy being paid, and on submitting an implementation report will receive a further 45% refunding. Companies are furthermore entitled to a tax rebate of R25 000-00 for each person placed for a learnership. On successful completion of the learnership and thus receiving the qualification, the company receives a further R25 000-00; thus for one successful student a company receives a total of R50 000-00. This creates immense commercial incentives for companies to participate in learnership initiatives (Baird & Groenewald, 2003:2).

According to Baird and Groenewald (2003:2), a learnership may be defined as "formal learning programs that link theoretical learning and structured workplace experience, to prepare employees and those outside of work with the skills and knowledge required to perform competently in an occupation for which there is a clear demand".

According to SAQA (2005a:1) a learnership is defined as a new professional and vocational education and training programme. They combine theory and practice and culminate in a qualification that is registered on the NQF (SAQA, 2005a:1).

A learnership is a mixture of theory and practice and is normally conducted on the premises of a company. Companies, trade associations, professional bodies, training providers or community groups that identified the need for learnerships can initiate it. Learnerships must conform to the Sector Skills Plan and the Sector Education and Training Authorities (SETAs), must ensure that a learnership is properly organised and will offer quality training. A guiding principle for a learnership is that a minimum of thirty percent and a maximum of seventy percent of the required credits for a

learnership must be achieved through applied competence in a work environment. Learnerships must meet specific criteria and were generally funded from SETA funding allocations obtained from the skills levy fund (Baird & Groenewald, 2003:5).

According to Baird and Groenewald (2003:9), universities of technology in South Africa could become involved in learnership programmes (compare section D, question 13, Appendix B) by redesigning of curricula, but will not benefit from the Department of Education's (DoE) subsidy formulae in this regard. Students who participate in HEIs learnership programmes do derive substantial benefits, but there were a number of aspects that still require attention.

Universities of technology may benefit in many ways from the skills development initiative such as learnerships by becoming involved in the redesigning of curricula of for instance the experiential learning curriculum or from discretionary grants allocated for experiential learning in HEIs, such as CHIETAs. Furthermore, higher education institutions could play a role in the quality assurance of such learnerships during their training at the workplace by monitoring and supervising the training as well as assessment of such learners.

Another dimension in skills development involves the skills programmes.

3.7.5 Skills programmes

With reference to the Skills Development Act (No 97 of 1998), Engelbrecht (2003a:230) describes a skills programme as "a programme which consists of a number of unit standards which is occupationally based and when successfully completed will constitute a credit towards a qualification registered in terms of the National Qualification Framework (NQF) and render the student employable". According to SAQA (2005a:14), a skills programme is occupationally based and will constitute credits towards a qualification registered on the NQF, and provisioning is undertaken by a training provider accredited by the ETQA. In addition, it describes a skills programme as a type of short learning programme.

A skills programme consists of a cluster of unit standards. A unit standard is the smallest exit unit indicating either accomplishment of a skill or complete unit of knowledge. It must be noted that a skills programme does not result in a qualification itself and should be regarded as a smaller unit leading to a learnership or qualification (Engelbrecht, 2003a:231).

Higher education institutions (HEIs) main aim is to focus on higher levels in the NQF framework, namely NQF level 5 and above. HEIs domain should preferably be limited to its intended purpose,

teaching and learning, research and community engagement. There are various ways for HEIs to accommodate short courses and skills programme within the higher education sector (UP, 2005), and they can access discretionary grants offered by some SETAS (CHIETA) for the purpose of experiential learning (work-based learning) (CHIETA, 2005:11).

The involvement of the local community in higher education sector is very important. This can be seen by the initiation and implementation of service learning in HEIs in South Africa.

3.8 COMMUNITY SERVICE AND SERVICE LEARNING

3.8.1 Community service

According to Deruosi and Sherwood (1997,46), there is an increasing demand on higher education institutions to produce engaged pro-active citizens rather than passive, reactive workers (compare section D, question 14 to 16, Appendix B). The needs of the direct community should be addressed by possibly designing programmes that address the needs of the community while providing students with academically related experiences. According to Telepak (1995:64), work skills and behaviour acquired through community projects prepare students better for vocational training and future employment. Furthermore, it provides structure and an experiential basis for students to develop job readiness skills. According to the CHE (2006:5), the Higher Education Quality Committee (HEQC), requires HEIs in South Africa to comply with specific criteria set for HEIs on service learning.

Deruosi and Sherwood (1997:47) describe a model for enhancing curriculum service learning. According to Deruosi and Sherwood (1997:48), there must be vision for a learning environment that challenges the students, faculty staff and community to work together to develop productive citizens and engages students in their cooperative education with community related activities. Such a programme should not only be directed towards service learning but also incorporate the well established goals and benefits of cooperative education. This creates the opportunity to gain experience while developing career awareness and suitability to career aspirations. The goal of the experience is application of academic skills and refinement of career goals.

The Council on Higher Education (CHE, 2001:52) describes three models of community service, namely community service with the primary focus on service, second, student learning, with the primary focus on maximising students' learning by placing students within the workplace and thirdly

service learning with the primary focus on integrating community service with the scholarly activities of learning, teaching and research.

Learning opportunities related to community service can provide students with real world training, job-related skills and first hand opportunity to explore career options (Derousi and Sherwood, 1997:53). These experiences can produce outcomes that often exceed those provided through traditional internships and whilst students absorb academic and career related skills they gain a realistic perspective of their community. Universities and community agencies should become engaged in such combined effort to built strong and healthy communities (Derousi & Sherwood, 1997:54).

HEIs should work together to design programmes that address the needs of the community while providing students with academically related learning experiences. Derousi and Sherwood (1997:47) propose a model for enhancing community service involvement ("service learning") in which students learn to develop through active participation in organised community service, meets the need of the community, integrates and enhances academic curriculum opportunities for students to reflect on their community service experiences and the enhancement of student appreciation of themselves and their commitment to be active citizens throughout their lives.

Derousi and Sherwood (1997:48) recommend the combination of cooperative education and community services projects and suggest students in cooperative education to become engaged with community related activities. Selection of community service projects should be of such nature to incorporate well-established goals and benefits of cooperative education. According to Derousi and Sherwood (1997:49) community service projects provide a unique opportunity to gain experience while developing career awareness and suitability to career aspirations. Learning experiences related to community service can provide students with real world training, job related skills and a first hand opportunity to explore career options (Derousi & Sherwood, 1997:51).

Kallebreg and Engelstad (2000:64) identify one distinctive characteristic of American universities as the breadth of their ties to local communities. According to Kallebreg and Engelstad (2000:64), community service could mean several different things and indicates that the most visible form of community service has been the provision of adult education programmes, initially offered for "enrichment" rather than practical skills or credit towards degrees.

3.8.2 Service learning

Service learning is described by the Council on Higher Education (CHE) (CHE, 2001:52), as one of the models of community service (compare section D, question 14 to 16, Appendix B). The Council on Higher Education (CHE, 2006:26) defines service learning as "applied learning which is directed at specific community needs and is integrated into an academic programme and curriculum. It could be credit-bearing and assessed, and may or may not take place in a work environment."

Hoyt and Thalman (2001:16) emphasise John Dewey's theory of the primary experience, service learning which is interactive and democratic, engaging the whole student and transforming the learning process. Hoyt and Thalman (2001:16) focus on three components of service learning, namely preparation of the student which includes setting of objectives for skills to be learned and issues to consider, secondly, performing the service and thirdly, analysis of the student of the experience and the reflection of work.

Service learning promotes a concern about community issues and can be used to increase citizenship skills of participants of any age or background. It can be a tool to achieve the desired results of programmes. The CHE recognises service learning as a means of reconnecting Higher Education to society by making its academic mission more responsive and relevant to the real problems of the society.

Combining service with learning has generated abundant terms, namely community service, cooperative education, experiential learning, internships, participatory research and many more. The language of service learning has emerged since it best expresses the meaning of community involvement. It covers initiatives with strong research components, multicultural orientations and leadership development. This term expresses the relationship of service to learning and attributes equal weight to both service and learning goals (Hoyt & Thalman, 2001:18). Service learning furthermore improves student ability to apply what they learn in the real world environment and has an impact on outcomes such as problem analysis, critical thinking and cognitive development. According to Hoyt and Thalman (2001:18) service learning has a positive impact on student's academic learning and there is a stronger faculty relationship than those who were not involved in service learning.

Service learning is still in its infancy in the South African context and needs to become more prominent at all educational levels, especially in higher educational institutions (HEIs). Unless proper resourcing is provided for activities in cooperative education/experiential learning, for instance work-integrated learning and service learning, only limited success can be achieved.

3.9 RESOURCE PROVISION IN COOPERATIVE EDUCATION

According to Engelbrecht (2003a:260), a number of learning programmes with an experiential learning component have failed because the driving force was but a single person with limited influence whilst the success rate was higher when there was a broad base of support (compare section D, question 20, 21 and 37, Appendix B). Furthermore, cooperative education is unlikely to flourish in a traditional structure.

Wilson (1997:49) argues that there were several critical matters to attend to before actually starting with cooperative education which include; approval of an operating budget, creating a cooperative education administrative entity, appointment of staff, forming an advisory committee, developing a marketing plan, devising a MIS and planning programme evaluation.

Wessels (2003:2) recommends the provision of the necessary resources for the successful implementation and management of cooperative education within an HEI, which may include the necessary infrastructure and equipment, provision of funding for operational purposes, which must include an income/expenditure budget and the provision of the necessary human resources, such as cooperative education lecturers and administrative support staff.

Funding of cooperative education is essential for the successful implementation and management of cooperative education within a university.

3.10 FUNDING AND FINANCIAL ADMINISTRATION OF COOPERATIVE EDUCATION

3.10.1 Funding of cooperative education

Cooperative education and the components thereof, such as experiential learning, is a concept not associated with government organisations in South Africa, whereas cooperative education is well known and well supported in the USA (Sovilla & Varty, 2004:6). The government currently refers to work-based learning (CHE, 2004a). Only in the last few years a concerted attempt was made by the Southern African Society for Cooperative Education (SASCE) to sensitise and make government more aware of the principles and value of cooperative education in HEIs in South Africa (Du Pre, 2004a) (compare section D, question 20 and 21, Appendix B). In the USA, after legislation (Higher Education Act 1965), federal funding facilitated the huge expansion of

cooperative education, with a tremendous increase in the number of cooperative education programmes and practitioners (Sovilla & Varty, 2004:5).

Engelbrecht (2003a:279) identifies three main contributors to cooperative education, namely the state, industry and students. He recommends that a percentage of the levy of the skills development fund should go to HEIs, which has to manage this educational principle, while industry already contributes and students make their contribution by registration and levy payments for experiential learning in HEIs (Engelbrecht, 2003a:279). Jacobsz (2004:3) points out that skills programmes and learnerships were funded by the National Skills Fund (NSF) and the SETAs. Jacobsz (2004:3) also mentions that Singh regards work-based learning as an important theme in developing countries, but needs to be transformed. A major concern is that the SA Vice-Chancellors Association clearly indicated to the Department of Education that quality will be forfeited if the newly implemented subsidy is to be maintained (Jacobsz, 2004:5).

According to the CTP report (2003) on state funding (compare 2.3.2) for experiential learning for universities of technology in South Africa, the following was noted:

There was a misconception that the DoE did not fund experiential learning (EL). Costs that should ideally be spent on EL were about triple their actual costs. Additions to the universities of technology coefficients to fund EL generated R33 million for the universities of technology, then known as technikons in 2002/2003. According to the CTP report (2003:3), there was also a neglect of the proper capturing and reporting of FTEs of students on EL by universities of technology in South Africa. In addition, the following was noted in this report with regard to universities of technology:

- The number of students who have not graduated and who were awaiting EL placements amounts to 9 701 of the total of 137 623 for compulsory EL students (7,05 %).
- "About 40% of students whose programmes have a compulsory EL were not employed and generally experience difficulty in finding placement."

This report indicated that universities of technology in higher education did not always deliver with regard to the EL process and contributed as one of the reasons, to the cessation of funding for EL (CTP, 2003:3).

According to the CTP report (2003:3) on EL, the percentage of students doing EL across faculties in universities of technology (UoT) in South Africa, amounts to 28,5% (6 months) and 46,7% (12 months). This six to one year experiential learning period generated large amounts of funds in the

past for universities of technology in South Africa. According to a personal discussion with Du Pre (2004b) considerable progress has been made to re-instate funding for experiential learning, based on certain quality assured standards in South Africa.

Finally, universities of technology in South Africa, should provide the necessary resources for cooperative education to ensure that experiential learning (compare 3.9) is properly executed. Funds allocated for experiential learning be used for experiential learning and not for any other purposes. It is important that HEIs provide in the necessary human resources and infrastructure to improve EL output, national and international benchmarks be used to guide and implement a cost effective mode of delivery in experiential learning. This will concomitantly improve the throughput of students in HEIs in South Africa.

Consideration must be given in HEIs for second and third stream funding for cooperative education. HEIs should continually find new ways of financing the management and administration of cooperative education in order to produce the resources expected from this form of education. Cooperative education is necessary since it adds value to both theoretical and laboratory learning and it gives HEIs the competitive edge (CTP, 2000a:47).

Not only funding should be considered for cooperative education, but the proper management and administration of such resources is essentially to be successful in this endeavour.

3.10.2 Financial management and administration of cooperative education

According to Engelbrecht (2003a:280), the cooperative education function in a HEI should be financially planned and the financial viability of the institution will determine to what extent cooperative education will be practiced.

Engelbrecht (2003a:280) distinguishes between two facets of financial management of cooperative education, namely the expense- and the income structure. In the expense structure, a determination should be done of all the possible expenses especially the "essentials" and not the wish list, and may include staff compensation, costs involved in general industry liaison, staff development, equipment, administration and transport. On the income side, methods of generating income should be explored, and those to whom the service is provided, namely students. Engelbrecht (2003a:282) identifies the students as contributing as service recipients, who should contribute in the form of class fees (registration) and paying levies for the service

provided to them. The Department of Education (DoE) in South Africa presently provides little if any subsidy, for various reasons. The cost of placement, monitoring and evaluation of students should be recovered from the students and the state (Engelbrecht, 2003a:282).

Consideration should also be give to academic staff members involved in cooperative education. Exposure of academic staff to industry has become essential since academics tend to become isolated from the external environment. Academic staff needs to be exposed to industry to stay abreast with new technologies in their field of study.

3.11 EXPOSURE OF STAFF TO INDUSTRY

In South Africa, the corporate sector is at present undergoing significant transformation. Higher education institutions (HEIs) need to adjust to these changes. According to Weisz and Chapman (2004:256), cooperative education is a proven model that can provide HEIs with the means and confidence to succeed in the dynamic and even radical changing world of work.

Staff from HEIs with a career focused educational mandate, like universities of technology, should stay abreast with the needs and opportunities in the corporate sector. Staff should not only limit themselves to the classroom-learning environment, but should explore new avenues to acquire new knowledge and skills (Engelbrecht, 2003a:289) (compare section D, question 22, Appendix B).

Whilst universities in South Africa, specialize in academic and scientific teaching and research, the task of universities of technology (UoT) is to teach the theory and practice of technology. The largest cohort of instructional programmes offered by UoTs in South Africa was focused on the provision of career focused education, and similarly such programmes were offered by traditional universities. The competitive edge of UoTs is founded in the practice of cooperative education requiring a close linkage with the world of work. It is for this reason that there should be a conscious effort to link the academic component with the world of work. Qualified academic staff should facilitate this process and for this reason they should gain exposure to current practices in their field of expertise by applied research (problems solving) and should be in continuous consultation with commerce and industry (Engelbrecht, 2003a:290).

The Organisation for Economic Co-operation and Development (1999:112) emphasises the importance of the presence of academic staff acting as "animateurs" as key factor in the partnership process between different networks and organisations. Such academic staff or "animateurs" need to be equipped with the necessary skills to become actively involved in such

partnerships in the region in which the HEI is actively involved. Once the key academic staff members have the skills they need to mobilise the HEI as a whole, an internal dialogue about the future regional role would be possible.

Engelbrecht (2003a:292) emphasises that academic staff responsible for the more advanced learning programmes need more frequent exposure to the real world, and the present need of industry should be brought into the classroom. He emphasises that every member of staff has the responsibility to render the best service to students in their field of expertise. Engelbrecht (2003a:293) expresses the opinion that "industrial experience too should be made a requirement for tenure and promotion to full professional rank". These requirements should become part of the policies and strategies of the educational institution with regard to the professional development of staff". Exposure of staff to industry should be properly planned and executed which may include contracts/agreements with companies. Monitoring mechanisms should also be in place (Engelbrecht, 2003a:296).

Many schools have begun to address this lack of understanding by facilitating teacher/industry staff exchanges and allow teachers to understand how academic and technical skills were applied at the work site. Teachers were given release time from the classroom duties or paid a daily fee for time engaged in summer/winter activities. Teachers work and observe in commerce and industry for one to five days. When teachers return to classroom, they arrange for one or more individuals they worked with in business to spend at least one day at the school with the students (Brown, 1995:43).

Brown (1995:43) found the connections through these exchanges provided valuable resources and technical support needed to increase the likelihood of success. The involvement of business staff from the earliest stages of planning is critical. The most common barrier Brown (1995:43) found, was the lack of knowledge about how to initiate the connection between companies and schools. According to Brown (1995:43) "a successful school-to-work system requires both school and business to work continuously – as a team – to clarify the conceptual linkage between school based enterprises, work-based learning and career plans".

Exposure and exchange of academic staff to industry and industry staff to HEIs not only contribute to "partnership" relationships but are beneficial for all relevant role players.

Cooperative education makes provision for the integration of classroom learning with learning in the workplace. Cooperative education therefore requires academic staff to interact or liaise with

internal as well as external stakeholders to ensure this teaching and learning strategy is effective executed.

3.12 LIAISON

3.12.1 Introduction

Cooperative education implies a cooperative venture or "partnership" between the HEI and the company organisations (compare section D, question 25, Appendix B). At present, in South Africa it is mainly higher education institutions who were active participants in cooperative education (Du Plessis, 1991:228). There is also a tendency in South Africa to involve other higher educational institutions, such as traditional universities, in cooperative education. Locally, the South African Society for Cooperative Education (SASCE) primary function is to promote cooperative education whilst on internationally level the World Association for Cooperative Education (WACE) is engaged in this role. In most industrial countries in the world it is general practice that universities were involved in cooperative education (Du Plessis, 1991:229). Locally, universities were only involved to a limited extend in cooperative education.

The utilisation of the term "model/s"(compare 3.2.3) in cooperative education could be applicable for various purposes. Du Plessis (1991:230) applies the term "model" to the various course compositions of under-graduate/diploma programmes in HEIs, for example 2 years of classroom and one year of experiential learning. There is a tendency in HEIs in South Africa to increase the time spent on campus whilst the experiential learning component is decreased, due to various reasons. In Europe a very popular model involves that students attend three days of classes and one to two days practical work at a cooperating company (Du Plessis, 1991:232).

Gayten and Parnell (1996:21) stress that the Boeing company recognised the need for the company community to be more actively involved in working with community colleges, improving education, skills and employability with 75 % of individuals who will not likely complete a four-year college education. The Boeing company has developed and implemented a model "school-to-associate degree-to-work" effort by utilising a nationally recognised Tech Prep Associate Degree programme which combines a high school and community college curriculum that integrates the academic and vocational with contextual teaching leading to a degree. Contextual teaching means the combining of subject matter content with context of application in the teaching and learning process. This programme is being accomplished in two phases, namely the initial phase to help

build the contextual phase in the secondary school system and the second phase was to promote the development of the programme and provide summer work based student internship programmes related to manufacturing technology (Gayten & Parnell, 1996:21).

The involvement of academic staff in the liaison/partnership activity in HEIs is important, and will be discussed in more detail below.

3.12.2 Liaison: academic staff

Lecturers have become business partners since business has come to the realisation that they cannot alone upgrade workers skills and were forced to turn to the educational system to help them meet the challenges. Most of the American nation's problems come from international competitiveness to improve standards of living, ultimately rests on one word, namely education.

Teamwork involves the cooperation of a group of multi-skilled workers who rotate jobs and complete product or service under minimal supervision, while innovation creates a solution but also implements it. The only means to deal with change is to be innovative. The combination of both teamwork and innovation is a potent mechanism for achieving high levels of productivity.

Two very important practical concepts in the world of work were teamwork and innovation. Student acquires new skills apart from the "basic" skills of reading and writing, which may be called "new basics" and which refer to non-technical skills. These skills include intercommunication skills, problem solving, teamwork etc.

According to Piaget's Constructivist Theory (Papalia and Olds, 1988:236) all knowledge arises from the interactions between students and their environment (compare 2.9.2.1). The lecturer in a higher education institution can help to facilitate this by building a bridge between the two and will help the content become more accessible to students. Two concepts used by business and education in essence were the same, "work design" in industry and "restructuring " in education.

The role of companies as external partner is important since the absence of a suitable placement opportunity at a company, experiential learning is not possible. The willingness of companies to participate as partner is essential in the tri-partite relationship.

3.12.3 Liaison: companies

Coll and Chapman (2000b:1) describe companies as an integral part of the cooperative education triangle and argue that their continued support is crucial to the long-term success of any academic programme (compare section D, question 23, Appendix B). The fact that companies show considerable loyalty to programmes is often taken as an indicator of success. Company's needs were crucial for the success of cooperative education programmes. Research by Coll and Chapman (2001:7) found the matching of students to company needs is the core business of placement coordinators, soft skills like communication and interpersonal skills were rated highly with less emphasis placed on technical skills and as companies needs may change over time. Coordinators need to be more flexible by focusing more on the needs of the company rather the coordinators needs themselves.

Riches (1997:1) indicates that the position with regard to the provision of middle and high level manpower in South Africa has not been improved and there continues to be a shortage of suitably educated and trained manpower at this level. Exchange of professional expertise between HEIs and industry with regard to curriculum development, staff development and the acquisition of appropriate technology were of critical importance. According to Riches (1997:4), there is a current trend among HEIs of vocational education and training to move towards some form of workplace attachment, work shadowing or in-service training. In the past 15 years the clothing industry has considerably participated in the assimilation and absorption of HEIs students into the workplace as part of their training. The economy is not driven by qualifications but by market forces and the production processes which were related to the needs of the consumer and the country (Riches, 1997:5).

The advisory committee is an ideal forum for interaction and participation of all stakeholders in the cooperative education venture, to ensure companies make significant contribution to the learning programme in question.

3.12.4 Advisory committees

According to Heard and Farrington (1998:105), a company liaison group, also known as an advisory committee, on departmental basis for learning programmes is aimed to embed personal ("enterprise") skills development into all teaching and learning on a systematic basis (compare section D, question 12, Appendix B). This company liaison group is keen to participate in academic departments with aims in two areas, namely comment and guidance on personal skills

development in the curriculum and direct involvement in students' preparation for employment. Heard and Farrington (1998:106) found that companies did not seek involvement with regard to the academic contents of such programmes.

The importance of advisory committees cannot be overemphasised. Usually one advisory committee is appointed for each instructional programme within a HEI. According to the Best Practice in Cooperative Education (CTP, 2000a:81), the purpose of such advisory committee is strictly advisory and should remain a sounding board for advice on operating procedures, re-curriculating, planning and guidance regarding cooperation with commerce and industry. An advisory committee normally consists of seven to twelve persons selected from the following representation groups, namely the higher education institution which include the head of the academic department, administrative staff member, lecturers, and co-coordinators, from business, chamber of commerce representatives, civic of professional clubs and company representatives from labour, labour organisations, unions, students, a capable student and SRC representative, for example SRC President, professional board representative such as ECSA, HPCSA, SAICA, SETA and Skills Development Facilitator (SDF) and a representative from selected companies.

Advisory committees need to function efficiently if each member plays a definite part in planning and monitoring of the overall operations of the cooperative education plan. It is recommended that the frequency of each advisory committee meeting is to be determined by itself but is recommended that at least one meeting for each academic programme is convened per semester (CTP, 2000a:82). According to the CHE (2004a:6), engagement on local, regional, national level and international imperatives (criterion 1) for HEIs is essential to establish a fitness for purpose.

Engelbrecht (2003a:255) distinguishes between two types of advisory committees, namely

- An academic advisory group in programmes in which academic credit is awarded for experiential learning. In such cases an advisory committee is appointed for each instructional programme having the primary duty to be advisory; and
- Companies-only advisory group to keep companies informed of what is going on in the higher education institution.

The Senate of the HEI concerned should approve the policy and guidelines required for the management of an advisory committee.

The principle and nature of partnerships are discussed in the following sections.

3.12.5 Partnerships

3.12.5.1 Introduction

According to Moore (2005:2), partnerships should have a clear vision of the need for rigorous frameworks to be in place to support the learning process. According to Olivier (2002:4), the education system in South Africa does not make provision for skilled workers and there is no shortage of work opportunities but the education system creates workers not in demand. Furthermore, self-driven people who are capable to work independently and with easy adjustment are required. Companies should become mentors of educational institutions, such as schools and HEIs, and should transfer companies' creativity concerning education to such institutions.

According to Butt (1993:28) partnerships between industry and higher education institutions (HEIs) has a long and proud history in South Africa. He emphasises the importance of the three major participants, namely the student, HEI and industry. He strongly believes cooperative education exists in isolation and has become "divorced from the real world". The modern trend is for more active participation by all role players, but this seems not to occur since both industry and HEI become consumed by their daily routine.

A good example of a partnership between the education sector and commerce and industry, is the SBE (School Based Enterprise) whereby students open a business at the school or otherwise produce goods or services that they intend to sell. According to Brown (1995:41), students who had experience in traditional part-time work believed their jobs in school-based enterprises had stronger connections to their education than non-school jobs. Moore (2005:2) expresses the opinion that there is a major shift in the academia to value work-based learning (WBL) as a form of independent learning having systems in place to ensure quality.

According to Brown (1995:43), one major obstacle to develop strong work-based learning experience is a lack of empathy. Lecturers often do not understand how academic content is applied in the workplace and so companies and employees in the private sector have little insight into the problems of lecturers or education.

Below, the relationship between cooperative education and partnership is explored.

3.12.5.2 Cooperative education and partnerships

Cooperative education being a national and international phenomenon in higher education needs to be considered as an important partnership mechanism in the interaction process between HEIs and industry.

Cooperative education still remains the only way through which all three role players could become more closely involved. In HEIs where no cooperative education is practiced, this interaction becomes limited, to the detriment of all role players. Commerce and industry are predominantly caught up in the wheel of the economic activity and many times HEIs involvement simply becomes an irritation. However, the formal industry and especially the building industry were deeply involved in education and training (Butt, 1993:30). More emphasis should be placed on the word "cooperative" in cooperative education with regard to all three-major participants. HEIs would have to give industry what they want or face becoming irrelevant (Butt, 1993:30).

The importance of partnership linkages with commerce and industry is not only limited to HEIs but early experiential learning models for high school students is suggested as the next natural step in assuring sustained growth of focused careers in economically disadvantaged world communities (Frances, 2001:1). According to Kay and Shadbolt (2005:12), cooperative education activities were underpinned and supported by a range of industry engagements strategies in the higher education institution; if not it remains fragile, narrow and operational activities were of short term nature.

Potential areas of collaboration between stakeholders will be investigated below.

3.12.5.3 Areas of collaboration in partnerships

According to Priestley (1996:1), cooperative education is an ideal vehicle for building partnerships between business and education, developing vocational skills and improving graduate selection. Cooperative education therefore benefits the HEI, the student as well as companies. Due to an oversupply of graduates in the labour market, companies were increasingly seeking and selecting for a range of vocational skills necessary for the company market. The development of work-related competencies is best achieved as an integration of the education process (Priestley, 1996:1). Cooperative education facilitates this development and furthermore provides opportunities for companies to assess a potential recruit.

The building of partnerships through collaborative arrangements could be in the following areas: graduate recruitment, student work placements, scholarships, training and education, consultancy, research, representational, donations, chairs and endowments. Priestley (1996:2) states "cooperative education which integrates work experience into higher education programmes is an ideal vehicle for building partnerships between business and education, developing vocational skills and improving graduate selection".

Higher Education institutions have interfaced rather poorly with the private sector in the past and now demand far closer collaboration between higher education and commerce and industry. Institutions of higher education interact and cooperate with commerce and industry in various ways. Recent developments in academic research (Carstens & Mouton, 2002:4) point to a growing emphasis on close collaboration between commerce and industry and higher education and identifies a number of prominent forms of research collaborations between the two role players, namely consultancy and contracting, dynamic research and development (R&D) networks, long-term strategic alliances, co-vocational collaboration, research centres, research institutes, technology transfer offices, academic incubators, science parks, academic spin-off companies.

Society needs to learn how to work. This can be achieved from the early days of learning in even primary and secondary school education phases. There should be a merger or symbiotic relationship between all levels of education and business. In the United States of America (USA) the government schools-to-work opportunities Act of 1994 has set school business partnerships in action. About 1 billion dollar has been invested in the creation of such partnerships. These partnerships included four basic elements, namely "career" majors, on syllabi including academic and vocational majors in school, work-based learning including coordination of school work with work experience and training, connecting activities, namely mentorship and apprenticeships involving companies and students, career development in helping students to match their strengths and aptitudes with career choices (Black, 1998:36).

In school-to-work partnerships, business should contribute time, money and manpower. Such investments will pay of in the short to long term. Both parties must realise the benefits. For schools it include tangible resources such as gifts, loans, money equipment etc. whilst for business the benefits were mainly economic, provision of human resources and even includes satisfaction of teaching students at the workplace and involvement in schools (Black, 1998:37). Black (1998:37) argues that the majority of students leaving high school were skills deficient workforce that hampers the entire countries economic growth.

The benefits to the relevant stakeholders of the partnership relationship also need to be explored.

3.12.5.4 Benefits of partnerships

George *et al.* (2001:604) confirm that companies developing links with universities can have a beneficial effect on the company's operations and companies with university linkages have lower research and development expenses while having higher levels of innovative output, but do not support the proposition that companies with university linkages achieve higher financial performances.

In recruiting for specific disciplines, the features that distinguished between applicants were communication skills, interpersonal skills, presentation and motivation (Priestley, 1996:3). Priestley (1996:4) found that project work in classrooms, and extracurricular work in and off campus developed interpersonal and communication skills and the most effective means of developing vocational skills were through work experience. Various programmes to recruit and develop graduates for the workforce were traineeship, scholarships, cooperative education programmes, vacation students, new graduates and further education. According to Priestley (1996:7), "co-operative education programs provide higher education institutions with opportunities for developing partnerships with business and industry through the extensive contacts that were generated".

According to the School-to-work Opportunities Act, schools across the country of Kentucky in the USA were implementing reforms aimed at more closely aligning education with the needs of business and industry. Typical restructured curricula call for more students to learn at the actual workplace. (Brown, 1995:41). Brown (1995:41) believes that it is not difficult to find examples of companies willing to participate in or contribute to the education of students.

According to the report by the Organization for Economic Co-operation and Development (1999:6) it was recommended that government needs to promote partnerships and dialogue between regional education providers and schools, further education, higher education and other education providers. Partnerships were intended for the long term and affect the behaviour of participants. The report emphasises the need of a training institution to become involved on a regional basis, in the provision of skilled human resources according to the needs of the labour market of the region.

The USA has no formal system for helping young people to navigate successfully between their learning and work experiences. Lecturers and business need to link students to the world of work. According to Black (1998:37) students who participated in school-to-work programmes were more likely to be employed, participate in some form of training, earn more money and have higher status jobs than students who do not participate in these programmes. It is estimated that 30% of

high schools involved in partnerships, teachers will work with companies to develop curriculum units for either the school or worksite. Curriculum changes in schools is of lower priority than career development or workplace activities and focus more on career awareness for students, introducing students to careers, helping them with career choices (Black, 1998:38).

According to Richards and Merker (1997:43) the introduction of students from a very early phase of education, namely primary school level to work related concepts and experiences is of importance. Fostering of relationships between business and educational communities by training business volunteers to work with teachers in elementary school has proved to be successful. Classrooms may be visited by such volunteers to present children with an informative and entertaining view of the world of work. Workplace visits should be designed to let students actively participate and ask lots of questions. Business volunteers should visit schools on a consistent basis giving students time and means to become acquainted with the world of work on a personal level and students then gain an understanding of how the skills learned in school connect to work and teachers must learn to view the classroom as an important "workplace" for children (Richards & Merker, 1997:44).

Many opportunities exist for HEIs to form partnerships with commerce and industry and cooperative education is an excellent vehicle to create such opportunities.

Partnerships should not be limited to the national level but should be extended beyond boarders to the international level, especially with regard to the placement and exchange of students for experiential learning.

3.13 INTERNATIONALISATION OF COOPERATIVE EDUCATION

According to Reeve (2004:189), as early as 1948 engineering students accessed work experience abroad through the establishment of the International Association for the Exchange of Students for Technical Experience (IAESTE). Many articles appeared in this regard in 1969 in the Journal for Cooperative Education (compare section D, question 26, Appendix B).

The World Association for Cooperative Education (WACE) published and presented a Guide for Developing International Co-op Programs at the 10th world conference in cooperative education in Cape Town, South Africa. This guide on international cooperative education was based on a survey conducted in 1996-1997, based on the involvement of post-secondary students from one country being sent to another country to gain work experience in areas related to their academic

discipline. It must be noted that in all these programmes, the cooperative education activity in more than 40 different academic disciplines, more than 2000 students were placed per annum. Most of the international cooperative education programmes operated between educational institutions in two countries (Reeve, 2004:189).

The Guide for Developing International Co-operative Education Programs (WACE, 1997) described the various models of current best practices, as well as the criteria of importance to the success of international cooperative education programmes. De Lange (2002:13) describes three German-South African exchange models as very successful in transferring new technologies from a developed country (Germany) to a developing economy (South Africa) and includes the branch location placement model, consortium placement model and academic/work exchange model.

According to Whitmore (2005:7), international placements of students require the cultivation of a broad range of "cultural intelligence" to success in the global workforce – they must be aware of their own cultural values, be sensitive to intercultural matters, and have intercultural communication skills.

To introduce an international exchange model it is best to pursue, the exchange model, especially in the initial stages of development. Reeve (2004:205) recommends finding exchange partners at the World Association for Cooperative Education conferences held bi-annually (Reeve, 2004:205).

Furthermore, cooperative education should be promoted internally as well as externally to the university to ensure stakeholders were knowledgeable with the aims and objectives of cooperative education.

3.14 PROMOTION OF COOPERATIVE EDUCATION

Coll and Eames (2004:280), suggest two forms of cooperative education publicity, the first in which cooperative education success stories were used for student recruitment and second for companies in which research based studies of company benefits were used to help convince companies of cooperative education involvement (compare section D, question 27 to 29, Appendix B). Sovilla and Varty (2004:3) states: "Our call is to draw upon expertise and new research to legitimise co-op as educational endeavour. To us the long-term survival of co-op lies in articulating a clear perception of what coop is and what it is not, and providing a strong research base that supports the contention that it is about educating students."

Apart from the proposals from the researchers mentioned it is recommended that the following endeavours should be considered in promoting cooperative education within and external to the higher education institution:

3.14.1 Within the higher education institution (HEI)

Staff within a HEI, should be well informed with regard to the purpose and value of cooperative education. HEIs such as the universities of technology, locally and abroad have a strong focus on the provision of vocational education, and cooperative education forms the core of this philosophy (Duignan, 2005:59).

Often academics were not well informed with regard to cooperative education within higher education institution's (HEIs), and tend to treat cooperative education as if it is on the periphery of the HEI (Eames and Cates, 2004:39). For this reason academic staff members co-operate well, while others show complete ignorance and even resistance towards cooperative education.

Wessels (2003:8) identifies the following, among others, as different strategies to promote cooperative education within a higher education institution:

- The Manager for cooperative education should maintain an open communication/support channel on an individual basis with all academic staff at all times. The manager should maintain good interpersonal relationships with all academics and students;
- Academic staff and cooperative education practitioners (coordinators) should participate in cooperative education discussions through a proper forum, such as a cooperative education committee. Each faculty should have their own cooperative education committee, consisting of cooperative education practitioners, lecturers and students;
- Implement a system/structure for the management of cooperative education in which key academics were involved in the initial and/or later phase;
- Regular workshops on an individual basis with deans, heads of departments and coordinators. It is also recommended that group workshops be done on specific cooperative education issues. Training of cooperative education practitioners is essential;
- Internal newsletters and information (electronic) must be distributed to academic as well as non-academic staff to inform/educate staff on cooperative education matters;
- Interact with students in class through coordinators; and

- Involve student councils/student affairs department.

Consideration should also be given towards promotion of cooperative education external to the university.

3.14.2 External to the higher education institution (HEI)

Higher education institutions (HEIs) cannot function in isolation from the world of work. It is very important on the one hand for HEIs to provide in the needs of industry, for example skilled human resources and on the other hand create opportunities for industry to deliver advice and inputs with regard to economic activity and changes in technology (Engelbrecht, 2003a:255).

Human resource development should be provided by HEIs to commerce and industry according to the needs of companies in the specific region served. Each region has their own training needs and academics need to have the necessary skills to become actively involved in partnerships in such region, in which the HEI is involved.

According to Wessels (2003:9) the following were, among others, strategies to promote cooperative education in commerce and industry:

- Regular contact and interaction by the cooperative education manager/practitioners within companies/companies;
- Informing companies with regard to cooperative education activities by means of information brochures, web pages, CDs etc.;
- Establish and maintain contact on a daily basis with commerce and industry;
- Involvement of companies in HEIs on activities e.g. advisory committees;
- Active involvement in the local community and chamber of commerce; and
- Inputs/feedback from companies in HEIs with regard to research, short courses, technology and training needs. Inputs include needs from industry with regard to curriculum development to provide in competent and skilled labour force to industry.

