

An economic impact assessment of the closure of Vista University, Sebokeng Campus

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ABSTRACT

The former Minister of Education, Prof Kader Asmal, stated in his report; "Transformation and Restructuring: A new institutional landscape for Higher Education" in 2001, that it is his intention to close Vista University, Sebokeng Campus and to incorporate the students and staff of Vista University, Sebokeng Campus, into the merged Potchefstroom University for CHE and University of North West. In this regard the North-West University was established on 1 January 2004 in terms of the Higher Education Act (Act 107 of 1997 as amended). In the National Plan on Higher Education and White Paper on Higher Education, specific goals related to this incorporation of Vista University, Sebokeng Campus, students and staff were set. This includes that the problem of geographical location of institutions based on ideological and political considerations must be addressed, the poor pattern of race and gender presentation must be addressed, the student and staff equity profile must be addressed, race, gender and social class distribution and access of students from previously disadvantaged communities, must be promoted. To determine if these goals will be met and to determine the economic impact of this decision to close Vista University, Sebokeng Campus, and to incorporate students and staff into the North-West University, Vaal Triangle, an economic impact assessment is done. The methodology used to do this economic impact assessment, includes a cost benefit analysis where the results are documented in a planned balance sheet. These results are analysed against the theoretical background of welfare economics, consumer surplus, producer surplus and externalities.

The conclusion reached in this study is that students and staff will experience a welfare loss i.t.o. higher travelling costs, higher tuition fees, extra travel time and if not compensated i.t.o. free transport, it will not lead to a pareto improvement. The same conclusion is reached i.t.o. North-West University, where a net welfare loss is expected after the incorporation of the students and staff of Vista University, Sebokeng Campus. If the NWU is not compensated by Government, it will affect the financial viability of North-West University. In the case of no compensation it can be expected that a pareto improvement will not be reached.

It is concluded that if the winners (Government) of this incorporation of the staff and students of Vista University, Sebokeng Campus into North-West University, Vaal Triangle Campus are prepared to compensate the losers (students and staff of Vista University, Sebokeng Campus and North-West University, Vaal Triangle Campus) according to Kaldor-Hicks, a welfare improvement can still take place.

OPSOMMING

Die vorige Minister van Onderwys, prof. Kader Asmal, het in 2001 in 'n verslag getiteld "Transformation and Restructuring: A new institutional landscape for Higher Education" aangetoon dat dit beoog word om studente en personeel van Vista Universiteit, Sebokeng Kampus, te inkorporeer in die saamgesmelte Potchefstroom Universiteit vir Christelike Hoër Onderwys en die Universiteit van Noordwes. In dié opsig het die Noordwes-Universiteit op 1 Januarie 2001, ingevolge die Hoër Onderwyswet (Wet nr. 107 van 1997 soos gewysig), tot stand gekom. In die Nasionale Plan op Hoër Onderwys en die Witskrif t.o.v. Hoër Onderwys, word spesifieke doelstellings gestel. Hierdie doelstellings sluit in dat die geografiese ligging van instellings gebaseer op ideologiese en politieke oorwegings moet verander, die ongelyke samestelling van ras en geslag aangespreek moet word, die student en personeel gelykheid en profiel moet verander en dat geslag- en sosiale klas-verspreiding t.o.v. voorheen benadeelde groepe moet verander. Om te bepaal of hierdie doelwitte bereik kan word, is 'n ekonomiese impakstudie uitgevoer. Die metodologie wat gevolg is, is 'n koste-voordeelanalise waar die bevindings gedokumenteer is in 'n beplanningsbalansstaat. Hierdie bevindings is geanaliseer teen die teoretiese agtergrond van welvaartseconomie, verbruikersurplus, produsente surplus en eksternaliteite.

Die slotsom waartoe gekom is, is dat personeel en studente van Vista, Universiteit Sebokeng kampus, benadeel sal word i.t.v. hoër vervoerkoste, hoër klasgeld en addisionele vervoertyd. Indien hierdie studente nie vergoed kan word i.t.v. gratis vervoer nie, sal 'n pareto verbetering nie plaasvind nie. 'n Welvaartsverlies word in hierdie verband verwag.

Met betrekking tot die Noordwes-Universiteit, Vaaldriehoekskampus, sal die finansiële lewensvatbaarheid negatief beïnvloed word, indien die regering nie bereid sal wees om die Noordwes-Universiteit te vergoed d.m.v. verhoogde subsidie nie.

Die gevolgtrekking is dus dat as die wenners (regering) bereid is om die verloorders (studente en personeel van Vista en Noordwes-Universiteit) te vergoed, 'n welvaartsverbetering steeds haalbaar sal wees, volgens Kaldor-Hicks.

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LIST OF ABBREVIATIONS

BCR	:	Benefit Cost Ratio
CBA	:	Cost Benefit Analysis
CEA	:	Cost Effectiveness Analysis
CHE	:	Council on Higher Education
CS	:	Consumer Surplus
CV	:	Compensated Variation
CVM	:	Contingent Valuation Method
DBSA	:	Development Bank of Southern Africa
DOE	:	Department of Education
EIA	:	Economic Impact Assessment
ELM	:	Emfuleni Local Municipality
EV	:	Equivalent Variation
FTE	:	Full Time Equivalent
HP	:	Hedonic Pricing
MCA	:	Multi Criteria Analysis
NPHE	:	National Plan on Higher Education
NPV	:	Net Present Value
MRTS	:	Marginal Rate of Technical Substitution
NWU	:	North-West University
NWUVTC	:	North-West University, Vaal Triangle Campus
PBS	:	Planned Balance Sheet
PS	:	Producer Surplus

PU FOR CHE	:	Potchefstroom University for Christian Higher Education
PV	:	Present Value
RBA	:	Risk Benefit Analysis
RP	:	Revealed Preferences
SAUVCA	:	South African Universities Vice Chancellors Association
SP	:	Stated Preference
SET	:	Science, Engineering and Technology
SW	:	Social Welfare
TCM	:	Travel cost method
VT	:	Vaal Triangle
VUSC	:	Vista University, Sebokeng Campus
WTA	:	Willingness to accept
WTP	:	Willingness to pay

CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

The first attempts at measuring the advantages and disadvantages in terms of society's net gain of projects, can be traced back to 1844 in the publication of Dupuit: "On the management of the utility of public works" (*in* Mullins, 2002:1). In his work, Dupuit focuses on the net social impact of a project involving persons who are not direct beneficiaries of this project, but who may obtain some form of spillover benefits or costs from such a project.

Today, project evaluation in the private sector requires that a comparison be made between expected costs and benefits over the estimated time-span of a new project. If the project yields a positive net benefit, it can be said to be feasible and potentially acceptable.

The same can be said of public projects, with the exception, that government must also try to maximise the difference between total social benefits and total social costs. This implies, that government must try to avoid negative effects on third parties (society) when passing new laws, building roads, closing universities, etc. This is standard practise in the USA and Norway (Nas, 1996:4).

The closure of Vista University, Sebokeng Campus (VUSC) and the incorporation of students and staff from VUSC into the new merged university as proposed by the former Minister of Education, Prof. Kader Asmal, in the report "Transformation and restructuring; a new landscape for Higher Education" of the Department of Education (DOE, 2001a:7), is no exception. It is, therefore, important to determine the cost and benefits to the university as well as the social costs and benefits to society (e.g., students and staff).

This decision of government to close the VUSC, was taken with political and financial goals in mind, according to the Council on Higher Education (CHE, 2002:51). "The current landscape and institutional configuration of higher education has its roots in an

“apartheid” past, and is inadequate to meet socio-economic needs and this is no longer sustainable. South Africa does not have the human and financial resources to maintain the present institutional configuration” (CHE, 2002:51).

Besides this and the ‘problems’ of sustainability and inadequate institutional configuration, a new pattern of student enrolments have also taken place since 1994, with the outcome that some institutions are at risk in terms of student numbers and that some institutions no longer satisfy the specification to continue as independent institutions (CHE, 2002:51).

Although the financial implications of the entire institutional configuration were taken into account, the question arises as to whether individual costs and benefits of affected universities (in this case the North-West University, Vaal Triangle Campus (NWUVT)) were taken into account and whether social costs and benefits of affected students and staff from the VUSC were taken into account.

1.2 RESEARCH PROBLEM

The research will determine whether or not the incorporation will benefit the existing NWUVT as well as the students and staff of VUSC. This will be done against the background of the goals and plans of the Council for Higher Education, White Paper 3, and the decisions of the former Minister of Education, Prof. Kader Asmal, regarding the incorporation of the Vista University, Sebokeng Campus (VUSC) into the new merged North-West University (former Potchefstroom University for Christian Higher Education). The specific goals and plans that will be looked at, include the following.

- Attention to the pressing local, regional and national needs of the South African society (CHE, 2002:13). Would the new merged university be able to address local needs?
- To redress the problem of geographical location of institutions earlier based on ideological and political considerations (CHE, 2002:16). Vista University (Sebokeng Campus) opened its doors in 1982 to address the needs of South Africa’s African

population (SAUVCA, 2003:1). Will this new merged university be able to address the needs of the Vaal Triangle's African population?

- To redress the problem of poor patterns of race and gender presentation of academic and administrative staff (CHE, 2002:16). Will the new university be able to redress the problem of poor patterns of race and gender presentation?
- The decline in student enrolments within the public Higher Education sector (CHE, 2002:16). To what extent will the new merged institution be able to attract students from the previously disadvantaged communities?
- The possible crippling effects on the ability of several institutions to continue to fund their activities, because of the relationship between enrolments and funding (CHE, 2002:17). Will the new merged institution be financially viable?
- To ensure equity in the new institution, i.e. to increase the race, gender and social class distribution of students in various fields and levels of study and to improve the racial and gender representativity of staff and to ensure financial access for poor students (CHE, 2002:23). To what extent will the racial and gender composition of North-West University change after incorporation?
- Promoting access and equity through improvements in quality and efficiency or, at least, do not make access and equity more difficult to achieve (CHE, 2002:52). Will the new merged university be accessible for students from previously disadvantaged communities?
- Improving the student and staff equity profile (CHE, 2002:52). To what extent will student and staff equity be addressed?
- Enabling more rational and efficient use of buildings, facilities and human resources (CHE, 2000:52). To what extent will the incorporation enable the efficient use of buildings, facilities and human resources and if not, what will the cost/financial implications be?

It is also necessary to examine the following outcomes of the National Plan for Higher Education (NPHE) of the Department of Education (DOE).

- Outcome 7: Increased equity in access and success rates

This means, that the participation rate of African and Coloured students must increase (DOE, 2001b:82). Will the new NWUVTC be able to increase the participation rate of African and Coloured students?

- Outcome 16: New institutional and organizational forms

The National Plan for Higher Education emphasises that economies of scale through reduction in costs, must be reached by new institutions (DOE, 2001b:82). Will the new merged university be able to reach economies of scale?

To assess whether the above-mentioned goals or outcomes could be reached, it is necessary to determine the economic impact of the closure of VUSC on the students, staff and NWUVTC in terms of access, cost, etc.

A detailed economic impact assessment will thus be done, in which the costs and benefits of the institution, as well as social costs and benefits of students and staff, will be examined.

1.3 OBJECTIVES OF THE STUDY

The objective of the study is to assess the economic impact of the closure of Vista University, Sebokeng Campus. This will include the objective to determine the welfare impact of the incorporation of Vista University, the Sebokeng Campus (VUSC), into the North-West University, Vaal Triangle Campus (NWUVTC) i.r.o. –

- students of the former VUSC;
- staff of the former VUSC; and
- NWUVTC.

This will be done to provide possible answers to the questions stated in the research problem.

1.4 HYPOTHESIS

It is expected that the closure of VUSC and the incorporation into NWUVTC will have a:

- negative financial impact on the new university and, if not subsidized by government, will have a negative effect on the viability and sustainability of the NWUVTC. This means, that this decision will have a negative welfare impact on the institution.
- negative impact on the students from traditionally disadvantaged areas, as it will increase the social cost to students from traditionally disadvantaged areas. This implicates, that if they could not be transported from Sebokeng to NWUVTC free of charge, they would be worse off than before the incorporation.

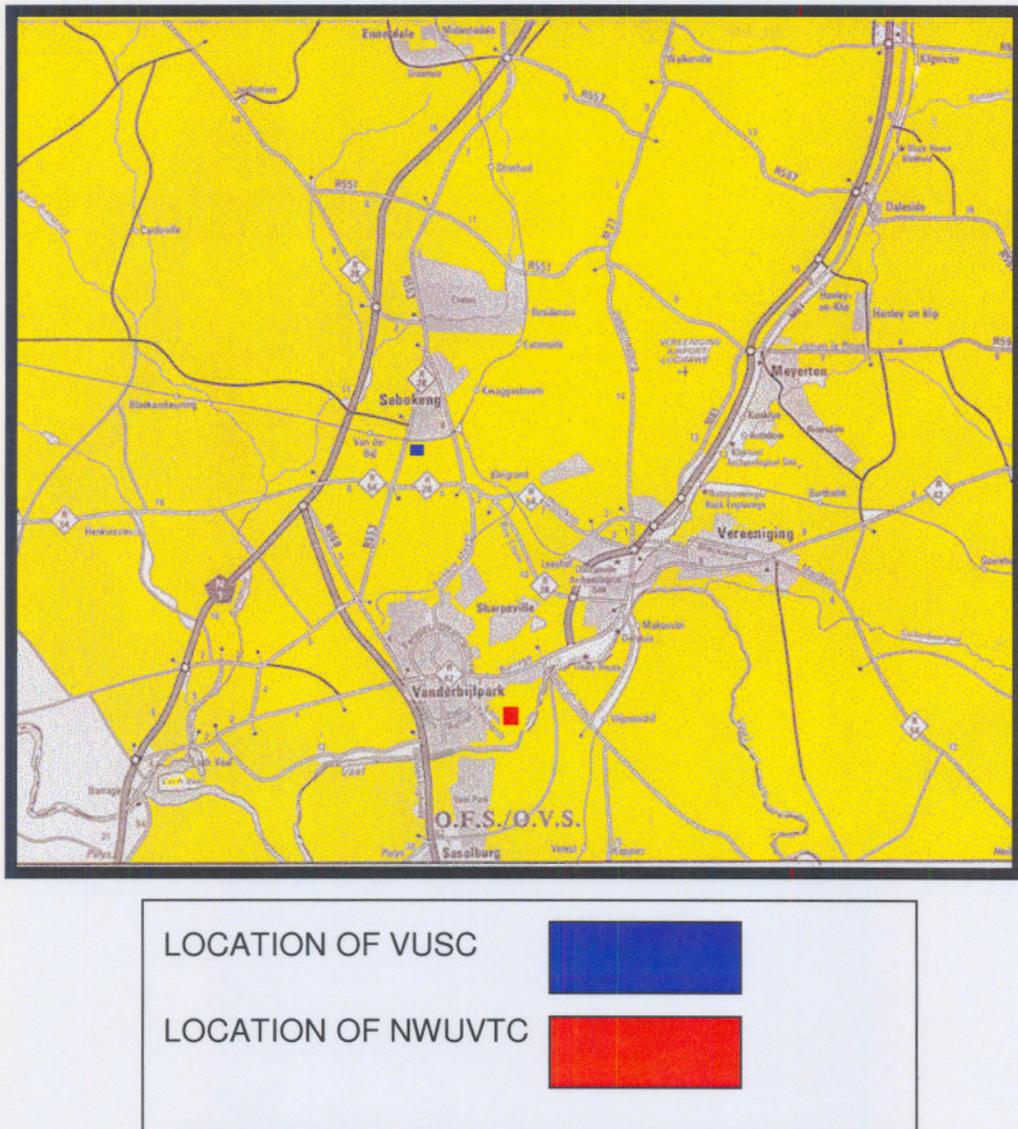
1.5 STUDY AREA

Vista University, the Sebokeng Campus (VUSC), is situated in Emfuleni municipal area in Southern Gauteng and more specifically in Sebokeng township, Zone 10. The university is accessible to students from nearby townships by foot, bicycle and taxi. In 2002 a total of 597 students of which 595 were African students were enrolled at the VUSC. This is in sharp contrast to a total of 1 194 students who were enrolled in 1999. As at October 2002, a total of 43 staff members were employed by VUSC of which 26 were support staff and 17 academic staff (North-West University, 2003:7).