On a national level cooperative education is promoted by the Southern African Society for Cooperative Education (SASCE) and on international level by the World Association for Cooperative Education (WACE). Similar associations were now practiced on most continents (Reeve, 2004:189).

The cooperative education venture requires entrepreneurship skills and activities that need to be explored.

3.15 ENTREPRENEURSHIP IN COOPERATIVE EDUCATION

The word entrepreneur is derived from the French verb "entreprendre", which means to undertake, to pursue opportunities to fulfil needs and wants through innovation, to assume the risks of launching a new product venture or idea. Entrepreneurs were people who find creative ways to get things done. Such entrepreneurs were found in government and large corporations and the business world. They were truly the driving force behind successful economic systems (Van Dyk *et al.*, 1993:336).

Various entrepreneurship programmes were offered nationally as well as internationally to become an entrepreneur. It has been noted by Van Dyk *et al.* (1993: 336) that the majority of university offered programmes in South Africa have been proved to be unsuccessful since most universities and business schools were orientated entirely towards teaching, training and educating professional managers - students whom will be employed by someone else. Van Dyk *et al.* (1993: 340) refer to one successful entrepreneurship programme at the De Paul University in Chicago, Illinois as one of the most comprehensive in the world.

According to van Dyk *et al.* (1993:356), for the South African economy to become more vitally productive in the post-apartheid era entrepreneurial principles must be fostered in all economic sectors. According to Olawuni and Bamiro (2005:20), universities in Nigeria need to be innovative and should reach out to industries and students need to be prepared for the future demanding entrepreneurial and technopreneurship development.

Entrepreneurship plays a very important role in the cooperative education venture as part of the management function of cooperative education. Managers/practitioners of cooperative education should not only have academic skills, but should have entrepreneurial and business skills, for the following reasons:

- Managers of cooperative education should have the initiative, interpersonal, communication and business skills to interact with all relevant role players, namely commerce and industry, the HEI and the student;
- Managers of cooperative education should establish and manage cooperative education as a business entity either internally or externally to the HEI;

- If limitations towards the growth and expansion of cooperative education is experienced within a HEI, entrepreneurial initiatives should be taken to privatise cooperative education and provide such a service to HEIs;
- Create second and third stream funding initiatives for cooperative education for the HEI;
- Identify any possible initiative from commerce and industry to provide in a service needed by such industries, with a commercial outcome; and
- Cooperative education practitioners were entrepreneurial with regard to research as well as on operational level in cooperative education, internally as well externally to the HEI.

The cooperative education managers/practitioners should be an entrepreneur in the true sense of the word since cooperative education requires such skills to be able to create opportunities not only for students, the HEI, but also in the industrial environment. Lastly, entrepreneurial skills were a requirement since it would enable managers of cooperative education to optimise the cooperative education venture as a strategy of learning.

Higher education institutions should explore all means to improve on the cooperative education activity with the relevant stakeholders. Technology applications should be considered for such purposes.

3.16 TELEMATIC APPLICATIONS IN COOPERATIVE EDUCATION

According to Grobler (1995:28), a computer-supported cooperative education environment has the benefit that it holds the potential to prepare the student better for the world of work than the traditional classroom. According to Tyler-Smith (2005:1) web-based learning has the possibility to deal with the perceived weaknesses of traditional methods of work-place based training and instruction.

Hoyt and Thalman (2001:18) suggests the innovative use of on-line technologies for service learning since it increases participation of students, provide more opportunities for critical thinking, enhance communication between all role players, cohesive group work, projects were completed closer to deadlines, there was earlier interaction with supervisors etc. The use of an on-line platform in a workplace will optimize employee time on projects, reduce costs, maximise outcome performance and improve efficiency of other work activities (Hoyt & Thalman, 2001:18). Todd and

Cates (2005:5) describe the use of on-line data collection and evaluation tools, to enable the effective gathering of data and being able to communicate such data to faculty administration.

According to Stuart (1999:16), the utilisation of Interactive Instructional Television (IITV) enhances the development of specific skills required for work placement amongst students who choose to access educational opportunities at a distance from the HEI campus. According to Engelbrecht (2003a:83), IITV is the "next best thing to being there" to enhance skills development through demonstrations and feedback. Cooperative education programmes were now able to offer coursework and work placements to students at great distances from the campus. Furthermore, it offers educators/CELs the opportunity to reach many more students. This technology can be used to enhance learning experience of students through increased interpersonal contact, thus preparing them to apply the learning in their workplace. Stuart (1999:17) recognises this as a challenge to effectively deliver the curriculum such that students were both knowledgeable and self-aware in order to meet the challenges of the workplace. IITV is more effective than telephone discussions, videotapes etc. For cooperative education students who were required to demonstrate their skills in the workplace throughout their educational experience, the use of IITV provides additional opportunities for reflection (debriefing) and practice in a relatively safe classroom environment during or prior to entering a workplace (Stuart, 1999:22).

IITV could be used during the experiential learning process at the worksite (Sheperd, 1998:135) (compare section D, question 30, Appendix B). Micetic-Turk *et al.* (2005:6) differentiate between distance education and e-learning and emphasise that learners can access learning by e-learning anywhere, any place and any time.

The application of telematic technology within a HEI may among others include:

- Cooperative education Web page: as part of the HEI to be used as an information source, registration for EL by students, SASCE registration, company usage etc.;
- CD Rom material: in which cooperative education practitioners may be provided with a CD Rom material to promote cooperative education either internally or externally; and,
- On-line student preparation: where the student can prepare himself/herself for the workplace individually or in class using updated material.

According to Engelbrecht (2003a:83) the advent of interactive technology in education brings in a dynamic aspect of learning into the students educational experience with a total paradigm shift to

encourage regular student involvement. In this way cooperative education programmes can be offered to students at great distances from the campus.

Video conferencing can be used for campus recruitment and selection as well as for conducting employment recruitment interviews for HEI applicants with the advantage that it is cost saving and having greater access to more applicants. The use of computers to be linked to company websites via internet is of great value in cooperative education. The use of e-mail for communication with students and companies has many advantages – presenting CVs for company selection and application forms for placement/employment could be done by using e-mail, the consideration of using "logbooks" electronically should be considered, to replace the complexity of logbook handling in a HEI. The University of Waterloo has developed an on-line system to place all their cooperative education positions, companies and applicants (Engelbrecht, 2003a:84).

In South African HEIs a number of cooperative education subsystems were used mostly on an ad hoc basis, for example the Inter-tertiary System (ITS) developed by ITS in South Africa (Engelbrecht, 2003a:88).

Finally, the management of quality of cooperative education is essential for compliance to minimum standards on work-based learning, as set by the HEQC (CHE, 2004a:11) according to criteria 7 and 15.

3.17 QUALITY MANAGEMENT (COMPARE FIGURE 2.6; 6.5)

The institutionalisation of quality assurance is firmly on the agenda of higher education in a number of developed and developing countries around the world (CHE, 2003:1) (compare section D, question 31, Appendix B). There is a greater demand for accountability and efficiency concerning all matters in higher education globally. This has also lead to an increasing implementation of formal quality assurance arrangements within higher education institutions and systems, in South Africa. A quality assurance system is intended to ensure that all higher education and training programmes were relevant and responsive to the needs of students, companies and other stakeholders (CHE, 2001:1).

According to the founding document of the Council on Higher Education (2001:1) the construction of a national quality assurance system is a critical component of the restructuring of higher education in South Africa, which is currently underway. This committee makes it clear that quality is identified as one of the principles that should guide the transformation of higher education.

According to the Council on Higher Education (CHE, 2001:8) it is committed to a quality driven higher education system in South Africa having the central objective to ensure that providers effectively and efficiently deliver education, training, research and community service of high quality and which produce socially useful and enriching knowledge as well as a relevant range of graduate skills and competencies necessary for social and economic progress. Furthermore, the primary responsibility of the Council on Higher Education as an Education and Training Quality Assurer (ETQA) will be to ensure that the quality provision of qualifications in higher education is maintained and enhanced through evaluating and monitoring the capacity of higher education providers to deliver those qualifications effectively and efficiently.

According to the CHE founding document (CHE, 2001:15) the primary responsibility for quality assurance rests with the higher education providers. The role of the HEQC will be to provide external validations of the judgments of providers about quality levels based primarily on self-evaluation reports. This document (CHE, 2001:16) emphasises that students as important stakeholder want opportunities for personal development as well as certification from quality providers to enhance education and training progression as well as employment possibilities, whilst companies as another stakeholder want flexibility skilled graduates who do not need a long settling in period before they contribute to productivity and competitiveness. It states that government and society in general wants value for money in the production of high skilled workforce necessary for economic competitiveness and social development.

According to the CHE (2001:18), the cooperative education model in higher education institution sector is a good example of community service programmes (compare 3.8). It is intended to that quality assurance for community service programmes will be conducted cooperatively with bodies such as the SETA'S within the context of a policy framework that is acceptable to the CHE.

In the last decade, most universities of technology (former technikons) and the former Technikon component of comprehensive universities in South Africa have been subjected to regular external validation from the Certification Council of technikons (SERTEC) and institutional self-evaluation (ISE). One of these, the Cape Peninsula University of Technology (former Cape Technikon) has developed a model for quality control based on institutional self-evaluation (ISE) in 1990 (Kok, 2000:55). According to Kok (2000:55) the ISE of the former Cape Technikon comprises comprehensive evaluation of all programmes, including students' experiential learning as well as academic support activities. The quality assurance system relies on selected panels for investigating and evaluating all facets of the various activities within the HEI for example teaching methods, placing and monitoring of cooperative education students, service provision, assessment

methods and feedback from students and industry. All panel reports were submitted for scrutiny to the Quality Assurance Committee (QAC), which in turn reports to Senate.

According to the CHE (2004a:11), criteria for institutional audits, directs HEIs with regard to requirements for the management of quality for work-based learning and service learning as part of cooperative education.

According to Kok (2000:56) institution-wide surveys were conducted annually by means of questionnaires. Total quality management, according to Kok (2000:57) is not only about providing the necessary institutional infrastructure but also particularly ensuring that all systems were managed so that quality is enhanced. Effective cooperative education learning is dependent upon well managed institutional systems such as selection of suitable cooperative education coordinators, administrative support structures, curriculum changes, learning contracts and feedback (debriefing), staff evaluation and relationships to commerce and industry. Kok (2000:59) claims that "a very sound relationship with stakeholders in commerce and industry is essential for an experiential learning system to be successful". A variety of contact techniques were employed by the Cape Technikon, such as telephonic contact, visits to students, invitations to visit the institution, involvement in advisory committee meetings and involvement of companies in external examinations (Kok, 2000:59).

Since the implementation of the quality management model for the Cape Technikon for the last 10 years, it resulted in staff being more motivated and confident to improve student learning practices and this initiative has resulted that the Cape Technikon is being regarded as one of the leading HEIs in South Africa (Kok, 2000:60).

According to the New Academic Policy for Programs and Qualifications in Higher Education (CHE, 2001:1of 4), "the people of our country deserve nothing less than a quality higher education system". To establish a higher education system that can meet the challenges and grasp the opportunities to us in the contemporary world we must be able to produce graduates with high quality skills and competencies in all fields. Furthermore, it is necessary to integrate the research and training capacity of higher education with the needs of industry and to produce graduates with the skills and competencies to meet the resource needs of the country (CHE, 2001:1of 20).

Cooperative education implies quality education in HEIs since it intends not only to coordinate and promote cooperative education principles but to endeavour to align training needs with the training needs of the country and promote quality academic programmes within HEIs.

Forbes (2004a:173) proposes a cooperative education quality assurance model for experiential learning in HEIs in South Africa. According to Forbes (2004a:174), the classroom moves into commerce and industry and the mentor from industry supports the student, the coordinator from the HEI is to ensure that the structured learning process is effectively managed. Experiential learning (EL) for students is managed by staff who have to ensure that the total learning experience meets the agreed outcomes specified in the course submissions to SAQA (Forbes, 2004a:174).

According to the Best Practice in Cooperative Education (CTP, 2000a:11), cooperative education can be managed according to three models (compare 3.2.3). Irrespective of which management model is selected by the HEI it is more important that a quality management system be in place to measure specific outcomes intended for cooperative education within the HEI. Page and Geck (2000:43) defines the term "quality" as a level of superiority or a degree of excellence. Forbes (2005:5) differentiates between the various terminology related to quality. Several authors in cooperative education have advanced to a fitness for use definition suggesting that quality is relative to the needs of the consumer (CHE, 2001:14). Cooperative education literature relates quality to that which is satisfactory, excellent, good or successful.

3.18 SUMMARY

In this chapter a literature review was undertaken to achieve objective 1 (compare Table 1.1, p 5), namely to compare best practices in cooperative education, nationally and internationally. Special attention was given to best practices in the South African context in higher education institutions (HEIs), with a special focus on universities of technology and comprehensive universities. A literature survey could not present information regarding cooperative education in traditional universities in South Africa.

From the literature review it is clear that there is a definite correlation between local and international best practices and that there are specific benchmark higher education institutions locally and abroad with regard to cooperative education. The literature review confirms best practices in cooperative education in especially universities of technology/ comprehensive universities in South Africa, having a specific “cutting edge”, namely career education through cooperative education. Locally, best practices vary from one higher education institution (universities of technology/comprehensive universities) to another, but significant progress has been made with regard to the development of such practices. It must be noted that benchmarks

not only exists in UoTs in South Africa but also exists in the traditional universities, but has not been noted in the literature in relation to the concept of cooperative education.

In can be concluded that according to the literature review on cooperative education, higher education institutions (universities of technology and traditional universities) in the USA, have well established practices in cooperative education, than the South African counterparts, and the practice of cooperative education is established in more than 60 countries, globally.

It was noted that higher education institutions in South Africa have excelled in the establishment of best practices in cooperative education, but still have to go a long way in comparison with the USA, for instance. Federal legislation and funding stands out as a major contributor in the advancement of cooperative education in South Africa.

Finally, a comparative literature survey on best practices in cooperative education locally and abroad has been presented in this chapter.

In the next chapter the research design and methodology will be discussed.

CHAPTER 4
RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

In this chapter there will be a focus on defining the research problem, explaining the purpose of the empirical study, collection methods, the structure of the questionnaire as measuring instrument, the pilot study, administrative procedure used, data processing, population sampling and the principles related to validity, reliability, generalisability and factor analysis in relation to the three population groups selected for this study, with a final summary.

The definition of the research problem and explanation of the purpose of this study in relation to the objectives of this study are presented below. This is followed by a discussion of the data collection methods in which a questionnaire was used as a measuring instrument in this research and in which all the advantages and disadvantages of a structured, closed-ended questionnaire as well as the structure of the questionnaire was discussed. Thereafter a discussion of the pilot study is presented, followed by the administrative procedure used, editing and coding of data and data processing. The population and sampling are discussed and an explanation is given of the principles of validity, reliability and generalisibility. The chapter is concluded by an explanation of factor analysis and a summary.

4.2 DEFINITION OF A RESEARCH PROBLEM

4.2.1 Problem definition

Welman and Kruger (1999:12) define a research problem as some difficulty the researcher experiences in the context of either a theoretical or practical situation and to which the researcher wants to find a solution.

The problem, as defined in Chapter 1, is the lack of clear guidelines in higher education institutions in South Africa to standardise, implement and manage cooperative education practices (compare 1.3 and 7.3). It is intended with this research to determine the present status of cooperative

education in specific targeted study population in teaching and learning organisations in the Gauteng region (compare 4.12.2) in South Africa, to propose guidelines as to give direction with regard to cooperative education in not only higher education institutions in South Africa but also serve as directive to commerce and industry in this regard. It must be noted that a multidisciplinary approach was followed in mechanical engineering, nursing and accounting (compare 4.12.3). All three disciplines were directed by professional bodies and the qualifications were directed towards a professional profession.

With the problem having been defined above, it is necessary to describe the purpose of this research.

4.3 THE PURPOSE OF THE EMPIRICAL INVESTIGATION

The purpose in this empirical investigation was to collect data from two target populations, namely higher education institutions (HEIs) and companies in industry, located in the Gauteng province in South Africa. The study population within these target populations consisted of students and academic heads of departments in the higher education institutions and supervisors of students in companies in industry.

From this research, the tendencies were observed from the study population and guidelines were compiled which could be used as directive by HEIs and commerce and industry for the improvement of cooperative education principles and practices.

The different data collection methods were explored.

4.4 DATA COLLECTION METHODS

4.4.1 The questionnaire as measuring instrument

According to Neuman (1994:221), the survey is the most widely used data gathering instrument in many fields of study, and is almost too popular. White (2003:66) explains that a questionnaire is an instrument with open or closed questions or statements to which a respondent must act and is the most widely used technique for obtaining information from subjects. Cohen *et al.* (2003:245) also remarks that a questionnaire is a widely used instrument for collecting survey information providing structured and numerical data, as it can be administered without the presence of a researcher and it is comparatively straightforward to analyse.

Questionnaires are therefore used in research to gather information in writing, which is not normally visible and may be used to collect information with regard to behaviour, attitudes and beliefs or opinions, characteristics, expectations, classification and knowledge (Neuman, 1994:222).

According to Alreck and Settle (2004:146), the questionnaire has several functions or objectives. The first section of the questionnaire, for example, introduces the survey to the respondents; the internal section contains the items and scales to measure the survey topics; and the final section has the questions to measure the respondents characteristics to group and compare the individual cases.

White (2003:66) suggests the following guidelines for writing effective questions or statements in the questionnaire:

- Make items clear;
- Avoid double-barrelled questions;
- Respondents must be competent to answer;
- Questions should be relevant;
- Simple items are the best;
- Avoid negative items; and
- Avoid biased items or terms.

4.4.2 The advantages and disadvantages of the structured (closed-ended) questionnaire as research method

Cohen *et al.* (2003:247) distinguishes one important rule for questionnaires, namely the larger the size of a sample the more structured, closed and numerical the questionnaire have to be and the smaller the sample size the less structured, and more open and word-based the questionnaire should be.

According to White (2003:67), the closed ended questionnaire only permits certain responses and the quantification and analysis of results may be carried out easily and very effectively. It should be used where the answer categories are discrete, distinct, and relatively few in number.

Neuman (1994:232) argues that the issue is not which form is the best, but rather under what conditions a form is most appropriate. A researcher's choice between the open and closed-ended question depends on the purpose of a research project. Large-scale surveys normally make use of close-ended questions, since they were quicker an easier for both researcher and respondents. Open-ended questions may be used to learn how respondents think, what is really important to them or to get answers to a question having many answers. According to Neuman (1994:234) it is also recommended that the questionnaire be mixed with open and closed-ended questions offering a change in pace and to help the interviewer to establish rapport.

According to White (2003:68), most questionnaires contain both open and closed questions and recommends that the researcher uses closed questions as much as possible during their research. It is further recommended that a section of the questionnaire consist of closed questions for statistical analysis and a section with open questions to be processed manually.

Some open-ended questions may be included in the questionnaire, since it invites an honest, personal comment from respondents. Furthermore, it catches the authenticity, richness, depth of response, honesty and candour, which were the hallmark of qualitative data (Cohen *et al.,* 2003:255).

White (2003:67) and Neuman (1994:233) describe the following advantages and disadvantages of closed-ended questionnaire used as a research method:

4.4.2.1 The advantages of the structured (closed-ended) questionnaire as research method

- It is easier and quicker for respondents to answer;
- The answers of different respondents were easier to compare;
- Answers are easier to code and statistically analyse;
- The response choices can clarify question meaning for respondents;
- Respondents were more likely to answer about sensitive topics;
- There are fewer irrelevant or confused answers to questions;
- Less articulate or less literate respondents are not at a disadvantage; and
- Replication is easier.

4.4.2.2 The disadvantages of the structured (closed-ended) questionnaire as research method

- They can suggest ideas that the respondent would not otherwise have;
- Respondents with no opinion or no knowledge can answer in any way;
- Respondents are frustrated because their desired answer is not a choice;
- It is confusing if many e.g. 20 response choices were offered;
- Misinterpretation of a question can go unnoticed;
- Distinctions between respondents answers may be blurred;
- Clerical mistakes or marking the wrong response is possible;
- They force respondents to give simplistic responses to complex issues; and
- They force people to make choices they would not make in the real world.

It is also necessary to understand the motivation for using a closed-ended questionnaire for this study.

4.4.3 Motivation for using a structured (closed-ended) questionnaire for this research

According to Cohen *et al.* (2003:255), the following reasons are stated why a structured (closed-ended) questionnaire may be used:

- The relative ease of accessibility to the three study population groups in question (compare 4.12);
- The study is of large proportion and the consideration to include interviews was excluded since it would be more time and cost consuming (compare 4.12);
- Objectivity of the test results would be ensured using close ended questions;
- It is relatively less expensive than interviews;
- Respondents would be able to complete the questionnaires in their own time;
- The ease of processing closed-ended questionnaires in comparison with open-ended questionnaires;

- The anonymity of the respondents was ensured; and
- Sensitive and confidential questions would more easily be answered.

Based on the above mentioned reasons, it was decided by the researcher to utilise a structured (closed-ended) questionnaire for this research.

Next, the various steps in conducting a survey must be highlighted.

4.4.4 Steps in conducting an survey

According to Neuman (1994:225), the researcher follows a deductive approach and begins with a theoretical or applied research problem, ending with empirical measurement and data analysis. Neuman (1994:225) proposes the following steps in survey research:

4.4.4.1 Design and planning phase

Decide on type of survey, for example mail, telephone, interview and type of respondent. Develop the survey instrument:

- Write questions to measure variables;
- Decide on response categories;
- Organise question sequence;
- Design question layout;
- Plan a system for recording answers;
- Pilot test the instrument and train interviews if necessary;
- Draw the sample;
- Define population;
- Decide on type of sample;
- Develop sampling frame;
- Decide on sample size; and
- Select sample.

4.4.4.2 Data collection phase

The following steps have been followed for data collection:

- Locate and contact the respondents;
- Make introductory statements or provide instructions;
- Ask questions and record answers;
- Thank respondents and continue to next respondent; and
- End data collection and organise data

Bornman (2001) proposes the following steps in survey research, namely

- Survey research begins with a theoretical or applied research problem;
- A questionnaire is developed;
- Pre-testing or pilot testing of questionnaire;
- A sample of people or other units of analysis, e.g. organisations.;
- Data gathering or administering of questionnaires;
- Capturing of data;
- Data analysis; and
- Report writing.

Above, the type of questionnaire used and the motivations for using it were explained; the structure of the questionnaire is described below.

4.5 THE STRUCTURE OF THE QUESTIONNAIRE (COMPARE APPENDIX B)

The covering letter and layout of the questionnaire will be described in the following sections.

4.5.1 The covering letter (compare Appendix A)

White (2003:73) argues that the success of the initial mailing depends on the effectiveness of the cover letter that accompanies the questionnaire and if it explains the purpose and importance of the survey the respondent is likely to become interested in the problem and will be inclined to cooperate.

According to Cohen *et al.* (2003:259), the questionnaire is normally accompanied by a covering letter having the purpose to indicate the aim of the research, to convey its importance to the respondents, to assure the confidentiality thereof and to encourage their replies. Cohen *et al.* (2003:260) suggests where possible, it is useful to personalise the letter, avoiding formal expressions such as "Dear Sir" etc and replacing it with the exact names.

4.5.2 The layout of the questionnaire (compare Appendix B)

According to Alreck and Settle (2004:24) the questionnaire consists of mainly three parts, namely the introduction, the body and the conclusion. The first part initiates the task for the respondent and sets the stage and suggests what kinds of questions will follow. Furthermore, this is not the place to ask delicate questions or seek sensitive information. The second part of the questionnaire is the body, which is the middle part. It contains the questions or items that deal with the substance and detail of the survey topic and is much larger than the introduction or the conclusion. The final part is reserved for two kinds of questions, namely those that deal with the most sensitive or delicate issues and those that measure the characteristics of the respondents.

According to Ary *et al.* (1996:429), the structure of the questionnaire should comply with the following requirements:

- Should not be to long;
- Should provide sufficient information;
- Must be interesting;
- Must be constructed in such a way that it could be easily completed;
- Items must be numerically listed; and
- Instructions should be clear.

A structured closed-ended questionnaire was compiled from information in Chapter 2 and 3.

Questions in section C and D required respondents to make choices in the questionnaire on a 4 point Likert scale (Huysamen, 1976:17; Steyn, 2005:3), namely

1: Strongly agree; indicating a high level of agreement

2: Agree; indicating a medium level of agreement

3: Disagree; indicating a medium level of disagreement

4: Strongly disagree; indicating a high level of disagreement

The questionnaire consisted of the following sections:

SECTION A: Biographical Information

Items in this section relate to biographical data needed to provide insight to the researcher with regard to different responses by various questions with regard to the capacity in which the questionnaire is completed, and include

Question 1: Age

Question 2: Gender

Question 3: Highest qualification

Question 4: Position held

Question 5: Total years of experience in job or position

SECTION B: Demographical Information

According to Alreck and Settle (2004:24), demographic groups differ significantly on the issues of importance and can be used to identify segments, groups, audiences, or constituencies of people who were both identifiable and behave in similar ways. The following question topics were included as part of the demographic survey:

Question 1: Company employment/placement (all respondents)

Question 2: Employed/placement in higher education institution (HEI) (all respondents)

Question 3: Registered with HEI (only student respondents)

Question 4: Duration of experiential learning (EL) (only student respondents)

Question 5: How EL was received (only student respondents)

Question 6: City employed/placed (all respondents)

Question 7: Company/Organisations sector (all respondents)

Question 8: Current number of EL students busy with EL in company/organisation (only company employee respondents)

Question 9: Current number of EL students busy with EL in academic department in HEI (only academic respondents).

SECTION C: Basic principles and the nature of cooperative education

The questions in this section investigated the basic principles and the nature of cooperative education in the study populations, namely students, HODs and supervisors of the target populations, namely higher education institutions and companies in industry (compare objective 1, 2 and 3, Table 1.1 and 1.3). The following questions which related to the basic principles and nature of cooperative education were of critical concern and were investigated. The following questions were grouped in categories, as follows:

NOTE: The grouping was done by calculating the mean of the items which cluster together. As a result of the Likert scale used (compare 4.5.2), i.e. 1: strongly agree; 2: agree; 3: disagree; 4: strongly disagree, the mean of such a cluster results in a number between 1 and 4. This implies that if the mean of a construct was close to 1, then for that cluster the indication is that the respondents' overall response is close to "strongly agree". On the other hand, if the mean is close to 4, it implies that for that construct the repondents' overall response is close to "strongly disagree".

TABLE 4.1 **Clustering of questions (items) into constructs according to basic principles and nature of cooperative education**

	BASIC PRINCIPLES AND NATURE OF COOPERATIVE EDUCATION (CONSTRUCTS)	QUESTIONS (ITEMS)
1.	The concept of cooperative education and related terminology	1,2,3,4,5,6,7.
2.	The nature of cooperative education	8,9,10,11,24.
3.	The benefits of cooperative education	12,13,14.
4.	The purpose and role of cooperative education	15,16,17,20,21,22,23,24.
5.	The aim of cooperative education	25
6.	Improvement in cooperative education	18,19

SECTION D: Best practices in cooperative education

The questions in this section investigated best practices in cooperative education in the study populations, namely students, HODs and supervisors of the target populations, namely higher education institutions and companies in industry (compare objective 1, 2 and 3 Table 1.1 and 1.3.

Data related to best practices determined the importance of best practices in cooperative education with regard to the three role players (compare Figure 2.2) and would be a directive to determine the tendencies of the current status of cooperative education in the mentioned study populations as well as in the target populations, from which tendencies were observed and guidelines proposed.

The questions were not asked in a specific sequence, with the intention to prevent the respondent from becoming prejudiced towards the areas under investigation. The following questions were grouped in categories, as follows:

NOTE: The grouping was done by calculating the mean of the items which cluster together. As a result of the Likert scale used (compare 4.5.2), i.e. 1: strongly agree; 2: agree; 3: disagree; 4: strongly disagree, the mean of such a cluster results in a number between 1 and 4. This implies that if the mean of a construct was close to 1, then for that cluster the indication is that the respondents' overall response is close to "strongly agree". On the other hand, if the mean is close to 4, it implies that for that construct the repondents' overall response is close to "strongly disagree".

TABLE 4.2 Clustering of questions (items) into constructs according to best practices in cooperative education

	BEST PRACTICES IN COOPERATIVE EDUCATION (CONSTRUCTS)	QUESTIONS (ITEMS)
1.	Management of cooperative education	1,2, 3
2.	Policies and procedures	2,3
3.	Management Information system	4
4.	Experiential learning	4,5,6,7,8,9,10,11,17,18,19,26,32,36
5.	Role players involved	33,34,35
6.	Skills development	13
7.	Community service learning	14,15,16.
8.	Resource provision	7,20,21,37
9.	Funding and financial administration	20,21
10.	Exposure of staff to industry	22
11.	Liaison	12,23
12.	Partnerships	23,25
13.	Internationalisation	26
14.	Promotion	27,28,29.
15.	Telematic application	30
16.	Quality management	31
17.	Graduate placement	24

A pilot study was undertaken before the questionnaires were distributed

4.6 THE PILOT STUDY

According to Cohen *et al.* (2003:260), the wording of a questionnaire is of paramount importance and pre-testing is crucial to ensure its success. Furthermore, a pilot study has many functions but mainly to increase reliability, validity and practicability of the questionnaire.

The pilot study serves:

- To check the clarity of the questionnaire items, instructions and layout;
- To gain feedback on the validity of questionnaire items, application of the constructs and purposes of the research;
- To eliminate ambiguities or difficulties in the wording;
- To gain feedback on the type of question and its format;
- To gain feedback on response categories for closed questions and for appropriateness of specific questions;
- To gain feedback on the attractiveness and appearance of the questionnaire;
- To gain feedback on the layout sectionalising, numbering and itemisation of the questionnaire;
- To check the time taken to complete the questionnaire;
- To check whether the questionnaire is to long, short, easy too difficult, too unengaging, too threatening, too instructive and too offensive;
- To generate categories from open-ended responses to use as categories for closed response models;
- To identify questions which consistently gain total yes or no response – thus questions which do not discriminate in any way;
- To identify misunderstood or non-completed items; and
- To try out the coding /classification systems for data analysis.

Cohen *et al.* (2003:261) recommends that everything should be piloted and nothing should be excluded, not even the typeface or quality of paper.

The pilot study has been done to test the questions and to eliminate possible problems. Furthermore, the pilot study was carried out on selected individuals within the range of the study

populations, namely, students, HODs and supervisors, within the target population (higher education institutions and companies in industry). After receipt of the draft questionnaire following the pilot study, the necessary adjustments were made after which the final questionnaire was compiled and distributed to 28 supervisors in companies in industry, 18 academic heads of departments and 180 postgraduate students in higher education institutions.

The feedback of targeted respondents was recorded on the questionnaire in question.

Feedback on the pilot study performed on the questionnaire

The targeted respondents provided the following feedback that was incorporated in the questionnaire;

- Objectives of the study needed to be in alignment with questionnaire;
- The questions to be expanded on the concept of cooperative education;
- Expansion of questions related to higher education institutions, namely it should include universities, universities of technology and comprehensive universities;
- Change in the scale of the questionnaire, namely from level of importance to level of agreement or disagreement;
- Various language editing/adjustments were recommended;
- Question 24 section D needed to be rephrased;
- Question 6 section B needed to include, other, please specify; and
- The time tested by candidates during the pilot study confirmed it to be consistent with the time indicated to complete.

The administrative procedure is discussed next.

4.7 THE ADMINISTRATIVE PROCEDURE

The various higher education institutions (HEIs) which included universities, comprehensive universities, universities of technologies and companies in industry in the Gauteng province have been approached to receive approval to dispatch questionnaires for completion.

A request was forwarded by e-mail and by telephonic discussions to the relevant heads of departments in higher education institutions and supervisors of companies. The questionnaires were distributed to HEIs and companies in industry, delivered mostly by hand, but also by electronic mail (e-mail) and by postage.

An explanatory letter (See Appendix A, p 361) was attached as part of the questionnaire on distribution to all target populations for the purpose of this research and the anonymity of the information was guaranteed.

The questionnaires were then distributed to the target population groups.

4.8 DISTRIBUTION OF THE QUESTIONNAIRE

After the pilot study investigation, the explanatory letter (compare Appendix A) and the final questionnaire (compare Appendix B) have been distributed by hand mostly, e-mail and by post, in which the purpose of the research project was explained, the request to collaborate and the anonymity of the respondents were ensured. questionnaires distributed by mail (postage) were accompanied by a returning envelope for each questionnaire.

The questionnaires were presented in English only. After the completion of the questionnaire by the respondents it was sent back to the researcher. In cases where students had no access to e-mail facilities, it was sent back with enclosed envelopes.

Record keeping of research material and results (data) were essential.

4.9 RECORD KEEPING

All records of questionnaires of respondents (including statistical data), whether complete or in-complete, correspondence with respondents, dates of delivery and receipt of questionnaires, discussions with respondents have been stored. The researcher reviewed the individual responses on the questionnaires of the completed 146 questionnaires with the intention to transfer information from questionnaires to a format for statistical analysis.

The next step in the research process is the editing and coding of data.

4.10 EDITING AND CODING OF DATA

According to Cooper and Schindler (2001:423) the first step in data analysis is to edit raw data. Editing detects errors and omissions, and corrects them when it is possible and certifies that the minimum data quality standards have been achieved. The researcher has attempted at all times to guarantee data is accurate, consistent with the intent of the questions and other information in the survey, it is uniformly entered, complete and arranged to simplify coding and tabulation.

After the collection of the data, data has been organised and coded in order to be analysed. Coding implies that we have to identify the variable to be statistically analysed and decide on various code values such variable represents (Welman and Kruger, 1999:208). Through coding of raw data, data is transformed into symbols that may be tabulated and counted (Churchill, 1991:687). The researcher did not complete any incomplete answers, thereby avoiding the creation of misrepresentation or bias in the study.

After the editing and coding of data, data needs to be processed.

4.11 DATA PROCESSING

The questionnaires were coded by the researcher prior to data capturing in collaboration with the Statistical Services of the North-West University (Potchefstroom campus) for statistical analysis. Responses were captured directly from the questionnaires by the Statistical Services of the North-West University (Potchefstroom campus). Data was then processed with the aid of the SAS programme (Windows release 6.12.1996). The reliability was confirmed by using Cronbach alpha estimations.

For the purpose of this study, descriptive statistics and uni-directional variance analysis were used to indicate the statistical meaningful differences between the study populations (students, HODs and supervisors) of the target pupulations (HEIs and companies in industry). The d-values of Cohen (Steyn, 2005:3) were calculated to indicate the practical meaningful differences between study pupulations and target populations (compare 1.4.2.4).

Population and sampling in this research needs to be described.

4.12 POPULATION AND SAMPLING

4.12.1 The target populations (compare Table 4.3; 4.4; 4.12.3)

The population or universe is the set products, companies and markets that were of interest to the researcher. According to Visser (2002:100), the population to be researched should be well defined by the researcher.

In this case the target populations refers to companies in industry and higher education institutions (universities, comprehensive universities and universities of technology) located in the Gauteng province, of South Africa.

4.12.2 The study populations (compare Table 4.3; 4.4; 4.12.3)

The study populations in this study, selected from the target populations (HEIs and companies) included students and academic heads of departments from selected higher education institutions (HEIs) (compare Table 4.3) and supervisors from selected companies from industry (compare Table 4.3) in the Gauteng region.

4.12.3 Sample size and method

Sample size

According to Visser (2002:174), sample size refers to the number (n) of items to be selected from the universe of the population to make up a specific sample.

Sample method

An availability sampling method (White, 2003:64) was used and not a random sampling method. According to White (2003:64), for availability sampling the respondents are nearest and most easily available. There are, however, two limitations to availability sampling, namely there is no precise way of generalising from the sample to any type of population and generalisability is limited to the characteristics of the subjects – it does not mean they are not useful, it only means that caution is needed in generalising.

Response

Questionnaires were used as a research instrument and have been delivered and collected by hand by the researcher. In some cases where it was not possible to deliver by hand it was sent out by e-mail or by ordinary mail. Questionnaires were distributed to 226 respondents consisting of 180 students and 18 heads of departments in higher education institutions and 28 supervisors of companies in industry. No interviews were conducted as this was a quantitative research investigation.

Of the total of 226 targeted in the study populations, 146 questionnaires were received back, consisting of 101 students and 17 heads of departments in higher education institutions and 28 from supervisors of companies in industry, therefore, a total of 146 responded from a total 226 respondents targeted.

Therefore, no deductions can be made to be generalised to the Gauteng or South African situation (compare Table 4.5) and only tendencies can be observed which is of significant practical value. It is intended to provide directives in this study by the compilation of guidelines based on the outcomes achieved in this study to act as directive in cooperative education for teaching and learning organisations in South Africa. Reliability and validity testing have been discussed (compare 4.13), and results were recorded in Chapter 5.

TABLE 4.3 : Criteria used in the selection of target populations.