The study will determine the socio-economic impact on the 597 student and 43 staff members of the former VUSC in terms of the social cost and benefits on students and staff. These potential social costs for students can include extra accommodation costs, higher study fees, extra travelling costs, and extra time to travel to NWUVTC, while possible benefits can be that a qualification at NWUVTC is viewed as constituting a higher quality. The assumption made here, is that future students from the same areas will possibly be affected in a similar way as present students.

North-West University, the Vaal Triangle Campus (NWUVTC), is also situated in Emfuleni municipal area, more specifically in Vanderbijlpark, approximately 30 kilometres from the VUSC (see Map 1). In 2002, a total of 1 610 students of which 574 students were African students and 951 white students, were enrolled at the NWUVTC (North-West University, 2003:38).

Map 1 Location of VUSC and NWUVTC in the Vaal Triangle



Source: ELM, 2001

A total of 95 staff members, of which 44 are support staff and 51 academic staff (North-West University, 2003:7) are employed by the NWUVTTC. It is not the purpose of the study to examine the effect of the incorporation on students and staff of NWUVTTC, but the extra financial burden of the NWUVTTC as a result of the incorporation will be examined.

1.6 RESEARCH METHODOLOGY

Firstly, a literature study of the theoretical aspects of an economic impact assessment (EIA) and the methods that could be used to analyse the economic impacts of the decision to close down the VUSC and the incorporation of the students and staff into the NWUVTTC, will be done.

Secondly, an analysis of the financial implications of this decision on the NWUVTTC will be done. The costs and benefits will be documented in a planned balance sheet by using financial information obtained from the Vaal Triangle Campus of North-West University.

Thirdly, an analysis will be done of the social costs and benefits of the closure of the VUSC and the incorporation of the students and staff into the NWUVTTC. A questionnaire will be used to determine the social costs and benefits (extra accommodation costs, extra travelling costs, extra travelling time and extra value of the qualification as viewed by students). This part of the study will rely on data gathered in October 2001 by means of a questionnaire completed by students and a questionnaire completed by staff of VUSC, and data gathered in October 2003 by way of a questionnaire completed by students of VUSC.

1.7 OUTLINE OF THE STUDY

In **chapter 1** the research problem, the objectives of the study, hypothesis, study area and the research methodology are outlined.

In **chapter 2** an overview of the universities in the Vaal Triangle is given. Student and staff numbers, admission requirements and fees payable are also examined in this chapter.

In **chapter 3** a thorough examination is made of the goals and plans of the Council on Higher Education (CHE) and the former Minister of Education, Prof. Kader Asmal.

In **chapter 4** an overview of the micro-economic bases of welfare economics, externalities and consumer surplus is given.

In **chapter 5** the theory of economic impact assessment (EIA) and cost benefit analysis (CBA) are given. The recording methodology will then be done (according to a planned balance sheet).

In **chapter 6** an examination of the financial implications of the incorporation process is done by identifying cost of and benefits. This chapter relies on the questionnaires in order to determine the social cost of and benefits on students and staff. Finally, all private and social costs are documented in a planned balance sheet. This is done to prove the hypothesis stated in Chapter 1.

In **chapter 7** a conclusion is drawn to summarise all possible costs and benefits. Proposals are made to reduce the negative financial impact on the NWUVTTC, as well as the negative impact on students and staff. This impact is then interpreted against the theoretical background of pareto optimality or potential pareto optimality (in the sense that losses must be compensated to reach a welfare improvement).

CHAPTER 2 BACKGROUND OF THE UNIVERSITIES IN THE VAAL TRIANGLE

2.1 INTRODUCTION

The purpose of this chapter is to give a historical background of the former universities in the Vaal Triangle (VT). Firstly, a demographic description of the Vaal Triangle (VT) is given. Secondly, a discussion on the historical background of Vista University, Sebokeng Campus (VUSC) is given, with an analysis of staff and student numbers, trends in student population, admission requirements and payable fees at VUSC. Thirdly, NWUVTTC is analysed in terms of historical background, staff and student numbers, trends in student population, admission requirements and payable fees.

2.2 BACKGROUND OF THE VAAL TRIANGLE

The Vaal Triangle (VT) is discussed in terms of its demographic profile and a brief description is given of the economy of the Vaal Triangle. This is done because VUSC and NWUVTTC students are primarily from the VT. It also serve as a guideline in setting the questionnaires that were used to gather information for the study in terms of the geographic profile of students and staff at VUSC with regard to where the students and staff of this institution stay.

2.2.1 DEMOGRAPHIC PROFILE OF THE VAAL TRIANGLE

The VUSC and NWUVTTC are both situated in the Vaal Triangle (VT) having a total population of 839 039 in 2001, of which about 81.7% are African (Stats SA, 2003). The Vaal Triangle includes the following municipal areas: Emfuleni and Midvaal municipalities in Southern Gauteng and Metsimaholo municipal area in the Northern Free State (Stats SA, 2003). The Emfuleni municipal area includes the following towns.

- Vanderbijlpark
- Vereeniging

- Evaton
- Sebokeng
- Tshepiso
- Sharpeville
- Bophelong
- Boitumelo
- Boipatong.

The Midvaal municipality includes the following towns.

- Meyerton
- Randvaal.

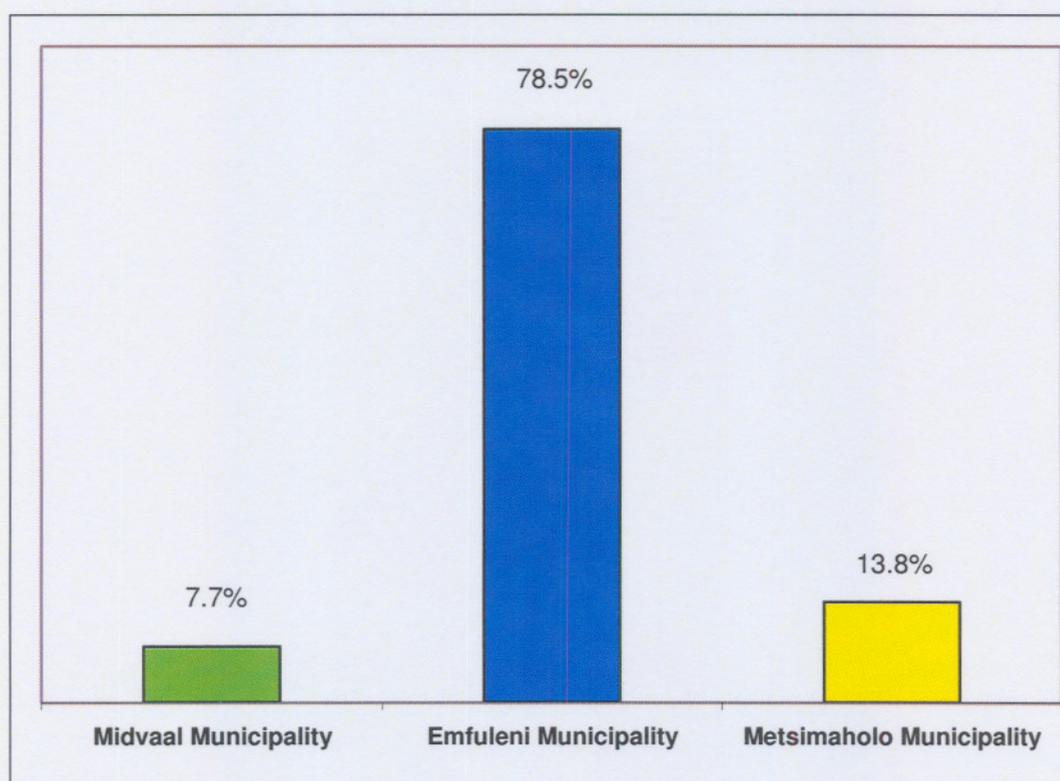
The Metsimaholo municipality area includes the following towns.

- Sasolburg
- Refenkgotso
- Zamdela.

In 2001 the population in these three municipal areas was estimated to be 839 039. The population of Emfuleni municipality was estimated at 658 420 or 78.47% of the total population in the Vaal Triangle, based on census Statistics (Stats SA, 2003). The Midvaal municipality's population was estimated at 64 642 or 7.71% of the total population in the Vaal Triangle (Stats SA, 2003).

The Metsimaholo municipality population is estimated at 115 977 or 13.82% of the total population of the Vaal Triangle. Figure 2.1 presents a comparison of the population of the respective municipal areas.

Figure 2.1 Population of the Vaal Triangle, 2001

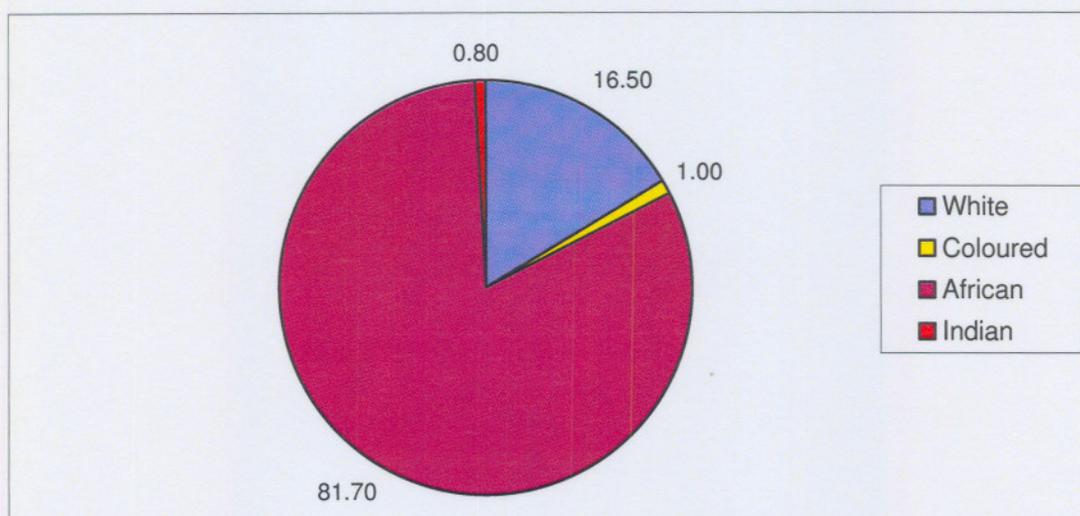


Source: Calculations based on Census data 2001, Stats SA (2003)

2.2.2 RACIAL COMPOSITION

Based on the estimates of Stats SA, 2001 Census data (2003), the African population in the Vaal Triangle is estimated at 685 495 or 81.7% of the total population, whereas the White population was estimated at 138 441 or 16.5% of the total population. The Indian population was estimated at 6 712 or 0.8% and the Coloured population at 8 390 or 1.0% of the population. The total population of the Vaal Triangle (VT) in terms of racial composition is portrayed in Figure 2.2.

Figure 2.2 Racial composition of the Vaal Triangle, 2001



Source: Compiled from Census data 2001 Stats, SA, (2003)

It is evident from Figure 2.2 that 81.70% of the Vaal Triangle population consists of African persons and 16.5% White persons. If the racial composition of the individual municipalities in the VT is analysed, it appears that in the Emfuleni municipality and Metsimaholo municipality, the African population is estimated at 84% and 81.1% respectively of the total population in these municipalities. The total population in the VT in terms of racial composition, is portrayed in Table 2.1.

Table 2.1 Racial composition of population in Vaal Triangle, 2001

	Midvaal Municipality (%)	Emfuleni Municipality (%)	Metsimaholo Municipality (%)
African	59.0	84.0	81.1
Coloured	1.4	1.1	0.5
Indians	0.5	0.9	0.2
White	39.1	14.0	18.3
Total	1000	100.0	100.0

Source: Calculations from Census data 2001 Stats, SA, (2003)

2.2.3 ECONOMIC PROFILE OF THE VAAL TRIANGLE

The economy of the VT depends to a great extent on the manufacturing of metal, fuel, petroleum and rubber products (Slabbert, 2002:46). The manufacturing sector contributes approximately 42.8% in terms of the Gross Geographical Product (GGP) to the total economic activity in the Vaal Triangle, which includes the manufacturing of metal, metal products, as well as machinery, fuel, chemical and petroleum products. The metal and metal products industries are responsible for 80.6% of the manufacturing activities in Emfuleni, while the fuel, petroleum and rubber products are responsible for 89.1% of manufacturing in the Metsimaholo municipality (Slabbert, 2002:46). Economic trends in the Vaal Triangle (VT) include the following.