TARGET POPULATION	CRITERIA
Higher Education Institutions (HEIs): 1. Two universities: UP[9] and Wits[10] 2. Two comprehensive universities: UJ[11] and UNISA[12] 3. Two universities of technology: TUT[13] and VUT[14]	• Government subsidised • Located in the Gauteng Region • Offer most or all programmes
Students	• Received training in government subsidised higher education institutions in Gauteng • Completed experiential learning i.e post graduates • In one of three disciplines: mechanical engineering, nursing or accounting
Heads of Departments	• Full time academic (HOD) staff member in discipline in government-subsidised HEIs mentioned. • In one of three disciplines mechanical engineering, nursing or accounting

[9] University of Pretoria
[10] University of the Witwatersrand
[11] University of Johannesburg
[12] University of Southern Africa
[13] Tshwane University of Technology
[14] Vaal University of Technology

TARGET POPULATION	CRITERIA
Companies: Supervisors	
Mechanical Engineering Nissan SA SASOL Spoornet NECSA ISCOR	• Well established • Approved for training Mechanical Engineering students
Nursing Private Hospitals Muelmed Eugene Marais Government Hospitals Pretoria West Hospital Pretoria Academic Hospital	• Well established hospitals in Pretoria • Involved in training of students (internships) • Approved for training nursing students
Accounting Calculus TAG Incorporated Moores and Roland Telkom	• Professional companies • Approved for training students

The following disciplines were used for the purposes of this study:

- Engineering: Mechanical Engineering;
- Health Sciences: Nursing; and
- Commerce: Accounting.

The motivation for the selection of the above mentioned disciplines include:

- All were vocational and professional career orientated learning programmes, having compulsory experiential learning/internship programmes);
- All programmes have professional bodies;
- All HEIs selected for the purpose of this study offer these programmes as far as possible; and
- All qualified students were required to register at a professional body before practising.

The following guidelines were used for the student study populations using a multidisciplinary approach in this study. Students targeted were those who completed experiential learning in the undergraduate programmes (postgraduates).

Mechanical Engineering:

- **Universities:** The Bachelor degree in Mechanical Engineering (BEng) at traditional universities consists of two practical subjects in the second and third year, in which students need to do industrial training respectively for a period of six weeks. This therefore justifies this training, as experiential learning which forms part of the bachelor degree used for measurement purposes. Students selected were from the BEng as well as those who completed their post graduate studies in engineering.
- **Comprehensive universities:** This was difficult to measure since former technikons and universities merged. In some cases learning programmes have been fully integrated, while in others they have not. Students selected to complete questionnaires were mainly from the BTech in Mechanical Engineering who completed their experiential learning as part of the National Diploma for Mechanical Engineering.
- **Universities of technology:** Since universities of technologies consisted of a merger between three technikons, students selected to complete questionnaires were from the BTech in Mechanical Engineering who completed their experiential learning as part of the National Diploma for Mechanical Engineering.

Nursing:

- **Universities:** Students who completed the BCur degree were approached to complete questionnaires and who completed their experiential learning (internship) as part of their undergraduate degree.

- **Comprehensive universities:** Postgraduate students (BTech/BCur degrees) were selected to complete questionnaires. These students completed their experiential learning as part of their undergraduate degree /national diploma programmes.
- **Universities of technology:** BTech degree (undergraduate) students were selected to complete questionnaires. It must be noted that no undergraduate programme was offered during 2005 in nursing at Vaal University of Technology (VUT).

Accounting

- **Universities:** No experiential learning is offered as part of the BCom degree programmes for accounting at universities. Practical training forms part of the internships to be done at applicable companies on post graduate levels. Internships for accounting were the responsibility of the professional board for accounting (SAICA) in South Africa.
- **Comprehensive universities:** Former technikons offered Cost Management and Accounting (CMA), whereas traditional universities offer BCom degrees in accounting. Since students do not do experiential learning for the BCom degrees at undergraduate levels and since experiential learning for CMA is non-compulsory, measurement of responses for BCom (Hons) students could only be done at the workplace. For CMA it was done at the workplace and in HEIs, if available. In CMA[15] responses of students were measured only if students did experiential learning voluntarily. In the cases of university students, post graduate students (BCom Hons) responses were measured at companies for the internships. Responses of heads of departments and supervisors at companies were measured simultaneously.
- **Universities of technology:** BTech students who completed their experiential learning as part of the Cost Management and Accounting (CMA) were selected to complete questionnaires. This could only be done where students completed experiential learning on voluntary basis. Experiential learning will only become compulsory for CMA in 2007.

Principles regarding sampling

Alreck and Settle (2004:60) advise that smaller samples are more likely to be different from the population than larger ones. Furthermore, the smaller the samples the larger the error and the lower the reliability. On the other hand, the larger the sample the lower the error and the less the sampling error is and the greater the reliability would be. Therefore, larger samples enable

[15] Experiential learning may be offered as compulsory or non compulsory options as part of learning programmes in Universities of Technology. In CMA it is currently offered only as non-compulsory.

researchers to draw more accurate conclusions and make more accurate predictions (Alreck and Settle, 2004:60). An attempt was made in this study to obtain the largest possible sample (compare Table 4.5).

After consultation with the Statistical Consultation Services of the North-West University (Potchefstroom campus) the following recommendations on population sampling was noted and incorporated in the study.

- The number of responses of supervisors of companies in industry need to be doubled;
- Sampling of the higher education institutions, students and HODs were suitable;
- Availability sampling (d values) will be done and not a random sampling (p-values) since the magnitude of the study would become impossible;
- Only tendencies can be observed and no deductions or generalisations can be made relevant to the Gauteng region or the South African situation; and
- Four companies were selected for each discipline.

TABLE 4.4 : Target populations

POPULATION 1: HIGHER EDUCATION INSTITUTIONS	
Population: 1A. Universities	**Heads of Academic Departments (HODs)**
1.1 University of Pretoria	
Mechanical Engineering	1
Nursing	1
Accounting	1
Total	3
1.2 University of the Witwatersrand	
Mechanical Engineering	1
Nursing	1
Accounting	1
Total	3
Great Total	6

Population: 1B. Comprehensive universities	HODs/Directors
1.1 University of Johannesburg (RAU-Wits Technikon)	
Mechanical Engineering	1
Nursing	1
Accounting	1
Total	3
1.2 UNISA (UNISA- Technikon Southern Africa)	
Mechanical Engineering	1
Nursing	1
Accounting	1
Total	3
Great Total	6

Population: 1C. Universities of technology	Heads of Academic Departments (HODs)
1.1 Tshwane University of Technology	
Mechanical Engineering	1
Nursing	1
Accounting	1
Total	3
1.2 Vaal University of Technology	
Mechanical Engineering	1
Nursing	1
Accounting	1
Sub-total	3
Total	6
Grand Total	18

Population 2: Companies in industry	Supervisors (No's)
Mechanical Engineering:	
Nissan SA	2
SASOL	2
Spoornet	2
NECSA	2
ISCOR	2
Total	10
Nursing:	
Private Hospitals	
Muelmed	2
Eugene Marais	2
Government Hospitals	
Pretoria General Hospital	2
Pretoria West Hospital	2
Total	8
Accounting Companies	
Calculus	2
Tag Incorporated	2
Moores and Roland	2
Telkom	2
Probeta	2
Total	10
Total	28

Population 3: Post Graduate Students in HEIs	Universities UP Wits	Comprehensive universities UJ and UNISA	Universities of technology TUT and VUT
Mechanical Engineering	20	20	20
Nursing (Internships)	20	20	20
Accounting	20	20	20
Total	60	60	60
Sub-total	180		
Grand Total	226		

TABLE 4.5 : Response Rate

QUESTIONNAIRES DISPATCHED	QUESTIONNAIRES RECEIVED BACK
HIGHER EDUCATION INSTITUTIONS(HODs/DIRECTORS)	
Population 1A: *Universities*	
Mechanical Engineering	2/2
Nursing	2/2
Accounting	2/2
Population 1B: *Comprehensive universities*	
Mechanical Engineering	2/2
Nursing	2/2
Accounting	2/2
Population 1C: *Universities of technology*	
Mechanical Engineering	2/2
Nursing	1/2
Accounting	2/2
TOTAL	17/18

QUESTIONNAIRES DISPATCHED	QUESTIONNAIRES RECEIVED BACK
POPULATION 2 : COMPANIES	
Mechanical Engineering:	
Nissan SA	2/2
Sasol	2/2
Spoornet	2/2
NECSA	2/2
ISCOR	2/2
Nursing:	
Private Hospitals	
Muelmed	2/2
Eugene Marais	2/2
Government Hospitals	
Pretoria West	2/2
Pretoria Academic	2/2
Accounting Companies:	
Calculus	2/2
Tag Incorporated	2/2
Moores and Roland	2/2
Telkom	2/2
Probeta	2/2
TOTAL	28/28
POPULATION 3: POST GRADUATE STUDENTS IN HEIs	
Universities:	
Mechanical Engineering	15/20
Nursing	19/20
Accounting	10/20
Comprehensive universities	
Mechanical Engineering	7/20
Nursing	9/20
Accounting	19/20

QUESTIONNAIRES DISPATCHED	QUESTIONNAIRES RECEIVED BACK
Universities of technology	
Mechanical Engineering	12/20
Nursing	10/20
Accounting	0/20
TOTAL	101/180
GRAND TOTAL	146[16]/226[17]

Results obtained need to be assessed in terms of its validity, reliability and generalisability.

4.13 VALIDITY AND RELIABILITY

4.13.1 Validity and reliability in quantitative research

4.13.1.1 Validity in quantitative research

According to Anastasi and Urbina (1997:113) validity of a test concerns what the test measures and how well it does so. White (2005:193) refers to validity as that which may either be true or correct, corresponds to the actual state of reality. White (2005:193) differentiates between two types of validity in quantitative research, namely *internal validity,* which refers to the degree to which the design of an experiment controls extraneous(external) variables, and *external validity,* which concerns itself whether the results of the research can be generalised to another situation, populations, different subjects, settings, times and occasions. Validity in quantitative research concerns conclusions about causal connections, for example when a connection between variables yields a statistically significant correlation (White, 2005:201)

According to Nunnally (1978:83), the term *validity* refers to the scientific use of a measuring instrument, that is, how well it measures what its suppose to measure and indicates that validity has three meanings, namely construct validity, measuring psychological attributes, predictive validity, establishing a relationship with a particular criterion and content validity, sampling from a poll of required content. According to Nunnally (1978:83), all forms of validity involve scientific

[16] Response rate
[17] Sample size (4.12.3)

generalisation, some were of the opinion that there is only one form of validity, i.e. construct validity. In this research construct validity will be tested (White, 2005:197).

White (2005:196) and Anastasi and Urbina (1997:117) categorise validities underlying measurement into *face validity*; refers to what a test should appears to measure and not to what it actually measures; *criterion validity,* where a valid test should relate closely to other measures of the same theoretical construct; *construct validity* refers to the degree to which it measures the intended construct rather than relevant constructs; and *content validity*, which samples the range of behaviours that is represented by the theoretical concept being measured.

According to Cronbach (1970:142), construct validation is an analysis of the meaning of test scores in terms of concepts or constructs. Cronbach (1970:143) refers to three parts in construct validation, namely (a) derive constructs that could account for test performance (b) derive hypothesis from the theory involving the construct and (c) to test the hypothesis empirically. In construct validation, both the measure and the theory relating the construct to other constructs were evaluated.

4.13.1.2 Reliability in quantitative research

White (2005:197) defines reliability "as the accuracy or precision of an instrument; as the degree of consistency or agreement between two independently derived sets of scores; and as the extent to which independent administrations of the same instrument yield the same or similar results under comparable conditions".

Reliability is primarily concerned not with what is being measured but how well it is being measured and can also be seen as an integral part of validity (White, 2005:197). According to White (2005:197), several procedures exist to measure reliability and include the test-retest and alternate forms methods and split half technique. Anastasi and Urbina (1997:84) describe reliability as the consistency of scores obtained by the same persons when they were re-examined with the same test on different occasions. According to Mitchell and Jolley (2001:115) reliability is the extent to which a measure produces stable and consistent scores. A measure can be reliable but not valid, but if a measure is not reliable it cannot be valid. Reliability is a pre-requisite for validity. Furthermore, reliability is necessary for validity and is easier to achieve than validity.

White (2005:198) differentiates between three types of reliability, namely determining stability (determined by the test-retest method); alternate forms (in which two tests were given to sample the same material); and split half techniques (which is used to determine internal consistency).

It is important to note that quantitative reliability is associated with accuracy stability, consistency and repeatability of the research (White, 2005:200)

According to Nunnally (1978:212), reliability considers the measurement of error. The reliability coefficient is used to estimate the ratio of variance in true scores to the variance in observed scores. All types of reliability were concerned with the degree of consistency and can all be expressed in terms of a correlation coefficient. A correlation coefficient expresses the degree of correspondence or relationship between two sets of scores (Anastasi & Urbina, 1997:85).

Cronbach's alpha is the mean reliability coefficient calculated from all possible split-half partitions of a measurements scale (Dillon, *et al.*1993:823). It is possible to determine the proportion of true score variance by computing the sum of item variances with the variance of the sum scale by using the formula:

$$\alpha = (k/(k-1)^* [1-\Sigma (s^2_i)/s^2_{sum}]$$

This formula is used for the most common index or reliability and is known as Cronbach's coefficient alpha (α). The coefficient alpha will be zero if there is no true score, but only an error in the items, then the variance of the sum will be the same as the sum of variances of the individual items. If all items were perfectly reliable and measure the same thing (true score) then the coefficient alpha is equal to 1 (StatSoft, 2004).

The Cronbach Alpha reliability coefficient testing was performed on all constructs by the Statistical Services of the North-West University and results were recorded in Chapter 5. It can be confirmed that the research carried out complied to the requirements, as described, for validity and reliability.

4.14 GENERALISABILITY

According to Cronbach (1970:154), generalisability is when we use a single observation as if it represented the universe. If the observed scores from a procedure agree closely with the universe score we can derive that such score is accurate and reliable or generaliseable (Cronbach, 1970:154).

According to Nunnally (1978:279) the generalisibility coefficient, describes, for instance, how well the mean judgements from one or more samples correlate with the mean judgement from a population or universe of potential judges. According to Cronbach (1970:156) the coefficient of generaliseability, also known as the reliability coefficient, refers to a ratio of two variances.

The findings of this research would only indicate certain tendencies, to be practically significant (StatSoft, 2004) and meaningful but would not be generalisable to the South African population or "universe".

4.15 FACTOR ANALYSIS

According to Anastasi and Urbina (1997:303), the object of factor analysis is to simplify the description of the data by reducing the number of variables. Nunnally (1978:447) describes factor analysis as a broad category of approaches to determine the structure of relations among measures. Factor analysis may be used to determine groupings of variables, which variables belong to which group, how many dimensions were needed to explain the relations among variables, a frame of reference to describe the relations among the variables and scores of individuals on such groupings. Factor analysis normally begins with a complete table of intercorrelations among a set of tests. Such a table is known as a correlation matrix, which shows the weight or loading of each of the factors in each test (Anastasi and Urbina, 1997:303)

According to Cronbach (1970:309), factor analysis is a systematic method for the examination of the meaning of a test by studying its correlation with other variables and the basic idea is to that of simple correlation itself. A factor analyst introduces composite variables also known as factors that can be interpreted and describes the test by its relation to key variables (Cronbach, 1970:312)

Variables were defined as combinations of entities known as factors. Factor analysis is considered as a general method of inquiry in an attempt to minimise some of the misuses in the past. Furthermore, its success is dependent upon the careful choice of variables and subjects to ensure all variables of interest correlate highly with other variables (Nunnallly, 1978:447).

- **Factor designs**

Factorial designs are used to measure the effect of two or more independent variables at various levels, and are useful when there is some reason to believe that the various levels of the independent variables might interact to produce results that neither could produce alone (Tull & Hawkins, 1980:182). According to Churchill (1991:813), there are three reasons why one might use a factorial design. First, it allows the interaction of the factors to be studied; second, a factorial design allows a saving of time and effort because all observations were employed to study the effects of each of the factors and third, the conclusions reached have broader application, since each factor is studied with varying combinations of other factors.

- **Factor loadings**

Factor loadings refer to correlations between the variable and the factor (StatSoft, 2004). According to Dillon *et al.* (1993:573), many procedures used to rotate the matrix of factor loadings do so in a manner to achieve simple structure.

It can be confirmed that in the factor analysis of this research, all variables chosen correlated highly with other variables concerned.

4.16 SUMMARY

In this chapter the research design and methodology with regard to data collection and the target population involved in this research was discussed. The research problem, measuring instruments used in the empirical research, the pilot study, data editing, coding and processing, population sampling, validity, reliability, generalisability and factor analysis were discussed.

The size of the various study population samples were acceptable and specific tendencies could be observed from data collected from questionnaires considering the fact that it was an availability sampling method of study and not a random sampling method.

In higher education institutions, availability of students was based on the fact that they completed experiential learning as part of their undergraduate learning programme; and heads of departments were selected on grounds of being experts in their field of study and the most knowledgeable about the discipline in the targeted HEI and because they could provide the best response in the discipline; and lastly, companies in industry were selected on the basis of high level of expertise in the discipline in industry and supervision experience of students, the most appropriate information could be gathered for this study.

Finally, through the distribution and collection of questionnaires, data was collected from target and study populations in question, to enable the researcher to observe certain tendencies in cooperative education on the current position/status of cooperative education relating to biographical and demographic information, the basic principles and nature and the best practices in cooperative education in higher education institutions and companies in industry, considering the multidisciplinary nature of learning programmes.

In Chapter 5 the analysis and interpretation of data with results are discussed.

CHAPTER 5
RESEARCH FINDINGS: ANALYSIS, INTERPRETATION AND DISCUSSION OF DATA AND RESULTS

5.1 INTRODUCTION

In Chapter 4, the various instruments and procedures used during the empirical study were discussed. The aim of the empirical study was to use a structured questionnaire (compare Appendix B) to determine the current status of cooperative education (compare Table 1.1, objective 3), through a multidisciplinary approach (compare Table 1.1, objective 2), in government-subsidised higher education institutions and industry, to enable the researcher to compile guidelines for higher education institutions and industry in cooperative education.

In this chapter the results obtained from the questionnaire recorded will be used to:

- Obtain a biographical and demographical scope of the study populations in their specific work environment, which includes, students and academic heads of departments in HEIs and supervisors of companies in industry, using a multidisciplinary approach in the Gauteng province;
- Determine the status with regard to the basic principles and nature and best practices in cooperative education in the target population and study populations;
- A frequency analysis was performed to determine the sub-groupings; and
- Calculate the d-values of Cohen to indicate the practically significant meaningful differences between group means (Steyn, 2005:3).

5.2 INTERPRETATION OF BIOGRAPHICAL DATA

According to the objectives of the study (compare Table 1.1) a multidisciplinary approach was followed on data in the three disciplines of engineering, nursing and accounting in mainly three groups, namely Group 1: company supervisors, Group 2: heads of academic departments (HODs)

and Group 3: students in government-subsidised higher education institutions in the Gauteng region. This data is represented in Table 5.1. Data with regard to biographical information for all three groups would therefore be interpreted as follows:

TABLE 5.1 **Biographical data of supervisors of companies in industry, academic heads of departments (HODs) and students (Engineering, Nursing and Accounting) in government-subsidised higher education institutions, in the Gauteng province in South Africa.**

ITEM	BIOGRAPHICAL DATA							
			Group 1 Supervisors		Group 2 HODs		Group 3 Students	
			f	%	f	%	f	%
1	Age	1 Younger than 30 yrs	6	22.2	-	-	85	84.16
		2. 31 to 35 years	3	11.1	1	5.88	9	8.91
		3. 36 to 40 years	6	22.2	4	23.63	1	0.99
		4. 41 to 45 years	3	11.1	2	11.76	1	0.99
		5. 46 years and older	9	33.3	10	58.82	5	4.95
		Total	27	100	17	100	101	100
2	Gender	1. Male	14	51.85	9	56.25	42	42.86
		2. Female	13	48.15	7	43.75	56	57.14
		Total	27	100	16	100	98	100
3	Highest Qualification	1. Matric and completed first year of undergraduate qualification	2	7.41	-	-	10	10.10
		2. Matric and completed second year of undergraduate qualification	-	-	-	-	27	27.27
		3. Degree or National Diploma	13	48.15	1	5.88	42	42.42
		4. Honours degree or equivalent	5	18.52	1	5.88	15	15.15
		5. Master's degree or equivalent	-	-	8	47.06	2	2.02
		6. Doctoral degree	1	3.70	7	41.18	2	2.02
		7. Other qualifications	6	22.22	-	-	1	1.01
		Total	27	100	17	100	99	100

ITEM	BIOGRAPHICAL DATA							
			Group 1 Supervisors		Group 2 HODs		Group 3 Students	
			f	%	f	%	f	%
4	Position in present job	1. Student	1	3.85	-	-	71	72.45
		2. Supervisor	8	30.77	-	-	5	5.10
		(Mentor)	2	7.69	-	-	2	2.04
		3. Human Resource Manager	7	26.92	-	-	-	-
		4. Training Manager	-	-	-	-	-	-
		5. Dean	-	-	10	58.82	2	2.04
		6. Head of Department	8	30.77	7	41.18	18	18.37
		7. Other						
		Total	26	100	17	100	98	100
5	Total work expe-rience in present job position	1. 0 to 3 years	7	25.93	6	35.29	72	77.42
		2. 4 to 9 years	9	33.33	4	23.53	15	16.13
		3. 10 or more years	11	40.74	7	41.18	6	6.45
		Total	27	100	17	100	93	100

Question 1: Age

According to Table 5.1 the majority respondents of supervisors in companies were 46 years or older (33.3%) (9 out of 27), but 22.2% (2 out of 9) of responding supervisors were 40 years or younger.

The majority of respondents of heads of departments (HODs) (58.82%) (10 out of 17) in higher education institutions (HEIs) were 46 years or older, whereas the smallest number of HOD respondents (5.88%) (1 out of 17) were between 31 and 35 years of age.

The majority of student respondents (84.16%) (85 out of 101) were younger than 30 years and the smallest number of student respondents (0.99%) (1 out of 101) were 45 years but not younger than 41.

Question 2: Gender

According to Table 5.1, the majority of supervisors respondents in companies were male (51.85%) (14 out of 27), and the majority of HODs in government-subsidised higher education institutions were also male (56.25%) (9 out of 16). This implies that male engineers were dominant in mechanical engineering in companies and higher education institutions. There is, however, a small

effect size between the male and female groups, indicating that females were increasingly entering this occupation (compare Table 5.1, p 162).

The majority of students respondents in higher education institutions were female (57,14%) (56 out of 98) and only 42.86% (42 out of 98) were male.

Question 3: Highest qualification

According to Table 5.1, the majority of supervisor respondents (48,15%) (13 out of 27) possess a degree or national diploma, while a small number of supervisors (23.70%) (1 out of 27) have a doctoral degree.

The majority of HODs (47.06%) (8 out of 17) in government-subsidised higher education institutions have a master's degree or equivalent, followed by a doctoral degree (41,18%) (7 out of 17), whereas the fewest HODs respondents possess either a national diploma or degree or an honours degree or equivalent (5,88%) (1 out of 17).

According to Table 5.1 the majority of student respondents possess a degree or national diploma (42,42%) (42 out of 99).

Question 4: Position held in present job/position

According to Table 5.1, the majority of supervisors respondents, namely 30,77% (8 out of 26) in companies held the position of supervisor, 26,92% (7 out of 26) held the position of training managers, while the least respondents (7,69%) (2 out of 26) held the position of human resource managers.

According to Table 5.1, the majority of HODs respondents, namely 58,82% (10 out of 17) held the position of HODs and the least respondents, namely 41,18% (7 out of 17) held other academic positions in government-subsidised higher education institutions.

According to Table 5.1, the majority of the student respondents, namely 72,45% (71 out of 98) were busy studying.

Question 5: Total years of work experience in job/position

According to Table 5.1, the majority of supervisor respondents (40,74%) (11 out of 27) have had 10 or more years work experience and the least number of supervisor respondents have had 0-3 years work experience in their companies.

The majority of HOD respondents in higher education institutions have had 10 or more years work experience (41,18%) (7 out of 17) while 35,29 % (6 out of 17) have had 0-3 years work experience and only 23,53% (4 out of 17) have 4 to 9 years work experience.

The majority of student respondents (77,42%) (72 out of 93) have had 0 to 3 years work experience and only 6,45% (6 out of 93) have had 10 years or more work experience.

Profile of the study population with regard to biographical information

The majority of supervisor respondents in companies in industry were 46 years or older, predominantly male, posses a degree or diploma, hold the position of a supervisor or training manager and have had 10 or more years of work experience.

The majority of HOD respondents in government-subsidised higher education institutions were also 46 years or older, predominantly male, possess a master's or doctoral degree, hold the position of HOD and have had 10 years or more work experience.

The majority of student respondents in government-subsidised higher education institutions were younger than 30 years of age, predominantly female, possess a degree or national diploma with 0 to 3 years work experience.

5.3 INTERPRETATION OF DEMOGRAPHICAL DATA

TABLE 5.2 Demographical data on respondents in the Gauteng province in South Africa

ITEM	DEMOGRAPHICAL DATA			
			RESPONSE	
			f	%
4	Duration of experiential learning (Students)	Less than 3 months	8	9.88
		6 Months	11	13.58
		1 year	16	19.75
		More than 1 year	37	45.68
		Other	9	11.11
		Total	81	100
5	Receive experiential learning (Students)	Work-based	62	81.58
		Simulated training	11	14.47
		Other	3	3.95
		Total	76	100
6	City employed/ placed (All)	Pretoria(Tshwane)	73	52.90
		Johannesburg	42	30.43
		Florida	1	0.72
		Vanderbijlpark	10	7.25
		Other	12	8.70
		Total	138	100

Three questions were selected from demographic data: question 4, in which students were requested to indicate the duration of experiential learning; question 5, on how student respondents received experiential learning; and question 6, on where student respondents received experiential

learning. All respondents (students, heads of departments and supervisors) were requested to respond to question 6, to indicate placement or employment.

Item 4: [18]Duration of experiential learning

According to Table 5.2, question 4, most of students (45,68%) responded by indicating that the duration of experiential learning was more than 1 year, followed by 1 year (19.75%) and then 6 months (13.58%). Only 9.88% of participating respondents responded by indicating that their duration of experiential learning was less than 3 months.

Item 5: How respondents received experiential learning

According to Table 5.2, question 5, most students (81,58%) responded to question 5 by indicating that they have received work-based learning and only 14.47% indicated that they received simulated experiential learning.

Item 6: City where employed/placed

According to Table 5.2, question 6, 52,90 % of respondents have been employed or placed for experiential learning (students only) in the Pretoria (Tshwane) region, followed by 30.43% in Johannesburg, Gauteng province. Most of the respondents, therefore, were employed or have been placed to do experiential learning in the Gauteng region.

Profile of student population

Based on the above discussion, it may be concluded that most student respondents completed work-based experiential learning for 1 year and more in the Pretoria/Johannesburg area of the Gauteng province.

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[18] Refers to the time the student is required to do experiential learning as part of the learning programme. Students completed their experiential learning.

5.4 INTERPRETATION OF DATA ON THE BASIC PRINCIPLES AND NATURE OF COOPERATIVE EDUCATION: SECTION C

5.4.1 Determination of the Cronbach alpha reliability coefficient and factor analysis on constructs related to the basic principals and nature of cooperative education.

5.4.1.1 The concept of cooperative education

Construct (Cronbach alpha) reliability

TABLE 5.3 The concept of cooperative education and related terminology

	CONSTRUCT	VALUE
	The concept of cooperative education and related terminology	0,78

The Cronbach alpha reliability coefficient[19] measure is 0,78 and it may therefore be deduced that this construct[20] is reliable in the context where it is used.

Construct validity

Factor Findings

Two factors have been retained: Variance explained 64,53%

[19] According to Statsoft (2004:4); if all items are perfectly reliable and measue the same thing (true score) then the coefficient alpha is equal to 1.
[20] A construct refers to clustered questions, relevant to the construct topics (compare Table 4.1and 4.2 Chapter 4).

TABLE 5.4 The concept of cooperative education and related terminology

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	The concept of cooperative education and related terminology	1 2	
	Questions		
1	The concept of cooperative education is well known	0.48	0.38
2	The concept of cooperative education is commonly used in universities	0.81	0.73
3	The concept of cooperative education is commonly used in comprehensive universities	0.78	0.71
4	The concept of cooperative education is commonly used in universities of technology	0.88	0.77
5	The term of *experiential learning* is commonly used in universities	0.83	0.70
6	The term of *experiential learning* is commonly used in comprehensive universities	0.84	0.70
7	The term of *experiential learning* is commonly used in universities of technology	0.72	0.52

5.4.1.2 The nature of cooperative education

Construct (Cronbach alpha) reliability

TABLE 5.5 The nature of cooperative education

	CONSTRUCT	VALUE
	The nature of cooperative education	0,58

The Cronbach alpha reliability coefficient measure is 0,58 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

Two factors have been retained: Variance explained 60,89%

TABLE 5.6 The nature of cooperative education

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	The nature of cooperative education	1 2	
	Questions		
8	Cooperative education is practiced in universities	0.86	0.74
9	Cooperative education is practiced in comprehensive universities	0.83	0.70
10	Cooperative education is practiced in universities of technology	0.47	0.43
11	Cooperative education is a teaching and learning strategy	0.75	0.61
24	The core feature of experiential learning is the integration of work experience and classroom learning	0.74	0.56

5.4.1.3 The benefits of cooperative education

Construct (Cronbach alpha) reliability

TABLE 5.7 The benefits of cooperative education

	CONSTRUCT	VALUE
	The benefits of cooperative education	0,81

The Cronbach alpha reliability coefficient measure 0,81 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

One factor has been retained: Variance explained 72,90%

TABLE 5.8 The benefits of cooperative education

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	The benefits of cooperative education	1	
	Questions		
12	Cooperative education is beneficial to companies	0.84	0.71
13	Cooperative education is beneficial to higher education institutions	0.88	0.77
14	Cooperative education is beneficial to students	0.84	0.71

5.4.1.4 The purpose and role of cooperative education

Construct (Cronbach alpha) reliability

TABLE 5.9 The purpose and role of cooperative education

	CONSTRUCT	VALUE
	The purpose and role of cooperative education	0,81

The Cronbach alpha reliability coefficient measure 0,81 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

Three factors have been retained: Variance explained 70,30%

TABLE 5.10 The purpose and role of cooperative education and related terminology

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	The purpose and role of cooperative education	1 2 3	
	Questions		
15	Universities give support to companies during the experiential learning of students	0.89	0.82
16	Comprehensive universities give support to companies during the experiential learning of students	0.58	0.56
17	Universities of technology give support to companies during the experiential learning of students	0.80	0.68
20	The study material of students for	0.84	0.73

	experiential learning must have a clear set of measurable outcomes		
21	Students were supported by lecturers from universities during experiential learning at the workplace	0.53	0.51
22	Students were supported by lecturers from comprehensive universities during experiential learning at the workplace	0.92	0.88
23	Students were supported by lecturers from universities of technology during experiential learning at the workplace	0.87	0.82
24	The core feature of experiential learning is the integration of work experience and classroom learning	0.75	0.63

5.4.1.5 The aim of cooperative education

No Cronbach alpha coefficient and factor findings were reported, since the construct consisted only of one question (compare Table 4.1, number 5).

5.4.1.6 Development in cooperative education

No Cronbach alpha coefficient and factor findings were reported, since the construct consisted only of two questions (compare Table 4.1, number 6).

5.4.2 Comparison of the differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) in government-subsidised higher education institutions in the Gauteng province in South Africa

The practically significant differences between the following groups will be determined using the d-value of Cohen (Steyn, 2005:22), with the aid of the following statistical formula:

$$d = \frac{\bar{X}1 - \bar{X}2}{\text{Maximum Sd}}$$

Where $\bar{X}$ = Mean and SD = Standard deviation

The effect sizes were determined according to the following criteria

(Ellis & Steyn, 2003):

Small effect size: d = 0,2

Medium effect size (^): d = 0,5

Large effect size (*): d = 0,8

According to Ellis and Steyn (2003:4), data with d ≥ 0,8, should be considered as practically significant, since it is the result of a difference having an equal or large effect.

The differences will be discussed as following:

TABLE 5.11 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the concept of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Supervisor	2,37	0,48	0,15
	HOD	2,44	0,40	

In this case (Table 5.11), there is a small effect size (d=0,15) between the responses of supervisors and HODs, on the concept of cooperative education. This means that supervisors in

companies and academic HODs do not disagree regarding the usage and familiarity of the concept of cooperative education. There exists no practically significant difference between supervisors and HODs on the concept and usage thereof in cooperative education (compare Table 5.4).

TABLE 5.12 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the nature of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Supervisor	2,08	0,45	0,04
	HOD	2,06	0.39	

In this case, in Table 5.12, there is a small effect size (d=0,04) between the responses of supervisors and HODs, on the nature of cooperative education. This means that supervisors in companies and academic heads of departments in higher education institutions (HEIs) have no difference of opinion with regard to the practice of cooperative education in HEIs, that cooperative education is a teaching and learning strategy and that it is about the integration of classroom learning with work experience. There is therefore no practically significant difference between the two groups on the nature of cooperative education (compare Table 5.6).

TABLE 5.13 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the benefits of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Supervisor	1,71	0,65	0,18
	HOD	1,59	0,40	

According to Table 5.13, there is only a small effect (d=0,18) between the responses of supervisors and HODs, on the benefits of cooperative education. This means that supervisors in companies and academic heads of departments in higher education institutions were familiar with the benefits of cooperative education in their specific environments. Therefore, there exists no practically significant difference between the two groups on the benefits of cooperative education (compare Table 5.8).

TABLE 5.14 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the purpose and role of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Supervisor	2,39	0,43	0,70 ^
	HOD	2.09	0,37	

According to Table 5.14, a medium effect size (d=0,70) is indicated between the responses of supervisors and HODs. The lower average (2,09) indicates that HODs were more familiar regarding the provision of support provided by HEIs to companies and students during experiential learning and the principle of work-integrated learning applied, than supervisors (2,39) in companies. Therefore, a substantial difference exists on the purpose and role of cooperative education between the supervisors in companies and HODs in government-subsidised higher education institutions (compare Table 5.10).

TABLE 5.15 **The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the aim of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Supervisor	2,14	0,77	0,42
	HOD	1.82	0,64	

In this case, according to Table 5.15, a small effect (d=0,42) between the supervisors and HODs' opinions can be observed. This means that both supervisors of companies and HODs of HEIs were in agreement that the main aim of cooperative education is to educate students. No practically significant difference therefore exists between the supervisors of companies and HODs in government-subsidised higher education institutions, on the aim of cooperative education (compare 5.4.1.5)

TABLE 5.16 **The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the improvement in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Improvement of cooperative education	Supervisor	1.56	0.48	0,50^
	HOD	1.78	0,41	

According to Table 5.16, a medium effect size (d=0,50) between the responses of supervisors and HODs can be observed. This means that there was a greater agreement among supervisors in companies in industry than among academic heads of departments in higher education institutions concerning the improvement of experiential learning and liaison with companies. Therefore, a

substantial difference exists between supervisors in companies and HODs in government-subsidised higher education institutions, concerning the improvement of cooperative education (compare 5.4.1.6).

5.4.3 Comparison of the differences between the responses of academic heads of departments (HODs) in government-subsidised higher education institutions (universities, comprehensive universities and universities of technology) in the Gauteng province in South Africa.

5.4.3.1 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the concept of cooperative education

TABLE 5.17 **The differences between the responses of academic heads of departments (HODs) of universities and universities of technology in government-subsidised higher education institutions on the concept of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Universities	2,39	0,44	0,50^
	Universities of technology	2,60	0,27	

In this case, according to Table 5.17, a medium effect size (d=0,50) between the responses of HODs of universities and universities of technology can be observed. The lower mean (2,39) indicates that HODs in universities were more familiar with the concept and terminology related to cooperative education, than HODs in universities of technology (2,60) in higher education institutions. Therefore, a substantial difference exists between the opinions of HODs in universities

and universities of technology in government-subsidised higher education institutions, with regard to the concept of cooperative education (compare Table 5.4).

TABLE 5.18 The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities of technology in government-subsidised higher education institutions on the concept of cooperative education

CONSTRUCT	GROUP	MEAN $\bar{X}$	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Comprehensive universities	2,35	0,47	0,53 ^
	Universities of technology	2,60	0,27	

In Table 5.18, a medium effect size (d=0,53) between the responses of HODs of comprehensive universities and universities of technology can be observed. The lower mean (2,35) indicates that HODs in comprehensive universities were more familiar with the concept and terminology related to cooperative education, than the HODs in universities of technology (2,60). Therefore, a substantial difference exists between the academic heads of departments in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the concept of cooperative education (compare Table 5.4).

TABLE 5.19 The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities in government-subsidised higher education institutions on the concept of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Comprehensive universities	2,35	0,47	0,09
	Universities	2,39	0,44	

In this case, according to Table 5.19, a small effect size (d=0,09) of the responses of HODs between comprehensive universities and universities is indicated. This means that there is no difference between academic heads of departments opinions of comprehensive universities and universities with regard to the familiarity of the concept and related terminology in cooperative education. Therefore, no practically significant difference exists between the HODs in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the concept of cooperative education (compare Table 5.4).

5.4.3.2 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the nature of cooperative education

TABLE 5.20 The differences between the responses of academic heads of departments (HODs) of universities and universities of technology in government-subsidised higher education institutions on the nature of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Universities	1,85	0,49	0,80 *
	Universities of technology	2,24	0,33	

In Table 5.20, a large effect size (d=0,80) of the HODs' responses between the universities and universities of technology can be observed. This means that the lower mean (1,85) indicates that HODs in universities practice and applies cooperative education as a teaching and learning strategy more extensively, than HODs in universities of technology (2,24) in higher education institutions. A practically significant difference therefore exists between the HODs in universities and universities of technology in government-subsidised higher education institutions, with regard to the nature of cooperative education (compare Table 5.6) .

TABLE 5.21 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities of technology in government-subsidised higher education institutions on the nature of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Comprehensive universities	2,11	0,25	0,39
	Universities of technology	2,24	0,33	

In this case, according to Table 5.21, a small effect size (d=0,39) between the responses of HODs in comprehensive universities and universities of technology can be observed. This means that HODs in comprehensive universities and universities of technology do not significantly differ regarding the practice and application of cooperative education as teaching and learning strategy in higher education institutions. No practically significant difference therefore exists between the HODs in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the nature of cooperative education (compare Table 5.6).

TABLE 5.22 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities in government-subsidised higher education institutions on the nature of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Comprehensive universities	2,11	0,25	0,53 ^
	Universities	1,85	0,49	

In this case (Table 5. 22), a medium effect size (d=0,53) can be observed between the responses of HODs of comprehensive universities and those of universities. The lower mean (1,85) indicates

that academic heads of departments in universities practice and applies cooperative education as a teaching and learning strategy to a greater extend, than comprehensive universities (2,11) in higher education institutions. A substantial difference exists between academic heads of departments in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the nature of cooperative education (compare Table 5.6).

5.4.3.3 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the benefits of cooperative education

TABLE 5.23 The differences between the responses of academic heads of departments (HODs) of universities and universities of technology in government-subsidised higher education institutions on the benefits of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Universities	1,61	0,39	0,02
	Universities of technology	1,60	0,43	

According to Table 5.23, a small effect size (d=0,02) between the responses of HODs of universities and universities of technology is indicated. This means that academic heads of departments from both universities and universities of technology agree that cooperative education is beneficial to all role players involved, namely students, employers and higher education institutions. Therefore, there exists no practically significant difference between the opinions of academic heads of departments regarding the benefits of cooperative education in universities and universities of technology in government-subsidised higher education institutions (compare Table 5.8).

TABLE 5.24 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities of technology in government-subsidised higher education institutions on the benefits of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Comprehensive universities	1,56	0,46	0,09
	Universities of technology	1,60	0,43	

According to Table 5.24, a small effect size (d=0,09) on the responses of HODs between comprehensive universities and universities of technology is recorded. This means that there exists no disagreement amongst academic heads of departments in comprehensive universities and universities of technology with regard to the realisation of the benefits of cooperative education to students, companies and universities. Therefore, no practically significant difference exists in HODs' opinions between the comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the acknowledgement of the benefits of cooperative education (compare Table 5.8).

TABLE 5.25 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities in government-subsidised higher education institutions on the benefits of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Comprehensive universities	1,56	0,46	0,11
	Universities	1,61	0,39	

According to Table 5.25, a small size effect (d=0,11) between the HODs' responses of comprehensive universities and universities is indicated. This implies that HODs in both

comprehensive universities and universities in higher education institutions were not in disagreement with regard to the benefits of cooperative education for all role players involved. No practically significant difference exists between the opinions of HODs in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the benefits of cooperative education (compare Table 5.8).

5.4.3.4 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the purpose and role of cooperative education.

TABLE 5.26 The differences between the responses of academic heads of departments (HODs) of universities and universities of technology in government-subsidised higher education institutions on the purpose and role cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Universities	1,93	0,30	1,18 *
	Universities of technology	2,33	0,34	

According to Table 5.26 a large effect size (d=1,18) is indicated between the responses of HODs of universities and universities of technology. The lower mean (1,93) indicates that universities recognise the purpose and role of cooperative education much more, than universities of technology (2,33) in higher education institutions. This means that HODs in universities were more familiar with regard to the support provided by HEIs to companies and students during experiential learning and the principle of work-integrated learning being applied than HODs in universities of technology. A practically significant difference exists of the opinions of HODs between the universities and universities of technology in government-subsidised higher education institutions, with regard to the purpose and role of cooperative education (compare Table 5.10).

TABLE 5.27 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities of technology in government-subsidised higher education institutions on the purpose and role cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Comprehensive universities	2,04	0,42	0,69 ^
	Universities of technology	2,33	0,34	

According to Table 5.27, a medium effect size (d=0,69) between the responses of HODs of comprehensive universities and universities of technology can be observed. The lower mean (2,04) indicates that comprehensive universities recognise the purpose and role of cooperative education more, than universities of technology (2,33) in higher education institutions. This means that HODs in comprehensive universities were more familiar with regard to the support role provided by HEIs and lecturers to companies during experiential learning and the principle of work-integrated learning being applied than HODs in universities of technology. Therefore, a substantial difference exists between the academic heads of departments in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the purpose and role of cooperative education (compare table 5.10).

TABLE 5.28 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities in government-subsidised higher education institutions on the purpose and role cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Comprehensive universities	2,04	0,42	0,26
	Universities	1,93	0,30	

In this case, according to Table 5.28 a small effect size (d=0,26) between responses of HODs of comprehensive universities and universities is indicated. This means that HODs in universities were more familiar with regard to the support role provided by HEIs to companies and students during experiential learning and the principle of work-integrated learning being applied than HODs in comprehensive universities. No practically significant difference exists regarding the opinions of HODs in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the purpose and role of cooperative education (compare Table 5.10).

5.4.3.5 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the aim of cooperative education.

TABLE 5.29 The differences between the responses of academic heads of departments (HODs) of universities and universities of technology in government subsidised higher education institutions on the aim of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Universities	2,0	0,63	0,63 ^
	Universities of technology	1,60	0,55	

According to Table 5.29 a medium effect size (d=0,63) between the responses of HODs in universities and universities of technology is indicated. The lower mean (1,60) indicates that universities of technology recognise the aim of cooperative education, more than universities (2,0). This means that academic heads of departments in universities of technology recognise the aim of cooperative education, namely to educate students, as more important than universities, in higher education institutions. A substantial difference exists between the response of HODs in universities and universities of technology in government-subsidised higher education institutions, with regard to the aim of cooperative education (compare, 5.4.1.5).

TABLE 5.30 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities of technology in government-subsidised higher education institutions on the aim of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Comprehensive universities	1,83	0,75	0,31
	Universities of technology	1,60	0,55	

According to Table 5.30, a small effect size (d=0,31) between the responses of HODs in comprehensive universities and universities of technology can be observed. This means that there is no difference between academic heads of departments in comprehensive universities and universities of technology on the aim of cooperative education, namely to educate students. No practically significant difference exists between the HODs in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the aim of cooperative education (compare, 5.4.1.5).

TABLE 5.31 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities in government-subsidised higher education institutions on the aim of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Comprehensive universities	1,83	0,75	0,23
	Universities	2,0	0,63	

In this case, according to Table 5.31, a small effect size (d=0,23) is indicated between the responses of HODs in comprehensive universities and universities. This means that there exists no

difference between the opinions of HODs in comprehensive universities and universities with regard to the aim of cooperative education i.e. to educate students. Therefore, no practically significant difference exists between the academic heads of departments in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the aim of cooperative education (compare, 5.4.1.5).

5.4.3.6 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the improvement of cooperative education.

TABLE 5.32 The differences between the responses of academic heads of departments (HODs) of universities and universities of technology in government-subsidised higher education institutions on the improvement of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Universities	2,0	0,0	0,44
	Universities of technology	1,8	0,45	

According to Table 5.32, a small effect size (d=0,44) between the responses of HODs in universities and universities of technology is indicated. This means that there is no disagreement by academic heads of departments in universities and universities of technology, that cooperative education needs to be improved in terms of experiential learning and liaison with companies. No practically significant difference therefore, exists between the universities and universities of technology in government-subsidised higher education institutions, with regard to the improvement of cooperative education (compare, 5.6).

TABLE 5.33 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities of technology in government-subsidised higher education institutions on the improvement of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Comprehensive universities	1,58	0,49	0,50^
	Universities of technology	1,80	0,45	

In this case, according to Table 5.33, a medium effect size (d=0,50) between the responses of HODs in comprehensive universities and universities of technology can be observed. This means that HODs in comprehensive universities agree more than universities of technology that experiential learning as well as liaison activities with companies, should be more improved in cooperative education, in higher education institutions. A substantial difference therefore exists between the opinions of HODs in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the improvement of cooperative education (compare, 5.4.1.6).

TABLE 5.34 **The differences between the responses of academic heads of departments (HODs) of comprehensive universities and universities in government-subsidised higher education institutions on the improvement of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Comprehensive universities	1,58	0,49	0,86 *
	Universities	2,0	0,0	

In Table 5.34, a large effect size (d=0,86) between the response of HODs in comprehensive universities and universities is indicated. The lower mean (1,58) indicates that HODs' in comprehensive universities acknowledge that the improvement of experiential learning and liaison with companies in cooperative education in higher education institutions is needed much more, than universities (2,0). This implies that there is a practically significant difference of the opinions of academic heads of departments in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the improvement of cooperative education, in higher education institutions (compare, 5.4.1.6)

5.4.4 Comparison of the differences between the responses of students in government-subsidised higher education institutions (universities, comprehensive universities and universities of technology) in the Gauteng province in South Africa.

5.4.4.1 The differences between the responses of students of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the concept of cooperative education

TABLE 5.35 The differences between the responses of students of universities and universities of technology in government-subsidised higher education institutions on the concept of cooperative education

CONSTRUCT	GROUP	MEAN $\bar{X}$	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Universities	2,27	0,55	0
	Universities of technology	2,27	0,68	

According to Table 5.35 no effect size (d=0) between the responses of students of universities and universities of technology was recorded. This means that according to students in the various

disciplines in universities and universities of technology do not disagree with regard to the concept of cooperative education and its usage, and related terminology, in higher education institutions. No practically significant difference exists between students of universities and universities of technology in government-subsidised higher education institutions, with regard to the concept of cooperative education (compare Table 5.4).

TABLE 5.36 The differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the concept of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Comprehensive universities	2,17	0,43	0.15
	Universities of technology	2,27	0,68	

In this case, according to Table 5.36 a small effect size (d=0,15) of the students responding from comprehensive universities and universities of technology were observed. This means that students in the three disciplines in comprehensive universities and in universities of technology do not differ with regard to the concept of cooperative education, its usage and related terminology in higher education institutions. No practically significant difference exists between responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the concept of cooperative education (compare Table 5.4).

TABLE 5.37 **The differences between the responses of students of comprehensive universities and universities in government-subsidised higher education institutions on the concept of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The concept of cooperative education	Comprehensive universities	2,17	0,43	0,18
	Universities	2,27	0,55	

In Table 5.37, a small effect size (d=0,18) between the responses of students in comprehensive universities and universities was observed. This means that students in the various disciplines do not differ on the concept of cooperative education, the usage thereof, and related terminology in higher education institutions. Therefore, no practically significant difference exists between the responses of students in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the concept of cooperative education (compare Table 5.4).

5.4.4.2 The differences between the responses of students of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the *nature of cooperative education*

TABLE 5.38 **The differences between the responses of students of universities and universities of technology in government-subsidised higher education institutions on the nature of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Universities	1,84	0,43	0,31
	Universities of technology	1,99	0,48	

In this case, according to Table 5.38, a small effect size (d=0,31) between the responses of students in universities and universities of technology was recorded. This means that students in the various disciplines in universities of technology have no difference of opinion with those of universities with regard to the practice of cooperative education in HEIs, that cooperative education is a teaching and learning strategy and that it is about the integration of classroom learning, with work experience, in higher education institutions. Therefore, no practically significant difference exists between the responses of students in universities and universities of technology in government-subsidised higher education institutions, with regard to the nature of cooperative education (compare Table 5.6).

TABLE 5.39 The differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the nature of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Comprehensive universities	2,02	0,42	0,06
	Universities of technology	1,99	0,48	

According to Table 5.39, a small effect size (d=0,06) between the responses of students in comprehensive universities and universities of technology was indicated. This implies that students in the various disciplines have no difference of opinion with regard to the practice of cooperative education in HEIs, that cooperative education is a teaching and learning strategy and that its about the integration of classroom learning with work experience. However, no practically significant difference exists between the responses of students in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the nature of cooperative education (compare Table 5.6).

TABLE 5.40 **The differences between the responses of students of comprehensive universities and universities in government-subsidised higher education institutions on the nature of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Comprehensive universities	2,02	0,42	0,42
	Universities	1,84	0,43	

In this case, according to Table 5.40, a small effect size (d=0,42) between the responses of students in comprehensive universities and universities was observed. This means that there is no difference of opinion by students in comprehensive universities and universities, with regard to the practice of cooperative education in HEIs, that cooperative education is a teaching and learning strategy and that it is about the integration of classroom learning with work experience, in higher education institutions. No practically significant difference exists between the comprehensive universities and universities in government-subsidised higher education institutions, with regard to the nature of cooperative education (compare Table 5.6).

5.4.4.3 The differences between the responses of students of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the *benefits of cooperative education*

TABLE 5.41 **The differences between the responses of students of universities and universities of technology in government-subsidised higher education institutions on the benefits of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Universities	1,68	0,57	0.03
	Universities of technology	1,70	0,70	

In Table 5.41, a small effect size (d=0,03) between the responses of students in universities and universities of technology was recorded. This means that students in the various disciplines in universities and universities of technology, do not disagree about the benefits of cooperative education to companies and higher education institutions. No practically significant difference exists between the responses of students in universities and universities of technology in government-subsidised higher education institutions, with regard to the benefits of cooperative education (compare Table 5.8)

TABLE 5.42 The differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the benefits of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Comprehensive universities	1,74	0,46	0.06
	Universities of technology	1,70	0,70	

In this case, according to Table 5.42, a small effect size (d=0,06) between the responses of students in comprehensive universities and universities of technology was recorded. This means that students in the three disciplines do not disagree with regard to the benefits cooperative education has for higher education institutions and companies. Therefore, no practically significant difference exists between the responses of students in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the benefits of cooperative education (compare Table 5.8).

TABLE 5.43 **The differences between the responses of students of comprehensive universities and universities in government-subsidised higher education institutions on the benefits of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The benefits of cooperative education	Comprehensive universities	1,74	0,46	0,11
	Universities	1,68	0,57	

In this case, according to Table 5.43, a small effect size (d=0,11) between the responses of students in comprehensive universities and universities can be observed. This implies that students from both comprehensive universities and universities in the disciplines studied do not disagree that cooperative education is beneficial for companies and higher education institutions. Therefore, no practically significant difference exists between the responses of students in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the benefits of cooperative education (compare Table 5.8).

5.4.4.4 The differences between the responses of students of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the *purpose and role of cooperative education*

TABLE 5.44 **The differences between the responses of students of universities and universities of technology in government-subsidised higher education institutions on the purpose and role of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Universities	2,10	0,47	0,74 ^
	Universities of technology	1,75	0,45	

According to Table 5.44, a medium effect size (d=0,74) between the responses of students in universities and universities of technology was recorded. The lower mean (1,75) indicates that students in universities of technology were slightly more aware of the purpose and role of cooperative education, than those in universities (2,10) in higher education institutions. This means that students in the three disciplines in universities of technology were more familiar with regard to the support provided by HEIs and lecturers to companies during experiential learning and the principle of work-integrated learning being applied than students in universities. A substantial difference exists between the responses of students in universities and universities of technology in government-subsidised higher education institutions, with regard to the purpose and role of cooperative education (compare Table 5.10).

TABLE 5.45 The differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the purpose and role of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Comprehensive universities	2,20	0,51	0,88 *
	Universities of technology	1,75	0,45	

In this case, according to Table 5.45, a large effect size (d=0,88) between the responses of students in comprehensive universities and universities of technology was indicated. The lower mean (1,75) indicates that students in universities of technology were more aware of the purpose and role of cooperative education, than those in comprehensive universities (2,20) in higher education institutions. This means that there is a large practical tendency in the students' opinions in the various disciplines between comprehensive universities and universities of technology with regard to the support provided by HEIs and lecturers to companies during experiential learning and the principle of work-integrated learning applied. A practically significant difference exists between the responses of students in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the purpose and role of cooperative education (compare Table 5.10)

TABLE 5.46 **The differences between the responses of students of comprehensive universities and universities in government-subsidised higher education institutions on the purpose and role of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Comprehensive universities	2,20	0,51	0,20
	Universities	2,10	0,47	

In this case, according to Table 5.46, a small effect size (d=0,20) between the responses of students in comprehensive universities and universities can be observed. This means that there is no difference of opinions of students in the various disciplines, in comprehensive universities and universities with regard to the support provided by HEIs and lecturers to companies and students during experiential learning and the principle of work-integrated learning being applied. No practically significant difference exists between the responses of students in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the purpose and role of cooperative education (compare Table 5.10).

5.4.4.5 The differences between the responses of students of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the *aim of cooperative education*

TABLE 5.47 **The differences between the responses of students of universities and universities of technology in government-subsidised higher education institutions on the aim of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Universities	1,68	0,64	0,34
	Universities of technology	1,91	0,68	

According to Table 5.47, a small effect size (d=0,34) between the responses of students in universities and universities of technology was recorded. This means that students in the various disciplines do not differ in universities and universities of technology on the aim of cooperative education which is to educate students. No practically significant difference exists between the opinions of students in universities and universities of technology in government-subsidised higher education institutions, with regard to the aim of cooperative education (compare, 5.4.1.5).

TABLE 5.48 The differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the aim of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Comprehensive universities	1,69	0,53	0.32
	Universities of technology	1,91	0,68	

In this case, according to Table 5.48, a small effect size (d=0,32) between the responses of students on comprehensive universities and universities of technology is indicated. This means that students in the three disciplines do not differ in their opinions in comprehensive universities and universities of technology with regard to the aim of cooperative education, which is to educate students. No practically significant difference exists between the responses of students in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the aim of cooperative education (compare, 5.4.1.5).

TABLE 5.49 **The differences between the responses of students of comprehensive universities and universities in government-subsidised higher education institutions on the aim of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The aim of cooperative education	Comprehensive universities	1,69	0,53	0.02
	Universities	1,68	0,64	

According to Table 5.49, a small effect size (d=0,02) between the responses of students in comprehensive universities and universities can be observed. This implies that students in the various disciplines in comprehensive universities and in universities do not differ regarding the aim of cooperative education, namely to educate students. No practically significant difference exists between the responses of students in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the aim of cooperative education (compare, 5.4.1.5).

5.4.4.6 The differences between the responses of students of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the *improvement of cooperative education*

TABLE 5.50 **The differences between the responses of students of universities and universities of technology in government-subsidised higher education on the improvement of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Universities	1,76	0,5	0,36
	Universities of technology	1,55	0,58	

According to Table 5.50, a small effect size (d=0,36) between the responses of students in universities and universities of technology was recorded. This means that students in the respective disciplines do not differ with regard to the improvement of cooperative education in terms of experiential learning as well as liaison with companies in industry in universities and universities of technology. No practically significant difference exists between the opinions of students in universities and universities of technology in government-subsidised higher education institutions, with regard to the improvement of cooperative education (compare, 5.4.1.6).

TABLE 5.51 The differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the improvement of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Comprehensive universities	1,80	0,50	0,43
	Universities of technology	1,55	0,58	

In this case, according to Table 5.51, a small effect size (d=0,43) between the responses of students in comprehensive universities and universities of technology is indicated. This means that students in the various disciplines in comprehensive universities and universities of technology do not differ in opinion regarding the improvement of cooperative education, namely in terms of experiential learning and liaison with companies in industry. No practically significant difference exists between the opinions of students in comprehensive universities and universities of technology in government-subsidised higher education institutions, with regard to the improvement of cooperative education (compare, 5.4.1.6).

TABLE 5.52 **The differences between the responses of students of comprehensive universities and universities in government-subsidised higher education institutions on the improvement of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Comprehensive universities	1,80	0,50	0,08
	Universities	1,76	0,52	

According to Table 5.52, a small effect size (d=0,08) between the responses of students in comprehensive universities and universities is indicated. This means that students in the various disciplines in comprehensive universities and universities do not differ with regard to the improvement of cooperative education in terms of experiential learning and liaison with companies in industry. No practically significant difference exists between the responses of students in comprehensive universities and universities in government-subsidised higher education institutions, with regard to the improvement of cooperative education (compare, 5.4.1.6).

5.4.5 Discussion of data interpretation on the basic principles and nature of cooperative education (section C)

The purpose of this study in section C, was to compare and determine the status of cooperative education on the basic principles and nature of cooperative education by respondents, namely supervisors in companies, heads of academic departments and students in government-subsidised higher education institutions in the Gauteng region in South Africa.

The Cronbach alpha reliability coefficient was reported (compare 5.4.1). Data has been collected and tabulated (compare 5.4.2 and 5.4.4) for interpretation.

It must be noted that only large effect sizes ($d \geq 0,8$) (compare 5.4.2) were selected to indicate differences in opinions of respondents (Ellis & Steyn, 2003:4).

Discussions on section C on the basic principles and nature of cooperative education are as follows;

5.4.5.1 Comparison of supervisors with academic heads of departments in higher education institutions

The *means* related to the respondents on all constructs (compare Table 4.1) by supervisors of companies in industry and academic heads of departments of higher education institutions, never recorded a mean[21] of 3 or above. This implies that all respondents of both mentioned groups either agreed or strongly agreed on the constructs related to the basic principles and nature of cooperative education, and there was no disagreement on the constructs (compare Table 4.1).

All *d-values* never exceeded a value of 0,8 and thus no practically significant difference was observed by respondents on all constructs in section C. This means that there was no practically significant difference by supervisors of companies in industry and academic heads of departments in higher education on all constructs in section C (compare Table 4.1)

5.4.5.2 Comparison of academic heads of departments in higher education institutions

The *means* related to the respondents on all constructs (compare Table 4.1) by academic heads of departments in higher education institutions never recorded a mean of 3 or above. This implies that all academic head of departments either agreed or strongly agreed on the constructs related to the basic principles and nature of cooperative education, and there was no disagreement on any of the constructs (compare Table 4.1).

Most *d-values* never exceeded a value of 0,8 and thus no practically significant difference was observed by most respondents on all constructs in section C. This implies that there was no practically significant difference by academic heads of departments in higher education institutions on all constructs in section C (compare Table 4.1) except for the following:

[21] Mean of 3 used as cut-off.

TABLE 5.53 **Differences between the responses of academic heads of departments of universities and universities of technology in government-subsidised higher education institutions on the nature of cooperative education (Compare Table 5.20).**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The nature of cooperative education	Universities	1,85	0,49	0,80 *
	Universities of technology	2,24	0,33	

TABLE 5.54 **Differences between the responses of academic heads of departments of universities and universities of technology in government-subsidised higher education institutions on the purpose and role cooperative education (compare Table 5.26)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Universities	1,93	0,30	1,18 *
	Universities of technology	2,33	0,34	

TABLE 5.55 **Differences between the responses of academic heads of departments of comprehensive universities and universities in government-subsidised higher education institutions on the improvement of cooperative education (compare Table 5.34).**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The improvement of cooperative education	Comprehensive universities	1,58	0,49	0,86 *
	Universities	2,0	0,0	

Therefore a practically significant difference can only be observed by academic heads of departments in higher education institutions with regard to:

1. **Nature of cooperative education (compare Table 5.20)** in which academic heads of universities more strongly agree on the nature of cooperative education than universities of technology and have recorded a large practically significant difference on this construct.

2. **Purpose and role of cooperative education (compare Table 5.26)** in which academic heads of universities more strongly agree than those in universities of technology on the purpose and role of cooperative education and have recorded a large practically significant difference on this construct.

3. **Improvement of cooperative education (compare Table 5.34)** in which academic heads of comprehensive universities agree more strongly than those in universities on this construct and have recorded a large practically significant difference on this construct.

Therefore, academic heads of departments at universities differ significantly with regard to the nature, purpose and role of cooperative education with universities of technology and on the improvement of cooperative education academic heads of departments differs significantly in comprehensive universities from universities. Academic heads of departments furthermore agree on all other constructs in higher education institutions on the basic principles and nature of cooperative education.

5.4.5.3 Comparison of students in higher education institutions

The *means* of student respondents on all constructs (compare Table 4.1) in higher education institutions never recorded a mean of 3 or above. This implies that all students in higher education institutions either agreed or strongly agreed on the constructs related to the basic principles and nature of cooperative education, and there was no disagreement on any of the constructs (compare Table 4.1).

Most *d-values* never exceeded a value of 0,8 and thus no practically significant difference was observed by most student respondents on all constructs in section C. This implies that there was no practically significant difference by students in higher education institutions on all constructs in section C (compare Table 4.1) except for the following:

TABLE 5.56 Differences between the responses of students of comprehensive universities and universities of technology in government-subsidised higher education institutions on the pupose and role of cooperative education (compare Table 5.45).

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The purpose and role of cooperative education	Comprehensive universities	2,20	0,51	0,88*
	Universities of technology	1,75	0,45	

Therefore a practically significant difference can only be observed by students in higher education institutions with regard to:

5.4.5.4 Purpose and role of cooperative education (compare Table 5.45)

In which students of universities of technology agree more strongly on this construct than comprehensive universities and have recorded a large practically significant difference on this construct.

Therefore students only practically significantly differ with regard to the purpose and role of cooperative education in universities of technology with those in comprehensive universities.

Furthermore, students agree on all other constructs in higher education institutions on the basic principles and nature of cooperative education.

5.5 INTERPRETATION OF DATA ON THE BEST PRACTICES IN COOPERATIVE EDUCATION: SECTION D

5.5.1 Determination of the Cronbach alpha reliability coefficient and factor analysis on the constructs related to the best practices in cooperative education

5.5.1.1 The management of cooperative education

Construct (Cronbach alpha) reliability

TABLE 5.57 The management of cooperative education

	CONSTRUCT	VALUE
	The management of cooperative education	0,82

The Cronbach alpha reliability coefficient measure 0,82 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

One factor has been retained: variance explained 74,07%

TABLE 5.58 The management of cooperative education

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	The management of cooperative education	1	
	Questions		
1	Cooperative education should be properly planned and executed within higher education institutions	0.83	0.69
2	Guidelines for students should be included in the study material for experiential learning	0.87	0.76
3	Guidelines for supervisors should be included in the study material for experiential learning	0.88	0.77

5.5.1.2 Experiential learning

Construct (Cronbach alpha) reliability

TABLE 5.59 Experiential learning

	CONSTRUCT	VALUE
	Experiential learning	0.82

The Cronbach alpha reliability coefficient measure 0,82 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

Four factors have been retained: variance explained 63,77%

TABLE 5.60 Experiential learning

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	Experiential learning	1 2 3 4	
	Questions		
4	A management information system (MIS) should be used for the management and administration of cooperative education in higher education institutions.	0.52	0.46
5	Students should be prepared for the experiential learning process and the workplace prior to placement for experiential learning.	0.62	0.62
6	Cooperative education is only about placement of students for experiential learning.	0.74	0.58
7	Students must be visited at the workplace by lecturers to monitor the progress of students during experiential learning.	0.66	0.74
8	A supervisor should be assigned by the company to supervise and coach students during experiential learning.	0.63	0.46
9	Lecturers must assess competencies of students during experiential learning.	0.70	0.72
10	Students must give account of their experiential learning experiencesto companies and lecturers after the experiential learning period.	0.63	0.45
11	Students can also receive simulated experiential learning, e.g. on the campus of a higher education institution.	0.74	0.57
17	Lecturers at universities should encouragestudents towards and support them during experiential learning.	0.87	0.78
18	Lecturers at comprehensive niversities should encourage students towards and support them during experiential learning.	0.87	0.81

19	Lecturers at universities of technology should encourage students towards and support them during experiential learning.	0.80	0.68
26	Students should also be placed internationally for experiential learning.	0.82	0.71
32	Students should only be placed with companies for experiential learning	0.73	0.60
36	Students should be remunerated by companies during experiential learning	0.66	0.74

5.5.1.3 Role players involved

Construct (Cronbach alpha) reliability

TABLE 5.61 Role players involved

	CONSTRUCT	VALUE
	Role players involved	0.91

The Cronbach alpha reliability coefficient measure 0,91 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

One factor has been retained: variance explained 85,39%

TABLE 5.62 Role players involved

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	Role players involved	1	
	Questions		
33	Universities should only offer programmes that meet the requirements of industry	0.92	0.85
34	Comprehensive universities should only offer programmes that meet the requirements of industry	0.96	0.92
35	Universities of technology should only offer programmes that meet the requirements of industry	0.89	0.78

5.5.1.4 Community service learning

Construct (Cronbach alpha) reliability

TABLE 5.63 Community service learning

	CONSTRUCT	VALUE
	Community service learning	0.89

The Cronbach alpha reliability coefficient measure 0,89 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

One factor has been retained: variance explained 82,80%

TABLE 5.64 Community service learning

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	Community service learning	1	
	Questions		
14	Universities should be involved in community service learning	0.93	0.86
15	Comprehensive universities should be involved in community service learning	0.92	0.85
16	Universities of technology should be involved in community service learning	0.88	0.78

5.5.1.5 Resource provision

Construct (Cronbach alpha) reliability

TABLE 5.65 Community service learning

	CONSTRUCT	VALUE
	Resource provision	0.66

The Cronbach alpha reliability coefficient measure 0,66 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

One factor has been retained: variance explained 50,58%

TABLE 5.66 Resource provision

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	Resource provision	1	
7	Students must be visited at the workplace by lecturers to monitor the progress of students during experiential learning	0.67	0.44
20	Experiential learning in higher education institutions should be financed by the Department of Education	0.78	0.61
21	Experiential learning in higher education institutions should be financed by the National Skills Fund	0.79	0.63
37	Human resource capacity should be provided in higher education institutions for the proper functioning of cooperative education	0.59	0.34

5.5.1.6 Promotion

Construct (Cronbach alpha) reliability

TABLE 5.67 Promotion

	CONSTRUCT	VALUE
	Promotion	0.90

The Cronbach alpha reliability coefficient measure 0,90 and it may therefore be deduced that this construct is reliable in the context where it is used.

Construct validity

Factor findings

One factor has been retained: Variance explained 83,56%

TABLE 5.68 Promotion

	CONSTRUCT: QUESTIONS	FACTOR LOADING	COMMUNALITY
	Promotion	1	
	Questions		
27	Universities should promote cooperative education in commerce and industry	0.89	0.79
28	Comprehensive universities should promote cooperative education in commerce and industry	0.95	0.89
29	Universities of technology should promote cooperative education in commerce and industry	0.91	0.82

5.5.2 Comparison of the differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) in government-subsidised higher education institutions in the Gauteng province in South Africa

The practically significant differences between the following groups will be determined using the d-value of Cohen (Ellis & Steyn, 2003) with the aid of the following statistical formula:

$$d = \frac{\bar{X}2 - \bar{X}2}{\text{Maximum Sd}}$$

Where $\bar{X}$ = Mean and Sd = Standard deviation

The effect sizes were determined according to the following criteria (Ellis & Steyn, 2003):

Small effect size: d = 0,2

Medium effect size (^): d = 0,5

Large effect size (*): d = 0,8

According to Ellis and Steyn (2003:4), data with the value d ≥ 0,8 should be considered as practically significant, since it is the result of a difference having an equal or large effect .

The relevant differences will be discussed below:

TABLE 5.69 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the management of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The management of cooperative education	Supervisor	1,48	0,47	0,31
	HOD	1,63	0,48	

In this case, according to Table 5.69, there is a small effect size (d=0,31) between responses of supervisors and HODs, with regard to the management of cooperative education. This means that no difference exists between supervisors and academic heads of departments that cooperative education be properly planned and executed within HEIs and that guidelines for students and supervisors be included in the study material of experiential learning students. However, there is no practically significant difference between supervisors of companies and HODs in higher education institutions, regarding the management of cooperative education (compare Table 5.58).

TABLE 5.70 **The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the policies and procedures of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures in cooperative education	Supervisor	1,43	0,47	0,42
	HOD	1,65	0,52	

In this case, according to Table 5.70, there is small effect size (d=0,42) between the responses of supervisors and HODs, regarding policies and procedures for cooperative education. This implies that there is no difference between supervisors of companies in industry and academic heads of departments in higher education institutions on their opinions with regard to the inclusion of guidelines for students and supervisors in the study material used for experiential learning. Therefore, there exists no practically significant difference between the two groups with regard to the importance of policies and procedures related to cooperative education (compare Table 4.2, questions 2 and 3).

TABLE 5.71 **The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on experiential learning**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning	Supervisor	1,63	0,49	0,36
	HOD	1,68	0,53	

In this case there is small effect size (d=0,36) between the responses of supervisors and HODs, on the experiential learning process. This means, no difference is indicated between the supervisors in companies in industry and academic heads of departments in higher education institutions concerning the experiential learning process which includes preparation, placement, monitoring,

assessment and debriefing of students. There is therefore no practically significant difference between the two groups on the experiential learning process in cooperative education (compare Table 5.60).

TABLE 5.72 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions with regard to the role players involved in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The role players involved in cooperative education	Supervisor	1,89	0,28	0,25
	HOD	1,97	0,32	

According to Table 5.72, there is a small effect size (d=0,25) between the responses of supervisors and HODs, with regard to the role players involved in cooperative education. This means that supervisors of companies and academic heads of departments do not differ on the issue that higher education institutions should only offer programmes that meet the requirements of industry. However, there exists no practically significant difference between supervisors and HODs with regard to the role players involved in cooperative education (compare Table 5.62).

TABLE 5.73 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on skills development (learnerships) in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Supervisor	2,30	0,75	0,11
	HOD	2,22	0,74	

In this case, according to Table 5.73), there is a small effect size (d=0,11) of the responses of supervisors and HODs, on learnerships (skills development). This implies that supervisors of companies and academic heads of departments in higher education institutions do not disagree on the benefits of learnerships to students and companies. However, there exists no practically significant difference between the two groups on the recognition of the importance of learnerships as skills initiative in the higher education sector (compare Table 4.2, question 13).

TABLE 5.74 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on community service learning

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning	Supervisor	1,59	0,64	0,50^
	HOD	1,88	0,60	

According to Table 5.74, there is a medium effect size (d=0,50) between the responses of supervisors and HODs, on community service learning involvement. This means that supervisors of companies in industry agree more than academic heads of departments in higher education institutions that HEIs should be more involved in community service learning. Therefore, there is a substantial difference between the opinions of the two groups on the involvement in community service learning in higher education institutions (compare Table 5.64).

TABLE 5.75 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Supervisor	2,04	0,44	0,52 ^
	HOD	1,81	0,36	

In this case, according to Table 5.75, there is a medium effect size (d=0,52) between the supervisors and HODs' responses on resource provision. This means that the lower mean of (1,81) obtained by HODs indicates a stronger response of academic heads of departments concerning the provision of resources for cooperative education, than supervisors (2,04). This means that HODs responded much stronger on the need to provide in human and financial recourses for the proper functioning of cooperative education within higher education institutions, than supervisors. Therefore, there is a substantial difference between the two groups on their opinions with regard to the provision of resources for cooperative education in higher education institutions (compare Table 5.66).

TABLE 5.76 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on exposure of staff to industry (work environment)

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry	Supervisor	2,06	0,89	0,30
	HOD	1,79	0,59	

In this case, according to Table 5.76, there is a small effect size (d=0,30) between the supervisors and HODs' responses, on the exposure of staff to industry and the workplace. This means that supervisors of companies and academic heads of departments do not disagree that academic staff, namely lecturers in higher education institutions, be regularly exposed to the work environment and industry to stay abreast with the latest developments in their field of expertise. Therefore, there exists no practically significant difference between the two groups that academic staff in higher education institutions be exposed to industry on a regular basis (compare Table 4.2, question 22).

TABLE 5.77 **The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on liaison in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Supervisor	1,37	0,49	0,04
	HOD	1,35	0,49	

In this case there is a small effect size (d=0,04) between the supervisors and HODs' responses, on the role of liaison between industry en higher education institutions. This implies that supervisors of companies and academic heads of departments were not in disagreement regarding company inputs through advisory committees for the long-term sustainability of learning programmes in higher education institutions. However, there exists no practically significant difference between the two groups with regard to the importance of liaison in higher education institutions and industry (compare Table 4.2, questions 12 and 23).

TABLE 5.78 **The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on partnerships**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships	Supervisor	1,52	0,40	0,28
	HOD	1,65	0,46	

According to Table 5.78, there is a small effect size (d=0,28) between the supervisors and HODs' responses on partnerships by higher education institutions with industry. This means that supervisors of companies and academic heads of departments were not in disagreement regarding the collective engagement in partnerships by companies with higher education institutions, regarding teaching and learning, research and community service. There exists no practically

significant difference between the two groups on partnerships in higher education institutions with industry (compare Table 4.2, questions 23 and 25).

TABLE 5.79 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on internationalisation in cooperative education.

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Supervisor	1,54	0,41	0,25
	HOD	1,68	0,56	

In this case there is a small effect size (d=0,25) between supervisors and HODs, responses on the internationalisation of students in cooperative education. This means that supervisors of companies and academic heads of departments were not in disagreement regarding the international placement of students for experiential learning in cooperative education. Therefore, there exists no practically significant difference between the two groups on the internationalisation of students in cooperative education (compare Table 4.2, question 26).

TABLE 5.80 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on the promotion of cooperative education.

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion of cooperative education	Supervisor	2,22	0,75	0,11
	HOD	2,12	0,93	

In this case there is a small effect size (d=0,11) between the supervisors and HODs' responses, with regard to the promotion of cooperative education to industry. This means that supervisors of companies and academic heads of departments were not in disagreement to promote cooperative

education to commerce and industry. It must be noted that there exists no practically significant difference between the two groups on the promotion of cooperative education to industry (compare Table 5.68).