- A large dependency of the region on the manufacturing sector (ELM, 2001:37).
- An unemployment rate of 51.3% (Slabbert, 2004:v).
- A low monthly individual income level, (74% of persons in the Emfuleni local municipal area earn less than R1 500 per month). (ELM, 2001:37.)

2.3 BACKGROUND OF VISTA UNIVERSITY, SEBOKENG CAMPUS (VUSC)

Vista University, Sebokeng Campus (VUSC) is situated one kilometre outside Sebokeng and is located approximately 30 km from the North-West University, Vaal Triangle (NWUVTC) (see Map 1, Chapter 1).

The VUSC is discussed in terms of its historical background, staff and student numbers, student population trends, admission requirements and payable fees.

2.3.1 HISTORICAL BACKGROUND

The VUSC has its roots in a report on university needs for South Africa's urban black population, which was submitted in 1980 by a commission of inquiry appointed by the government (Vista, 2003a:1). According to Vista University, it provided innovative, relevant, affordable, value-based education and primarily focused on the communities it

served (Vista, 2003a:1). Vista University (before unbundling) was formed by seven contact campuses across South Africa, namely the Port Elizabeth Campus, Bloemfontein Campus, East Rand Campus, Mamelodi Campus, Sebokeng Campus, Soweto Campus, Welkom Campus and the Distance Education campus based in Pretoria (Vista, 2003a:1).

The University started with 300 students in 1982, which grew to 21 451 students in 2002. This growth of the former Vista University is shown in Table 2.2.

Table 2.2 Growth of Vista University, 1982-2002

Year	Staff				Students		
	Academic	Professional and admin	Service workers	Total	Contact tuition	Distance education	Total
1982	14	5	6	25	0	300	300
1983	76	57	93	226	610	2 400	4 010
1984	151	107	71	329	1 485	4 767	6 252
1985	173	126	87	386	3 055	7 082	10 137
1986	214	149	102	465	2 573	11 718	14 291
1987	255	159	106	520	3 752	14 909	18 661
1988	282	176	121	579	4 573	17 164	21 737
1989	315	218	125	658	5 577	18 148	23 725
1990	402	245	168	815	5 789	19 034	24 823
1991	486	266	179	931	6 954	19 946	26 900
1992	519	444	213	1 176	9 731	18 716	28 447
1993	609	538	230	1 377	12 869	20 120	32 989
1994	661	678	207	1 546	15 492	18 387	33 879
1995	695	825	57	1 577	20 025	15 586	35 611
1996	723	828	138	1 689	19 341	12 841	32 182
1997	748	974	202	1 924	18 499	10 153	28 652
1998	848	951	186	1 985	18 092	10 129	28 221
1999	742	753	162	1 657	15 091	10 434	25 525
2000	747	841	155	1 743	12 704	9 751	22 455
2001	496	463	85	1 044	12 429	7 880	20 309
2002	456	450	83	989	14 465	6 986	21 451

Source: Vista (2003b:13)

It is evident from an analysis of Table 2.2 that growth in terms of student numbers has taken place since 1982 to 1995, when the maximum number of 35 611 students were reached. Since 1995 a decline in student numbers has taken place and up to 2001 a decline of 39.7% since 1995 in student numbers has occurred. A similar increase in staff numbers has taken place, but since 1998 a decline was also recorded.

Table 2.3 gives an historical overview of the number of undergraduate and postgraduate qualifications awarded or conferred at the Vista University for the period 1983 to 2001.

Table 2.3 Certificates and diplomas awarded and degrees conferred, 1983-2001

Academic Year	Undergraduate			Postgraduate				Total
	Certificates	Diplomas	Bachelor's Degrees	Diplomas	Honours Degree	Master's Degree	Doctoral Degree	
1983	11	21						32
1984	389	37				1	2	429
1985	1 040	62	73			2	2	1 179
1986	1 631	47	60			3	3	1 744
1987	1 997	502	290			3	4	2 796
1988	1 924	734	321			7	1	2 987
1989	2 424	1 218	449		3	4	4	4 102
1990	2 385	1 191	538		49	6	4	4 173
1991	2 045	1 518	637		26	12	6	4 344
1992	2 457	2 205	918		119	15	8	5 722
1993	2 755	2 389	1 145		196	23	10	6 518
1994	2 084	3 603	1 248		302	15	5	7 257
1995	1 303	4 015	1 684	244	267	26	6	7 545
1996	916	4 008	2 082	228	277	15	5	7 531
1997	509	3 155	2 133	188	285	4	5	6 279
1998	388	3 015	2 626	224	312	20	15	6 600
1999	199	1 989	2 303	192	344	32	11	5 070
2000	107	2 048	2 246	174	390	48	9	5 022
2001	15	1 390	1 958	138	413	47	3	3 964
	24 579	33 247	20 711	1 388	2 983	283	103	83 294

Source: Vista (2003b:13)

Table 2.3 shows, that the total number of certificates and diplomas awarded and degrees conferred has declined from 7 545 in 1995 to 3 964 in 2001. This proves the point of the Council for Higher Education (CHE, 2002:51) that " ... a new pattern of student enrolments has also taken place since 1994, with the outcome that some institutions are at risk in terms of student numbers and that some institutions no longer satisfy the specification to contribute as independent institutions".

This is one of the reasons why the former Minister of Education, Prof. Kader Asmal, decided to close Vista University in 2001 by merging some of the campuses with other universities and by incorporating the VUSC with the NWUVTC (DOE, 2001b:7). These plans of government are discussed in chapter 3.

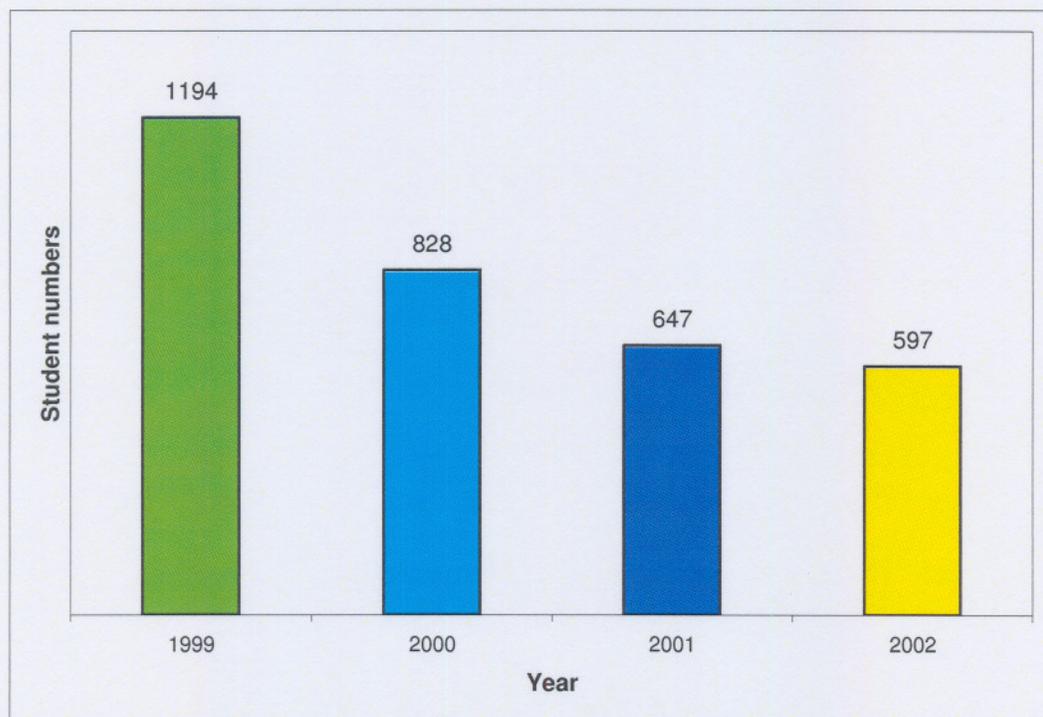
2.3.2 STAFF AND STUDENT NUMBERS

2.3.2.1 Student numbers

Student numbers also increased since 1985 (when VUSC started) to a total of 1 194 students in 1999. Since 1999 student numbers have decreased to 597 students in 2002 (North-West University, 2003:37).

African students made up almost 100% of the student numbers. Figure 2.3 shows the number of students enrolled at VUSC in the period 1999 to 2002.

Figure 2.3 Student enrolments at Vista University, Sebokeng Campus

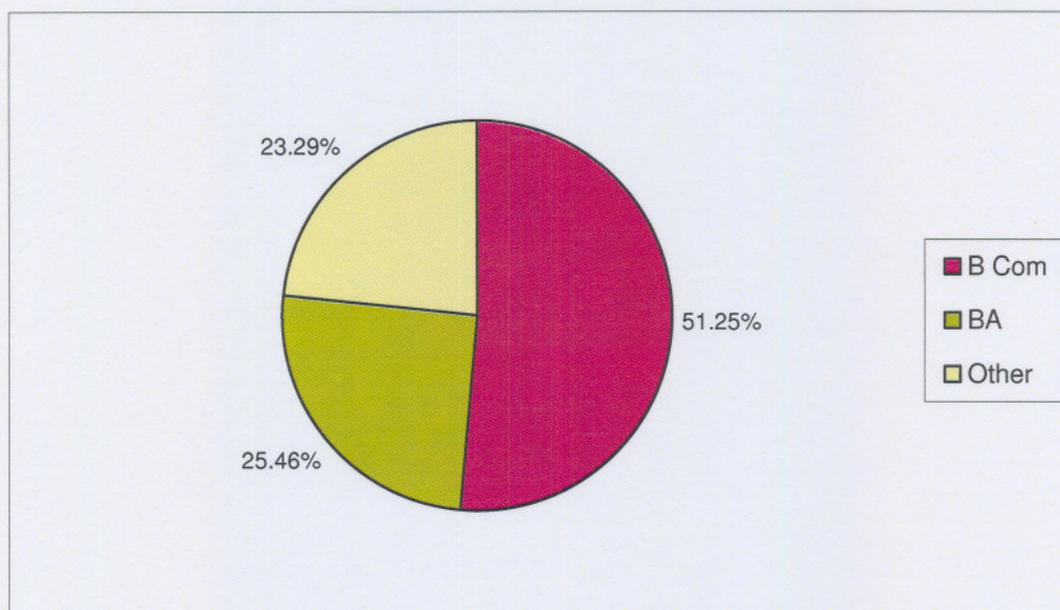


Source: Compiled from data obtained from North-West University (2003:37)

In 2002 a total of 306 (51.25% of the total number of students) were enrolled for B.Com courses at VUSC, while a total of 152 students (25.46% of the total number of students) were enrolled for BA courses (North-West University, 2003:38).

Figure 2.4 portrays the enrolments of students by type of course at VUSC.

Figure 2.4 Student enrolments by type of course at Vista University, Sebokeng Campus (VUSC), 2002



Source: Compiled from data obtained from North-West University (2003:38)

The student enrolment totals by gender of the VUSC in 2002 were 363 female (60.8%) and 234 male students (39.2%) (North-West University, 2003:39).

2.3.2.2 Staff numbers

A total of 15 permanent academic staff, 5 contract academic staff and 6 temporary academic staff and a total of 25 support staff were employed at the VUSC in 2003 (North-West University, 2003:38).

2.3.3 ADMISSION REQUIREMENTS

The admission requirements for Bachelor's Degrees at the VUSC differ from the admission requirements of NWUVTC, in the sense, that Grade 12 subject symbols are used as a selection model at VUSC as compared to the M-score model used by NWUVTC (see Appendix A and B). This selection model may prevent some students from VUSC to enroll at NUWVTC, since potential students from VUSC will be screened according to a more strict formula, before being admitted to NWUVTC.

2.3.4 PAYABLE FEES

A detailed summary of fees payable at the VUSC is given in Table 2.4.

Table 2.4 Payable fees at Vista University, Sebokeng Campus (VUSC), 2003

	Vista University, Sebokeng Campus (Contact) R	Vista University, Sebokeng Campus (Distance tuition) R
Application fee	100	100
Late application fee	150	150
Registration fee	120	120
Late registration fee	230	230
BA (per year)	4 900	3 230
B Com (per year)	4 900	3 230
B Com IT (per year)	4 900	3 230
Certificates and Diplomas (per year)	2 650	1 760
Honours Degree (full course)	5 910	5 910

Source: Compiled from data obtained from Vista (2003c)

2.4 BACKGROUND OF NORTH-WEST UNIVERSITY, VAAL TRIANGLE CAMPUS (NWUVTC)

North-West University, Vaal Triangle Campus (NWUVTC), is situated approximately 5 kilometres outside Vanderbijlpark, on the banks of the Vaal River and is approximately 30 kilometres from VUSC in Zone 10, Sebokeng (see Map 1, Chapter 1). NWUVTC is discussed in terms of its historical background, staff and student numbers, student population, admission requirements and payable fees payable.

2.4.1 HISTORICAL BACKGROUND

The NWUVTC started in 1963 as the former Potchefstroom University for Christian Higher Education (PU for CHE) in the Vaal Triangle (VT) on request from the business community in the VT. In 1973 the student numbers increased to 385 and a permanent office was established in the Vaal Triangle. Up to 1973 lecturers commuted from Potchefstroom to the Vaal Triangle (VT). In 1976 a building in Goodyear Street, Vanderbijlpark, was purchased and the first full-time professors were transferred to

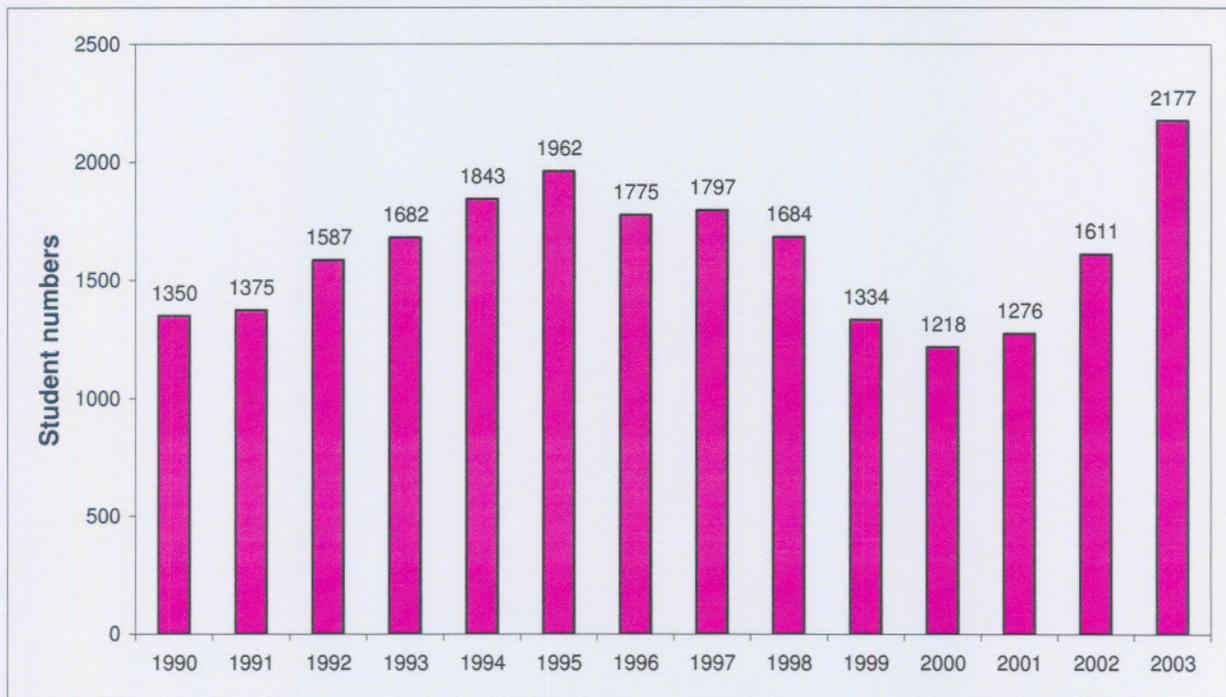
Vanderbijlpark. In 1977 a total of 6 permanent lecturers started lectures for 52 full-time students. In 1984 the activities of the Vaal Triangle Campus were transferred to the Campus in Hendrik van Eck Boulevard, Vanderbijlpark, where student numbers increased to 1 140 in 1984. In 1985 student numbers increased to 1 400 and the first two men's residences were occupied. In 1992 English was instituted as additional medium of instruction and student numbers increased to 2 177 in 2003. (Prinsloo, 2003:1.)

2.4.2 STAFF AND STUDENT NUMBERS

2.4.2.1 Student numbers

Figure 2.5 portrays the growth of student numbers at the North-West University, Vaal Triangle Campus (NWUVTC), since 1990. Student numbers increased from 385 part-time students in 1973 to 1 930 full- and part-time in 1988. Although the student numbers declined to 1 350 in 1990 it increased again to 1 962 students in 1995. The student numbers decreased after 1995 to 1 218 in 2000, but finally increased again to 2 177 students in 2003 (North-West University, 2003:38). By 2002 approximately 35.7% of the students were African, 59% White, 2% Coloured and 2.3% Asian (North-West University, 2003:38).

Figure 2.5 Student numbers at NWUVTTC, 1990-2003

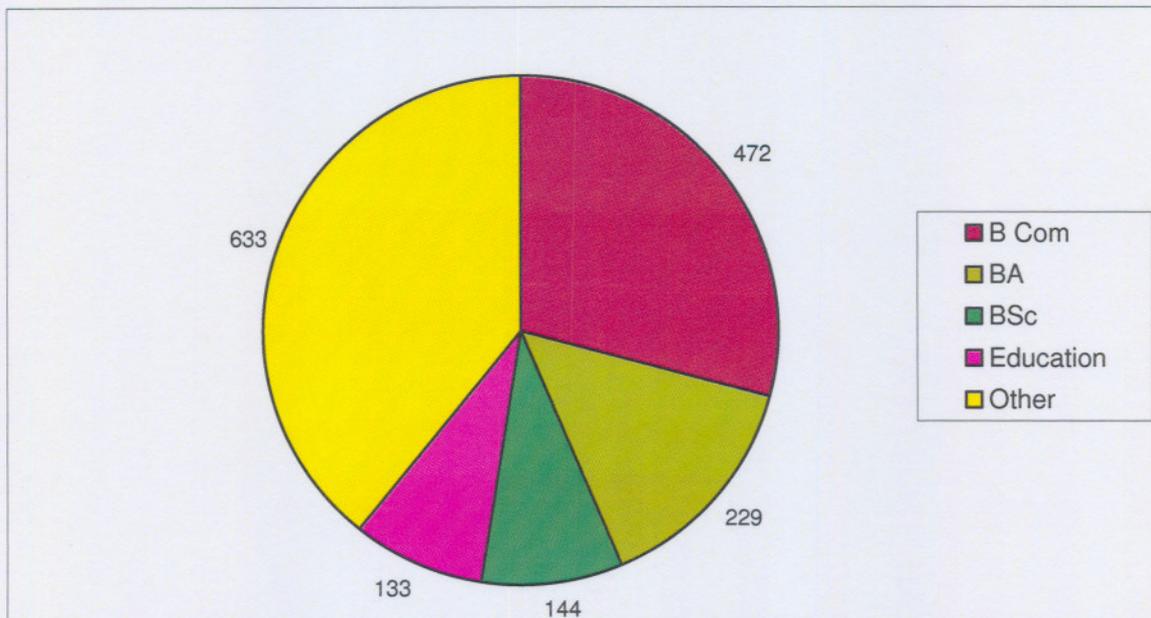


Source: North-West University (2003:29)

In 2002 a total of 472 students (29.3%) were enrolled for a B Com degree; 229 students (14.2%) for a BA degree, 144 students (8.9%) for a BSc degree and 133 (8.25%) students for a degree in education.

Figure 2.6 portrays the enrolments by type of course followed at the North-West University, Vaal Triangle Campus (NWUVTTC).

Figure 2.6 Enrolments by type of course, 2002



Source: Compiled from data obtained from North-West University (2003:39)

2.4.2.2 Staff numbers

The total number of staff increased from 6 in 1977 to a total of 53 academic staff and 58 support staff at the end of 2003 (North-West University, 2003:42).

2.4.3 ADMISSION REQUIREMENTS

The admission requirements of the North-West University, Vaal Triangle Campus (NWUUTC), are based on a candidate's performance in grade 12. A selection model, with an M-score, is used, which differs from VUSC where no M-score is used (North-West University, 2003:30). (See Appendix A and B.)

The application, registration and study fees at the North-West University, are shown in Table 2.5.

Table 2.5 Payable fees at NWUVTC, 2003

Application fee	R150
Late application fee	R250
Registration fee	R565
Late registration fee	R815
BA (per year)	R9 060
B Com (per year)	R9 660
BSc (per year)	R11 590
Education (per year)	R9 330
Honours degree (per year)	R6 520

Source: PU for CHE (2003)

The payable fees of NWUVTC (Table 2.5) differ considerably from the payable fees of VUSC, as shown in Table 2.4. Study fees for a BA degree at VUSC are approximately 54.1% of the fees for a BA degree at NWUVTC. These fees payable will be analysed in chapter 6 in order to determine the potential costs of future students from the areas from where former VUSC attracted most of its students before incorporation.

2.5 ENVISAGED NORTH-WEST UNIVERSITY

The North-West University was established on 1 January 2004 in terms of the Higher Education Act (Act 101 of 1997 as amended) (North-West University, 2003:1). This new institution is a result of a merger between the University of North-West and the Potchefstroom University for CHE (PU for CHE) and the incorporation of the Vista University, Sebokeng Campus (VUSC) into the new North-West University, Vaal Triangle Campus (NWUVTC).

The name of the new institution is North-West University, constituting the four campuses.

- Potchefstroom Campus
- Mafikeng Campus

- The Vaal Triangle Campus (NWUVTC)
- Mankwe Campus.

The study, however, will focus only on NWUVTC and the incorporation of VUSC.

2.6 SUMMARY AND CONCLUSION

The VUSC and NWUVTC are both situated in the Vaal Triangle (VT), with a total population of 839 039 in 2001, about 81.7% of which are African. The VUSC was established in 1985 to serve the African communities of the VT. VUSC grew to a maximum of 1 194 students in 1999 and declined to a total of 597 students in 2002. Almost 100% of the total number of students of the VUSC came from the African communities in the VT. In contrast to this, NWUVTC served the white communities of the VT, where 59% of students came from the white community in 2002.

If growth patterns are taken into consideration, it is evident that the future prospects of VUSC most likely played a role in the decision of the Government to close VUSC. On the other hand, it is also necessary to look at the difference in admission requirements and payable fees that may have a negative impact on mainly African students. The decision by the Minister to close VUSC can be seen against the background for a need to transform society, but the question arises as to whether this decision to close VUSC, will have negative or positive welfare implications. In the next chapter the background of the decision of the Minister and the Government in general, is discussed while the impact on society is discussed in chapter 6.

CHAPTER 3 BACKGROUND TO THE LEGAL FRAMEWORK OF MERGERS AND INCORPORATIONS OF UNIVERSITIES IN SOUTH AFRICA

3.1 INTRODUCTION

The purpose of this chapter is to discuss the historical developments that have taken place in the Higher Education Arena since 1996. This will be done so that the goals set out by Government can be analysed, and to determine whether these goals can be met in the case of Universities in the Vaal Triangle (VT).

In chronological order, the following documents were released: The report of the Commission on Higher Education, which laid the basis for the subsequent Green Paper, White Paper, The Council on Higher Education (CHE) Report, "Towards a New Higher Education Landscape", and the final document which was released on 5 March 2001 by the Minister of Education, Professor Kader Asmal, namely the National Plan for Higher Education. The National Plan for Higher Education is the final plan that will shape the transformation of the Higher Education system for decades to come (DOE, 2001b:1).

The White Paper, which has laid the foundation for the work of the CHE Task Team, will be discussed first. Subsequently, the findings and document of the Task Team will then be discussed. The National plan for Higher Education will finally be discussed, since this document or plan will shape the transformation of Higher Education in the future (DOE, 2001b:1).

3.2 THE WHITE PAPER: A PROGRAMME FOR THE TRANSFORMATION OF THE HIGHER EDUCATION SYSTEM

The White Paper of 1997 identifies the various, and indeed diverse social purposes that higher education must serve in the new South Africa (CHE, 2002:13). These include the following.

- Attention to the pressing local, regional and national needs of South African society and the problems and challenges of the broader African context.
- The mobilisation of human talent and potential through lifelong learning to contribute to the social, economic, cultural and intellectual life of a rapidly changing society.
- Laying the foundations of a critical civil society, with a culture of public debate and tolerance, which accommodate differences and competing interests.
- The training and provision of person-power to strengthen this country's enterprises, services and infrastructure.
- The production, acquisition and application of new knowledge.

The Paper also sets the various goals for the higher education system and for various institutions (CHE, 2002:13). These include the following.

- Increased and broadened participation within higher education in order to meet person-power needs and advance social equity.
- Co-operative governance of the system, institutions and partnerships.
- Curriculum restructuring and knowledge production responsive to social interests and needs.
- Promotion of quality and quality assurance through accreditation and assessment of programmes.
- Incorporation of higher education programmes and qualifications within a National Qualification Framework designed towards promoting greater articulation, mobility and transferability.
- Improved institutional planning and management and the development of three-year institutional plans.

The key challenges, however, according to the White Paper, is to redress past inequalities and to transform the Higher Education system to serve a new social order

and to meet national needs, as well as to respond to new realities and opportunities (DOE, 1997:1). It is thus evident, that the higher education system in the VT must also be transformed against the background of VUSC that served only the African communities, and NWUVTTC that to a great extent serves the White community (see Chapter 2).

According to the White Paper, the role of higher education in a knowledge-driven world is threefold.

- Human resource development: the mobilization of human talent and potential through lifelong learning i.r.o. the social, economic, cultural and intellectual life of a rapidly changing society.
- High level skills training: the training and provision of person-power to strengthen this country's enterprises, services and infrastructure.
- Production, acquisition and application of new knowledge: national growth and competitiveness is dependent on continuous technological improvement and innovation, driven by a well-organised vibrant research and development system, which integrates the research and training capacity of higher education with the needs of industry and of social reconstruction (DOE, 1997:2).

3.3 COUNCIL ON HIGHER EDUCATION: SHAPE AND SIZE OF HIGHER EDUCATION

3.3.1 BACKGROUND TO CHANGES IN HIGHER EDUCATION

In January 2000, the Minister of Education requested the Council on Higher Education (CHE) to conduct an overarching exercise to put strategies into place that will ensure that the SA higher education system can be transformed (CHE, 2002:2.) For these purposes, the CHE established a Size-and-Shape Task Team. Its members were drawn from labour, business, Universities and Technikons (CHE, 2002:2).

Soon after taking office as Minister of Education, Professor Kader Asmal announced his intention to review the institutional landscape of higher education. On July 27 1999, in his Call to Action, he stated that “ ... the shape and size of higher education system cannot be left to chance if we are to realise the vision of a rational, seamless higher education system, responsive to the needs of students of all ages and the intellectual challenges of the 21st century. The institutional landscape of higher education will be reviewed as a matter of urgency in collaboration with the Council on Higher Education (CHE). This landscape was largely dictated by the geo-political imagination of “apartheid” planners. As our policy documents make clear, it is vital that the mission and location of higher education institutions be re-examined with reference to both the strategic plan for the sector, and the educational needs of local communities and the nation in the 21st century” (CHE, 2002:5).

The Minister subsequently requested the CHE to provide him with advice on the reconfiguration of the higher education system. In December 1999, the CHE submitted a memorandum, “Towards a Framework and Strategy for reconfiguring the Higher Education System in South Africa”. The memorandum made recommendations and proposed the key principles and basis upon which the reconfiguration of the higher education system should take place. The CHE also proposed the establishment of a Task Team to develop details of a framework and strategies for the reconfiguration of the higher education landscape (CHE, 2002:6).

In late January 2000, the Minister indicated his broad agreement with the approach of the Council and signalled his expectations of the Task Team.

In a May 2000 press statement, the Minister made it clear that the work of the Task Team was not targeted at closing institutions and in particular historically disadvantaged institutions, but to prevent the closure of those institutions that are experiencing serious difficulties (CHE, 2002:7).