TABLE 5.81 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government subsidised higher education institutions on telematic application in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Supervisor	1,68	0.53	0,09
	HOD	1,73	0,44	

In this case there is a small effect size (d=0,09) between the supervisors and HODs' opinions, on telematic application in cooperative education. This means that supervisors of companies in industry and academic heads of departments in HEIs were not in disagreement regarding the value and application of interactive instructional television to monitor the progress of students during experiential learning. However, there exists no practically significant difference between the two groups on the importance of telematic application on students in cooperative education (compare Table 4.2, question 30).

TABLE 5.82 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on quality management in cooperative education.

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Supervisor	2,44	0,64	0,63^
	HOD	2,00	0,70	

According to Table 5.82, there is a medium effect size (d=0,63) between the supervisors and HODs' responses, on quality management in cooperative education. This means that academic heads of departments were more strongly in agreement on the usage of a quality management system to ensure quality in cooperative education practices in higher education institutions, than supervisors of companies in industry. There is therefore a substantial difference between the two groups recognition on the importance of quality management practices in cooperative education in higher education institutions (compare Table 4.2, question 31).

TABLE 5.83 The differences between the responses of supervisors of companies in industry and academic heads of departments (HODs) of government-subsidised higher education institutions on graduate placement in cooperative education.

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Supervisor	1,96	0,52	0,03
	HOD	1,94	0,66	

In this case there is a small effect size (d=0,03) between the supervisors and HODs' opinions, on the importance of accessibility to graduate placement in higher education institutions. This means that supervisors of companies and academic heads of departments in higher education institutions were not in disagreement that students should have access to a graduate placement office on campuses of higher education institutions. There exists no practically significant difference between the two groups on the recognition of the importance of a graduate placement office in higher education institutions (compare Table 4.2, question 24).

5.5.3 Comparison of the differences between the responses academic heads of departments (HODs) in government-subsidised higher education institutions (universities, comprehensive universities and universities of technology) in the Gauteng province in South Africa

5.5.3.1 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the management of cooperative education

TABLE 5.84 **The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on the management of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The management of cooperative education	Universities	1,61	0,57	0,21
	Universities of technology	1,73	0,43	

According to Table 5.84, there is a small effect size (d=0,21) between the HODs' responses on the management of cooperative education. This means that academic heads of departments in universities and universities of technologies do not disagree, that cooperative education should be properly planned and executed in HEIs, and that guidelines for students and supervisors should be included in study material for experiential learning. Therefore, there exists no practically significant difference between the HODs' responses on the management of cooperative education between universities and universities of technology (compare Table 5.58).

TABLE 5.85 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on the management of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The management of cooperative education	Comprehensive universities	1,56	0,50	0,34
	Universities of technology	1,73	0,43	

In this case there is a small effect size (d=0,34) between the HODs' responses on the management of cooperative education. This means that HODs in comprehensive universities and universities of technology, do not disagree that cooperative education should be properly planned and executed within HEIs, and that guidelines should be included for both students and supervisors in study material for experiential learning. There exists no practically significant difference between the HODs' responses on the management of cooperative education between comprehensive universities and universities of technology (compare Table 5.58).

TABLE 5.86 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on the management of cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
The management of cooperative education	Comprehensive universities	1,56	0,50	0,09
	Universities	1,61	0,57	

In this case there is a small effect size (d=0,09) between the HODs' opinions on the management of cooperative education. This implies that academic heads of departments in comprehensive universities and universities do not disagree that cooperative education should be properly planned

and executed within higher education institutions and that guidelines for students and supervisors be included in the study material for experiential learning. There is therefore no practically significant difference between the HODs' responses on the management of cooperative education between comprehensive universities and universities (compare Table 5.58).

5.5.3.2 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the policies and procedures in cooperative education

TABLE 5.87 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on policies and procedures in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures in cooperative education	Universities	1,58	0,66	0,33
	Universities of technology	1,80	0,45	

According to Table 5.87, there is a small effect size (d=0,33) between the HODs' opinions on policies and procedures in cooperative education. This means that academic heads of departments in universities and universities of technology do not disagree regarding that guidelines for students and supervisors to be included in the study material for experiential learning. There exists therefore no practically significant difference between the HODs' responses on the inclusion of policies and procedures (guidelines) in students and supervisors study material in cooperative education between universities and universities of technology (compare Table 4.2, questions, 2 and 3).

TABLE 5.88 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on policies and procedures in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures in cooperative education	Comprehensive universities	1,58	0,49	0,50^
	Universities of technology	1,80	0,45	

In this case there is a medium effect size (d=0,50) between the HODs' responses on policies and procedures in cooperative education. This means that academic heads of departments in comprehensive universities agree more than universities of technology, that guidelines for students and supervisors be included in the study material for experiential learning. Therefore, there exists a substantial difference between the HODs' responses on the inclusion of policies and procedures (guidelines) in students and supervisors study material in cooperative education between comprehensive universities and universities of technology (compare Table 4.2, questions 2 and 3).

TABLE 5.89 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on policies and procedures in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures in cooperative education	Comprehensive universities	1,58	0,49	0,00
	Universities	1,58	0,66	

In this case there is no effect size (d=0,00) between the HODs' responses on policies and procedures in cooperative education. This implies that academic heads of departments in comprehensive universities and universities agree that guidelines be included in the study material of students and supervisors for experiential learning. There exists no practically significant difference between the HODs' responses on the inclusion of policies and procedures (guidelines) in students and supervisors study material in cooperative education between comprehensive universities and universities (compare Table 4.2, questions 2 and 3).

5.5.3.3 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on experiential learning in cooperative education

TABLE 5.90 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on experiential learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Universities	2,0	0,63	0
	Universities of technology	2,0	0	

According to Table 5.90, there is no effect size (d=0) between the HODs' opinions on experiential learning in cooperative education. The means measured were both equal (2,0) for universities and universities of technology. Therefore, there exists no practically significant difference between the HODs' responses on experiential learning in cooperative education between universities and universities of technology (compare Table 5.60).

TABLE 5.91 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on experiential learning in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,5	0,55	0,91*
	Universities of technology	2,0	0	

In this case there is a large effect size (d=0,91) between the HODs' opinions on experiential learning in cooperative education. The lower mean (1,5) in comprehensive universities indicates that respondents agree more to the experiential learning process which includes preparation, placement, monitoring, assessment and reflection of learning (debriefing), than universities of technology (2,0) . This means that academic heads of comprehensive universities agree more on the experiential learning process than students in universities of technology. There exists a practically significant difference between the HODs' responses on experiential learning in cooperative education between comprehensive universities and universities of technology (compare Table 5.60).

TABLE 5.92 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on experiential learning in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,5	0,55	0,80 *
	Universities	2,0	0,63	

In this case there is a large effect size (d=0,80) between the HODs' responses on experiential learning in cooperative education. This means that the lower mean of comprehensive universities (1,5) indicates more agreement by HODs in comprehensive universities on the experiential learning process in cooperative education, than universities (2,0). There exists a practically significant difference between the HODs' responses on experiential learning in cooperative education between comprehensive universities and universities (compare Table 5.60).

5.5.3.4 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on role players involved in cooperative education

TABLE 5.93 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on the role players involved in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Universities	1,97	0,43	0,09
	Universities of technology	1,93	0,29	

According to Table 5.93, there is a small effect size (d=0,09) between the HODs' opinions on role players involved in cooperative education. This means that academic heads of departments in universities and universities of technology do not disagree that higher education institutions should only offer programmes that meet the requirements of industry. Thus, there exists no practically significant difference between the HODs' responses on role players involved in cooperative education between universities and universities of technology (compare Table 5.62).

TABLE 5.94 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of governmentsubsidised higher education institutions on the role players involved in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Comprehensive universities	2,01	0,28	0,28
	Universities of technology	1,93	0,29	

In this case there is a small effect size (d=0,28) between the HODs' responses on role players involved in cooperative education. This implies that academic heads of departments in comprehensive universities and universities of technology, do not disagree that comprehensive universities and universities of technology should only offer programmes that meet the requirements of industry. Therefore, there exists no practically significant difference between the HODs' responses on role players involved in cooperative education between comprehensive universities and universities of technology (compare Table 5.62).

TABLE 5.95 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on the role players involved in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Comprehensive universities	2,01	0,28	0,09
	Universities	1,97	0,43	

In this case there is a small effect size (d=0,09) between the HODs' opinions on role players involved in cooperative education. This means that academic heads of departments in comprehensive universities and universities do not disagree that comprehensive universities and

universities should only offer programmes that meet the requirements of industry. There exists no practically significant difference between the HODs' responses regarding role players involved in cooperative education between comprehensive universities and universities (compare 5.62).

5.5.3.5 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on skills development (learnerships) in cooperative education

TABLE 5.96 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on skills development (learnerships) in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Universities	2,61	0,80	0,85 *
	Universities of technology	1,93	0,64	

In this case there is a large effect size (d=0,85) between the HODs' opinions on learnerships in cooperative education. The lower mean (1,93) indicates the recognition of the benefits of learnerships to be more important in universities of technology, than universities(2,61). This means that the responses of academic heads of departments at universities of technology more strongly agree on the benefits of learnerships in the universities of technology environment than in universities. There exists a practically significant difference between the HODs' responses on the recognition that learnerships are advantageous for students and companies in cooperative education for universities and universities of technology (compare Table 4.2, question 13).

TABLE 5.97 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on skills development (learnerships) in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Comprehensive universities	2,06	0,71	0,18
	Universities of technology	1,93	0,64	

In this case there is a small effect size (d=0,18) between the HODs' responses on learnerships in cooperative education. This means that academic heads of departments in comprehensive universities and universities of technology do not disagree that learnerships are beneficial to students and companies. There exists no practically significant difference between the HODs' responses on the recognition that learnerships are beneficial for students and employers in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 13).

TABLE 5.98 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on skills development (learnerships) in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Comprehensive universities	2,06	0,71	0,69 ^
	Universities	2,61	0,80	

In this case there is a medium effect size (d=0,69) between the HODs' opinions on learnerships as beneficial to students and companies in cooperative education. The lower mean of comprehensive universities (2,06) indicates that academic heads of departments in comprehensive universities more strongly agree on the benefits of learnerships for students and companies than universities (2,61). Therefore, there exists a substantial difference between the HODs' responses on the benefits of learnerships for students and companies in cooperative education between comprehensive universities and universities (compare Table 4.2, question 13).

5.5.3.6 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on community service learning in cooperative education

TABLE 5.99 **The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on community service learning in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning in cooperative education	Universities	2,0	0,63	0
	Universities of technology	2,0	0,71	

According to Table 5.99, there is a small effect size (d=0) between the HODs' responses to become involved with community service learning in cooperative education. This means that there exists no difference between the opinions of academic heads of departments at universities and at universities of technology to become involved in community service learning. There exists no practically significant difference between the HODs' responses to be involved with service learning between universities and universities of technology (compare Table 5.64).

TABLE 5.100 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on community service learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning in cooperative education	Comprehensive universities	1,67	0,52	0,50^
	Universities of technology	2,0	0,71	

In this case, according to Table 5.100, there is a medium effect size (d=0,50) between the HODs' responses on service learning in cooperative education. This implies that academic heads of departments in comprehensive universities agree more than those in universities of technology, that higher education institutions should be involved in community service learning. There exists a substantial difference between the HODs' responses to become involved in service learning in cooperative education between comprehensive universities and universities of technology (compare Table 5.64).

TABLE 5.101 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on community service learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning in cooperative education	Comprehensive universities	1,67	0,52	0,52 ^
	Universities	2,0	0,63	

In this case there is a medium effect size (d=0,52) between the HODs' responses to become involved with community service learning in cooperative education. The lower mean of compre-

hensive universities (1,67) indicates the recognition by HODs that HEIs should be more involved with service learning, than universities (2,0). This means that academic heads of departments in comprehensive universities more strongly agree that higher education institutions should be more involved in community service learning than universities. There exists a substantial difference between the HODs' responses to become involved with community service learning in cooperative education between comprehensive universities and universities (compare Table 5.64).

5.5.3.7 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on resource provision in cooperative education

TABLE 5.102 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Universities	1,83	0,41	0,24
	Universities of Technology	1,93	0,15	

According to Table 5.102, there is a small effect size (d=0,24) between the HODs' opinions on the resource provision in cooperative education. This means that academic heads of departments do not disagree in universities and universities of technology on the provision of resource capacity in higher education institutions. There exists no practically significant difference between the HODs' responses on the provision of resources in cooperative education between universities and universities of technology (compare Table 5.66).

TABLE 5.103 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on the role players involved in resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Comprehensive universities	1,67	0,47	0,55 ^
	Universities of technology	1,93	0,15	

In this case, according to Table 5.103, there is a medium effect size (d=0,55) between the HODs' responses on the provision of resources in cooperative education. The lower mean (1,67) in comprehensive universities indicates the recognition of a stronger agreement regarding resource provision in cooperative education, than in universities of technology(1,93). This means that academic heads of departments more strongly agree that resources capacity, such as human and financial resources be provided for the execution of cooperative education in higher education institutions, than universities. There exists a substantial difference between the HODs' responses on the provision of resources in cooperative education between comprehensive universities and universities of technology (compare Table 5.66).

TABLE 5.104 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Comprehensive universities	1,67	0,47	0,34
	Universities	1,83	0,41	

In this case, according to Table 5.104, there is a small effect size (d=0,34) between the HODs' opinions on the provision of resources in cooperative education. This implies that academic heads of departments do not disagree in comprehensive universities and universities on the provision of resources which include human and financial resources for the proper execution of cooperative education in higher education institutions. There exists no practically significant difference between the HODs' responses on the provision of resources for cooperative education between comprehensive universities and universities (compare Table 5.66).

5.5.3.8 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on exposure of staff to industry in cooperative education

TABLE 5.105 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on exposure of staff to industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry	Universities	1,67	0,75	0,31
	Universities of technology	1,90	0,22	

According to Table 105, there is a small effect size (d=0,31) between the HODs' responses on the exposure of staff to industry. This means that academic heads of departments in universities and universities of technology, do not disagree that academic staff should be regularly exposed to industry and the work environment to stay abreast with the developments in the field of study. There exists no practically significant difference between the HODs' responses on the exposure of staff to industry and the work environment in cooperative education between universities and universities of technology (compare Table 4.2, question 22).

TABLE 5.106 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on exposure of staff to industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry	Comprehensive universities	1,83	0,68	0,10
	Universities of technology	1,90	0,22	

In this case there is a small effect size (d=0,10) between the HODs' responses on the exposure of staff to industry in cooperative education. This implies that academic heads of departments in comprehensive universities and universities of technology, do not disagree that academic staff should be regularly exposed to industry and the work environment to stay abreast with the developments in the field of study. There exists no practically significant difference between the HODs' responses on the exposure of staff to industry in cooperative education between comprehensive universities and universities of technology (compare Table 4.2, question 22).

TABLE 5.107 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on exposure of staff to industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry	Comprehensive universities	1,83	0,68	0,21
	Universities	1,67	0,75	

According to Table 5.107, there is a small effect size (d=0,21) between the HODs' responses on the exposure of staff to industry in cooperative education. This means that academic heads of departments in comprehensive universities and universities, do not disagree that academic staff

should be regularly exposed to industry and the work environment to stay abreast with the developments in the field of study. There exists no practically significant difference between the HODs' responses on the exposure of staff to industry in cooperative education between comprehensive universities and universities (compare Table 4.2, question 22).

5.5.3.9 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on liaison in cooperative education

TABLE 5.108 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on liaison in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Universities	1,5	0,55	0,18
	Universities of technology	1,4	0,55	

According to Table 5.108, there is a small effect size (d=0,18) between the HODs' responses on liaison in cooperative education. This means that academic heads of departments of universities and universities of technology do not disagree that companies' inputs are required through advisory committees for the long-term sustainability of the learning programme in higher education institutions. There exists no practically significant difference between the HODs' responses on liaison with industry in cooperative education between universities and universities of technology (compare Table 4.2, questions 12 and 23).

TABLE 5.109 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on liaison in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Comprehensive universities	1,17	0,41	0,42
	Universities of technology	1,40	0,55	

In this case (Table 5.109) there is a small effect size (d=0,42) between the HODs' responses on liaison with industry in cooperative education. This means that academic heads of departments of comprehensive universities and universities of technology do not disagree that companies' inputs are required through advisory committee for the long-term sustainability of the learning programme in higher education institutions. There exists no practically significant difference between the HODs' responses on the liaison with industry in cooperative education between comprehensive universities and universities of technology (compare Table 4.2, question 12 and 23).

TABLE 5.110 **The differences between heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on liaison in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Comprehensive universities	1,17	0,41	0,60 ^
	Universities	1,50	0,55	

In this case there is a medium effect size (d=0,60) between the HODs' responses on liaison with industry in cooperative education. The lower mean of universities (1,50) indicates a greater agreement by HODs on liaison with industry in cooperative education, than comprehensive universities (1,17). This means that academic heads of departments in comprehensive universities

were more in agreement that companies' from industryies' inputs are required through advisory committee for the long-term sustainability of the learning programme in higher education institutions, than universities. Therefore, there exists a substantial difference between the HODs' responses on the liaison with industry in cooperative education between comprehensive universities and universities (compare Table 4.2, questions 12 and 23).

5.5.3.10 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on partnerships with industry in cooperative education

TABLE 5.111 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on partnerships with industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships with industry	Universities	1,67	0,61	0,05
	Universities of technology	1,70	0,45	

According to Table 5.111, there is a small effect size (d=0,05) between the HODs' responses on partnerships with industry in cooperative education. This means that academic heads of departments of universities and universities of technology do not disagree that companies and higher education institutions should collectively engage in partnerships, with regard to teaching and learning, research and community service. There exists no practically significant difference between the HODs' responses on partnerships with industry in cooperative education between universities and universities of technology (compare Table 4.2, questions 23 and 25).

TABLE 5.112 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on partnerships with industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships with industry	Comprehensive universities	1,58	0,38	0,27
	Universities of technology	1,70	0,45	

In this case, according to Table 5.112, there is a small effect size (d=0,27) between the HODs' opinions on partnerships with industry in cooperative education. This means that academic heads of departments of comprehensive universities and universities of technology do not disagree that companies and higher education institutions should collectively engage in partnerships, with regard to teaching and learning, research and community service. There exists no practically significant difference between the HODs' responses on partnerships with industry in cooperative education between comprehensive universities and universities of technology (compare Table 4.2, question 23 and 25).

TABLE 5.113 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on partnerships with industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships with industry	Comprehensive universities	1,58	0,38	0,15
	Universities	1,67	0,61	

In this case there is a small effect size (d=0,15) between the HODs' responses on partnerships with industry in cooperative education. This means that academic heads of departments of

comprehensive universities and universities do not disagree that companies and higher education institutions should collectively engage in partnerships, with regard to teaching and learning, research and community service. There exists however, no practically significant difference between the HODs' responses on partnerships with industry in cooperative education in comprehensive universities and universities (compare Table 4.2, questions 23 and 25).

5.5.3.11 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on internationalisation of students in cooperative education

TABLE 5.114 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on internationalisation of students in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Universities	1,83	0,75	0,31
	Universities of technology	1,60	0,42	

According to Table 5.114, there is a small effect size (d=0,31) between the HODs' opinions, on the internationalisation of students in cooperative education. This implies that academic heads of departments of universities and universities of technology do not disagree that students be placed internationally for experiential learning. There exists no practically significant difference between the HODs' responses on the internationalisation of students in cooperative education between universities and universities of technology (compare Table 4.2, question 26).

TABLE 5.115 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on internationalisation in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Comprehensive universities	1,58	0,49	0,04
	Universities of technology	1,60	0,42	

In this case there is a small effect size (d=0,04) between the opinions of HODs, on the internationalisation of students in cooperative education. This means that academic heads of departments of comprehensive universities and universities of technology do not disagree that students be placed internationally for experiential learning. Therefore, there exists no practically significant difference between the HODs' responses on the internationalisation of students in cooperative education between comprehensive universities and universities of technology (compare Table 4.2, question 26).

TABLE 5.116 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on internationalisation in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Comprehensive universities	1,58	0,49	0,33
	Universities	1,83	0,75	

In this case, according to Table 5.116, there is a small effect size (d=0,33) between the HODs' responses on the internationalisation of students in cooperative education. This means that academic heads of departments of comprehensive universities and universities do not disagree

that students be placed internationally for experiential learning. There exists no practically significant difference between the HODs' responses on the internationalisation of students in cooperative education in comprehensive universities and universities (compare Table 4.2, question 26).

5.5.3.12 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on promotion in cooperative education

TABLE 5.117 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on promotion in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion in cooperative education	Universities	2,0	0,89	0,22
	Universities of technology	2,2	1,30	

According to Table 5.117, there is a small effect size (d=0,22) between the opinions of HODs on the promotion of cooperative education. This means that academic heads of departments in universities and universities of technology do not disagree that cooperative education should be promoted to commerce and industry by higher education institutions. There exists no practically significant difference between the HODs' responses on the promotion of cooperative education in universities and universities of technology (compare Table 5.68).

TABLE 5.118 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on promotion in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion in cooperative education	Comprehensive universities	2,17	0,75	0,04
	Universities of technology	2,2	1,30	

In this case, according to Table 5.118, there is a small effect size (d=0,04) between the opinions of HODs on the promotion of cooperative education. This implies that academic heads of departments in comprehensive universities and universities of technology do not disagree that cooperative education be promoted to commerce and industry by higher education institutions. There exists no practically significant difference between the HODs' responses on the promotion of cooperative education between comprehensive universities and universities of technology (compare Table 5.68).

TABLE 5.119 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on promotion in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion in cooperative education	Comprehensive universities	2,17	0,75	0,19
	Universities	2,0	0,89	

In this case, according to Table 5.119, there is a small effect size (d=0,19) between the HODs' responses on the promotion of cooperative education. This means that academic heads of departments in comprehensive universities and universities do not disagree that cooperative

education should be promoted to commerce and industry by higher education institutions. There exists no practically significant difference between the HODs' responses on the promotion of cooperative education between comprehensive universities and universities (compare Table 5.68).

5.5.3.13 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on telematic application in cooperative education

TABLE 5.120 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on telematic application in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Universities	1,72	0,57	0,02
	Universities of technology	1,73	0,43	

According to Table 5.120, there is a small effect size (d=0,02) between the responses of HODs on telematic applications in cooperative education. This means that academic heads of departments of universities and universities of technology do not disagree that interactive instructional television can be used to monitor the progress of students during experiential learning. There exists no practically significant difference between the HODs' responses on telematic applications in cooperative education in universities and universities of technology (compare Table 4.2, question 30).

TABLE 5.121 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on telematic application in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Comprehensive universities	1,72	0,39	0,02
	Universities of technology	1,73	0,43	

In this case, according to Table 5.121, there is a small effect size (d=0,02) between the HODs' opinion on telematic applications in cooperative education. This means that academic heads of departments in comprehensive universities and universities of technology do not disagree that interactive instructional television can be used to monitor the progress of students during experiential learning. There exists no practically significant difference between the HODs' responses on telematic applications in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 30).

TABLE 5.122 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on telematic education in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Comprehensive universities	1,72	0,39	0
	Universities	1,72	0,57	

In this case, there is no effect size (d=0) between the HODs' opinions on telematic applications in cooperative education. This implies that academic heads of departments of comprehensive universities and universities agree that interactive instructional television can be used to monitor

the progress of students during experiential learning. There exists therefore no practically significant difference between the HODs' responses on telematic applications in cooperative education between comprehensive universities and universities (compare Table 4.2, question 30).

5.5.3.14 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on quality management in cooperative education

TABLE 5.123 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on quality management in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Universities	2,17	0,75	0,23
	Universities of technology	2,0	0,71	

According to Table 5.123, there is a small effect size (d=0,23) between the responses of the HODs on the application of quality management in cooperative education. This means that academic heads of departments in universities and universities of technology do not disagree on quality management systems to be used to ensure the quality of cooperative education practices in higher education institutions. There exists no practically significant difference between the HODs' responses on the application of quality management in cooperative education in universities and universities of technology (compare Table 4.2, question 31).

TABLE 5.124 **The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on quality management in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Comprehensive universities	1,83	0,75	0,23
	Universities of Technology	2,0	0,71	

In this case, according to Table 5.124, there is a small effect size (d=0,23) in the HODs' responses on the quality management in cooperative education. This means that academic heads of departments in comprehensive universities and universities of technology do not disagree on quality management systems to be used to ensure the quality of cooperative education practices in higher education institutions. There exists no practically significant difference between the HODs' responses on the application of quality management in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 31).

TABLE 5.125 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on quality management in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Comprehensive universities	1,83	0,75	0,50^
	Universities	2,17	0,75	

In this case there is a medium effect size (d=0,50) between the opinions of HODs on quality management in cooperative education. This means that academic heads of departments in comprehensive universities agree more than those of universities on quality management systems

to be used to ensure the quality of cooperative education practices in higher education institutions. Therefore, there exists a substantial difference between the HODs' responses on the application of quality management in cooperative education between comprehensive universities and universities (compare Table 4.2, question 31).

5.5.3.15 The differences between the responses of academic heads of departments (HODs) of universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on graduate placement in cooperative education

TABLE 5.126 The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on graduate placement in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Universities	1,83	0,75	0,04
	Universities of technology	1,80	0,45	

According to Table 5.126, there is a small effect size (d=0,04) between the HODs' responses on graduate placement in cooperative education. This implies that academic heads of departments in universities and universities of technology do not disagree that students should have access to a graduate placement office on campuses of higher education institutions to enable students to become employed. There exists no practically significant difference between the HODs' responses on the need for a graduate placement office for students in cooperative education in universities and universities of technology (compare Table 4.2, question 24).

TABLE 5.127 The differences between the responses of academic the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on graduate placement in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Comprehensive universities	2,16	0,75	0,50^
	Universities of technology	1,80	0,45	

According to Table 5.127, there is a medium effect size (d=0,50) between the HODs' responses on graduate placement in cooperative education. This means that academic heads of departments in universities of technology agree more than those in comprehensive universities that students should have access to a graduate placement office on campuses of higher education institutions to enable students to become employed. There exists a substantial difference between the HODs' responses on the need for a graduate placement office for students in comprehensive universities and universities of technology (compare Table 4.2, question 24).

TABLE 5.128 The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on graduate placement in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Comprehensive universities	2,16	0,75	0,44
	Universities	1,83	0,75	

In this case there is a small effect size (d=0,44) between the responses of HODs on graduate placement in cooperative education. This implies that academic heads of departments in comprehensive universities and universities do not disagree that students should have access to a graduate placement office on campuses of higher education institutions to enable students to become employed. There exists no practically significant difference between the HODs' responses on the need for a graduate placement office for students in cooperative education in comprehensive universities and universities (compare Table 4.2, question 30).

5.5.4 Comparison of the differences between the responses of students in government-subsidised higher education institutions (universities, comprehensive universities and universities of technology) in the Gauteng province in South Africa

5.5.4.1 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the management of cooperative education

TABLE 5.129 The differences between responses of students in universities and universities of technology of government-subsidised higher education institutions on the management of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Management of cooperative education	Universities	1,50	0,51	0,18
	Universities of technology	1,41	0,51	

According to Table 5.129, there is a small effect size (d=0,18) in students' opinions on the management of cooperative education. This means that no disagreement exists in responses of students in the three disciplines in universities and universities of technology on cooperative

education to be properly planned and executed within HEIs and that guidelines for students and supervisors must be included in the study material of experiential learning students. There exists no practically significant difference in students' responses on the management of cooperative education in universities and universities of technology (compare Table 5.58).

TABLE 5.130 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on the management of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Management of cooperative education	Comprehensive universities	1,63	0,50	0,43
	Universities of technology	1,41	0,51	

In this case, according to Table 5.130, there is a small effect size (d=0,43)in the students' opinions on the management of cooperative education. This implies that no difference exists in the responses of students in the various disciplines in cooperative education to be properly planned and executed within HEIs and that guidelines for students and supervisors must be included in the study material of experiential learning students. Therefore, there exists no practically significant difference between the students' responses on the management of cooperative education in comprehensive universities and universities of technology (compare Table 5.58).

TABLE 5.131 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on the management of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Management of cooperative education	Comprehensive universities	1,63	0,50	0,25
	Universities	1,50	0,51	

In this case (Table 5.131) there is a small effect size (d=0,25) in the students' opinions on the management of cooperative education. This means that no disagreement exists between students in the various disciplines in comprehensive universities and universities on cooperative education to be properly planned and executed within HEIs and that guidelines for students and supervisors must be included in the study material for experiential learning. There exists no practically significant difference between the responses of students on the management of cooperative education in comprehensive universities and universities (compare Table 5.58).

5.5.4.2 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the policies and procedures of cooperative education

TABLE 5.132 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on the policies and procedures of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures of cooperative education	Universities	1,49	0,52	0,18
	Universities of technology	1,39	0,55	

According to Table 5.132, there is a small effect size (d=0,18) between students' responses on policies and procedures in cooperative education. This means that students in the various disciplines in universities and universities of technology, do not disagree that guidelines for students and supervisors be included in the study material for experiential learning. There exists no practically significant difference in the students' responses on policies and procedures in cooperative education in universities and universities of technology (compare Table 4.2, questions 2 and 3).

TABLE 5.133 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on the policies and procedures in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures of cooperative education	Comprehensive universities	1,64	0,55	0,50^
	Universities of technology	1,39	0,55	

In this case there is a medium effect size (d=0,50) in students' opinions, on policies and procedures in cooperative education. This implies that students in the various disciplines in universities of technology agree more than those in comprehensive universities that guidelines for students and supervisors be included in the study material for experiential learning. Therefore, there exists a substantial difference between the responses of students on policies and procedures in cooperative education between comprehensive universities and universities of technology (compare Table 4.2, question 2 and 3).

TABLE 5.134 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on the policies and procedures of cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Policies and procedures of cooperative education	Comprehensive universities	1,64	0,55	0,27
	Universities	1,49	0,52	

According to Table 5.134, there is a small effect (d=0,27) in responses of students on policies and procedures in cooperative education. This means that students in the three disciplines in comprehensive universities and universities, do not disagree that guidelines for students and supervisors be included in the study material for experiential learning. There exists no practically

significant difference between the responses of students on policies and procedures in cooperative education in comprehensive universities and universities (compare Table 4.2, question 2 and 3).

5.5.4.3 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on experiential learning in cooperative education

TABLE 5.135 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on experiential learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Universities	1,77	0,68	0,66 ^
	Universities of technology	1,32	0,48	

According to Table 5.135, there is a medium effect size(d=0,66) in the students' opinions on experiential learning in cooperative education. The lower mean of universities of technology (1,32) indicates the rating of a greater agreement towards experiential learning in cooperative education, than universities (1,77). This means that students in the various disciplines from universities agree more on the experiential learning process, which include preparation, placement, monitoring, assessment and debriefing, than students in universities of technology. There exists therefore a substantial difference between the students' responses on experiential learning in cooperative education in universities and universities of technology (compare Table 5.60).

TABLE 5.136 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on experiential learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,77	0,49	0,92 *
	Universities of technology	1,32	0,48	

In this case there is a large effect size (d=0,92) between the responses of students on experiential learning in cooperative education. The lower mean (1,32) in universities of technology indicates a greater agreement towards experiential learning in cooperative education than comprehensive universities (1,77). This means that students in the various disciplines in comprehensive universities agree more on the experiential learning process which include preparation, placement, monitoring, assessment and debriefing, than students from universities of technology. Therefore, there exists a practically significant difference between the students' responses on experiential learning in cooperative education in comprehensive universities and universities of technology (compare Table 5.60).

TABLE 5.137 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on experiential learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,77	0,49	0
	Universities	1,77	0,68	

In this case there is no effect size (d=0) in students' opinions on experiential learning in cooperative education. The mean (1,77) implies that both comprehensive universities and

universities have been measured equally, meaning there is no significant difference of responses of students in the various disciplines, on experiential learning in cooperative education for comprehensive universities and universities. There exists therefore no practically significant difference between the responses of students on experiential learning in cooperative education in comprehensive universities and universities (compare Table 5.60).

5.5.4.4 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the role players involved in cooperative education

TABLE 5.138 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on role players involved in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Universities	1,83	0,39	0,88 *
	Universities of technology	1,47	0,41	

According to Table 5.138, there is a large effect size (d=0,88) in the responses of students on role players involved in cooperative education. The lower mean of universities of technology (1,47) indicates the rating of a greater agreement towards role players involved in cooperative education, than universities (1,83). This means that students in the various disciplines in universities of technology agree more on the need that HEIs as role player should only offer programmes that meet the requirements of industry in cooperative education, than universities. Therefore, there exists a practically significant difference in students' responses on role player's involvement in cooperative education in universities and universities of technology (compare Table 5.62).

TABLE 5.139 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on the role players involved in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Comprehensive universities	1,83	0,37	0,88 *
	Universities of technology	1,47	0,41	

According to Table 5.139, there is a large effect size (d=0,88) between the opinions of students on role players involved in cooperative education. The lower mean (1,47) in universities of technology indicates a greater agreement by students towards role players involved in cooperative education, than comprehensive universities (1,83). This means that students in the various disciplines from universities of technology agree more towards the need of HEIs as role player to offer programmes that meet the requirements of industry in cooperative education, than comprehensive universities. Therefore, there exists a practically significant difference between the responses of students on role players involved in cooperative education in comprehensive universities and universities of technology (compare Table 5.62).

TABLE 5.140 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on the role players involved in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Comprehensive universities	1,83	0,37	0
	Universities	1,83	0,39	

In this case, according to Table 5.140, there is no effect size (d=0) between the responses of students, on the role players involved in cooperative education. The mean of both universities

(1,83) and comprehensive universities(1,83) indicates an equal rating. This means that students in the various disciplines are in agreement, that HEIs as role player should offer programmes that meet the requirements of industry in cooperative education. There exists no practically significant difference between the students' responses on the role player's involvement in cooperative education in comprehensive universities and universities (compare Table 5.62).

5.5.4.5 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on skills development (learnerships) in cooperative education

TABLE 5.141 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on skills development (learnerships) in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Universities	2,32	0,82	1,02 *
	Universities of technology	1,48	0,66	

According to Tale 5.142, there is a large effect size (d=1,02) in responses of students on skills development (learnerships) in cooperative education. The lower mean of universities of technology (1,48) indicates the rating of a greater agreement towards the benefits of learnerships in cooperative education, than universities (2,32). This means that students in the various disciplines from universities of technology agree more that learnerships are beneficial to students and companies, than students from universities. Therefore, there exists a practically significant difference between the students' responses on skills development (learnerships) in cooperative education in universities and universities of technology (compare Table 4.2, question 13).

TABLE 5.142 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on skills development (learnerships) in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION SD)	D-VALUE
Skills development (learnerships) in cooperative education	Comprehensive universities	2,25	0,95	0,81*
	Universities of technology	1,48	0,66	

In this case there is a large effect size (d=0,81) in students' opinions on skills development (learnerships) in cooperative education. The lower mean (1,48) in universities of technology indicates a greater agreement towards the need for skills development(learnerships) in cooperative education, than comprehensive universities (2,25). This means that students in the various disciplines in universities of technology agree more that learnerships are beneficial to students and companies, than students from comprehensive universities. There exists a practically significant difference between the students' responses on skills development (learnerships) in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 13).

TABLE 5.143 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on skills development (learnerships) in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Comprehensive universities	2,25	0,95	0,07
	Universities	2,32	0,82	

In this case, according to Table 5.143, there is a small effect size (d=0,07) in the students' opinions on skills development (learnerships) in cooperative education. This means, students from the various disciplines in comprehensive universities and universities do not disagree that learnerships are beneficial to students and companies. There exists no practically significant difference between the students' responses on skills development (learnerships) in cooperative education in comprehensive universities and universities (compare Table 4.2, question 13).

5.5.4.6 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on community service learning in cooperative education

TABLE 5.144 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on community service learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning in cooperative education	Universities	1,72	0,63	0,24
	Universities of technology	1,95	0,95	

According to Table 5.144, there is no a small effect size (d=0,24) in students' opinions on community service learning in cooperative education. This means that students from the various disciplines in universities and universities of technology do not disagree that higher education institutions should be involved in community service learning. There exists no practically significant difference between the students' responses on community service learning in cooperative education in universities and universities of technology (compare Table 5.64).

TABLE 5.145 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on community service learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning in cooperative education	Comprehensive universities	1,86	0,60	0,09
	Universities of Technology	1,95	0,95	

In this case there is a small effect size (d=0,09) in students' responses on community service learning in cooperative education. This implies that students from the three disciplines in comprehensive universities and universities of technology do not disagree regarding higher education involvement in community service and learning. There exists no practically significant difference between the students' responses on community service learning in cooperative education in comprehensive universities and universities of technology (compare Table 5.64).

TABLE 5.146 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on community service learning in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Community service learning in cooperative education	Comprehensive universities	1,86	0,60	0,22
	Universities	1,72	0,63	

In this case, there is a small effect size (d=0,22) in the opinions of students regarding community service learning in cooperative education. This means that students from the three disciplines in comprehensive universities and universities do not disagree regarding higher education involvement in community service learning. There exists no practically significant difference

between the students' responses on community service learning in cooperative education in comprehensive universities and universities (compare Table 5.64).

5.5.4.7 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on the resource provision in cooperative education

TABLE 5.147 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on the resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Universities	1,74	0,75	0,13
	Universities of technology	1,64	0,50	

According to Table 5.147, there is a small effect size (d=0,13) in the opinions of student's on resource provision in cooperative education. This means that students from the three disciplines in universities and universities of technology do not disagree on the provision of resource capacity, which include human and financial resources in higher education institutions. There exists no practically significant difference between the students' responses on resource provision in cooperative education in universities and universities of technology (compare Table 5.66).

TABLE 5.148 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on the resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Comprehensive universities	1,95	0,65	0,50^
	Universities of technology	1,64	0,50	

In this case there is a small effect size (d=0,50) in students' responses on resource provision in cooperative education. This means that students from the various disciplines in universities of technology agree more than those in comprehensive universities on the provision of resources capacity such as financial and human resources, in higher education institutions. Therefore, there exists a substantial difference between the students' responses on resource provision in cooperative education in comprehensive universities and universities of technology (compare Table 5.66).

TABLE 5.149 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on the resource provision in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Resource provision in cooperative education	Comprehensive universities	1,95	0,65	0,28
	Universities	1,74	0,75	

In this case, according to Table 5.149, there is a small effect size (d=0,28) in students' responses on resource provision in cooperative education. This means that students from the three disciplines in comprehensive universities and universities do not disagree on the provision of resources capacity, which include human and financial resources in higher education institutions. There

exists no practically significant difference between the students' responses on resource provision in cooperative education in comprehensive universities and universities (compare Table 5.66).

5.5.4.8 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on exposure of staff to industry in cooperative education

TABLE 5.150 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on the exposure of staff to industry in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry in cooperative education	Universities	2,07	0,86	0,72 ^
	Universities of technology	1,45	0,67	

According to Table 5.150, there is a medium effect size (d=0,72) in the responses of students on the exposure of staff to industry in cooperative education. The lower mean of universities of technology (1,45) indicates the rating of a greater agreement to expose staff to industry, than universities (2,07). This means that students in the various disciplines in universities of technology agree more than academic staff members in universities, to be regularly exposed to the work environment and industry, to stay abreast with developments in their field of study. There exists a substantial difference between the students' responses on the exposure of staff to industry in cooperative education in universities and universities of technology (compare Table 4.2, question 22).

TABLE 5.151 **The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on the exposure of staff to industry in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry in cooperative education	Comprehensive universities	1,90	0,58	0,67^
	Universities of technology	1,45	0,67	

In this case there is a medium effect size (d=0,67) in students' opinions on the exposure of staff to industry in cooperative education. The lower mean (1,45) in universities of technology indicates a greater agreement towards the need to expose staff to industry in cooperative education, than comprehensive universities (1,90). This means that students in the three disciplines in universities of technology agree more than academic staff members in universities, to be regularly exposed to the work environment and industry, to stay abreast with developments in their field of study than comprehensive universities. There exists a substantial difference between the responses of students on the exposure of staff to industry in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 22).

TABLE 5.152 **The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on the exposure of staff to industry in cooperative education**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Exposure of staff to industry in cooperative education	Comprehensive universities	1,90	0,58	0,20
	Universities	2,07	0,86	

In this case, according to Table 5.152, there is a small effect size (d=0,20) in responses of students on the exposure of staff to industry in cooperative education. This means that students in

the respective disciplines in comprehensive universities and universities do not disagree regarding regular exposure of academic staff to industry and the workplace, to stay abreast with new developments in the field of study. There exists no practically significant difference between the students' responses on the exposure of staff to industry in cooperative education in comprehensive universities and universities (compare Table 4.2, question 22).

5.5.4.9 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on liaison in cooperative education.

TABLE 5.153 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on liaison in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Universities	1,43	0,59	0,19
	Universities of technology	1,32	0,48	

According to Table 5.153, there is a small effect size (d=0,19) in students' opinions on liaison in cooperative education. This means that students in the various disciplines in universities and universities of technology do not disagree that companies' inputs are required through advisory committees for the long-term sustainability of learning programmes in higher education institutions. There exists no practically significant difference between the students' responses on liaison in cooperative education in universities and universities of technology (compare Table 4.2, question 12 and 23).

TABLE 5.154 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on liaison in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Comprehensive universities	1,47	0,56	0,27
	Universities of technology	1,32	0,48	

In this case, according to Table 5.154, there is a small effect size (d=0,27) in the responses of student's, on liaison in cooperative education. This means that students from the various disciplines in comprehensive universities and universities of technology do not disagree that companies' inputs are required through advisory committees for the long-term sustainability of learning programmes in higher education institutions. There exists no practically significant difference between the students' responses on liaison in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 12 and 23).

TABLE 5.155 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on the liaison in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Liaison in cooperative education	Comprehensive universities	1,47	0,56	0,07
	Universities	1,43	0,59	

In this case there is a small effect size (d=0,07) in the responses of students on liaison in cooperative education. This means that students in the three disciplines in comprehensive universities and universities do not disagree that companies' inputs are required through advisory committees for the long-term sustainability of the learning programmes in higher education institutions. There exists no practically significant difference between the students' responses on

liaison in cooperative education in comprehensive universities and universities (compare Table 4.2, question 12 and 23).

5.5.4.10 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on partnerships in cooperative education

TABLE 5.156 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on partnerships in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships in cooperative education	Universities	1,58	0,52	0,29
	Universities of technology	1,43	0,50	

According to Table 5.156, there is a small effect size (d=0,29) in the students' opinions on partnerships in cooperative education. This means that students in the three disciplines in universities and universities of technology do not disagree that higher education institutions should collectively engage in partnerships, with regard to teaching and learning, research and community service. There exists no practically significant difference between the responses of students on partnerships in cooperative education in universities and universities of technology (compare Table 4.2, question 23 and 25).

TABLE 5.157 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on partnerships in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships in cooperative education	Comprehensive universities	1,79	0,46	0,72 ^
	Universities of technology	1,43	0,50	

In this case, according to Table 5.157, there is a medium effect size (d=0,72) in the students' opinions on partnerships in cooperative education. The lower mean (1,43) in universities of technology indicates a greater agreement towards the need for partnership arrangements in research, teaching and learning and community engagement, than comprehensive universities (1,79). This means that students in the various disciplines in universities of technology agree more than students in comprehensive universities that companies and higher education institutions should collectively engage in partnerships, with regard to teaching and learning, research and community service. There exists a substantial difference between the students' responses on partnerships in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, questions 23 and 25).

TABLE 5.158 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on partnerships in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Partnerships in cooperative education	Comprehensive universities	1,79	0,46	0,40
	Universities	1,58	0,52	

In this case there is a small effect size (d=0,40) in responses of students on partnerships in cooperative education. This means that student's in the various disciplines in comprehensive universities and universities, do not disagree that companies and higher education institutions should collectively engage in partnerships, with regard to teaching and learning, research and community service. There exists no practically significant difference in students' responses on partnerships in cooperative education in comprehensive universities and universities (compare Table 4.2, questions 23 and 25).

5.5.4.11 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on internationalisation in cooperative education

TABLE 5.159 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on internationalisation in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Universities	1,57	0,51	0,04
	Universities of technology	1,55	0,53	

According to Table 5.159, there is a small effect size (d=0,04) in the responses of students on the internationalisation of students in cooperative education. This implies that students in the various disciplines in universities and universities of technology do not disagree that students be placed and exchanged internationally for experiential learning. There exists no practically significant difference between the responses of students on the internationalisation in cooperative education in universities and universities of technology (compare Table 4.2, question 26).

TABLE 5.160 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on internationalisation in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Comprehensive universities	1,65	0,49	0,19
	Universities of technology	1,55	0,53	

In this case, there is a small effect size (d=0,19) in students' opinions on the internationalisation in cooperative education. This means that students in the three disciplines in comprehensive universities and universities of technology do not disagree that students be placed and exchanged internationally for experiential learning. There exists no practically significant difference between the responses of students on the internationalisation in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 26).

TABLE 5.161 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on internationalisation in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Internationalisation in cooperative education	Comprehensive universities	1,65	0,49	0,16
	Universities	1,57	0,51	

In this case, according to Table 5.161, there is no a small effect size (d=0,16) in the students' opinions on the internationalisation in cooperative education. This implies that students in the various disciplines in comprehensive universities and universities do not disagree that students be placed and exchanged internationally for experiential learning. There exists no practically

significant difference between the responses of students on the internationalisation in cooperative education in comprehensive universities and universities (compare Table 4.2, question 26).

5.5.4.12 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on promotion in cooperative education

TABLE 5.162 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on promotion in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion in cooperative education	Universities	1,84	0,90	0,50^
	Universities of technology	1,43	0,75	

According to Table 5.162, there is a medium effect size (d=0,50) in responses of students on the promotion of cooperative education. This implies, that students in the various disciplines in universities of technology agree more than those in universities to promote cooperative education to commerce and industry. There exists a substantial difference between the students' responses on the promotion of cooperative education, in universities and universities of technology (compare Table 5.68).

TABLE 5.163 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on promotion in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion in cooperative education	Comprehensive universities	1,76	0,65	0,44
	Universities of technology	1,43	0,75	

In this case there is a small effect size (d=0,44) in the students' opinions on the promotion of cooperative education. This means that students in the three disciplines in comprehensive universities and universities of technology were not in disagreement to promote cooperative education to commerce and industry. There exists no practically significant difference between the students' responses on the promotion of cooperative education, in comprehensive universities and universities of technology (compare Table 5.68).

TABLE 5.164 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on promotion in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Promotion in cooperative education	Comprehensive universities	1,76	0,65	0,09
	Universities	1,84	0,90	

In this case, according to Table 5.164, there is a small effect size (d=0,09) in the responses of students on the promotion of cooperative education. This implies that students in the various disciplines in comprehensive universities and universities were not in disagreement to promote cooperative education to commerce and industry. Therefore, there exists no practically significant difference in the students' responses on the promotion of cooperative education, in comprehensive universities and universities (compare Table 5.68).

5.5.4.13 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on telematic application in cooperative education

TABLE 5.165 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on telematic application in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Universities	1,62	0,57	0,56 ^
	Universities of technology	1,30	0,45	

According to Table 5.165, there is a medium effect size (d=0,56) in the responses of students on telematic application in cooperative education. The lower mean of universities of technology (1,30) indicates the rating of a greater agreement towards the use of telematic application, namely the use of interactive instructional television (IITV) to monitor the progress of students during experiential learning, than universities (1,62). This means that students from the various disciplines in universities of technology were more in agreement than students from universities regarding the usage of IITV to monitor the progress of students during experiential learning. There exists a substantial difference between the students' responses on telematic application, in cooperative education in universities and universities of technology (compare Table 4.2, question 30).

TABLE 5.166 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on telematic application in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Comprehensive universities	1,66	0,54	0,67 ^
	Universities of technology	1,30	0,45	

In this case there is a medium effect size (d=0,67) in students' opinions on telematic application in cooperative education. The lower mean (1,30) in universities of technology indicates a greater agreement towards telematic application, namely the use of interactive instructional television to monitor the progress of students during cooperative education, than comprehensive universities (1,66). This means that students from the three disciplines in universities of technology were more in agreement than students from comprehensive universities regarding the usage of IITV to monitor the progress of students during experiential learning. Therefore, there exists a substantial difference between the students' responses on telematic application in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 30).

TABLE 5.167 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on telematic application in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Telematic application in cooperative education	Comprehensive universities	1,66	0,54	0,07
	Universities	1,62	0,57	

According to Table 5.167, there is a small effect size (d=0,07) in students' opinions on telematic application in cooperative education. This means that students from the various disciplines in

comprehensive universities and universities were not in disagreement regarding the usage of IITV to monitor the progress of students during experiential learning. There exists no practically significant difference between the students' responses on telematic application in cooperative education, in comprehensive universities and universities (compare Table 4.2, question 30).

5.5.4.14 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on quality management in cooperative education

TABLE 5.168 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on quality management in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Universities	2,54	0,81	0,95 *
	Universities of technology	1,64	0,95	

According to Table 5.168, there is a large effect size (d=0,95) in the responses of students on quality management in cooperative education. The lower mean of universities of technology (1,64) indicates the rating of a greater agreement towards the need for quality management systems to ensure quality cooperative education practices, than universities (2,54). This means that students from the various disciplines in universities of technology agree more than students from universities on quality management systems to ensure the quality of cooperative education practices in higher education institutions. Therefore, there exists a practically significant difference between the responses of students on quality management in cooperative education, in universities and universities of technology (compare Table 4.2, question 31).

TABLE 5.169 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on quality management in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Comprehensive universities	2,21	0,81	0,60 ^
	Universities of technology	1,64	0,95	

In this case there is a medium effect size (d=0,60) in students' opinions on quality management in cooperative education. The lower mean (1,64) in universities of technology indicates a greater agreement towards the need for quality management systems to ensure quality cooperative education practices, than comprehensive universities (2,21). This means that students from the various disciplines in universities of technology agree more than students from comprehensive universities on quality management systems to ensure the quality of cooperative education practices in higher education institutions. There exists a substantial difference between the students' responses on quality management in cooperative education, in comprehensive universities and universities of technology (compare Table 4.2, question 31).

TABLE 5.170 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on quality management in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in cooperative education	Comprehensive universities	2,21	0,81	0,41
	Universities	2,54	0,81	

In this case, according to Table 5.170, there is a small effect size (d=0,41) in students' opinions on quality management in cooperative education. This means that students from the various disciplines in comprehensive universities and universities do not disagree on quality management systems to ensure the quality of cooperative education practices in higher education institutions. There exists no practically significant difference between the students' responses on quality management in cooperative education, in comprehensive universities and universities (compare Table 4.2, question 31).

5.5.4.15 The differences between the responses of students in universities, comprehensive universities and universities of technology in government-subsidised higher education institutions on graduate placement in cooperative education

TABLE 5.171 The differences between the responses of students in universities and universities of technology of government subsidised higher education institutions on graduate placement in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Universities	1,70	0,67	0,43
	Universities of technology	1,41	0,59	

According to Table 5.171, there is small effect size (d=0,43) in responses of students on graduate placement in cooperative education. This implies that students from the various disciplines in universities and universities of technology do not disagree that students should have access to a graduate placement office on campuses of higher education institutions to enable students to become employed. There exists no practically significant difference between the students' responses on graduate placement in cooperative education in universities and universities of technology (compare Table 4.2, question 24).

TABLE 5.172 The differences between the responses of students in comprehensive universities and universities of technology of government subsidised higher education institutions on graduate placement in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Comprehensive universities	1,71	0,63	0,50^
	Universities of technology	1,41	0,59	

In this case there is a medium effect size (d=0,50) in students' opinions on graduate placement in cooperative education. This means that students in the three disciplines in universities of technology agree more than those in comprehensive universities that students should have access to a graduate placement office on campuses of higher education institutions to enable students to become employed. There exists a substantial difference between the students' responses on graduate placement in cooperative education in comprehensive universities and universities of technology (compare Table 4.2, question 24).

TABLE 5.173 The differences between the responses of students in comprehensive universities and universities of government-subsidised higher education institutions on graduate placement in cooperative education

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Graduate placement in cooperative education	Comprehensive universities	1,71	0,63	0,01
	Universities	1,70	0,67	

In this case, according to Table 5.173, there is a small effect size (d=0,01) in the students' opinions on graduate placement in cooperative education. This implies that students from the different disciplines in comprehensive universities and those from universities do not disagree that students should have access to a graduate placement office on campuses of higher education institutions to

enable students to become employed. There exists no practically significant difference between the students' responses on graduate placement in cooperative education in comprehensive universities and universities (compare Table 4.2, question 24).

5.5.5 Discussion of data interpretation on best the practices in cooperative education

The purpose of this study in section D was by using a multidisciplinary study, to compare and determine the status of cooperative education on best practices in cooperative education by respondents, namely supervisors of companies in industry, heads of academic departments and students in government-subsidised higher education institutions in the Gauteng region in South Africa.

Data has been collected and tabulated (compare 5.5) for interpretation. The Cronbach alpha reliability coefficient was reported (compare 5.5.1)

It must be noted that only large effect sizes (d= d ≥0,8) (compare 5.5.2) were selected to indicate differences in opinions of respondents (Ellis & Steyn, 2003:4).

Discussions on section D on the best practices in cooperative education were as follows;

5.5.5.1 Comparison of supervisors with academic heads of departments in higher education institutions

The *means* related to the respondents on all constructs (compare Table 4.2) by supervisors of companies and academic heads of departments of higher education institutions never recorded a mean[22] of 3 or above. This implies that all respondents of both these groups either agreed or strongly agreed on the constructs (compare Table 4.2) related to best practices in cooperative education, and there was no disagreement on the constructs (compare Table 4.2).

All *d-values* never exceeded a value of 0,8 and thus no practically significant difference was observed by respondents on all constructs in section D. This implies that there was no practically significant difference by supervisors of companies in industry and academic heads of departments

[22] A mean of 3 was used as cut-off.

in higher education on all constructs on best practices in cooperative education (section D) (compare Table 4.2)

5.5.5.2 Comparison of academic heads of departments in higher education institutions

The *means* related to the respondents on all constructs (compare Table 4.2) by academic heads of departments in higher education institutions never recorded a mean of 3 or above. This implies that all academic heads of departments either agreed or strongly agreed on the constructs (compare Table 4.2) related to best practices in cooperative education, and there was no disagreement on any of the constructs (compare Table 4.2).

Most *d-values* never exceeded a value of 0,8 and thus no practically significant difference was observed by most respondents on all constructs in section D. This implies that there was no practically significant difference by academic heads of departments in higher education institutions on all constructs on the best practices in cooperative education (section D) (compare Table 4.2) except for the following:

TABLE 5.174 The differences between the responses of academic heads of departments in comprehensive universities and universities of technology of government-subsidised higher education institutions on experiential learning in cooperative education (compare Table 5.91)

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,5	0,55	0,91*
	Universities of technology	2,0	0	

TABLE 5.175 **The differences between the responses of academic heads of departments in comprehensive universities and universities of government-subsidised higher education institutions on experiential learning in cooperative education (compare Table 5.92)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,5	0,55	0,80 *
	Universities	2,0	0,63	

TABLE 5.176 **The differences between the responses of academic heads of departments in universities and universities of technology of government-subsidised higher education institutions on skills development (learnerships) in cooperative education (compare Table 5.96)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Universities	2,61	0,80	0,85 *
	Universities of technology	1,93	0,64	

Therefore a practically significant difference can only observed by academic heads of departments in higher education institutions with regard to:

1. **Experiential learning (compare Table 5.174 and 5.175 with Table 5.91 and 5.92)** in which comprehensive universities agree more strongly on this construct than universities of technology and universities and have thus recorded a practically significant difference on this construct.

2. **Skills development (learnerships) (compare Table 5.176 with Table 5.96)** in which universities of technology more strongly agree than universities on this construct and have recorded a practically significant difference in this construct.

Therefore, academic heads of departments only practically significantly differ with regard to experiential learning in comprehensive universities with universities of technology and universities (compare Table 5.174 and Table 5.175). A practically significant difference was also recorded between universities and universities of technology on skills development (learnerships) in cooperative education (compare Table 5.176). Academic heads of departments therefore agree on all other constructs in higher education institutions on the best practices in cooperative education.

5.5.5.3 Comparison of students in higher education institutions

The *means* related to the respondents on all constructs (compare Table 4.2) by students in higher education institutions never recorded a mean of 3 or above. This implies that all students in higher education institutions either agreed or strongly agreed on the constructs (compare Table 4.2) related to the best practices in cooperative education, and there was no disagreement on any of the constructs (compare Table 4.2).

Most *d-values* never exceeded a value of 0,8 and thus no practically significant difference was observed by most student respondents on all constructs in section D. This implies that there was no practically significant difference by students in higher education institutions on all constructs in section D (compare Table 4.2) except for the following:

TABLE 5.177 The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on experiential learning in cooperative education (compare Table 5.136)

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Experiential learning in cooperative education	Comprehensive universities	1,77	0,49	0,92 *
	Universities of technology	1,32	0,48	

TABLE 5.178 **The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on role players involved in cooperative education (compare Table 5.138)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Universities	1,83	0,39	0,88 *
	Universities of technology	1,47	0,41	

TABLE 5.179 **The differences between the responses of students in comprehensive universities and universities of technology of government-subsidised higher education institutions on the role players involved in cooperative education (compare Table 5.139)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Role players involved in cooperative education	Comprehensive universities	1,83	0,37	0,88 *
	Universities of technology	1,47	0,41	

TABLE 5.180 **The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on skills development (learnerships) in cooperative education (compare Table 5.141)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Universities	2,32	0,82	1,02 *
	Universities of technology	1,48	0,66	

TABLE 5.181 **The differences between the responses of students in comprehensive universities and universities of technology of governmentsubsidised higher education institutions on skills development (learnerships) in cooperative education (compare Table 5.142)**

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Skills development (learnerships) in cooperative education	Comprehensive universities	2,25	0,95	0,81 *
	Universities of technology	1,48	0,66	

TABLE 5.182 The differences between the responses of students in universities and universities of technology of government-subsidised higher education institutions on quality management in cooperative education (compare Table 5.168)

CONSTRUCT	GROUP	MEAN ($\bar{X}$)	STANDARD DEVIATION (SD)	D-VALUE
Quality management in in cooperative education	Universities	2,54	0,81	0,95 *
	Universities of technology	1,64	0,95	

Therefore a practically significant difference can only observed by students in higher education institutions with regard to:

1. **Experiential learning in cooperative education (Table 5.177 and Table 5.136)** in which students in universities of technology agree more strongly on this construct than comprehensive universities and have recorded a practically significant difference on this construct.

2. **Role Players involved in cooperative education (Table 5.178, 5.179 and Table 5.138 and 5.139)** in which students in universities of technology agree more strongly on this construct than comprehensive universities and universities and have recorded a practically significant difference on this construct.

3. **Skills development (learnerships) in cooperative education (Table 5.180, 5.181 and Table 5.141 and 5.142**) in which students in universities of technology agree more strongly on this construct than comprehensive universities and universities and have recorded a practically significant difference on this construct.

4. **Quality management in cooperative education (Table 5.182 and Table 5.168)** in which universities of technology agree more strongly on this construct than universities and have recorded a practically significant difference on this construct.

Therefore students only practically significantly differ with regard to experiential learning, role players involved, learnerships and quality management in cooperative education in universities of

technology with students in comprehensive universities and universities. Students therefore agree on all other constructs in higher education institutions on the best practices in cooperative education.

5.6 SUMMARY

In this chapter the results obtained from constructs from respondents have been analysed with statistical techniques, interpreted and discussed.

The interpretation of data was done on biographical, demographic, basic principles and nature as well as best practices in cooperative education.

For the purpose of this study a construct validity (compare 4.13.1.1) approach was followed. Cronbach alpha reliability values were recorded for both section C on the basic principles and nature of cooperative education and section D on the best practices in cooperative education.

Through a unidirectional variance analysis the practical significance of differences (d-values) was determined on sections C and D. A frequency analysis was performed to determine the sub-groupings. The d-values have been calculated to determine the practical significant differences (small, medium and large). Differences have been analysed and discussed. If no differences were indicated between respondents of groups, it is accepted that the different groups were in agreement on constructs.

According to the empirical data the following findings may be made:

- The majority of supervisors in companies participating in this study were 46 years or older, predominantly male, hold a degree or diploma, hold the position of a supervisor or training manager and have 10 or more years of work experience.
- The majority of academic heads of departments participating in this study in government-subsidised higher education institutions were 46 years or older, predominantly male, hold a master's degree or doctoral degree, are appointed on an HOD level and have 10 years or more work experience.
- The majority of students who participated in this study in government-subsidised higher education institutions were younger than 30, predominantly female, hold a degree or national diploma and have 0 to 3 years work experience.

- Most participating students received work-based experiential learning for 1 year or more in the Pretoria/Johannesburg region of the Gauteng province.
- The mean on the basic principles and nature as well as the best practices in cooperative education never recorded 3 or above by supervisors of companies in industry or by students and academic heads of departments in higher education institutions in the Gauteng region. Therefore, all respondents either agreed or strongly agreed with the constructs on the basic principles and nature, as well as the best practices in cooperative education.
- All supervisors in companies and academic heads of departments in higher education institutions recorded no practically significant differences on all constructs on the basic principles and nature, as well as the best practices in cooperative education, thus indicating a major agreement by industry and higher education on all constructs in cooperative education in the Gauteng province.
- Academic heads of departments of universities differed practically significantly from their counterparts in universities of technology with regard to the constructs related to the nature, purpose and role of cooperative education while academic heads of comprehensive universities differed practically significantly from their counterparts in universities on the research and development of cooperative education.
- Academic heads of departments at comprehensive universities differed practically significantly from universities of technology and universities with regard to the constructs related to experiential learning and universities of technology with universities on skills development (learnerships) in cooperative education.
- Students at universities of technology differed practically significantly from those in comprehensive universities with regard to the constructs related to the purpose and role of cooperative education.
- Students at universities of technology differed practically significantly from students at comprehensive universities and universities with regard to the constructs related to experiential learning, role players involved, learnerships and quality management in cooperative education.

CHAPTER 6
GUIDELINES FOR THE IMPLEMENTATION OF COOPERATIVE EDUCATION IN HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA

6.1 INTRODUCTION

According to objective 4 of this study (Chapter 1, Table 1.1) information in this study from chapters 2, 3 and 5 has been considered with the aid of a conceptual model/s (Glasman,1997:209), to develop guidelines to standardise the implementation and practice of cooperative education in higher education institutions. In this chapter the terms *conceptual model* and *guidelines* will be described.

Furthermore, a conceptual model/s for the implementation of cooperative education will be described, which includes reference to a management model for cooperative education as well as a quality assurance model for the management of experiential learning in HEIs.

The purpose of this chapter is to compile guidelines for cooperative education with the aid of a conceptual model/s within the context of commerce and industry as well as the higher education landscape in the Gauteng region in South Africa. However, consideration will not be given to detailed information of the various variables.

6.2 DEFINITION: MODELS AND GUIDELINES

6.2.1 Background

Since many differences exist within the higher education landscape on cooperative education, this research was necessary to provide information with regard to the present status on the basic principles and nature as well as the best practices in cooperative education in the higher education sector as well as commerce and industry. Before the development of a conceptual model/s for

cooperative education for higher education institutions and industry can be commenced, the concept *model* needs to be clarified.

6.2.2 Defining the term *model*

Pearsall (1999:915) points out that the Oxford Dictionary defines a model as something used as an example, a simplified description of a system or process to assist calculations or predictions.

According to Mouton and Marais (1990:143) during the compilation of a model an attempt is made to demonstrate the relationship between the main elements in the process. Jonker (1994a:208) shows that a model is a support construction in which complex problem statements and variables are placed in logical sequence, with an interpretative and illustrative function. Marais *et al.* (1983:9) recognise models as support constructions which can aid the research by making phenomena more visible and understandable. According to Kriel (1995:196) a model to a certain extent suggests new focus areas for research, since certain aspects are being emphasised. Marais *et al.* (1983:9) indicate that a model can be represented graphically or schematically. Vermaak (1999:207) is of the opinion that a model is simplifying the complexity of information to be able to understand it in the true sense of the word.

According to Fourie (2000:252), a model can therefore be defined as a constructional presentation in which complex problem statements and variables were placed in relation and cognitively aid to explain theories and to indicate the relationship between variables concerned.

6.2.3 Characteristics of a model

Mouton and Marais (1990:144) identify the properties of an effective model as follows:

- A model identifies problems or questions towards that which is researched;
- A model provides explanations, illustrations and the means to make predictions. It does not provide explanations of the phenomenon;
- A model provides a new "language" e.g. definitions, to enable discussion on the phenomenon; and
- A model limits, simplifies and systematise the domain to be studied.

6.2.4 Types of models

Jonker (1994b:138) and Kowalski (1988:95) classify various models, such as physical models (for example, three-dimensional representations), which are concrete and specific; verbal models, which refer to oral or written presentations of the reality but is abstract; graphical models, which are representations of lines and symbols, supported by verbal and non-verbal explanations; mathematical models, which contain the reality by using mathematical equations and conceptual models which are used to indicate how it should look like or functions in general, normally containing very little detail.

6.2.5 Advantages of models

According to Vermaak (1999:212) and Fourie (2000:212-251) the advantages of a model include the following:

- A model represents research results within a specific framework;
- A model can represent a reduced or generalised picture of the problem statement researched;
- The value of the research results can be determined within a specific context; and
- A model limits the gap that exists between the empirical study and the theory.

6.2.6 Steps in the development of a model

Vermaak (1999:210) and Fourie (2000:251) stipulate the following steps in the development of a model:

Step 1: Identify the problem

Step 2: Make assumptions by the identification of variables to be able to classify and determine the inter-dependability of variables and sub-models

Step 3: Develop the model

Step 4: Verify the model to determine whether it address the problem and if it works in practice

Step 5: Implementation of the model.

6.2.7 Defining the term *guideline*

Pearsall (1999:915) refers to the Oxford Dictionary, which defines a *guideline* as a general rule, principle or piece of advice.

6.3 THE COMPILATION OF A CONCEPTUAL MODEL FOR THE IMPLEMENTATION OF COOPERATIVE EDUCATION IN HEIs

6.3.1 Introduction

According to Engelbrecht and Wessels (2005:19), since different emphasis is placed by cooperative education practitioners on the cooperative education principle, with a variety of components within this principle, the notion has been created of different models in cooperative education. These variations, implies variations in the organisation, administration and management of the cooperative education principle and not only the terminology which is used. Engelbrecht and Wessels (2005:19) point out that all models for cooperative education should include essential characteristics and include differences in the role of companies (supervisors or mentors), learner monitoring, coaching and assessment, pattern of participation (alternating or parallel), recognition of the faculty of cooperative education etc. Engelbrecht and Wessels (2005:19) also argue that "research examining the correlation between programme characteristics and outcomes will assist in identifying which models may be more effective in enhancing the outcomes for different audiences".

According to Glasman (1997:209), a conceptual framework (model) is defined as basic structures or arrangements which hold together notions or ideas of a class of objects. Most conceptual frameworks, according to Glasman (1997:209), are constructed on the basis of data which describe practice, and even though the data may be incomplete, it is constructed in anyway. Jonker (2004b:138-139), describes a conceptual model as a representation of the reality and is used to indicate how it is supposed to look or functions. Furthermore, its contains very little detail since it is a generalisation.

In this study, the compilation of guidelines with the aid of a conceptual model/s for cooperative education, the various components of cooperative education have been visualised. This study

therefore proposes a conceptual model/s for cooperative education as applicable to the higher education environment in South Africa.

6.3.2 Models in the United States of America (USA)

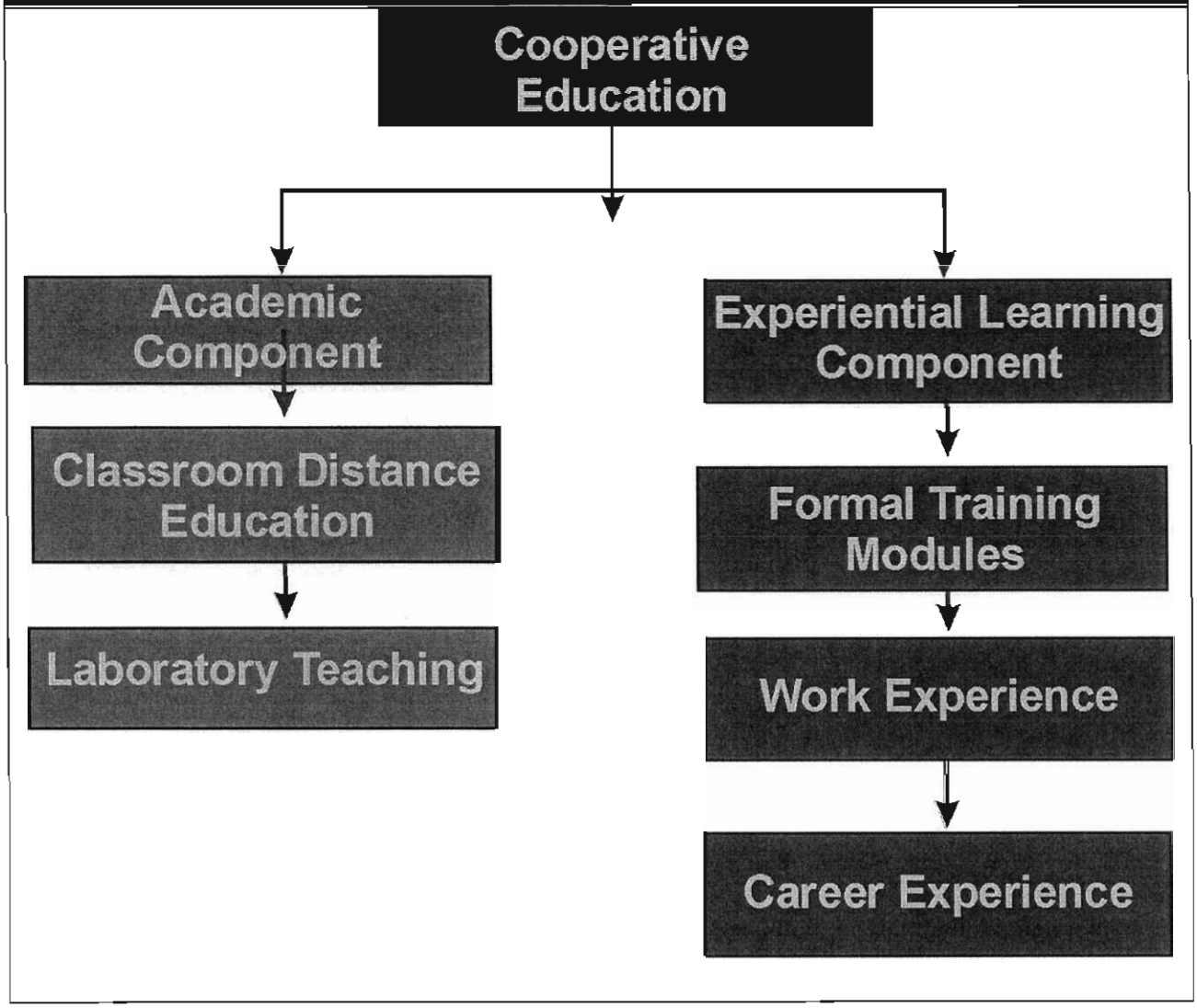
Engelbrecht (2003a:45) reports that the National Commission for Cooperative Education (http://www.co-op.ed/variations.html) lists five models used at post secondary level in the USA, which include a flexible four year model, a community college model, a non-traditional learner model (can be adapted in either flexible four year or community college models), an Accreditation Board for Engineering and Technology (ABET) Baccalaureate Model and an Articulated Cooperative Model. According to Engelbrecht and Wessels (2005:20), these models reveal programme differences in relation to the number of "work" and/or academic terms, the sequence thereof and the extent to which the work terms and academic terms were integrated. It must be noted that these cooperative education programmes have common objectives but have different prototypes.

6.3.3 The South African model

Irrespective of the model used, a certain structure (compare Figure 6.1, p 300) is always revealed, which forms the basis on which this educational model is based (Engelbrecht, 2003a:43). At present, in South Africa a compulsory as well as a non-compulsory option exist for learning programmes, resulting in many dissimilarities and variations within any particular higher educational institution (Engelbrecht & Wessels, 2005:20). To ensure integration[23] of classroom learning with work experience, the following conceptual model is proposed for academic learning programmes in higher education institutions:

[23] This model needs to be applied to all learning programmes in higher education institutions

FIGURE 6.1 **South African higher education cooperative education model (integrated approach on programme level)**



Due to the differences within learning programmes, there may be a variation of the above mentioned model applied within higher education institution in South Africa[24] (Engelbrecht & Wessels, 2005:20).

[24] Reported by the researcher whilst engaged with the research

6.4 MANAGEMENT OF COOPERATIVE EDUCATION

6.4.1 Management models: the integrated management model

In South Africa, there is also a tendency to confuse models of cooperative education with models for the management of cooperative education and the administration thereof, and clarification in this regards is also required. Brown (1971:11) identifies four models for cooperative education and also elaborates on the responsibilities of companies. Davies and Pillay (2000:196) identify various models of learning, which include experiential learning, work-based and problem-based learning. Wessels (2003:6) differentiates between three management models used in the management and administration of cooperative education in technikons in South Africa, with special emphasis on the integrated management model. De Lange and Gilbert (1994:1) report that 62% of American learning programmes function on a combined centralised-decentralised basis, which may be interpreted, as an integrated management model (compare 3.2.3).