3.3.2 PROBLEMS IN HIGHER EDUCATION

According to the Task Team, a number of conditions and developments within higher education present fundamental challenges to the system and major obstacles to the achievement of policy goals. These problems can be loosely characterised as structural (fundamental, long standing, contextual) and conjunctural (immediate, contextual).

Structural problems include the following.

- The geographical location of institutions based on ideological and political considerations rather than rational and coherent planning. This results in fragmentation and unnecessary duplication. (In the Vaal Triangle (VT) the VUSC was situated in Sebokeng and served only the African communities. The NWUVTTC, on the other hand, is located in a former White community and to a great extent served the White community.)
- The continued and even increasing fragmentation of the system. The higher education system still does not function in the co-ordinated way envisaged by the White paper. Neither the existing planning instruments nor the institutions have produced meaningful co-ordination and collaboration. Public universities and Technikons appear to regard their immediate neighbours and other public institutions more as market competitors rather than as colleagues striving towards a unified and co-ordinated higher education system.
- There are major inefficiencies related to student throughput rates, graduation rates, student dropouts, student repetition and the retention of failing students and the unit costs across the system.
- Skewed patterns of distribution of students in the various fields of study exist.
- The distribution of students in the various levels and fields of study, and at certain institutions, is skewed in terms of race and gender.
- Academic and administrative staff also display extremely poor patterns of race and gender representation and distribution.

- Most institutions have extremely low research outputs and even these institutions demonstrate a higher ratio of research outputs relative to other institutions, have uneven levels of output (CHE, 2002:16).

The conjunctural problems of the system include:

- the decline in student enrolments within the public higher education sector;
- the possible crippling effects on the ability of several institutions to continue to fund their activities because of the relationship between enrolments and funding, as well as their inability to attract more diverse sources of funding;
- a tremendous increase in private higher education institutions;
- fragile governance capacity experiences by many institutions;
- and the current higher education information systems which are sorely inadequate, especially in relation to information on finance matters (CHE, 2002: 20).

3.3.3 KEY CHALLENGES

3.3.3.1 Effectiveness challenges

According to the Task Team, the reconfiguration of higher education is faced with the challenge of increasing the absolute number of graduates and diplomats to address the shortage of high skills in the labour market (CHE, 2002:22). The accelerated construction of appropriate programme mixes which are responsive to the growth and development needs of the country as well, as to individual needs for employment, is also urgent, particularly to increase the number of learners in the Science, Engineering and Technological fields (CHE, 2002:22). According to the task team, the number of research outputs should also be addressed by measures aimed at increasing the number of researchers, as well as the research outputs (CHE, 2002:22).

3.3.3.2 Efficiency challenges

According to the Task Team, quality mechanisms will have to be put in place to reduce repeater, drop-out and failure rates of students, so that institutions could discharge their education and training missions and responsibilities. Planning targets, will make it possible for institutions to meet the needs of learners, industry and society. The Task Team's point of view is also, that collaboration and rationalisation will lead to economies of scale. A particular challenge that will require explicit attention by all higher education providers, is the development of information and communication technologies, because of the expanded potential for organisations to expand their sphere of operations and influence beyond their traditional geographical boundaries. It is also diminishing barriers to entry of potential competitors to higher education institutions by reducing the importance of geographical distance as a barrier, the overhead and logistical requirements of running education programmes and research agencies, and by expanding cheap access to information resources (CHE, 2002:23).

3.3.3.3 Equity challenges

According to the Task Team, one of the most critical challenges facing the reconfiguration of Higher Education is responding appropriately to the equity challenges. Equity challenges mean increasing the race, gender and social class distribution of students in various fields and levels of study, improving the racial and gender representivity of staff and ensuring financial access for poor students. The Task Team has recommended that equity targets should be set and monitored for all programmes, students and staff (CHE, 2002:23).

3.3.4 CHARACTERISTICS OF PUBLIC HIGHER EDUCATION

The Task Team set out key characteristics that should define institutions with different mandates (CHE, 2002:37).

3.3.4.1 Multi-purpose institutions

Public higher education institutions should be multi-purpose institutions and offer broad-base higher education to achieve the goals set for higher education. Programmes should not be concentrated in only one or two broad areas of study (CHE, 2002:37).

3.3.4.2 Academic and economic viable institutions

Academic viability as a multi-purpose institution, requires that student enrolment in public institutions should not be concentrated in a single broad area of study but should be spread over a number of broad areas of study. In terms of economic viability the Minister of Education determined that colleges of education with a number of fewer than 2000 students (full-time equivalent (FTE)), would have to be incorporated into a University or Technikon (CHE, 2002:38).

3.3.4.3 Research involvement of institutions

The goal of higher education is to contribute to the creation, dissemination and evaluation of new knowledge and to contribute towards finding new applications of knowledge. To reach this goal, institutions require appropriately qualified staff, possessing doctorates, which serve as an indicator of the institution's being able to conduct independent research. Guidelines of the Australian Vice-Chancellors Association state, that to operate as a university, at least 25% of all academic staff should have a relevant doctorate and some research experience (CHE, 2002:38).

3.3.5 ORIENTATION AND FOCUS OF INSTITUTIONS

According to the Task Team, the country should strive to reach institutions with the following broad mandates, principal orientation and core focus.

3.3.5.1 Institutions which constitute the bedrock of the Higher Education system

According to the Task Team, these institutions should be well-resourced to undertake their vital responsibility of providing undergraduate programmes of high quality to the

great majority of learners in the system. According to the team, the geographical location of these institutions must ensure that learners from both urban and rural areas are able to access education provision. Such institutions would function as multi-purpose institutions operating across a broad range of learning areas. In essence, the orientation and focus of these institutions should be the following.

- Quality undergraduate programmes.
- Limited postgraduate programmes up to taught master's level.
- Research-related to curriculum, learning and teaching application.

Institutions with such orientation, should consist of at least 4000 FTE'S (CHE, 2002:40).

3.3.5.2 Comprehensive postgraduate and research institutions

In essence, the mandate of such institutions should be:

- quality undergraduate programmes;
- comprehensive postgraduate taught and research programmes up to a doctoral level; and
- extensive research capabilities (basic, applied, strategic and developmental) across a broad range of areas (CHE, 2002:41).

These institutions should consist of at least 8000 FTE's and the enrolments of students should be a minimum of:

- 15% in the humanities and social sciences;
- 10% in commerce;
- 25% in SET (Science, Engineering and Technology); and
- 10% of enrolments should be at the master's and doctoral levels.

In addition, 40% of academic staff should have doctorates (CHE, 2002:43).

3.3.5.3 Extensive master's and selective doctoral institutions

In essence these institutions should provide:

- quality undergraduate programmes;
- extensive postgraduate taught and research programmes up to a master's level;
- selective postgraduate taught and research programmes up to a doctoral level; and
- select areas of research (basic, applied, strategic and development) (CHE, 2002:43).

These institutions should consist of at least 6 000 FTE'S. In addition, student enrolments should be a minimum of and be spread according to the following percentage distribution.

- An average of 25% in the humanities and social sciences.
- An average of 10% in commerce.
- An average of 15% in SET.
- An average of 5% of enrolments should be at the master's and doctoral levels.

In addition, 20% of academic staff should have doctorates (CHE, 2002:44).

3.3.6 STRATEGIC INTERVENTIONS, INSTITUTIONAL COMBINATION, TIME-FRAME AND LEGISLATIVE FRAMEWORK

3.3.6.1 Strategic interventions

According to the Task Team, key strategic interventions would be required to reconfigure the higher education system and institutions, which will include the following.

- Developing effective national steering, planning and implementation capabilities.

- Developing institutional missions and strategic planning in alignment with institutional mandates.
- Combining institutions and restructuring them in alignment with their institutional mandates and missions.
- Rationalisation and inter-institutional collaboration at regional level.
- Building inter-institutional collaboration in strategic areas.
- Developing strategic planning capacities and education management information systems.
- Building financial planning capacities and systems.
- Enhancing the quality of learning and teaching.
- Expanding the use of information and communication technologies in learning and teaching.
- Developing student equity in select areas, staff equity and redress and institutional redress.
- Addressing the personal implications of reconfiguration.
- Developing leadership, management and administrative capacities at all levels of the system.
- Engaging in periodic reviews of national planning and of the achievement of policy and planning objectives (CHE, 2002:51).

3.3.6.2 Institutional combinations

Against the background of these developments, the Task Team recommended, that the absolute number of institutions be reduced. Although the Higher Education Act of 1997, Section 23 makes provision for closure of institutions, the Task Team recommended that there should be no closures. The Task Team instead, recommends that the

present number of institutions must be reduced through combining various institutions (CHE, 2002:52).

According to the Task Team, savings should result from an increase in size of the institutions, with a reduction of unit costs. The elimination of unnecessary duplication and rationalisation of programmes should also result in savings. Reducing the number of councils and senior management and administrative teams, will also realise proportionate savings (CHE, 2002:52).

In making final decisions on the combination of institutions, a number of issues should be considered according to the Task Team. These considerations include the following with respect to social and educational goals, how, or to what extent, will a combination –

- promotes the overall social and educational goals that have been set for higher education;
- contribute to the achievement of particular regional and local economic and social needs; and
- contribute to the achievement of particular mandates and missions (CHE, 2002:53).

With respect to access and equity, how, or to what extent, will a combination –

- promote access and equity through improvements in quality and efficiency or, at least does not make access and equity more difficult to achieve;
- improve the student and staff equity profile; and
- permit historically disadvantaged institutions to play an important and effective role in the new landscape?

With respect to improving quality and efficiency of provision, how, or to what extent, will a combination –

- build synergy in terms of institutional orientation, broad areas of study, fields and discipline, variety and levels of programme offerings, distribution of students across broad areas of study, etc.;
- enable more effective provision of learning and teaching, as well as research and community service;
- enable more rational and efficient use of buildings, facilities and human resources;
- enable economies of scale through creation of larger multi-purpose institutions; and
- provide enhanced leadership, management and administrative capacities? (CHE, 2002:54).

With respect to overcoming the historical legacies of apartheid, how, or to what extent, combination –

- create institutions with new identities and cultures that transcend their past racial and ethnic institutional histories and contribute to their deracialisation; and
- create new institutions that transcend the past institutional histories as universities, technikons or colleges.

With respect to institutional viability and sustainability, how, or to what extent, will a combination –

- overcome the threat to the viability of institutions of low student Full-Time Equivalent (FTE's);
- address the viability of institutions as single-purpose public institutions; and
- develop potentially stronger, more viable and sustainable institutions? (CHE, 2002:53.)

3.3.6.3 Time-frame

The Task Team was of the opinion, that to reconfigure the system it could not be realised overnight, but should be the product of clear, realistic and explicit time-frames. This could be achieved through:

- consultations around the reconfiguration proposals;
- an iterative process around institutional mandates and missions;
- the development of a national plan; and
- combinations and the development of institutional missions and combatant strategies.

According to the Task Team, the first three activities are likely to require a minimum of six months while the activity that includes combinations, could require between one and three years (CHE, 2002:54).

3.3.6.4 Legislative framework

The legislative basis for combinations, is provided by the Higher Education Act of 1997, Section 23, which states that the Minister may, after consultation with the CHE and with notice in the Government Gazette, merge two or more public higher education institutions into a single public higher education institution (CHE, 2002:57).

3.3.6.5 Reference to the Vaal Triangle

The Task Team suggested that the Vista campuses that are relatively small and dispersed around the country, unbundle. According to the Task Team, these campuses could have large cost inefficiencies and the Minister should investigate the combination of Vista campuses with nearby Universities or Technikons closest to it and then offer similar programmes (CHE, 2002:63).

3.4 NATIONAL PLAN FOR HIGHER EDUCATION

The Minister of Education, Professor Kader Asmal, released the National Plan for Higher Education on 5 March 2001.

The National Plan proposes, that the institutional landscape of higher education must be restructured to create new institutional and organisational forms to address the racial fragmentation of the system, as well as administrative, human and financial capacity constraints. This will be achieved in the following ways.

- Institutional collaboration at the regional level in programme development, delivery and rationalisation; in particular, of small and costly programmes, which cannot be sustained across all the institutions.
- Investigating the feasibility of a more rational arrangement for the consolidation of higher education provision through reducing, where appropriate, the number of institutions but not the number of delivery sites, on a regional basis. (DOE, 2001b:1.)

The unbundling of Vista University and the incorporation of its constituent parts into the appropriate institutions within each region, was also announced in the National Plan.

3.4.1 STRUCTURE OF THE NATIONAL PLAN

The National Plan addresses five key policy goals and strategic objectives, which in the Ministry's view, are central towards achieving the overall goal of the transformation of the higher education system. The goals and strategic objectives are to –

- provide increased access to higher education to all, irrespective of race, gender, age, creed, class or disability and to produce graduates with the skills and competencies necessary to meet the human resource needs of the country;
- promote equity of access and to redress past inequalities through ensuring that the staff and student profile in higher education progressively reflect the demographic realities of South African society;

- ensure diversity in the organisational form and institutional landscape of the higher education system through mission and programme differentiation, thus enabling the addressing of regional and national needs in social and economic development;
- build high level research capacity to address the research and knowledge needs of South Africa; and
- build new institutional and organizational forms and new institutional identities through regional collaboration between institutions (DOE, 2001b:1.7).

3.4.2 OUTCOMES OF THE NATIONAL PLAN

The outcomes that must be reached, will be discussed below.

3.4.2.1 Outcome 1 Increased participation rate

In respect of the National Plan, the Minister of Education agrees with the CHE, that the participation rate of the age groups 20-24 in public higher education should be 20% as a target over the next 10-15 years (DOE, 2001b:2.2).

3.4.2.2 Outcome 2 Increased graduate outputs

The Ministry believes, that the long-term goal of increasing the overall participation rate must be complemented by strategies to increase graduate outputs in the short- to medium term (DOE, 2001b:2.3).

3.4.2.3 Outcome 3 Broadened social base of students

The Minister believes, that an important avenue for increasing the potential pool of recruits to higher education is to recruit non-traditional students (workers, mature learners, in particular women, and the disabled). This was the viewpoint of the White Paper and the CHE (DOE, 2001b:2.4). The National Plan also indicates, that the Minister expects of institutions to indicate in their institutional plans, the strategies and steps they intend taking to increase the enrolment numbers of these categories of learners.