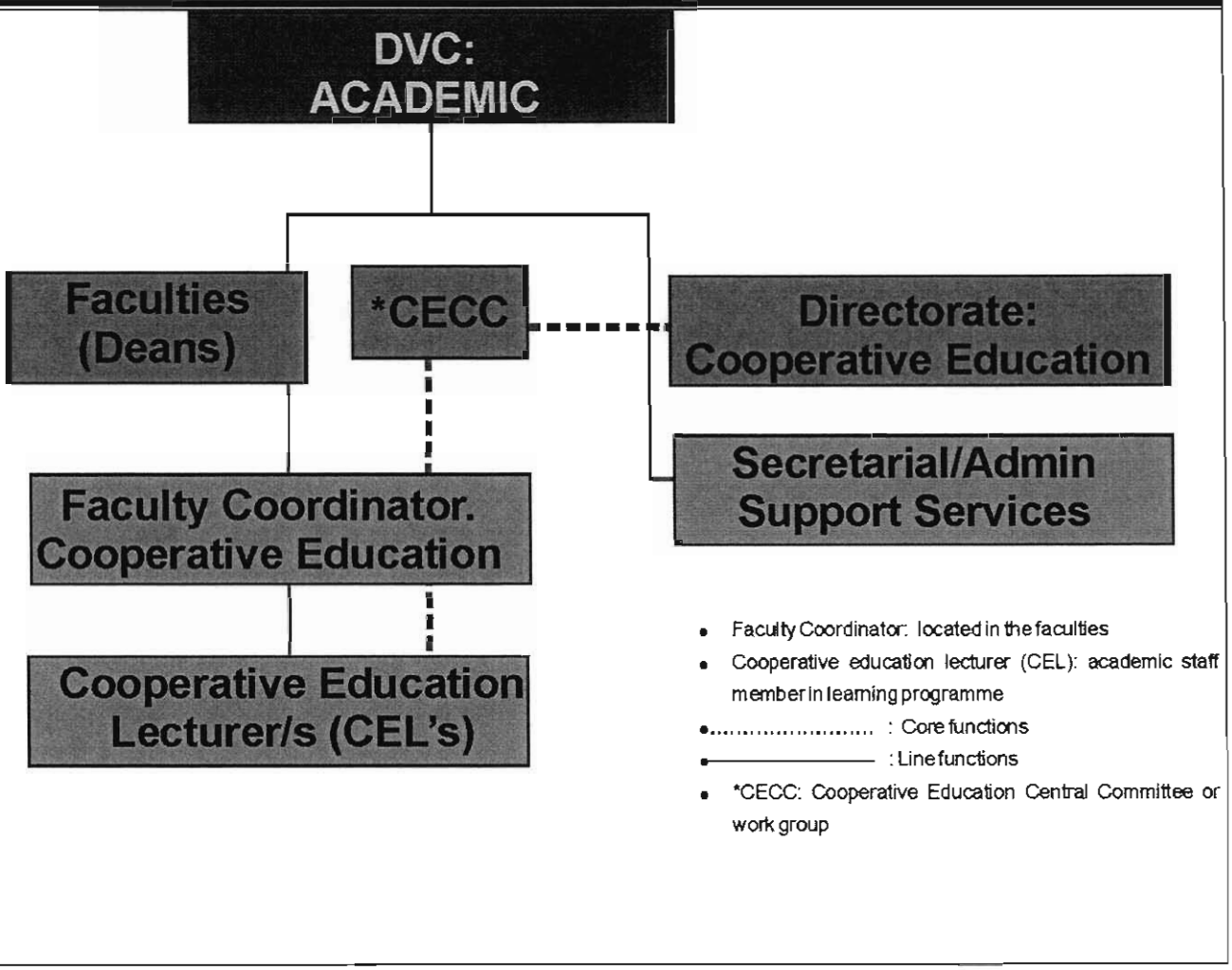
There has been a tendency over the past number of years[25], and especially during the merger process, for most higher education institutions, especially those in the universities of technology and comprehensive universities, to move away from the more traditional, centralised management model of cooperative education to either a decentralised or integrated (eclectic model) (compare Figure 6.2) approach.

The integrated (eclectic) management approach in principal involves a centralised-decentralised approach of management in the institution. In principle, it consists of a relatively small central office, in which a manager (academic), preferably on senior management level and with support staff, are responsible for institutional cooperative education and a decentralised component in which dedicated academic staff members in faculties arre responsible for faculty cooperative education in learning programmes. Since cooperative education is about the integration of classroom learning with work experience (Groenewald, 2004:17), integration at programme level needs to be managed by dedicated academic staff members. The latter may involve either fulltime cooperative education educators/coordinators responsible for cooperative education in faculties, which include experiential learning, such as work-integrated learning, service learning and learnerships and liaison activities such as guest lectures, partnerships and advisory committees

[25] Confirmed by deliberations with managers in cooperative education in HEIs in South Africa

(compare 2.5.2 and Figure 2.4). The following conceptual integrated management model for cooperative education is proposed (compare Figure 6.2)

FIGURE 6.2 Integrated management model for cooperative education in higher education institutions



6.4.2 Institutional cooperative education

On institutional level, the following functions for cooperative education are proposed in higher education institutions (compare Figure 3.1):

6.4.2.1 Strategic management of cooperative education (compare 3.2.1.1)

- Determine strategic direction of cooperative education within the institution[26] with the faculties;
- Coordination and communication of cooperative education between the relevant role players in all components of applicable programmes in faculties in the institution;
- Manage the Cooperative Education central office (compare 6.7.5);
- Provide leadership with regard to cooperative education trends and approaches;
- Compile, review and maintain policy, strategy and procedures;
- Promote and market cooperative education on institutional, national and international levels (compare 6.7.14);
- Serve as a central address/contact for industry on cooperative education for the university; and
- Advise senior management with regard to cooperative education matters.

6.4.2.2 Cooperative education (Figure 3.1)

- Identify, promote and communicate staff development in cooperative education;
- Manage financial resources allocated to the Cooperative Education central office (compare 6.7.10);
- Watch and communicate the latest cooperative education trends with relevant role players;
- Compile and present an institutional annual report on cooperative education to senate;
- Promote, encourage, stimulate and conduct research in cooperative education (compare 2.10) ; and
- Ensure funding received for experiential learning should be paid into cost centres of academic departments, to ensure usage for experiential learning students (compare 3.9).

[26] Institution refers to the applicable higher education institution (HEI)

6.4.2.3 Experiential Learning (compare 3.2.1.2; Figure 3.1)

- Standardise, compile, update and maintain documentation for Experiential Learning processes
- Ensure that funding received for experiential learning is allocated to relevant experiential learning programmes, to ensure usage for experiential learning students (compare 3.10.1, p 105).

6.4.2.4 Liaison (compare 3.2.1.3; Figure 3.1)

- **External (compare 3.12.3)**
- Promote and report on academic staff exposure to industry;
- Liaise with industry/commerce (e.g. partnerships projects, etc.);
- Liaise with higher education institutions with regard to cooperative education (e.g. collaboration agreements);
- Liaise with professional bodies, societies and associations (e.g. ECSA, HPCSA, SETAS, etc.);
    - Maintain active participation in the relevant societies and associations such as SASCE, WACE, HESA; and
    - Negotiate and establish partnerships with the community (industry and direct community).
- **Internal (compare 3.12.2)**
    - The Head/Director of Cooperative Education should establish and chair the Cooperative Education Central Committee (CECC) meetings;
    - Representation on relevant institutional committees (e.g. Academic Committee); and
    - Serve as an address for internal contact on cooperative education issues (academic and administrative).

6.4.2.5 Support (compare 3.2.1.4; Figure 3.1)

- Promote, implement, maintain and update the Cooperative Education Management Information System (records/data) for the institution;
- Provide information with regard to cooperative education processes; and
- Promote staff development with regard to cooperative education (TUT, 2005a).

6.4.2.6 The coordination and communication of cooperative education in higher education institutions (compare 3.2.1.2)

Cooperative education needs be coordinated and communicated within higher education institutions, through a Central Cooperative Education Committee (TUT,2005a).

6.4.2.7 Reporting on cooperative education with higher education institutions (compare 3.2.1.2)

There should be reports on cooperative education activities in annual departmental and faculty reports and these should be submitted to senate. Faculty reports need to be used to compile an institutional report on cooperative education (TUT,2005a).

6.4.3 Faculty cooperative education

On faculty level, the following functions for cooperative education are proposed in higher education institutions (compare Figure 3.2):

6.4.3.1 Cooperative education (compare 3.2; Figure 3.2)

- Coordinate and communicate cooperative education within the faculty;
- Initiate and conduct research in cooperative education (compare 2.10);
- Operationalise the latest educational trends in cooperative education in the curriculum;
- Ensure cooperative education is a standing item in advisory committee meeting agendas (compare 3.12.4);

- Manage financial resources allocated for cooperative education (committee)(compare 3.9 and 6.7.10);
- Organise exposure of academic staff to industry (compare 6.7.11) ;
- Coordinate staff development in cooperative education with the relevant departments;
- Manage the quality of cooperative education (compare 6.7.16); and
- Coordinate and execute mentors training.

6.4.3.2 Experiential learning (compare 3.2.2.1; 2.8; Figure 3.2)

- Execute the experiential learning processes (compare 2.8.3) with regard to:
  - student preparation;
  - placements;
  - monitoring;
  - assessment; and
  - debriefing/reflection on learning of students;
- Develop and review logbooks;
- Source relevant projects for the faculty (both staff and students); and
- Ensure and integration of experiential learning activities in curriculum.

6.4.3.3 Liaison (compare 3.2.2.2; 3.12; Figure 3.2)

- Maintain existing, negotiate and canvass for new work stations;
- Provide support to the relevant learnerships (compare 3.7.4);
- Communicate feedback from industry to the relevant departments and industry;
- Interact with professional bodies, societies and associations;
- Liaise with industry with regards to experiential learning (compare Figure 2.4; 2.5); and
- Arrange guest lecturers (compare Figure 2.4; 2.5).

6.4.3.4 Support (compare 3.2.2.3; Figure 3.2)

- Manage and improve the ITS cooperative education sub-system in the faculty/departments (companies and student data)(compare 3.4);
- Manage and administer logbooks;
- Compile and issue application for placement letters;
- Assist students in the compilation and structuring of CVs/portfolio's for relevant industries;
- Provide student resources for placements applications (e.g. fax); and
- Maintain records/documents on cooperative education (TUT, 2005a).

6.4.4 Role players involved: services, roles and responsibilities (compare 3.2.2)

6.4.4.1 Services provided by faculty cooperative education (compare Figure 3.2)

6.4.4.1.1 Students

Faculty cooperative education should support and assist students with regard to the following:

- The experiential learning process, which include preparation, placement, monitoring, assessment and debriefing of students (compare 2.8.3);
- Preparation of CVs for students for EL and the workplace;
- Collection and distribution of CVs to companies;
- Scheduling of job interviews;
- Arrangement of guest lectures by companies (compare Figure 2.4; 2.5);
- Assistance to students to make contact with companies;
- Monitoring/assessment of national/international students in EL (compare 2.8.3);
- Learnerships (workplace component) (compare Figure 2.4); and
- Service learning activities (compare Figure 2.4).

6.4.4.2 Services provided by institutional (central office) of cooperative education to the faculties (compare 3.2.1; 3.2.3)

The cooperative education central office should provide information, support and assistance to cooperative education and academic staff members within faculties with regard to the following:

- Coordinate aspects related to cooperative education;
- Convening of training workshops in collaboration with relevant support departments, for cooperative education/ academic staff in faculties/departments;
- Monitoring and distribution of information related to advisory committee meetings in various programmes (compare 3.12.4);
- Convene cooperative education committee meetings at institutional level (compare Figure 6.2);
- Facilitate the review of experiential learning documentation in the various faculties/-departments;
- Presentation of a module on cooperative education to new academic staff during induction programmes;
- Create opportunities for experiential learning by interaction with companies (compare 3.12.3);
- Promotion through cooperative education of the various academic programmes, students, departments, faculties and the institution (compare 6.7.14);
- Identify research opportunities in industry for the university students and academic staff members by transferring such opportunities to the various academic staff concerned (compare 6.7.4);
- Establish partnerships in higher education institutions and industry with regard to experiential learning (compare 6.7.12);
- Liaise with companies in commerce and industry (compare 3.12.3);
- The cooperative education central office should promote the participation of academic staff in SASCE/WACE (compare 3.14.1);
- Promote the involvement of members of staff in service learning activities (compare 3.8.2);

- The cooperative education central office of the institution should participate in organisations such as SASCE/WACE/ HESA; and
- Assistance and recording of learnership agreements in the university (compare 5.6).

6.4.4.3 Participating companies

Faculty cooperative education staff should provide support and assistance to companies with regard to the following:

- Convening of advisory committee meetings in collaboration with the academic departments (compare 3.12.4);
- Provision of available workstations/placement opportunities by companies for students to do experiential learning;
- Mentorship, assessment of students, or any other relevant matter, during the experiential learning process (compare 2.8.3);
- Approval of workstations according to specified criteria and requirements;
- Assist companies, where applicable, with the interviewing of students for placement and job opportunities;
- Act as provider with regard to learnership agreements, where applicable (compare 3.7.4);
- Workshops on mentorship preparation presented in collaboration with relevant support departments, by the institution to companies (compare 2.8.3);
- Arrangement of guest lectures to the university students where applicable (compare Figure 2.4; 2.5); and
- Participation in the Chamber of Commerce in the region (compare 6.7.12).

6.4.4.4 The role and responsibilities of cooperative education and academic staff in faculties[27]

6.4.4.4.1 Preparation of students (compare 2.8.3; 6.7.7; Figure 6.3)

Students need to be prepared for experiential learning and the workplace. Students should be prepared for such purposes before EL.

Time allocated for this purpose should be indicated on the timetable for experiential learning (EL), in a venue suitable for such purpose.

All matters regarding cooperative education, EL and the workplace should be discussed, namely preparation, placement, registration, visitation/monitoring, mentoring, assessment, debriefing, writing of a CV, the interview etc. Students should be equipped with life skills during such preparation.

6.4.4.4.2 Placement of students (compare 2.8.3; 6.7.7; Figure 6.3)

Cooperative education and dedicated academic staff members known as the cooperative education/academic staff should support and assist students in the faculty in finding placement. Both students and academic staff are responsible for the placment of students for experiential learning.

Cooperative education/academic staff in faculties should assist academic departments in this regard and should provide administrative and logistical support. Furthermore, it should provide a liaison service between companies, academics and students.

The placement process consists of several activities and includes advertising, canvassing for workstations, interview requests, selections, interview ranking and placement. Placement through the recruitment process is dependent on the availability of positions.

Students must register for EL in all qualification types that include an experiential learning component.

The placement process may be described as follows (compare Figure 6.3)

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[27] The experiential learning process needs to be applicable according to the specific programme requirements

1. Interview requests

Students may apply for any student placement position advertised by the faculty, where applicable. Only those applications received by the deadline dates should be considered.

A letter from the cooperative education/academic staff in the faculty, a copy of CV, academic record and ID must accompany applications for positions.

2. Preparation and distribution of CVs

Students need to type their own CVs. The cooperative education/academic staff in the faculty should then sort all CVs and send them to companies by the most appropriate method.

3. Scheduling of interviews

Companies should notify cooperative education/academic staff in faculties of their short lists for interviews. Cooperative education/academic staff should then coordinate the scheduling of interviews in faculties and should notify those students who have been selected and also those who have not selected for an interview. Cooperative education/academic staff should then schedule the venues for companies in faculties and confirm the interview schedule with the companies and the students.

4. Hosting companies

Cooperative education/academic staff within faculties should be responsible for hosting companies. This includes providing them with an interview schedule. Every effort should be made to ensure that companies' experiences on campus will be rewarding and professional.

5. Matching and ranking

Companies should rank the students according to their own criteria and preference. Students and academic departments should be informed by the cooperative education staff on the outcome.

6. Agreements/confirmation of placement

The company/student should forward to the staff involved in cooperative education within the faculty, a letter to confirm the experiential learning agreement with the specific company. Copies of such documents should be kept in the faculties by cooperative education/academic staff in the student's file.

7. *Unplaced students*

Any student who was not successfully placed for experiential learning should repeat the interview process.

6.4.4.4.3 Monitoring and evaluation of students (compare 2.8.3; 6.7.7; Figure 6.3)

- Cooperative education/ academic staff should monitor and assess/evaluate students in collaboration with companies. The cooperative education / academic staff in faculties should arrange to meet the student on site and to meet his/her supervisor/mentor.
- The purpose of the monitoring process is to assess the achievement of learning outcomes. Furthermore, it facilitates the monitoring of the acquisition of critical cross field outcomes, monitoring of the required notional hours and the progress of the student.
- The visit is the means to obtain information, which will ensure company support and participation in experiential learning.
- Monitoring and assessment must take place according to HEQC guidelines.
- Method of assessment of students should be in alignment with the intended learning outcomes.
- Cooperative education/academic staff will visit companies periodically for the purpose of monitoring the EL process.
- During visitation students must provide proof that training received is in alignment with the intended learning outcomes.
- The university will request students to submit assignments/logbooks/workbooks/projects during and after the experiential learning period.
- The process of visits to companies may include the following procedure:
    - Scheduling of a visit: the faculty cooperative education/academic staff member responsible for visitation makes initial contact with the company/mentor/student to schedule a visit;
    - Confirmation of the visit: The faculty cooperative education/academic staff member confirms the visit telephonically, fax etc. with the company, mentor and student to ensure all were present during visitation;

* Visitation: The faculty cooperative education/academic staff member meets both the student and mentor. The student is interviewed at first to discuss progress of training, review reports etc. The company/mentor is then interviewed to review the student's performance and verify the progress. Hereafter a meeting occurs between the student and the mentor by the cooperative education/academic staff member; and

* Report back: A report will then be completed by the relevant cooperative education/academic staff member within the faculty /department with regard to the visit and presented to the relevant academic department (HOD).

6.4.4.4.4 Debriefing (reflection of learning) (compare 2.8.3; 6.7.7; Figure 6.3)

This is the process whereby the university/company assesses the effectiveness of the student's work term. Students give feedback (reflects on learning) to the supervisor (company) and faculty academic staff of the university on experiential learning. Debriefing can take place during and/or after the experiential learning experience. The time and the venue are determined at the discretion of the cooperative education/academic staff member. Assessment of the student's performance may also be done during/after debriefing. Feedback by the company with regard to the cooperative education/experiential learning (EL) process of the student may accompany the student debriefing.

6.4.4.4.5 Approval of workplace (companies) (compare 2.8.3; 6.7.7; Figure 6.3)

The university (academic department) must approve companies for the purpose of experiential learning for students. Facilities/infrastructure as well as the training programme and mentor must be approved by the university. If students were trained without the prior consent of the university, the university (academic head) may reserve the right not to accept such training. Mentors (supervisors) were appointed at approved workstations to supervise students during the experiential learning period.

Certificates of approval will be issued to companies for accepting such a workplace as an experiential learning site. Approval of the workplace/company may either be done by the university as such or in collaboration with an applicable professional body/ association/ society.

The university indemnifies itself from any claim against injury, loss of life, HIV/Aids of any student during the experiential learning period on the premises of the company/company/workplace where the student receives experiential learning.

6.4.4.4.6 Recognition of prior learning (RPL) (compare 3.5)

Students with previous career experience and who would like to have such experience considered for exemption/partial exemption for experiential learning, may apply for recognition in terms of the institutions policy on RPL.

6.4.4.4.7 The role and responsibilities of students in cooperative education (compare 3.6)

Students who qualify for experiential learning are jointly responsible with academic staff responsible for their own placement and should receive instruction and assistance from the relevant cooperative education/academic staff. The university, and more specifically, cooperative education staff and/or academic department/staff, cannot guarantee suitable placement although every attempt will be made to assist students in the process. The institution has the responsibility of directing and assisting students to obtain experiential learning opportunities related to the job market. Given these opportunities, the student is the one responsible for procuring job placement.

6.4.4.4.8 Specific responsibilities of students (compare 3.6.3)

Students must:

- Register for all experiential learning programmes as soon as the company accepts them. students should ensure that the experiential learning is acceptable to the institution;
- Show respect for and understanding of the goals, rules and philosophies of the company and the institution;
- Take responsibility for own co-ordination, financing of transportation, accommodation and related expenses incurred in the experiential learning process;
- Notify the university of any change of address of the place where the experiential learning will be undertaken;
- Fulfil both experiential learning and academic education requirements before the student will be considered for the award of a qualification;
- Ensure that the logbook/workbook/project/assignment is kept up to date and signed by the specific mentor (supervisor) of the company (compare 2.8.3);
- Ensure that the experiential learning received is of the required standard and complies with the institutions' guidelines;

- A student may undertake experiential learning with more than one company, as long as the relevant cooperative education / academic staff / department was notified;
- A student may be requested to undergo an interview with a mentor (supervisor) and/or academic/cooperative education staff member upon completion of the experiential learning period; and
- Registration with a respective professional body as a student in training is the responsibility of the student.

6.4.4.4.9 The role and responsibilities of companies involved in cooperative education (compare 3.6.1)

Companies form an integral part of the experiential learning process and have the responsibility with the university and student to ensure maximum benefit to all participants.

Responsibilities of companies include:

- The companies provide experiential learning facilities, training and supervisory staff (mentor) for the purposes of experiential learning. The exact nature of this experiential learning is based on collaboration between the company and the institution in accordance with the requirements of the specific instructional programme;
- The companies inform the institution of experiential learning opportunities offered. The company should conduct an orientation programme at the beginning of the work period to familiarise the student with the working environment and the company's expectations;
- The companies and the student agree as to when experiential learning is to commence. This depends on the nature of the academic curriculum. Academic /cooperative education staff should act as support in this regard;
- Provide information to students about their organisation, conditions of employment etc. as required during the experiential learning period;
- In collaboration with the institution, the company and academic staff are jointly responsible for the control, monitoring and evaluation of the experiential learning programme;
- A record of the student's experiential learning progress and evaluation must be maintained for monitoring and reference purposes. A logbook/workbook etc. must be used for this purpose;

- On completion of the experiential learning, the logbook/workbook/ project/assignment must be signed/ approved by the mentor/company and the company's official stamp placed on the document;
- Companies who have been approved by the university must notify the responsible cooperative education/academic staff member in writing that the student has met/not met the requirements for experiential learning, to be considered/not considered for a qualification; and
- The university may also provide simulated (non-work-based) experiential learning (compare policy on cooperative education)(compare 2.8.4; Appendix B, section D, question 11).

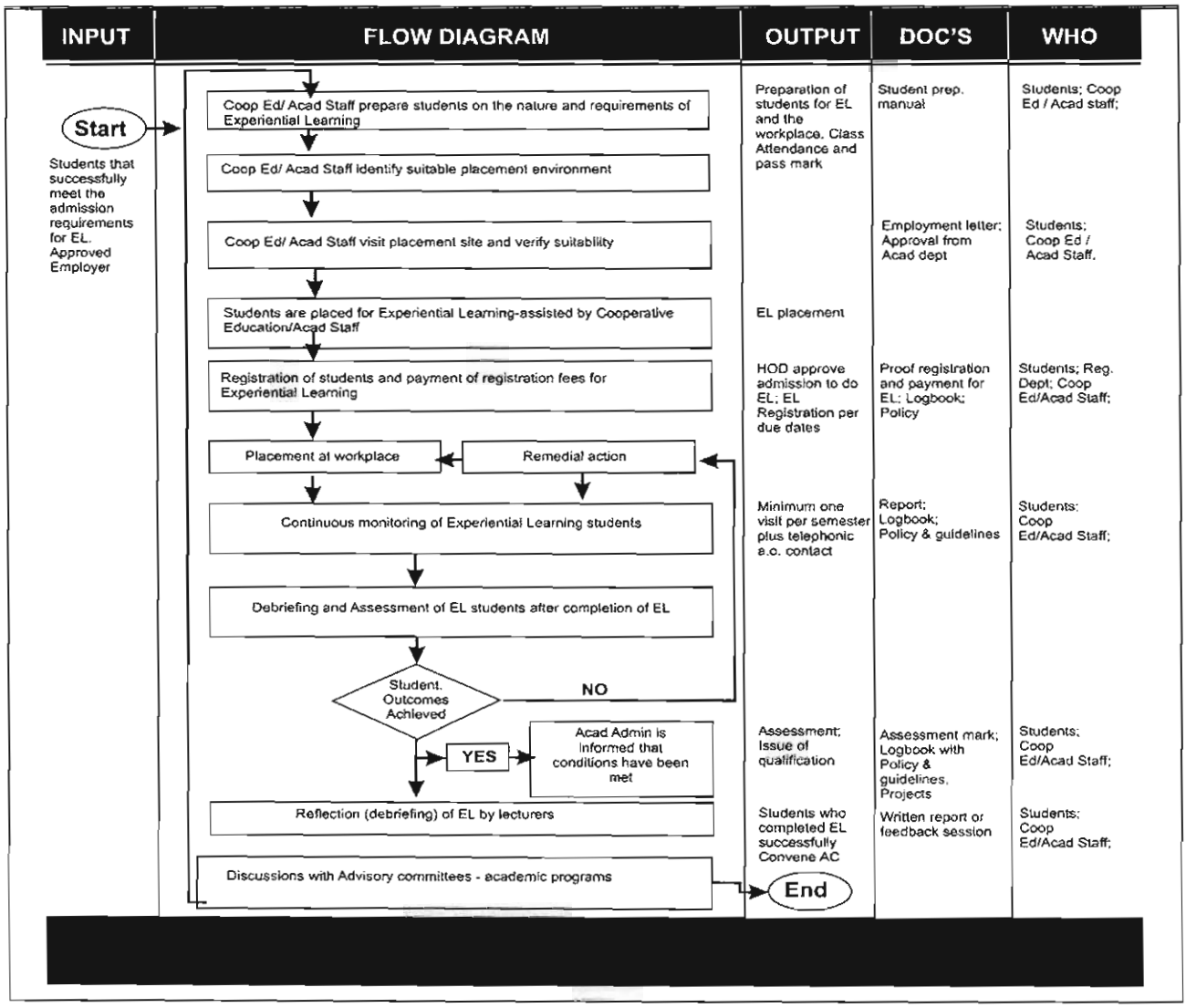
6.5 QUALITY MANAGEMENT IN COOPERATIVE EDUCATION

The following quality assurance cycle (flow chart) (compare Figure 6.3) is proposed as a conceptual model to ensure quality assurance of academic learning programmes in higher education institutions. Quality assurance of experiential learning includes work-integrated learning, service learning and learnerships (workplace component) in higher education institutions (compare 3.17; 5.6).

6.6 ROLE CLARIFICATION OF STAFF INVOLVED IN COOPERATIVE EDUCATION

It is recommended that academic staff and cooperative education staff clarify their functions, roles and responsibilities in cooperative education in faculties in higher education institutions through the identification of such functions, roles and responsibilities and quality assure this by using agreement forms between the relevant role players to prevent confusion on roles and responsibilities in cooperative education within higher education institutions (compare 3.6.2, Appendix C)

FIGURE 6.3 Quality assurance of experiential learning: experiential learning management



Therefore, based on the research and proposed conceptual models formulated and described, the following conceptual model is proposed for cooperative education in higher education institutions in partnership with industry South Africa.

FIGURE 6.4 **Conceptual model for cooperative education for higher education institutions in partnership with industry.**

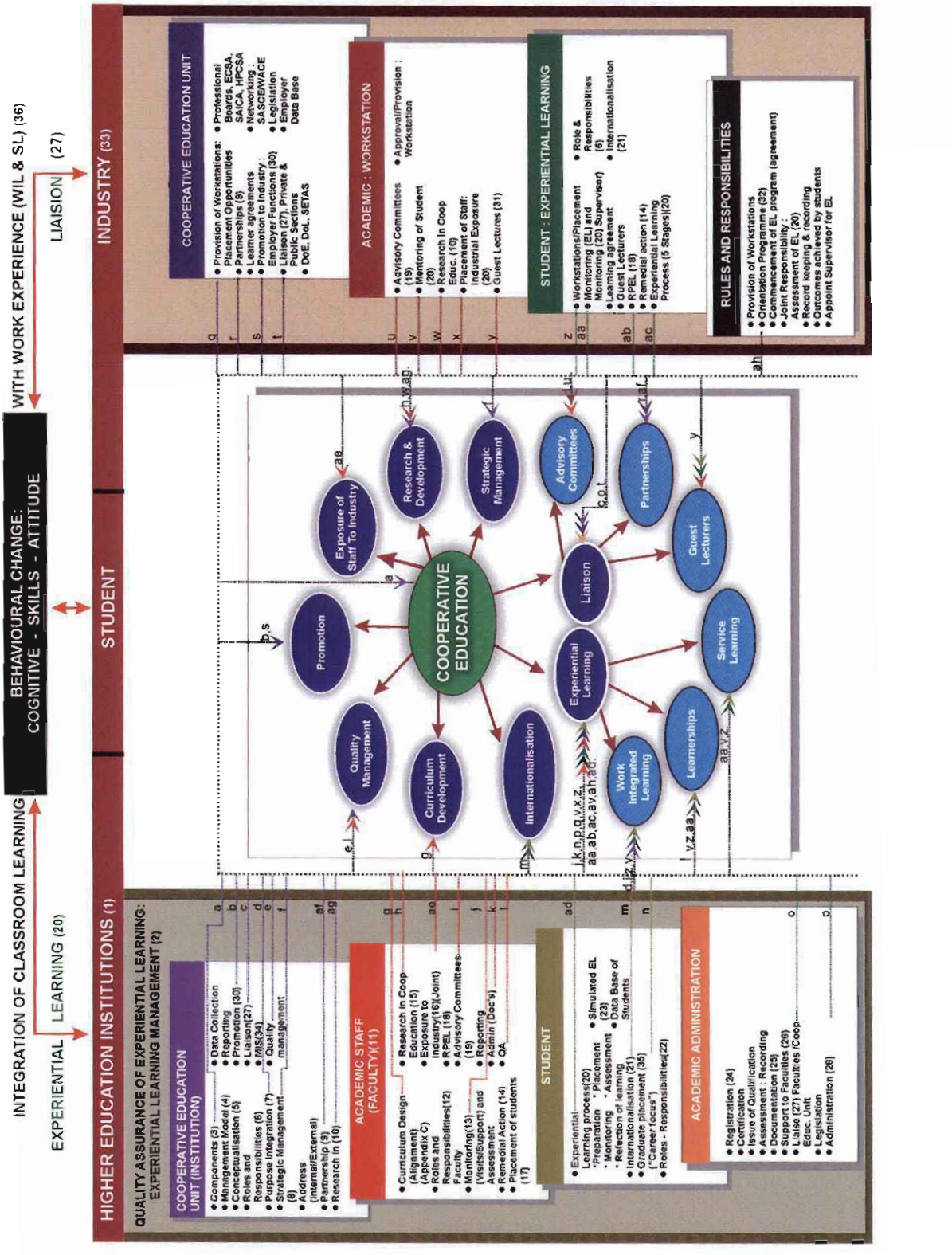


TABLE 6.1 [1]**Cross references for the conceptual model for cooperative education for higher education institutions in partnership with industry**

NUMBER	CROSS REFERENCE
1	Compare Figure 2.6; 3.6
2	Compare Figure 6.3; 6.7.16
3	Compare Figure 2.4
4	Compare Figure 6.1; 6.7.5
5	Compare Figure 2.1; 2.8; 2.5
6	Compare Figure 3.1; 3.6
7	Compare Figure 2.1
8	Compare Figure 2.4
9	Compare 3.12.5; Figure 2.4
10	Compare 2.10; 6.7.4; 5.4.5
11	Compare 6.4.3
12	Compare 3.6
13	Compare Figure 2.6
14	Compare Figure 6.3
15	Compare 2.10
16	Compare 3.11; 6.7.11
17	Compare Figure 2.6; 3.6
18	Compare 3.5
19	Compare 3.12.4
20	Compare Figure 2.6; Figure 6.3; 2.8; 6.7.7; 6.7.12; 5.5.5
21	Compare 3.13; 6.7.13
22	Compare 3.6
23	Compare 2.8.4
24	Compare Figure 6.3
25	Compare 3.3
26	Compare 3.2
27	Compare Figure 2.4
28	Compare 3.10.2

[1] For the purpose of this research links are highlighted in the conceptual framework/model (Figure 6.4, p 318)

30 Compare Figure 2.4; 6.7.14

31 Compare Figure 2.4

32 Compare 6.4.4.4.8

33 Industry: Defined in the context of this study as the public and private sectors and include commerce, industry and the local community. Compare 6.7.8; 5.5.5

34 Compare 6.7.6

35 Compare 6.7.17

36 Compare 5.4.5

Finally, based on the research and proposed conceptual models formulated and described, the following guidelines are proposed for HEIs in South Africa:

6.7 GUIDELINES FOR THE IMPLEMENTATION OF COOPERATIVE EDUCATION IN HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA

The following guidelines are proposed as a result of this study:

6.7.1 The concept of cooperative education and related terminology within the university (compare Table 4.1)

Higher education institutions (HEIs) clarify the concept[28] *cooperative education* and related terminology institutionally and in documented policies, strategies and in learning programmes (compare Table 4.1; Table 5.17 to 5.19[29]; 2.5)

6.7.2 The nature of cooperative education (compare Table 4.1)

Cooperative education should not only be practiced in universities of technology and comprehensive universities but should be extended towards implementation in the traditional

[28] The concept cooperative education and related terminology need to be clarified at a national level to standardise such terminology in higher education institutions. SASCE has launched a research project in this regard, as a result of this study.
[29] Reference is only given to the differences between HODs in HEIs

universities in the higher education landscape in South Africa (compare Table 5.20 to 5.22; 5.6;, 7.5).

6.7.3 The purpose and role of cooperative education (compare Table 4.1)

It is essential that all HEIs provide support to students and supervisors at companies in industry during experiential learning by the provision of cooperative education staff/ academic staff to support[30], monitor and assess students during experiential learning (compare CHE, 2004:11 criteria 7 and 2.8.3.3).

Experiential learning guides (for instance, workbooks) ought to be compiled for each experiential learning programme (work-integrated learning and service learning) for students in higher education institutions, and experiential learning guides must contain a clear set of measurable outcomes (compare Table 4.1, item 4 question 20; Table 5.26 to 5.28).

6.7.4 Improvement in cooperative education (compare Table 4.1)

Research, development and innovation in cooperative education at a micro and macro level must be advanced in higher education institutions by the provision of the necessary resources (compare Table 5.32 to 5.34; 2.10 and 7.3).

6.7.5 Management of cooperative education in higher education institutions (compare Table 4.2; Table 5.84 to 5.86)

Cooperative education is a teaching and learning strategy, and therefore necessitates report to the academic heads of higher education institutions (deputy vice- chancellor: academic, etc.) (compare 2.5; 6.4.1 and 7.4).

Cooperative education needs to be coordinated and communicated at an institutional level through a forum (committee, work group, project team) in which faculty cooperative education represen-

[30] Support means; staff should make contact with students by visiting student learners at the workplace, to encourage, coach and monitor progress of students and interact with students and supervisors, at least once per experiential learning period.

tatives hold a seat (CHE, 2004a:11). In very large universities a similar forum may be used in faculties, consisting of academic learning programme representatives (compare Figure 6.2).

Cooperative education should preferably be managed by means of an integrated (eclectic) management model/structure (compare Figure 6.2; 3.2), to ensure integration of cooperative education in the faculty and learning programmes. Higher education institutions should be encouraged to use an integrated model for the management of cooperative education in South Africa (compare 7.4).

Reports on cooperative education activities must be made available on an annual basis as part of the academic line of report (compare 7.3.1; 6.4.2.7). Policies, strategies, functions, role and responsibilities of the relevant role players in cooperative education within the higher education institution need to be clarified, documented and approved by senate for implementation (compare 3.6; 6.4).

Guidelines for students in universities and supervisors in companies in industry should also be included in experiential learning guides of learners and supervisors mentors (Table 4.2)

6.7.6 Management information system

A standardised and user friendly management information (MIS) system must be used in HEIs for the management of cooperative education (experiential learning; work-integrated learning and service learning), at both institutional and programme level (compare Table 4.2; Table 5.60)

6.7.7 Experiential learning as component of cooperative education (compare Figure 2.4; Table 5.90 to 5.92)

The following guidelines are applicable:

- The experiential learning process involves at least the following (compare 2.8; Figure 2.6; Figure 6.3; Table 5.90 to 5.92):

1. **Preparation of students for experiential learning and the workplace**

   Students must be prepared in class prior to EL placement, and preparation times must be indicated on the time tables of students. Academic and support staff prepare students.

2. Placement of students at companies

Placement should not be left to students, but academic staff must be responsible to assist students in placement. The objective should be to achieve a 100% placement. The HEIs (academic staff) are co-responsible since students pay a registration fee for experiential learning. Students should be approved by relevant academic head of department for admission to EL.

3. Monitoring of EL students at the workplace

Academic staff is primarily responsible for monitoring the progress of students (include support, coaching and encouragement of students) at the workplace, such as site visits (at least once per experiential learning period), IITV, telephonic contact, e-mail etc.

4. Mentoring of EL students at the workplace

Students must be supervised and mentored by professional company supervisory ("Lecturer") staff at the worksite. Supervisors must be approved and appointed by the relevant role players such as university, professional boards, community forum etc at the worksite to coach and mentor students.

5. Assessment of EL students

This remains the responsibility of the HEI and the assessment responsibility cannot be transferred to any other role player. Academic staff members are responsible for assessment of students learning outcomes.

6. Reflection of learning

This is applicable to all experiential learning activities, including work-integrated learning and service learning.

- Service learning, included as part of the experiential cycle/process (compare 3.8.2; Table 5.99 to 5.101);
- Dedicated academic staff takes responsibility for the experiential learning process, which involves work-integrated learning and service learning (compare Table 3.1; Table 5.90 to 5.92);

- Simulated experiential learning must be used as an alternative for work-based learning on the conditions of approval by the relevant role players, namely professional boards, HEIs etc (compare 2.8.4; Table 5.60; Table 5.90 to 5.92);
- Students must be remunerated by companies if possible (compare 2.11.3);
- Students register for experiential learning(work-integrated learning and service learning) at all times in HEIs (Figure 2.6); and
- Academic staff encourage students to cover themselves during experiential learning at the workplace, in case of accidents, HIV/Aids etc (compare 7.3.1).

6.7.8 Role players involved

HEIs learning programmes receive inputs from and must be aligned with the needs of the industry and the society, by using programme advisory committees (compare 7.3.1; section D, question 12, Appendix B; 5.6; Table 5.93 to 5.95)

6.7.9 Community service learning

Service learning must be implemented in conjunction with work-integrated learning, in higher education institutions where work-integrated learning is offered (compare 3.8; 7.2; Table 5.99 to 5.101)

6.7.10 Resource provision in cooperative education

Resource provision, that is, human resources (dedicated staff for cooperative education) and funds (budgets) must be made available in HEIs for cooperative education (work-integrated learning and service learning) (compare 3.9; 7.3.1; Table 5.102 to 5.104).

6.7.11 Exposure of academic staff to industry

All academic staff must be exposed to industry to stay abreast with developments in industry. This may be achieved by the development of a personal development plan for each academic staff member. All academic staff should be encouraged to become involved with the placement, monitoring and assessment activities of students during experiential learning at the workplace, to contribute to exposure to industry (compare 3.11; 7.4; Table 5.105 to 5.107)

6.7.12 Partnerships with industry

Cooperative education must be used as an effective vehicle to create and establish partnerships with industry. Learner contracts/agreements must be used to involve all role players (compare 3.12.5; 7.3.1; Table 5.111 to 5.113).

6.7.13 Internationalisation of cooperative education

Students must be placed and exchanged for experiential learning not only nationally but also internationally in higher education institutions (compare 3.13; Table 5.114 to 5.116).

6.7.14 Promotion of cooperative education

A marketing plan and promotion plan (internal and external) needs to be included as part of the business plan for cooperative education in HEIs (compare 3.14; Table 5.117 to 5.119)

6.7.15 Telematic application in cooperative education

Telematic applications, such as IITV, must be used in cooperative education, especially during experiential learning, namely the monitoring and assessment of students, at the workplace (compare 3.16; Table 5.120 to 5.122).

6.7.16 Quality management

Quality management of experiential learning must be ensured in HEIs by the use an experiential learning management cycle (compare Figure 6.3; 3.17; Table 5.123 to 5.125).

Usage of a MIS for cooperative education and experiential learning in HEIs (compare 6.7.6; 3.4).

6.7.17 Graduate placements

Access provided by students to a graduate placement office on campuses of HEIs to promote employment of graduates, on completion of experiential learning, to the employer market (compare 7.4; Table 5.126 to 5.128)

6.8 SUMMARY

In this chapter the terms model and guidelines have been defined and described. The characteristics, types, advantages and steps in the development of a conceptual model/s have been discussed.

Various conceptual models, which include a programme integration model (compare Figure 6.1), an integrated model for the management of cooperative education in HEIs (compare Figure 6.2), a descriptive institutional and faculty cooperative education model, which include functions, role and responsibilities of the relevant role players (compare 6.4.2; 6.4.3; 6.4.4; Appendix C), a quality assurance model for the management of experiential learning in HEIs (compare Figure 6.3) and finally a comprehensive model for cooperative education for HEIs (compare Figure 6.4) have been presented.

The literature review, the research and conceptual model/s supported the compilation of guidelines proposed for the implementation of cooperative education in higher education institutions in South Africa.

In the next chapter the research will be summarised and conclusions with recommendations will be presented.

CHAPTER 7
SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In this study, conceptual models (Figure, 6.1; Figure 6.2; 6.4.2; 6.4.3; 6.4.4; Appendix C; Figure 6.3; 6.5; 6.6; Figure 6.4) based on results obtained from this study was formulated to compile guidelines for the implementation of cooperative education.

7.2 SUMMARY

In the first chapter a background was presented on the research in question, the need for and purpose of this research, the research problem, objectives of this study, research procedures and methodology used.

In Chapter 2, a literature survey was conducted on the basic principles and nature of cooperative education on a national as well as international basis. The current status of cooperative education was discussed, with special reference to the origin and history of cooperative locally and abroad. The nature of cooperative education, which included the clarification of what cooperative education is all about, the identity of cooperative education and the tri-partite model of role players involved in cooperative education were explored in the literature and it was confirmed that cooperative education is about learning. In the compilation of the questionnaire to be used as a measuring instrument in this research, information was gathered from this research in relation to the objectives stated, namely to compare the basic principles and nature as well as best practices in cooperative education locally and abroad; determine multidisciplinary issues relevant to cooperative education; determine the status of cooperative education in government-subsidised HEIs and to develop guidelines for the standardisation of cooperative education in HEIs and industry in the Gauteng region in South Africa (compare 6.7).

The concept *cooperative education* and related terms were investigated and explored and an attempt was made to define cooperative education (compare 2.5; Figure 2.4).

The purpose and role of cooperative education were investigated, which included the function of cooperative education with special emphasis on the benefits of the role players involved in the cooperative education venture.

One of the most important components of cooperative education, namely experiential learning, was discussed and analysed. Experiential learning was defined and the quality assurance of experiential learning, as part of the learning programme, has been explained diagrammatically. The various stages of the experiential learning process, which involves preparation, placement, monitoring, mentoring assessment and debriefing (reflection of learning) were discussed and represented diagrammatically, to be used for the development of a quality assurance model (compare Figure 6.3).

The importance of theories of learning in cooperative education was then investigated and included Piaget's Cognitive Development Theory, Gagne's Conditions of Learning, Atkinson Model of Achievement Motivation and Bandura's Social Learning Theory, Kolb's Experiential Learning Model. The socio-cultural views of learning were also analysed and discussed. The above-mentioned theories of learning form the basis for cooperative education. The status of research in cooperative education was explored and finally, views on the future of cooperative education, were explored. The need for new initiatives and issues related to the future of cooperative education were discussed, including service learning, remuneration of students during experiential learning, different models of experiential learning, innovation and improvement and finally the survival of cooperative education.

Chapter 3 dealt with the best practices in cooperative education and involved a literature survey at both a national and an international level. In the compilation of the questionnaire to be used for the empirical study, information was gathered from this chapter in pursuit of the objective to determine the status of and best practices in cooperative education in companies and higher education institutions in the Gauteng region in South Africa (compare section D, Appendix B).

In this chapter an analysis and investigation of the management of cooperative education were performed and a functional model was formulated (compare 3.2) to diagrammatically explain the functions involved with the management of cooperative education in higher education institutions. Functions in cooperative education related to institutional as well faculty level were investigated and recorded. Matters related to the management of cooperative education at institutional level were analysed and discussed and different management models/structures were investigated. It also included reporting lines, staffing issues, policies and procedures and the usage of management information systems in cooperative education. The role and responsibilities of the

various role players, namely students, companies and the higher education institution involved in cooperative education were investigated and proposals were recommended. The role and responsibilities of academic staff, and more specifically those of the coordinator/cooperative education educator, were analysed and discussed.

The issue of skills development, especially learnerships (workplace component) in relation to cooperative education, was investigated since its application in higher education is a contentious issue. Service learning, as a form of experiential learning, has been explored since this has also become a major drive in higher education institutions in South Africa.

Funding of experiential learning (EL) in the higher education sector is another contentious issue. This matter has been explored considering the CTP report on state funding of former technikons, now known as universities of technology and comprehensive universities. The exposure of academic staff as an incentive through cooperative education in work-integrated learning and service learning was explored in the literature and regular exposure to new technologies was emphasised. Partnerships of higher education institutions with external role players, promotion of cooperative education, the exchange of knowledge and new technologies through advisory committees and guest lecturers in higher education institutions have been researched (compare Figure 2.4). Other components of cooperative education were, among others, researched in the literature and included promotion, entrepreneurship, telematic applications and quality assurance in cooperative education.

In Chapter 4, the research design and methodology were described and the motivation for the usage of a structured closed ended questionnaire was recorded. An explanation of the structure of the questionnaire was given and the decision to use the construct validity approach by clustering of items (questions) in constructs. The administrative procedure used for the distribution and collection of questionnaires and data-recording was described. Finally, the population and sampling were reported and the principles and application of validity, reliability and factor analysis, used in this study were explained.

In Chapter 5, the empirical investigation with regard to biographical, demographical, basic principles and nature, and best practices in cooperative education were reported, within the context of the higher education sector and industry in the Gauteng region, in South Africa.

In Chapter 6, based on the empirical study and the accompanied literature study, conceptual models were developed and described which aided to compile guidelines for the effective

development and implementation of cooperative education in teaching and learning organisations in higher education.

From the research it was then possible to make the following findings presented in 7.3.

7.3 FINDINGS

7.3.1 Conclusions with regard to objective 1

With regard to the first objective, namely to compare the basic principles and nature as well as best practices in cooperative education nationally and internationally by means of available literature, the following were found:

- Cooperative education is well established in higher education institutions especially in universities of technology and comprehensive universities. Cooperative education is also practiced in traditional universities but the term of cooperative education is not used to the same extent as those in the universities of technology and comprehensive universities in South Africa. Internationally, there is no differentiation has been observed (compare 2.3.1);
- Cooperative education is well established worldwide, and in some countries it has a high profile while in others it is still at an embryonic stage seeking to draw upon experiences of well established programmes (compare 2.3.1);
- Cooperative education is a teaching and learning methodology with the aim to enhance learning (compare 2.5; 2.7; Table 5.15[31]);
- From the student's point of view the purpose of cooperative education in a HEI is that of career clarification (compare 2.6; 6.7.3);
- Cooperative education has many benefits (compare 2.6.3);
- Quality assurance of the experiential learning process is essential (compare Figure 6.3; 6.7.16);
- Cooperative education is founded on theories of learning such as those of Kolb, Dewey etc. (compare 2.9);

[31] Reference is only given to the opinions of supervisors of companies in industry and academic HODs in HEIs

- Research, innovation and development in cooperative education are essential – more research needs to be done in cooperative education (compare 2.10; 5.6; Table 5.32[32]);
- Service learning, as a form of experiential learning needs to be integrated in the curriculum, as in the case of work-integrated learning, to enhance student societal awareness students (compare 3.8.2; 6.7.9; Table 5.99[33] to 5.101);
- Cooperative education needs to be re-defined at a national and even an international level and the concept cooperative education and related terms should be clarified (compare 2.5; Figure 2.4);
- The role, functions and responsibilities of centralised cooperative education units in higher education institutions (HEIs) in South Africa need to be clearly defined (compare 3.2; Figure 6.4);
- The management structure for cooperative education within HEIs is unique for each HEI, and needs to be developed according to the needs of each HEI (compare 3.2.3; Figure 6.2);
- There is a lack of clear guidelines with regard to the management models/structures for cooperative education in HEIs in South Africa and abroad (compare 3.2.3; Figure 6.2);
- Managers in cooperative education should preferably report to the academic head of the institution (compare 3.2.4; Figure 6.2);
- Adequate resources should be provided at institutional as well as faculty level to ensure the success of cooperative education within HEIs (compare 3.2.5; 3.9; 3.10; 6.7.10);
- Policies, strategies, procedures and guidelines should be documented and in place for cooperative education on institutional as well as at faculty/ programme levels (compare 3.3);
- There is a need for a standardised management information system to be used to manage and administer cooperative education within higher education institutions in South Africa (compare 3.4; 6.7.6);
- Industry and the local community need to become more involved in HEIs in South Africa (compare 3.6.1; 3.8; 6.7.12; Table 5.99[34] to 5.101);
- Proper feedback mechanism should be in place for students and industry (mentors) to ensure minimum quality assurance standards of experiential learning programmes are maintained (compare Figure 6.3; 3.12.4; 7.4);

[32] Reference is only given towards the opinions of academic HODs in HEIs

- The role and responsibilities of role players involved in cooperative education in HEIs should be clearly defined and documented (compare 3.6; 7.4);
- The appointment of cooperative education educators/lecturers/coordinators for the management and administration of experiential learning programmes is essential to ensure the success of an experiential learning programme (compare 3.6.2.2; 6.7.10);
- Students need to be well prepared by academic/support staff for experiential learning and the workplace prior to experiential learning placement (compare 3.6.2.2; 6.7.7; Table 5.71[35]);
- Higher education institutions are obliged to provide assistance and support for placement of students for experiential learning (compare 3.6.2.1; Table 5.71[36]);
- The safety and security of students in terms of injury, HIV etc. need to be researched and resolved in HEIs in South Africa (compare 6.7.7);
- The application of learnerships as a skills development initiative in the higher education sector needs to be clarified (compare 3.7.4; Table 5.73[37]);
- Students may benefit from service learning involvement in learning programmes in higher educations (compare 3.8.2; 6.7.9; Table 5.74[38]);
- Cooperative education needs to be funded by the Department of Education in all HEIs (compare 3.10; 6.7.10);
- Cooperative education is a unique way to expose academic staff to industry to stay abreast of new developments and new technologies in industry (compare 3.11; 6.7.11; Table[39] 5.76);
- The role of advisory committees as a forum of interaction to provide inputs and advice from industry needs to be promoted in higher education institutions in South Africa (compare 3.6.1; 3.12.4; 7.4; Table 5.77[40]);
- Cooperative education is an important academic engagement activity to strengthen the partnership relationship of the various role players involved (compare 3.12.5; 6.7.12, Table 5.77[41]);

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[33] Reference is only given towards the opinions of academic HODs in HEIs
[34] Reference is only given towards the opinions of academic HODs in HEIs
[35] Reference is only given towards the opinions of supervisors of companies in industry and academic HODs in HEIs
[36] Reference is only given towards the opinions of supervisors of companies in industry and academic HODs in HEIs
[37] Reference is only given towards the opinions of supervisors of companies in industry and academic HODs in HEIs
[38] Reference is only give towards the opinions of supervisors of companies in industry and academic HODs in HEIs
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[40] Reference is only given towards the opinions of supervisors of companies in industry and academic HODs in HEIs
[41] Reference is only given towards the opinions of supervisors of companies in industry and academic HODs in HEIs

- Proper guidelines have been developed to support the internationalisation of students in higher education institutions (compare 3.13; 6.7.3; 7.4; Table 5.114[42] to 5.116);
- Cooperative education needs to be continuously promoted within and externally to the higher education institution (compare 3.14; 6.7.14; 7.4; Table 5.117[43] to 5.119);
- Managers in cooperative education needs to have entrepreneurial and business skills (compare 3.15);
- Telematic applications (Interactive Instructional Television, IITV) in cooperative education need to be explored (compare 3.16; 6.7.15; Table 5.120 to 5.122[44]); and
- Quality management of experiential learning (work-based) programmes in higher education is essential (compare 3.17; 6.7.16; Table 5.123[45] to 5.125).

7.3.2 Conclusions with regard to objective 2

With regard to the second objective, namely to determine multidisciplinary issues relevant to cooperative education in industry in South Africa, the following is noted:

- A multidisciplinary approach was followed with students and academic heads of departments in higher education institutions and supervisors (mentors) in companies in industry in the Gauteng province, and included mechanical engineering, nursing and accounting (compare Table 4.3; 4.12).

7.3.3 Conclusions with regard to objective 3

With regard to the third objective, namely to determine the status of cooperative education in government subsidised HEIs and industry in South Africa, the following conclusions are made:

- All supervisors in companies and heads of academic departments in higher education institutions in the respective disciplines were in agreement about the basic principles and nature of cooperative education (compare 5.4.5);
- Most academic heads of departments in higher education institutions were in agreement about the basic principles and nature of cooperative education (compare 5.4.5);

[42] Reference is only given towards the opinions of academic HODs in HEIs
[43] Reference is only given towards the opinions of academic HODs in HEIs
[44] Reference is only given towards the opinions of academic HODs in HEIs
[45] Reference is only gven towards the opinions of academic HODs in HEIs

- Academic heads of departments of universities differ significantly with regard to the nature, purpose and role of cooperative education with universities of technology and academic heads of departments differ significantly regarding research and development in cooperative education in comprehensive universities and universities (compare 5.4.5);
- Most students in all disciplines in higher education institutions are in agreement on the basic principles and nature of cooperative education (compare 5.4.5);
- Students only differ with regard to the purpose and role of cooperative education in universities of technology with those in comprehensive universities (compare 5.4.5);
- All supervisors of companies and academic heads of departments were in agreement concerning best practices in cooperative education in higher education institutions (compare 5.5.5);
- Most academic heads of departments in higher education institutions agreed on the best practices in cooperative education (compare 5.5.5);
- Some academic heads of departments in comprehensive universities differ from universities of technology and universities regarding experiential learning, and universities of technology differ from universities on skills development (learnerships) (compare 5.5.5);
- Most students in the three disciplines in higher education institutions agreed on the best practices in cooperative education(compare 5.5.5); and
- Students in universities of technology differ from students in comprehensive universities and universities of technology on experiential learning, role players involved, learnerships and quality management in cooperative education (compare 5.5.5).

7.3.4 Conclusions with regard to objective 4

With regard to the fourth objective, namely to develop guidelines to standardise the implementation of cooperative education in higher education institutions and industry, the following conclusions are made:

- All models for cooperative education in South Africa should make provision for the inclusion of all essential characteristics and differences for a variety of learning programmes (compare 3.2; 6.3.3; Figure 6.1);

- Essentially, all educational models for cooperative education in South Africa consist of an academic and an experiential learning component, in that learning programmes have a compulsory experiential learning (EL) component (compare 6.3.3; Figure 6.1);
- At present, there is a preference among HEIs in South Africa to apply the integrated (eclectic) model for the management of cooperative education (compare 3.2; 6.4.1; Figure 6.2);
- There is a need for direction in HEIs at a national level for guidance with regard to the management models/structures in service learning in cooperative education (compare 3.8.2; 6.4.1);
- Cooperative education should fall under the supervision of the academic head of the higher education institution (compare 3.2; 6.4.1; Figure 6.2);
- A cooperative education educator/lecturer responsible for cooperative education should report to the dean or head of the faculty as an academic function. Alternatively, faculty cooperative education coordinators could also report to the head of cooperative education (compare 6.4.1; Figure 6.2);
- Cooperative education differentiates between institutional and faculty functions (compare 6.4);
- Cooperative education should be coordinated and communicated at institutional level as well as faculty level through committee structures(compare 6.4.2.6; Figure 6.2);
- Cooperative education activities need to be reported on an annual basis and departmental/faculty reports need to be submitted to senate for approval (compare 6.4.2.7);
- The role and responsibilities of all relevant role players in cooperative education need to be documented and approved (compare 6.4.4); and
- Quality management in cooperative education needs to be ensured in HEIs (compare 6.5; Figure 6.3).

7.4 RECOMMENDATIONS

Based on the findings as reflected in this study, a number of recommendations may be made:

Recommendation 1

- The purpose and role of cooperative education in higher education institutions need to be clarified and standardised (compare 2.6; 6.7.3).

Recommendation 2

- The principles and practices of experiential learning need to be clarified and standardised in higher education institutions (compare 6.7.7; 2.8).

Recommendation 3

- The role of learnerships and its value in cooperative education in higher education institutions need to be investigated (compare 3.7.4; 6.7.7).

Recommendation 4

- National guidelines must be developed for HEIs on how to develop, implement and manage service learning in cooperative education (compare 3.8; 6.7.9).

Recommendation 5

- Cooperative education needs to be an academic activity and cooperative education staff must report to the academic head of HEIs (compare 3.2; 6.4; 6.7.5).

Recommendation 6

- An integrated model/structure must be used to manage cooperative education within higher education institutions (compare 3.2.3; Figure 6.2; 6.4.1).

Recommendation 7

- Quality assurance principles for cooperative education which include experiential learning and service learning be applied in higher education institutions (compare 3.17; 6.5; 6.7.16).

Recommendation 8

- Policies, strategies, procedures and guidelines need to be developed, approved and implemented for cooperative education in HEIs (compare 3.3; 6.7.5).

Recommendation 9

- Cooperative education needs to be coordinated and communicated within higher education institutions (compare 3.2; 3.4; 6.7.5; 3.14.1).

Recommendation 10

- Adequate resources be provided by HEIs for cooperative education to ensure achievement of required outcomes (compare 3.10; 6.7.5; 6.7.10).

Recommendation 11

- In support of cooperative education Management Information System (MIS) in HEIs must be researched and standardised nationally (compare 6.7.6; 6.7.7).

Recommendation 12

- Higher education institutions should endeavour to become more engaged with industry to support students and companies during experiential learning, through partnership arrangements (compare 3.12; 6.7.12).

Recommendation 13

- The functions, roles and responsibilities and guidelines of all relevant stakeholders must be clarified and documented in HEIs (compare 3.2; 6.7.5).

Recommendation 14

- Students should be well prepared for experiential learning and the workplace by HEIs, prior to experiential learning placement (compare 2.8; 6.7.7).

Recommendation 16

- Cooperative education must be used to expose academic staff to industry (compare 3.11; 6.7.11).

Recommendation 17

- Internationalisation of students in cooperative education must be promoted and supported in HEIs (compare 3.13; 6.7.13).

Recommendation 18

- More research needs to be done in cooperative education in HEIs, and more specifically on program level (compare 2.10; 6.7.4)

Recommendation 19

- Service learning be offered in learning programmes in HEIs, by using an integrated curriculum approach (compare 3.8.2; 6.7.7).

Recommendation 20

- Cooperative education needs to be reconceptualised in HEIs in South Africa (compare 2.5; 6.7.1).

Recommendation 21

- The principles and practices of cooperative education must be extended towards traditional universities in South Africa (compare 6.7.2; 7.5).

Recommendation 22

- Cooperative education activities must be regularly reported on within HEIs (compare 3.2; 6.7.5; 6.7.6).

Recommendation 23

- All students approved and admitted to do experiential learning, such as work-integrated learning and service learning, must be well prepared for experiential learning and the workplace prior to experiential learning (compare 2.8; 6.7.7).

Recommendation 24

- Advisory committees must be used to make provision for inputs and feedback from industry and the local community regarding experiential learning (work-integrated learning and service learning) (compare 3.12; 6.7.12).

Recommendation 25

- Cooperative education must be promoted both internally and externally to HEIs (compare 3.14; 6.7.14).

Recommendation 26

- Alternative methods of student monitoring during experiential learning must be investigated and used, such as Interactive Instructional Television (IITV)(compare 3.16; 6.7.15).

Recommendation 27

- Access must be provided for students on campuses of HEIs for graduate placement, for employment (compare 6.7.17).

Recommendation 28

- Placement of students should not only be the responsibility of the student, as was claimed in the past years in HEIs, but must also be the responsibility of academics to ensure improved throughput rates in HEIs in South Africa (compare 2.8; 3.2; 6.7.7)

Recommendation 29

- A qualitative study can be conducted on the concept and meaning of cooperative education (compare 2.5 and Appendix B, section C, questions 1 to 7).

7.5 RECOMMENDATIONS FOR FURTHER RESEARCH

According to the findings in this study, the following recommendations are suggested for further research:

- The liability implications related to e.g. safety of students etc during experiential learning at the workplace (compare Figure 6.4);
- The application of telematic education (IITV) in cooperative education (compare 3.16; 6.7.15);
- Development of a workable and standardised MIS in cooperative education in HEIs in South Africa (compare 3.4; 6.7.6);
- Reconceptualisation of cooperative education and clarification of terminology in HEIs (compare 2.5);
- The value and application of learnerships in cooperative education in HEIs (compare 2.8; 3.7.4);
- Management and implementation of service learning in HEIs (compare 3.8.2; 6.7.7; 6.7.9.
- How cooperative education may be extended towards traditional universities (compare 7.4); and
- Research in cooperative education in relation to the disciplines of mechanical engineering, nursing and accounting (compare 1.3; 5.1; Table 1.1) .

7.6 FINAL REMARKS

Cooperative education as a partnership model in HEIs in South Africa and abroad has been proved to make a significant contribution to enhance learning as a teaching and learning methodology. In the cooperative education venture, the relevant stakeholders involved, namely companies in industry and HEIs, can make a significant contribution by fulfilling their role to provide in scarce and high skilled human resources for the country, by creating opportunities for students in cooperative education in industry and in HEIs to advance not only cooperative education opportunities but for students to become employed.

This study has made it clear that there is a strong agreement among all role players on the benefits of cooperative education for all stakeholders, especially the industrial partner and the student, as the recipient in this endeavour. Many who have been involved in cooperative education, locally and abroad, report on its value and the contribution it has made in the many years since its origin.

This study confirms the benefits of cooperative education for the higher education sectors and industry on the principles and practices of cooperative education and its value in the private, public and the community sectors. However, this study also has shown that much improvement needs to be done in terms of cooperative education in the higher education sector.

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APPENDIX A

YUNIBESITI YA BOKONE-BOPHIRIMA
NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT

Dear Sir/Madam,

I am aware that you are a very busy person and that you are working under much pressure, but your inputs with regard to the following issues regarding higher education are of vital importance.

There is a need to investigate the issue of cooperative education/ experiential learning/ work-integrated learning (WIL)/ workplace experience/ internships/ work-based learning (or whatever term may be used) in higher education, and its relationship towards commerce and industry, in which the learner is the most important role player.

I am currently a registered PhD student at the North-West University (Potchefstroom campus) working on a thesis with the title: **Guidelines for the implementation of cooperative education in South African teaching and learning organisations in higher education.** This research project is firstly aimed at investigating the problems and practices related to cooperative education in the relationship between the company, learner and the higher education institution (HEIs), after which guidelines will be developed for the implementation of cooperative education in higher education institutions in South Africa.

HEIs in this study include universities, comprehensive universities and universities of technology. Relevant companies and students are also involved. A multidisciplinary approach will be used to investigate disciplines in this relationship, such as engineering, health sciences and commerce.

I would appreciate it if you could take 20 minutes to complete the attached questionnaireand return it **before 31 October 2005.** Your anonymity is guaranteed.

I rely on your high level of integrity and I express my appreciation for your contribution in this regard. Should you be interested, I would gladly present you with the findings of this research,

since I believe this is a critical issue in the higher education sector as well as in commerce and industry. Kindly contact me at the number below.

Kind regards

Marius Wessels

(Director: Cooperative Education, Tshwane University of Technology, Garankuwa Campus)

Tel 082 5634 906

wesselsml@tut.ac.za

APPENDIX B

QUESTIONNAIRE

Please do not provide your name, since this information is only used for research purposes. All information will be handled with strict confidence.

SECTION A:
BIOGRAPHICAL INFORMATION

Please answer the following questions by encircling the applicable number and complete where "please specify" is indicated.

1. Age

Younger than 30 years	1
31 to 35 years	2
36 to 40 years	3
41 to 45 years	4
46 years and older	5

2. Gender

Male	1
Female	2

3. Your highest qualification

Matric and completed first year of undergraduate qualification	1
Matric and completed second year of undergraduate qualification	2
Degree or National Diploma	3
Honours degree or equivalent – please specify	4
Master's degree – please specify	5
Doctoral degree – please specify	6
Other qualifications – please specify	7

4. What position do you hold in your present job or position? (Select only one.)

Student	1
Supervisor (Mentor)	2
Human Resource Manager	3
Training Manager	4
Dean	5
Head of Department	6
Other – please specify	7

5. Total years of work experience in your present job, as mentioned in number 4

0 to 3 years	1
4 to 9 years	2
10 or more years	3

SECTION B:

DEMOGRAPHIC INFORMATION

Please answer the following questions by encircling the applicable number and complete where "please specify" is indicated.

Note: Answer either question 1 or 2.

1. With which of the following companies/organisations/hospitals are you employed?

ESKOM	1
Nissan South Africa	2
Private hospital – please specify	3
Government hospital – please specify	4
Accounting company – please specify	5
Other – please specify	6

OR

2. With which of the following higher education institutions (HEIs) are you employed?

University of Pretoria	1
University of the Witwatersrand	2
University of Johannesburg	3
UNISA	4
Tshwane University of Technology	5
Vaal University of Technology	6
Other – please specify	7

Note: **Questions 3, 4 and 5 should only be completed by students who completed their experiential learning.**

3. With which higher education institution have you been registered for experiential learning ?

University of Pretoria	1
University of the Witwatersrand	2
University of Johannesburg	3
UNISA	4
Tshwane University of Technology	5
Vaal University of Technology	6

4. Duration of your experiential learning

Less than 3 months	1
6 months	2
1 year	3
More than 1 year	4
Other – please specify	5

5. How did you receive your experiential learning?

Work-based	1
Simulated training	2
Other – please specify	3

6. In which city are you employed/placed? (**All respondents** must please answer this question)

Pretoria (Tshwane)	1
Johannesburg	2

Florida	3
Vanderbijlpark	4
Other, please specify	5

7. Which of the following best represents your organisation's sector? (**All respondents** must please answer this question)

Engineering, professional, scientific and technical service	1
Healthcare and social asistance	2
Commerce	3
University	4
Comprehensive university	5
University of technology	6

Note: Answer either question 8 or 9.

Students should not answer either of these questions. Question 8 and 9 should only be answered by employees of higher education institutions, companies/organisations and hospitals.

8. Current number of students in the specific discipline mentioned in number 7, busy with experiential learning in the company/organisations/hospital

None	1
1-30	2
31-60	3
61-100	4
101-250	5
251-500	6
501-1000	7

Over 1000	8

OR

9. Current number of students in the specific discipline mentioned in number 7, busy with experiential learning in the academic department:

None	1
1-30	2
31-60	3
61-100	4
101-250	5
251-500	6
501-1000	7
Over 1000	8

SECTION C:

BASIC PRINCIPLES AND NATURE OF COOPERATIVE EDUCATION

Listed below are a number of statements about **cooperative education**. Please indicate to which extent you agree or disagree with each statement by using the following scale 1 = strongly agree; 2 = agree; 3 = disagree; 4 = strongly disagree. Mark the appropriate block with a tick (√).

CONCEPT CLARIFICATION

> **Cooperative education** is the umbrella concept used to describe the cooperation between the university, industry, commerce and the public sector, to enhance learning. It comprises a number of components, namely, various forms of experiential learning such as work-based/work-integrated learning, and learnerships, service learning, as well as the various forms of liaison with the industry, such as partnerships, advisory committees, and exchange of knowledge and technology through guest lectures by the industry for the university or by the university for the industry. It also includes partnerships for the research, development and dissemination of new technologies and their applications. Cooperative education is therefore an integral aspect of curriculum development and implementation, and informs the teaching and learning strategy of the University.

Company:	used synonymously with commerce, industry and companies/organisations.
Higher education institutions:	refer to universities, comprehensive universities and universities of technology in South Africa.
Universities:	refer to traditional universities in South Africa.
Comprehensive universities:	refer to the merger between technikons and traditional universities in South Africa
Universities of technology:	refer to former technikons in South Africa.

		1 Strongly agree	2 Agree	3 Disagree	4 Strongly disagree
1	The concept ***cooperative education*** is well known.				
2	The concept *cooperative education* is commonly used in universities.				
3	The concept *cooperative education* is commonly used in comprehensive universities				
4	The concept *cooperative education* is commonly used in universities of technology				
5	The term *experiential learning* is commonly used in universities.				
6	The term *experiential learning* is commonly used in comprehensive universities.				
7	The term *experiential learning* is commonly used in universities of technology.				
8	Cooperative education is practiced in universities.				
9	Cooperative education is practiced in comprehensive universities.				
10	Cooperative education is practiced in universities of technology.				
11	Cooperative education is a teaching and learning strategy.				
12	Cooperative education is beneficial to companies.				
13	Cooperative education is beneficial to higher education institutions.				
14	Cooperative education is beneficial to students.				
15	Universities give support to companies during the experiential learning of students.				

16	Comprehensive universities give support to companies during the experiential learning of students.				
17	Universities of technology give support to companies during the experiential learning of students.				
18	Cooperative education could be improved in terms of experiential learning.				
19	Cooperative education could be improved in terms of liaison with companies.				
20	The study material of students for experiential learning must have a clear set of measurable outcomes.				
21	Students are supported by lecturers from universities during experiential learning at the workplace.				
22	Students are supported by lecturers from comprehensive universities during experiential learning at the workplace.				
23	Students are supported by lecturers from universities of technology during experiential learning at the workplace.				
24	The core feature of experiential learning is the integration of work experience and classroom learning.				
25	Cooperative education's main aim is to educate students.				

SECTION D:

BEST PRACTICES IN COOPERATIVE EDUCATION

Listed below are a number of some examples of best practices in cooperative education used in higher ducation institutions (HEIs) and in companies/organisations in South Africa. Please indicate to which extent you agree or disagree with each statement by using the following scale: 1 = strongly agree; 2 = agree; 3 = disagree; 4 = strongly disagree. Mark the appropriate block with a tick (√).

CONCEPT CLARIFICATION

Advisory committee A forum consisting of representatives from commerce and industry, academics and students to advise academics on matters related to the academic programme.

		1 Strongly agree	2 Agree	3 Disagree	4 Strongly disagree
1	Cooperative education should be properly planned and executed within higher education institutions.				
2	Guidelines for students should be included in the study material for experiential learning.				
3	Guidelines for supervisors should be included in the study material for experiential learning.				
4	A management information system (MIS) should be used for the management and administration of cooperative education in higher education institutions.				
5	Students should be prepared for the experiential learning process and the workplace prior to placement for experiential learning.				
6	Cooperative education is only about placement of students for experiential learning.				
7	Students must be visited at the workplace by lecturers to monitor the progress of students during experiential learning.				
8	A supervisor should be assigned by the company to supervise and coach students during experiential learning.				
9	Lecturers must assess competencies of students during experiential learning.				
10	Students must give account of their experiential learning to companies and lecturers after the experiential learning period.				

11	Students can also receive simulated experiential learning, e.g. on the campus of a higher education institution.				
12	An advisory committee could be used as a forum by higher education institutions to provide for companies' inputs regarding academic programmes.				
13	Learnerships are beneficial to students and companies.				
14	Universities should be involved in community service learning.				
15	Comprehensive universities should be involved in community service learning.				
16	Universities of technology should be involved in community service learning.				
17	Lecturers from universities should encourage students towards and support them during experiential learning.				
18	Lecturers from comprehensive universities should encourage students towards and support them during experiential learning.				
19	Lecturers from universities of technology should encourage students towards and support them during experiential learning.				
20	Experiential learning in higher education institutions should be financed by the Department of Education.				
21	Experiential learning in higher education institutions should be financed by the National Skills Fund.				
22	Lecturers should be regularly exposed to the work environment/industry to stay abreast of developments.				

23	Company inputs are crucial for the long-term sustainability of academic programmes in higher education institutions.				
24	Students should have access to an office for graduate placement (post-graduate qualification) on campuses of higher education institutions.				
25	Companies and higher education institutions should collectively engage in partnerships, research, teaching and learning and community development				
26	Students should also be placed internationally for experiential learning.				
27	Universities should promote cooperative education to commerce and industry.				
28	Comprehensive universities should promote cooperative education to commerce and industry.				
29	Universities of technology should promote cooperative education to commerce and industry.				
30	Interactive instructional television (IITV) can be used to monitor the progress of students during experiential learning.				
31	A quality management system should ensure the quality of cooperative education practices in higher education institutions.				
32	Students should only be placed with companies for experiential learning.				
33	Universities should only offer programmes that meet the requirements of industry.				
34	Comprehensive universities should only offer programmes that meet the requirements of industry.				
35	Universities of technology should only offer programmes that meet the requirements of industry.				

36	Students must be remunerated by companies during experiential learning.				
37	Human resource capacity should be provided in higher education institutions for the proper functioning of cooperative education.				

Thank you very much for your time.

APPENDIX C

ALLOCATION OF THE ROLE AND RESPONSIBILITIES OF COOPERATIVE EDUCATION AND ACADEMIC STAFF

KEY PERFORMANCE AREAS AND DUTIES OF COOPERATIVE EDUCATION AND ACADEMIC STAFF	ACADEMIC STAFF	COOPERATIVE EDUCATION STAFF
Admission requirements for work-integrated learning		
Compile a curriculum for work-integrated learning - *Cooperative Education Coordinator to submit inputs to CEL*		
Ensure quality criteria and experience for student preparation and placement		
Student Preparation – Work Preparedness		
Negotiate and identify placement opportunities (% ratio)		
Ensure quality placement opportunities (Approval of workstations)		
Monitoring (visiting students at workstations), minimum: once per semester		
Mentoring of students (employers: workstation)		
Assessment/evaluations of students		
Debriefing/Feedback: students/industry (employers)		
Examination Department (results)		
Advisory committee, minimum: once per annum		
Engage in career and personal counselling		
Promote cooperative education and manage administration		
Industry liaison		
Partnership/contracts		
Registration		
Generic policies and specific policies (guidelines for students: EL guides/logbooks/workbooks)		

National and international networks – exchange/placement od students		
Student's records		
Administration: Cooperative Education Annual Report		
Processing of EL guides/logbooks (issue and receipt)		
Learnership involvement		
Service learning involvement		

DUTIES OF COOPERATIVE EDUCATION STAFF IN SUPPORT OF THE STUDENT'S LEARNING EXPERIENCE

1. Preparation of students for work-integrated learning
    - Preparing a curriculum vitae / portfolio and applying for placements
    - Briefing students on work ethics and interview skills
    - Briefing students on what is expected of them during work-integrated learning
2. Placement of students for work-integrated learning
    - Conducting personal interviews with students, understanding their expectations and referring them on an individual basis to companies with suitable training positions
3. Monitoring (Visits)

- Visiting students at companies to monitor their progress and to give guidance and assistance
- Developing documentation and other promotional materials

4.Assessment

- The formative, summative, continuous / frequent assessment of the students' progress and the evaluation of projects, assignments and oral presentations
- Recording and communicating inputs that companies want to make towards syllabus outcomes (curriculum development) to ensure relevance and a competitive edge

5. Debriefing (Students)

- Conduct group session to facilitate reflection on work-integrated learning
- Identifying experienced people from industry (e.g. mentors, middle and senior management) and inviting them to serve on the Advisory Committee
- Establishing student records for counselling and placement purposes

6. Others

- Research and development, partnerships / contracts, skills development, marketing and etc.

Academic Staff Member / HOD	Date
Faculty Cooperative Education Coordinator	Department
Faculty: Dean	
Cooperative Education: Director	Date