3.4.2.4 Outcome 4 Increased recruitment of students from the Southern African Development Community

There is increasing evidence to suggest, that there is as yet an untapped potential to recruit students from the Southern African Development Community region, especially at the postgraduate level (DOE, 2001b:2.5).

3.4.2.5 Outcome 5 Changed enrolments by fields of study

The Minister will over the next five to ten years shift the balance in enrolments between the humanities, business and commerce and science, engineering and technology from the current ratio of 49%:26%:25% to a ratio of 40%:30%:30% respectively. In the case of science, engineering and technology, the Minister is keen to increase the enrolments in fields of information and communication technology (DOE, 2001b:2.6).

3.4.2.6 Outcome 6 Enhanced cognitive skills of graduates

The Ministry agrees with the CHE, that there is a need to review the current academic policy and qualifications structure so as to ensure that the qualification framework is appropriate for our needs. According to the National Plan, the desirability and feasibility of replacing the three-year undergraduate degree with a four-year degree in the long run, should be investigated (DOE, 2001b:2.7).

3.4.2.7 Outcome 7 Increased equity in access and success rates

The Ministry agrees with the recommendations of the CHE, that increasing the participation rate from 15% to 20% within a ten to fifteen year time frame, must be driven primarily by equity concerns (participation principally of African and Coloured students) (DOE, 2001b:3.2).

3.4.2.8 Outcome 8 Improved staff equity

According to the National Plan, many higher education institutions have not yet developed employment equity plans. The National Plan makes mention of the need to change institutional cultures, as there is evidence to suggest that historically White

institutions, in particular, are unable to recruit or retain Black staff because the institutional culture is alienating rather than accommodating (DOE, 2001b:3.3).

3.4.2.9 Outcome 9 Diversity through mission and programme differentiation

The Ministry agrees with the Council on Higher Education, that a differentiated and diverse higher education system is essential to meet the transformation goals of the White Paper. It also agrees, that if diversity is to be achieved, a clear regulatory and planning framework is required. The Ministry does not, however, support the CHE's proposal that differentiation and diversity should be achieved through structural differentiation between different institutional types based between teaching and research institutions.

The Ministry, therefore, proposes to ensure institutional diversity through mission and programme differentiation, based on the type and range of qualifications offered (DOE, 2001b:4.2.1).

3.4.2.10 Outcome 10 Regulation of distance education programmes

The Minister of Education has decided to lift the moratorium imposed during February 2000, on new distance education programmes at contact institutions. However, the Ministry will not fund new student places in current and new distance education programmes at contact institutions from 2002, unless the programmes have been approved as part of the institution's three-year rolling plans. The approval of distance education programmes will depend on the fit between the programme and the institution's mission, including institutional capacity, whether it addresses regional and/or or national needs (DOE, 2001b:4.4.1).

3.4.2.11 Outcome 11 Establishment of a single dedicated distance education institution

The Ministry agrees with the Council on Higher Education's recommendation, that a single predominantly dedicated education institution that provides innovative and quality

programmes especially at undergraduate level, is required for the country (DOE, 2001b:4.5).

3.4.2.12 Outcome 12 Regulation of private higher education

The Ministry agrees with the CHE, that private higher education has a role to play in complementing public provision. However, they should be subject to the same requirements as public higher education institutions (DOE, 2001b:4.6).

3.4.2.13 Outcome 13 Research concentration and funding linked to outputs

The Ministry disagrees with the CHE approach, to concentrate research resources in comprehensive research and post-graduate training institutions (DOE, 2001b:4.7).

3.4.2.14 Outcome 14 Increased graduate enrolments and output at the master's and doctoral levels

The Ministry is committed to increase the postgraduate enrolments in the long run. It is proposed, that over the next five years, the system as a whole should improve the efficiency of its postgraduate outputs in line with benchmarks.

- At least 6% of the annual output of graduates must be master's graduates.
- At least 1% must be doctoral graduates (DOE, 2001b:5.3).

3.4.2.15 Outcome 15 Programme and infrastructural collaboration

The Ministry believes, that programme collaboration between institutions which contributes to the efficient use of facilities and resources for learning, teaching and research at a regional level, have an important role to play in the transformation of the higher education system. The Ministry believes that, in principle, programme collaboration should be developed co-operatively and voluntarily between higher education institutions.

The Ministry indicated, that it intends to stop unplanned proliferation of satellite campuses by higher education institutions and that the Ministry will not fund student places at satellite campuses from 2002, unless the establishment and operation of these campuses have been approved as part of the institution's plans (DOE, 2001b:6.3.1).

The National Plan encourages institutions to continue to build on existing programmes and to develop new areas of collaboration. The following areas of collaboration are highlighted.

- The establishment of a National Higher Education Applications Information Service.
- The joint development of resource-based course materials.
- Library consortia with a common cataloguing system.
- Joint purchasing and sharing of expensive equipment.

3.4.2.16 Outcome 16 New institutional and organisational forms

This outcome is in line with Goal Five of the White Paper: the building of new institutional and organisational forms and new institutional identities and cultures. The National Plan emphasises the importance of the following.

- Economies of scale, through reducing costs and ensuring the continual provision of expensive and under-subscribed programmes, but which are necessary for social, cultural, intellectual and economic development.
- Economies of scope, that is, the broadening of the range of courses on offer.

The Ministry is also of the view, that there is no single factor that underpins the case for mergers or for new institutional and organisational forms. Instead, there are a range of factors linked to the specific context of different groups of institutions. For example, the rationale for merging a historically White and a historically Black institution, may well differ from that for merging two small institutions. In another case, the purpose may well differ from that for merging two small institutions. In the one case, the purpose may be

that of overcoming the racial fragmentation of the higher education system. In the other, it may be that of achieving economies of scale and/or scope.

The Ministry proposed to unbundle Vista University and to incorporate its constituent campuses into the appropriate existing higher education institutions within each region. To facilitate mergers and the development of new institutional and organisational forms, the Minister planned to set up a National Working Group to investigate and advise the Minister on the appropriate institutional structures on a regional basis (DOE, 2001b:6.5.2).

3.5 IMPLICATIONS FOR UNIVERSITIES IN THE VAAL TRIANGLE

The Minister of Education stated in his report "Transformation and restructuring: a new institutional landscape for higher education", that:

- The students and staff of the Sebokeng Campus of Vista University (VUSC) should be incorporated into the Vaal Triangle Campus of the merged Potchefstroom University for CHE and the University of the North West; and
- The infrastructure and facilities of the Sebokeng Campus of Vista University should be transferred to the Vaal Triangle Technikon. (DOE, 2001a:15)

This incorporation was also outlined in the "Guidelines for mergers and incorporations" published by the Department of Education in 2003" (DOE, 2003:87).

3.6 SUMMARY AND CONCLUSIONS

The following documents were released in chronological order, namely: the report on Higher Education, which laid the basis for the subsequent Green Paper and the White Paper; the Council on Higher Education (CHE) report "Towards a new Higher Education Landscape" and the final document which was released on 5 March 2001, namely The National Plan for Higher Education. Specific goals set out by these documents, can be summarised as follows.

- Attention must be given to meet local needs of society.

- A redress of geographical located institutions based on ideological and political considerations must take place.
- The poor patterns of race and gender representation must be rectified.
- The decline in student enrolments within the public higher education sector must be rectified.
- The financial viability of institutions must be ensured.
- Access and equity must be promoted.
- The participation rate of black and coloured students must be increased.

It is also stated in this chapter that the VUSC must be incorporated and facilities and buildings of VUSC must be taken over by the Vaal Triangle Technikon. The theoretical background of economic impact assessment to determine whether the above-mentioned goals can possibly be met will be discussed in the next two chapters.

CHAPTER 4 THEORETICAL FOUNDATION FOR THE MEASUREMENT OF WELFARE

4.1 INTRODUCTION

Any attempt to measure advantages and disadvantages in terms of society's net gain of projects, must focus on the net social impact of a project on persons who are not direct beneficiaries of this project, but who may obtain some form of spillover benefit or costs from such a project (Mullins, 2002:1).

This focus on the net social impact, also requires a general framework within which costs and benefits can be identified and assessed from society's perspective. The theoretical foundations for such a framework can be found in the theory of welfare economics (Nas, 1996:3): according to Nas, the theory of welfare economics can be used to analyse the nature of impacts on the welfare level of society at large. Mishan (1974:82) also indicates that cost benefit analysis must be evaluated with welfare improvement in mind. Trumbull (1990:202) indicates, that evaluation of costs and benefits must take place within the so-called "welfare space" where the preferences of all who are affected by the project, must be counted.

According to Mullins (2002:6), the idea of measuring the net advantage of projects must take place against society's net utility gains as described in welfare economics.

Against this background, it is important to discuss the theory of welfare economics applicable to the impacts on welfare levels of society in detail, so that this can serve as framework to identify costs and benefits, in order to analyse the potential impacts on society.

The concepts "welfare economics, pareto optimum, welfare analysis, Kaldor-Hicks criterion, externalities, consumer surplus and producer surplus", are discussed in this chapter. These concepts will serve the purpose to evaluate whether a welfare improvement has taken place in the case of the incorporation of VUSC into NWUVTC.

It will also serve the purpose to determine whether positive or negative externalities exist because of the incorporation of VUSC into NWUVTC.

4.2 WELFARE ECONOMICS

Before a detailed discussion of the theory of welfare economics takes place, it is necessary to define the concept “welfare economics” and to state the assumptions used in welfare analysis. The concept “welfare maximisation” that is used in this study, will also be discussed.

4.2.1 DEFINITION OF WELFARE ECONOMICS

“Welfare” in the context of studies to assess the impacts of projects on society, refers to utility gains (Nas, 1996:11). This concept of utility gains is also mentioned by Mullins (2002:6) where welfare is seen as society’s net utility gains. Miller and Meiners, (1986:565) define “welfare economics” as that part of the study of economics that explains how to identify and arrive at what are called socially efficient allocations of resources. In other words, it must be decided on what is “best” or “optimum” among alternative solutions available (Miller, 1982:422).

If the concepts of welfare and welfare economics are analysed against the background of the research problem in chapter 1, the incorporation of Vista University, the Sebokeng Campus (VUSC), will be analysed according to its welfare implications, in other words, whether the incorporation will lead to a “best solution” or “optimum solution” and whether there will be a net utility gain in terms of society’s viewpoint?

4.2.2 ASSUMPTIONS OF WELFARE ANALYSIS

In order to discuss welfare economics, it is important to state the assumptions underlying the theories of welfare analysis in detail.

According to Miller and Meiners (1986:566), it is important to make the following three assumptions so as to make welfare analysis less arbitrary:

- Firstly, the individual is the best judge of his or her own welfare.

- Secondly, if the individual prefers A to B, his or her welfare is greater with situation A than with situation B. – that is; the individual is “better off” with situation A than with situation B.
- Thirdly, the individual acts in accordance with his or her own preferences. The individual will choose that which he or she values more.

For the analysis in both this chapter and chapter 6, where the actual benefits and costs to society are analysed, these assumptions are accepted (e.g. when students and staff are asked for their opinions, the individual is assumed to be the best judge of his/her own welfare).

The only problem with the assumptions arises when social welfare of groups is analysed (Miller & Meiners, 1986:566). In other words, if individual “I” is better off with situation A than with B, but individual “II” is better off with situation B rather than situation A, how do we measure the social welfare of individuals “I” and “II”? This study of the incorporation of VUSC poses similar problems, in the sense that individual “I” may benefit from the incorporation while individual “II” may be worse off after incorporation. This problem, however, may be overcome by focusing on the concept of economic efficiency (Nas, 1996:10).

Economic efficiency can be specified according to the Italian economist Vilfredo Pareto, who specified a condition for optimal or efficient resource allocation referred to as the “pareto condition” (Miller & Meiners, 1986:567).

Nas (1996:11) describes the pareto condition or pareto optimality as an efficiency norm necessary to achieve optimality in resource allocation and also defines “pareto optimality” as a “ ... state of economic affairs where no one can be made better off without simultaneously making at least one other person worse off”. Boadway (1984:10) gives a similar explanation of pareto optimality.

This means, that pareto optimality can be reached with the incorporation of VUSC only if some roleplayers are made better off, while no roleplayers are worse off. Nas (1996:11), however, states that in most real-world situations, welfare improves at the

expense of at least one person becoming worse off, and therefore, gains in welfare can be viewed as potential rather than actual pareto improvements.

The Kaldor-Hicks criterion, also called the Kaldor-Hicks test, states, that as long as those who benefit can compensate those who lose, the reallocation decision is accepted as an improvement (Stokey & Zeckhauser, 1978:279). It is, however, not necessary that compensation takes place (Nas, 1996:57). This Kaldor-Hicks rule is also referred to as potential pareto improvement.

This pareto optimum and the Kaldor-Hicks rule are discussed in detail in section 4.3.3 of this chapter. It is, however, important to look at what is meant by welfare maximisation.

4.2.3 WELFARE MAXIMISATION

Against the background of utility gain and social welfare of groups, Bråthen (2000:6) gives a formal derivation of welfare maximization that states, that a change in social welfare can be determined by the summation of society's benefits, minus the summation of society's costs.

Bråthen (2001:21) derives this change in social welfare as follows.

If a society comprises of N individuals ($i = 1 \dots n$), each with a utility function of the form:

$$U_i = U_i(X_1, X_2, \dots, X_m). \quad (1)$$

where: U_i = the utility of individual i

$X_1 \dots X_m$ = the amount of goods available to individual i

Since individual i supplies some goods and receiving others, some of X_1, \dots, X_m will be negative (inputs) and some positive (outputs). The discussion can now be taken further by looking at the income of individual i .

The income of individual i is now given by the formula:

$$Y_i = \sum_{j=1}^m P_j X_j \quad (2)$$

where: P_j = price of goods j

X_j = amount of goods j

Y_i = income of individual i

If it is assumed, that individual i spent his/her entire budget, the following formula could be given:

$$Y_i - \sum_{j=1}^m P_j X_j = 0 \quad (3)$$

where: Y_i = the income of individual i

X_j = amount of goods j

P_j = the price of goods j

It must be stated that the individual i's utility and maximum utility are subject to his/her income, which can be written as:

$$\text{Max } W = U_i (X_1, \dots, X_m) \quad (4)$$

$$\text{s.t. } \sum_{j=1}^m P_j X_j = Y_i$$

If the individual's budget constraint is now taken into account, maximum welfare can be written as follows.

$$\text{LW} = U_i (X_1, \dots, X_m) + \lambda (Y_i - \sum_{j=1}^m P_j X_j) \quad (5)$$

where: LW = Langrangean welfare

U_i = utility of individual i consumer good j

X_1 = amount of good 1 available to individual i

Y_i = income of individual i

λ = undetermined Lagrangean multiplier

The relevant maximising condition can now be written as:

$$\frac{\partial W}{\partial X_j} = \frac{\partial U_i}{\partial X_j} - \lambda_i P_j = 0 \quad (6)$$

where: ∂W = change in welfare

∂X_j = change in amount of X_j

∂U_i = change in utility of individual i

P_j = price of good j

λ = undetermined Lagrangean multiplier

This undetermined Lagrangean multiplier is discussed by Henderson and Quandt (1971:18).

Equation (6) can now be written as:

$$\lambda_i = \frac{\frac{\partial U_i}{\partial X_j}}{P_j} \quad \text{and} \quad (7)$$

$$P_j \lambda_i = \frac{\partial U_i}{\partial X_j} \quad (8)$$

This further implies that:

$$\frac{\partial W}{\partial Y_i} = \lambda_i \quad \lambda_i \text{ is the marginal utility, or the marginal welfare change, of where}$$

λ = the marginal utility or marginal welfare change.

Any change of income to individual i will comprise changes in the goods and inputs X_j .

It follows then, that an increase ΔX_1 in the amount X_1 , available to I , will raise i 's utility by:

$$\frac{\partial U_i}{\partial X_1} \cdot \Delta X_1 \quad (9)$$

and similarly, for all goods comprising the change in income. The change in income will change the utility of individual i and can now be written as:

$$\Delta U_i = \frac{\partial U_i}{\partial X_1} \cdot \Delta X_1 + \dots + \frac{\partial U_i}{\partial X_m} \cdot \Delta X_m \quad (10)$$

This equation (10) can now be substituted into equation (8), to find the following equation:

$$\Delta U_i = \lambda_i \cdot P_1 \cdot \Delta X_1 + \dots + \lambda_i \cdot P_m \cdot \Delta X_m \quad (11)$$

which means also that a change in utility of individual i is equal to:

$$\Delta U_i = \lambda_i \cdot \sum_{j=1}^m P_j \cdot \Delta X_j \quad (12)$$

From equations 11 and 12 we see, that the utility from the increment of income is equal to the change in income, multiplied by the marginal utility of income. To find the change in **social** welfare from a rise in national income, we assume that a change in social welfare (ΔSW) is equal to:

$$\Delta SW = \Delta U_1 + \Delta U_2 + \dots + \Delta U_n = \sum_{i=1}^n \Delta U_i \quad (13)$$

This means, that the individual's utility can be aggregated to form the following equation:

$$\Delta SW = \sum_{i=1}^n \sum_{j=1}^m \lambda_i \cdot P_j \cdot \Delta X_{ij} \quad (14)$$

Equation 14 can also be applied to **costs** and **benefits**. It can then be stated, that some goods are “inputs”, i.e. negative, and others can be seen as “outputs” you **get**.

If equation 14 is expanded, the following equation can be written:

$$\Delta SW = \sum_{i=1}^n \left[\sum_{j=1}^k \lambda_i \cdot P_j \cdot \Delta b_{ij} - \sum_{j=1}^m \lambda_i \cdot P_j \cdot \Delta c_{ij} \right] \quad (15)$$

If the marginal utility of income is assumed equal for all persons, it can then be assumed that:

$$\lambda_1 = \lambda_2 = \dots = \lambda_n = \lambda$$

If the change in national product is distributed across the community, equation 15 can be simplified so that a change in social welfare (ΔSW) can now be written as:

$$\Delta SW = \lambda \cdot \left[\sum_{j=1}^k P_j \cdot \Delta b_{ij} - \sum_{j=1}^m P_j \Delta c_{ij} \right] \quad (16)$$

Since the absolute magnitude of SW is not relevant, we can write equation 16 as:

$$\Delta SW = \sum_{j=1}^k P_j \cdot \Delta b_{ij} - \sum_{j=1}^m P_j \cdot \Delta c_{ij} \quad (17)$$

or

$$\Delta SW = \sum_{j=1}^k B_j - \sum_{j=1}^m C_j \quad \text{if we set } B_j = P_j \cdot \Delta b_j \text{ and } C_j = P_j \cdot \Delta C_j \quad (18)$$

A conclusion can now be drawn, that a change in social welfare is equal to the sum of benefits minus the sum of costs.

The change in social welfare of roleplayers in the incorporation of VUSC will be measured against this final equation of Bråthen, namely that the summation of social costs must be deducted from social benefits. These calculations will be done in chapter 6.

It was mentioned earlier in this chapter, that “pareto optimality” and “potential pareto optimality” form an integral part of the analysis of the impact of the incorporation of VUSC into NWUVTC and these aspects will be analysed.

4.3 PARETO OPTIMALITY

Pareto optimality, according to Nas (1996:11) is an efficiency norm describing the conditions necessary to achieve optimality in resource allocation. It is a state of economic affairs where no one can be made better off without simultaneously making at least one other person worse off. According to Dinwiddy and Teal (1996:60), a welfare improvement can be described as an economic change where in the new situation, at least one individual is better off and no individual is worse off than before.

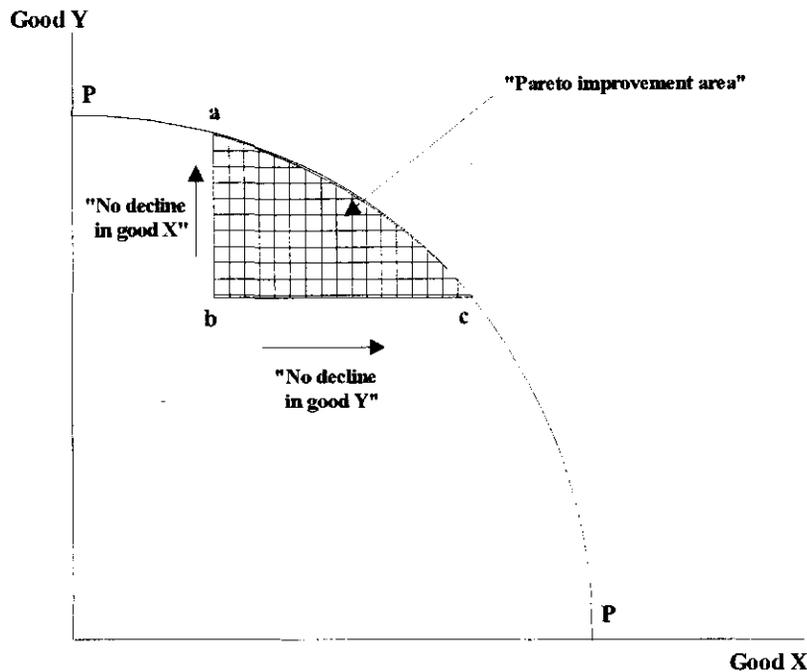
Pareto optimality can be divided into three underlying efficiency conditions, namely production efficiency, exchange efficiency and allocative efficiency.

4.3.1 PRODUCTION EFFICIENCY

Production efficiency represents a resource allocation where it is no longer possible to increase the output of one good without reducing the output of some other good (Bråthen, 2000:4). If the production efficiency is where improvement in one area can be achieved without reducing output levels in other sectors of the economy, such an improvement can be viewed as being a pareto improvement (Nas, 1996:12).

This can be explained with a production possibilities frontier (PPF).

Figure 4.1 Production possibilities frontier (PPF)



Source: Nas (1996:12)

The curve PP in Figure 4.1 illustrates the maximum attainable amounts of two goods (X and Y) that could be produced with a given resource base and technology. Points on the frontier such as (a) and (c) represent pareto efficiency. Points below the frontier, such as (b), represent inefficient uses of resources. A movement from (b) to either (a) or (c) can be achieved without lowering the output of X or Y. If a movement from (b) to (a) takes place, the production of Y increases, with no decline in the production of X and can be seen as a pareto improvement (Nas, 1996:12).

According to Nas (1996:12), a movement from (a) to (c) will cause factor utilisation levels to be altered in both X and Y, resulting in an increase in quantity of X and a decrease in the quantity of Y produced. The rate at which Y is converted into X, is called the marginal rate of transformation of Y into X (MRT_{XY}). This rate varies as factors are transferred from (a) to (c); it is lower at point (a) and rises as resources flow from Y to X along the curve. Browning and Zupan (1989:9) present a similar discussion of the PPF.

This means that as the output combination changes from (a) to (c), society gives up an amount of good Y and gains an amount of good X. It is stated in the introductory paragraph of Section 4.3, that Pareto optimality can be divided into three underlying conditions, namely production efficiency (which was discussed in Section 4.3.1), exchange efficiency and allocative efficiency taking place; it is important to discuss the concepts of isoquants, indifference curves, tangency between two sets of isoquants and tangency between two sets of indifference curves. This can be done by considering a two-sector model, consisting of two goods (X and Y) and two factors, capital (K) and labour (L). The two production functions for X and Y can be given as:

$$X = f(K_x, L_x)$$

where: X = output of X

K_x = capital used to produce X

L_x = labour used to produce X

and $Y = f(K_y, L_y)$

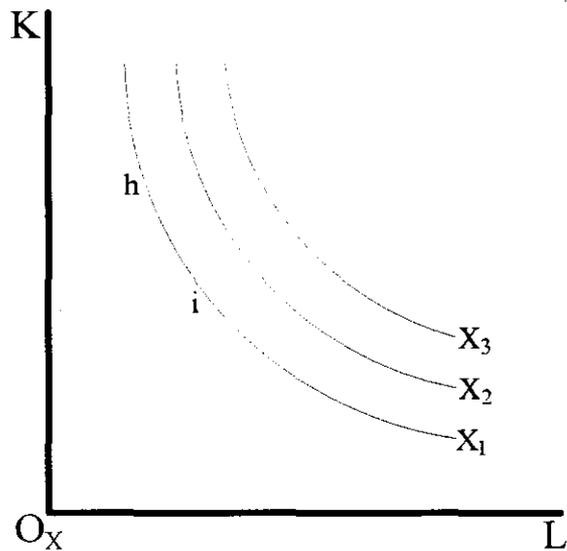
where: Y = output of Y

K_y = capital used to produce Y

L_y = labour used to produce Y. (Nas, 1996:23.)

In this model, capital and labour can be employed in various proportions, with output levels remaining unchanged in both sectors or rising in one sector at the expense of the other. This can be described by using isoquants, drawn for good X (Nas, 1996:23). This is portrayed in Figure 4.2.

Figure 4.2 Isoquants for good X



Source: Nas (1996:24)

As the factor combination varies along the isoquant, the output level remains the same. For example, the labour/capital combination at point h and i, yield the same output X_1 . In other words, the input combination can change an isoquant X_1 , but the output remains the same. Thus, assuming that resources can flow freely between the two sectors, factor movement between X and Y could result in increased output in both sectors or in one sector without reducing output in the other sector (Nas, 1996:24). If factor movements lead to a production stage where the output of X can be increased only by reducing the output of Y, then efficiency in production has been achieved (Nas, 1996:24). In technical terms, such a stage is reached when K and L are allocated between two goods X and Y, such that:

$$MRTS_{LK}^X = MRTS_{LK}^Y$$

where $MRTS_{LK}^X$ = marginal rate of technical substitution between labour and capital to product X.

$MRTS_{LK}^Y$ = marginal rate of technical substitution between labour and capital to produce Y.

or

$$(MP_L/MP_K)^X = (MP_L/MP_K)^Y$$

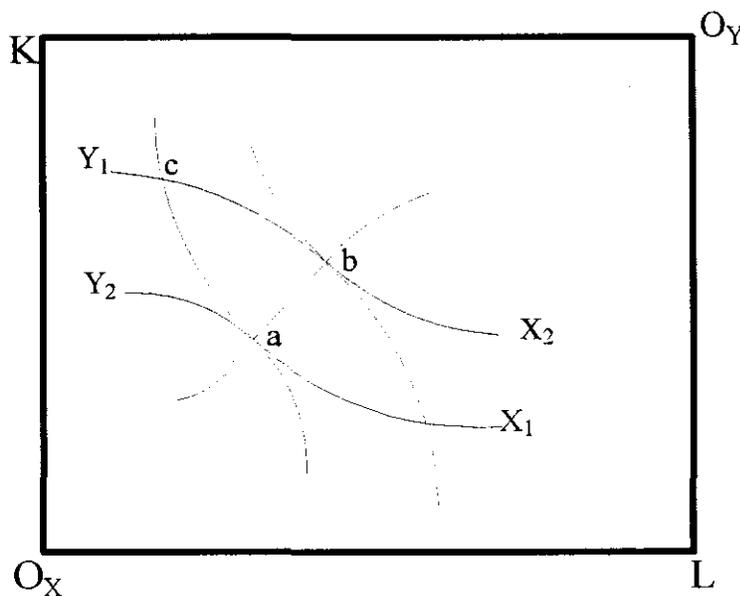
where MP_L = Marginal product of labour

MP_K = Marginal P product of capital.

The marginal rate of technical substitution or labour for capital, which is the amount of additional labour (L), requires to compensate for a marginal decrease in capital (K), still maintaining the same level of output (Nas, 1996:25).

Production efficiency can now be described by using Figure 4.3.

Figure 4.3 The tangency between two sets of isoquants



Source: Nas (1996:25)

In Figure 4.3 production efficiency is described by making use of an Edgeworth Box Diagram, where the horizontal and vertical axes represent the total quantity of labour and capital respectively. The output X, is measured from the origin of the bottom left corner, O_x and the output Y, is measured from the origin of the top right corner, O_y . The initial allocation of point c represents the K/L employed in X and Y. A change in K/L

from c to a, raises the output of Y, while keeping the output of X unchanged. A move from c to a is still on the same isoquant X_1 for Z, but implicates a move to a higher isoquant Y_2 for Y. Similarly, a change from c to b, raises the output of X while keeping Y unchanged. In other words, only at a and b, where the isoquants are tangent, do further rearrangements of L and K result in an increase in the output of one at the expense of the other. These are the points where the marginal rate of technical substitution (MRTS) of L for K for both goods are equal (Nas, 1996:25).

This reallocation of factors of production and the resulting changes in the output of X and Y are described in Figure 4.1 as the production possibilities curve. This production possibilities curve is derived from the contract curve, which is the locus of all efficient points (the tangency points between the two sets of isoquant maps in Figure 4.3) at given quantities of K and L (Nas, 1996:26).

4.3.2 EXCHANGE EFFICIENCY

According to Bråthen (2000:9), an allocation of resources can be optimal in the pareto sense if an efficiently produced output is also allocated efficiently among the consumers, meaning that it is impossible to make one individual better off without making anyone else worse off.

To illustrate exchange efficiency, a two-sector model with two utility functions can be considered, namely:

$$U^A = U^A(X, Y) \text{ and}$$

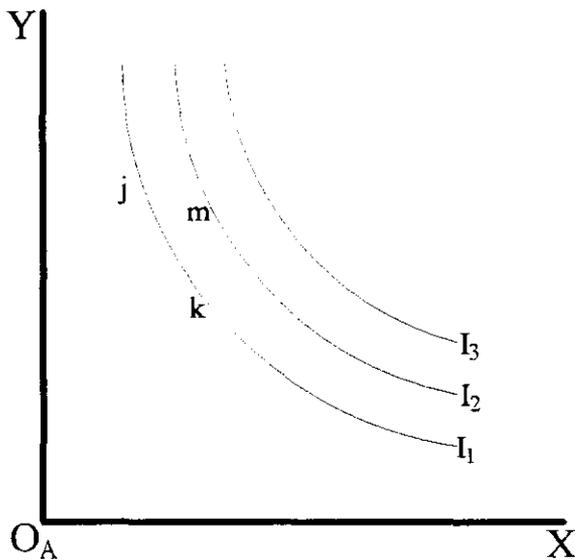
$$U^B = U^B(X, Y) \text{ where:}$$

U^A = utility that individual A derives from alternative combinations of X and Y.

U^B = utility that individual B derives from alternative combination of X and Y.

These combinations can be illustrated by using indifference curves depicted in Figure 4.4.

Figure 4.4 Indifference curves



Source: Nas (1996:27)

In Figure 4.4 an indifference curve represents all possible combinations of X and Y among which individuals are indifferent. Every point along an indifference curve, provides the same level of satisfaction (utility) and each curve corresponds to a different level of satisfaction (utility). For example, the combination of X and Y at point j provides the same utility as the combination at point k, but point m represents a higher level of utility than j and k (Nas, 1996:26).

With a move from j to k, utility remains the same, but the rate at which X and Y are substituted, varies. The rate at which X is substituted for Y, is called the marginal rate of substitution of X for Y (MRS_{XY}) and varies as a move along the indifference curve takes place (Nas, 1996:27). Browning and Zupan (1989:520) state that exchange efficiency takes place under the following condition:

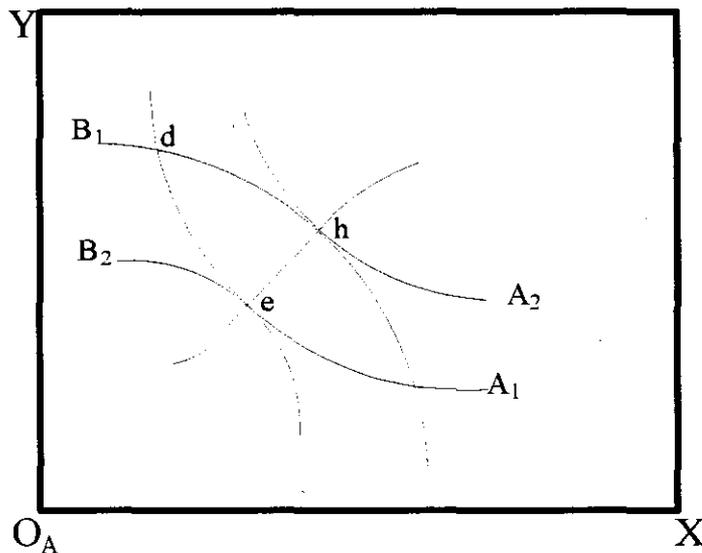
$$MRS_{XY}^A = MRTS_{XY}^B$$

where: MRS_{XY}^A = marginal rate of substitution between capital and labour for A

$MRTS_{XY}^B$ = marginal rate of technical substitution capital and labour for B.

This equality condition can be explained by using an Edgeworth Box Diagram depicted in Figure 4.5.

Figure 4.5 The tangency between two sets of indifference curves



Source: Nas (1996:27)

In Figure 4.5 it is assumed, that there are two outputs X and Y, with consumption levels of A and B measured from the origin O_A and O_B , respectively (Nas, 1996:27).

Both individuals gain from the reallocation of goods from an initial allocation point d to e or h. As a result of the reallocation from d to e, individual A remains on the same utility level, whereas individual B moves to a higher utility level (from B_1 to B_2). At the tangency points, MU_X/MU_Y of both individuals are equal (Nas, 1996:27).

This situation is depicted by the contract curve. This curve is the locus of all possible combinations of X and Y that can be allocated between A and B at one particular output level (Nas, 1996:27).

Each point on the contract curve satisfies the exchange efficiency condition, and any movement between points results in redistribution, benefiting one individual at the expense of the other. Points below or above the contract curve, on the other hand, represent inefficiency, because more can be gained from a given bundle of goods by

moving toward the curve. Thus, all movements other than those toward the contract curve, are inconsistent with pareto optimality (Nas, 1996:27).

This discussion of exchange efficiency is also discussed by Miller and Meiners (1986:569).

4.3.3 ALLOCATIVE EFFICIENCY

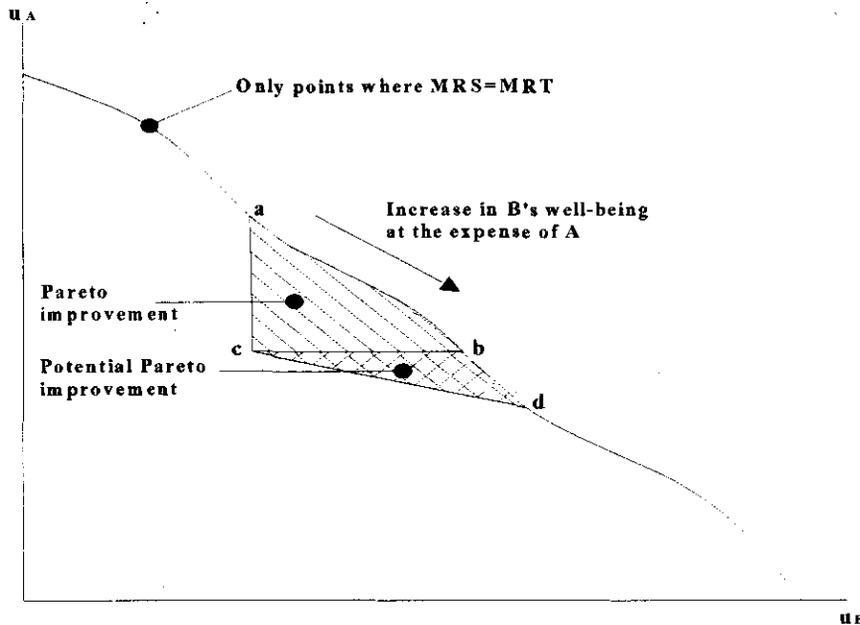
To satisfy the allocation efficiency condition, both the exchange and the production efficiency condition must be met. This means, that the rate at which goods are produced (MRT), must be equal to the rate at which consumers are willing to substitute one with the other (MRS). In other words, there is at least one particular allocation where:

$$MRT_{XY} = MRS_{XY}.$$

This is the allocation that meets both exchange and production efficiency conditions simultaneously (Browning and Zupan, 1989:521).

Such allocations are illustrated by the Grand Utility Frontier ($U_F U_F$) in Figure 4.6.

Figure 4.6 Grand Utility Frontier



Source: Nas (1996:15)

The Grand Utility Frontier is derived from the production possibilities curve by drawing allocation possibilities for each efficient output combination and specifying only the allocation points where MRT equals MRS. Depicting only those points that are efficient, both in production and in exchange, the frontier represents all of the efficient combinations of well-being between A and B (Gould & Lazear, 1989:541).

In Figure 4.6, a movement from (a) to (b) represents an improvement in well-being for B, but is only possible at the expense of reduced well-being of A. A rearrangement of resources changing the combination of both goods will not benefit B without reducing A's well-being. The welfare position at point (c) can be improved by moving to (a) or (b) or any other position within the ab range in order to improve welfare. Any reallocation within the acb triangle, will increase the welfare of one or both individuals without making anyone worse off (Nas, 1996:15).

A resource allocation from (c) to (d) does not meet pareto criteria, because B becomes better off at A's expense. Such a move is defined as a potential pareto improvement, in the sense that (d) is superior to (c), and a movement to (d) could be made possible by

having B compensating A for the loss resultant from the reallocation. This is the Kaldor-Hicks criterion where potential pareto improvement is reached if it is possible for B to compensate A. The sense that (d) is superior to (c) and movement to (d) could be made possible by compensating A for the loss that results from reallocation (Miller & Meiners, 1986:577).

With the pareto improvement and potential pareto improvement in mind, the question arises as to whether a pareto improvement has taken place in terms of the incorporation of VUSC in NWUVTC. In other words, is it a movement within triangle abc or is it a movement to triangle cbd where there is a potential pareto improvement.

If it is assumed in chapter 6, that a potential pareto improvement has taken place; in other words, some individuals are better off than others, but compensation could take place. The question that must then be answered, is: What is the compensation that must take place so that welfare can be improved?

4.4 EXTERNALITIES

As shown in the preceding discussion on pareto optimality in the real world, it may not be possible to achieve economic efficiency, and the source of inefficiency may be that marginal social benefit may deviate from marginal social cost; in other words, the total amount that an individual is willing to pay (benefit), for a good may be too small in terms of the marginal social cost to obtain this good (Eaton & Eaton, 1995:551).

This means, that if students are willing to pay for example R500 per annum extra to obtain a degree from NWUVTC instead of obtaining it from VUSC, while the extra travelling costs to NWUVTC plus other extra costs amount to R600, we can refer to a negative externality because of the net negative effect ($R500 - R600 = -R100$). This net negative effect (cost) (R100) must be added to the private cost (cost of the University) to get the social marginal cost (as described in Section 4.4.1). It is necessary to discuss the concept of externalities because it will be used in chapter 6 to determine whether net positive or negative externalities existed before and after incorporation.

4.4.1 DEFINITION OF EXTERNALITIES

Hogendoorn (1995:243) defines negative externalities as external diseconomies, or negative unfavourable spillovers on third parties, while positive externalities are called external economics or positive favourable spillovers on third parties.

Landsburg (2002:448) refers to the concept of private marginal costs, as those costs of a decision that are borne by the decision-maker, and social marginal costs as the costs of a decision as the private costs plus costs imposed on others.

Hogendoorn (1995:245) also gives a similar definition for social benefits and private benefits. In all cases, an externality is seen as the difference between social and private costs or benefits (Hope, 1999:444).

4.4.2 NEGATIVE AND POSITIVE EXTERNALITIES

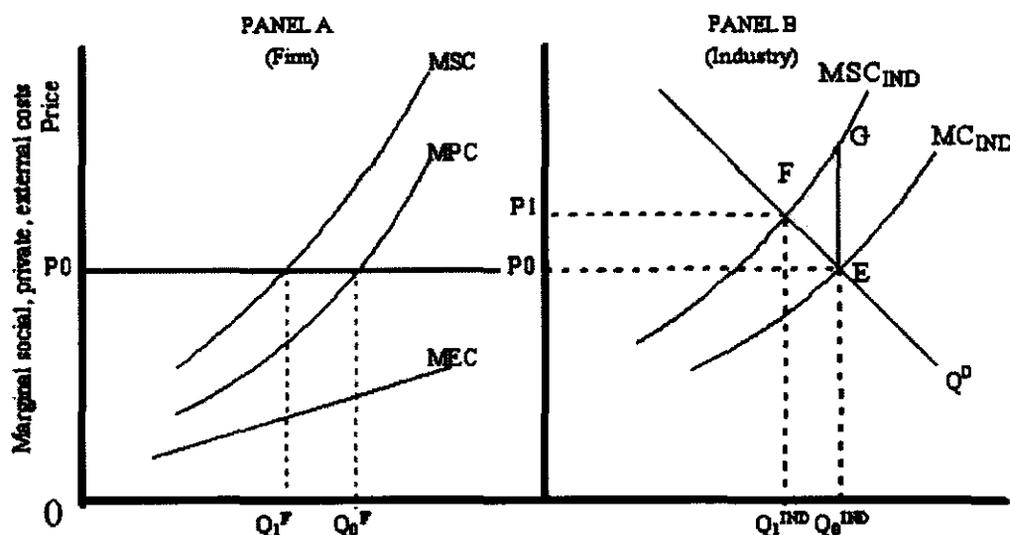
An example of externalities, in the language of the economist, can be a smokers' behaviour which imposes an externality on their non-smoking neighbours, because it directly affects their well-being. This is called a negative externality. But not all externalities are negative, because the creation of a new public park can be an example of a positive externality (Eaton & Eaton, 1995:545).

According to Nas (1996:37), externalities are costs and benefits imposed on third parties. Examples of external costs or negative externalities, include costs associated with a variety of industrial air pollutants produced as part of the production process.

Hope (1999:444) argues, that a negative production externality can be graphically explained.

Consider panel A and panel B in Figure 4.7, where the position of a competitive firm is explained in panel A and the position of the industry in which it operates, is explained in panel B.

Figure 4.7 Production externalities for the firm and industry



Source: Hope (1999:445)

In Figure 4.7 panel A indicates production externalities for the firm, while panel B indicates the production externalities for the industry.

In panel A and panel B it is assumed that:

- MSC curve = Marginal social cost
- MPC curve = Marginal private cost
- MEC curve = Marginal external cost
- Q^D = Market demand curve
- MC_{IND} = Industry supply curve
- MSC_{IND} = Marginal social cost of industry

The industry's price when there are no externalities, is P_0 (panel B) given by the intersection of the market demand curve Q^D and the industry supply curve (MC). Suppose now that this firm is responsible for emitting some type of harmful pollutant into the environment. We can present this by the marginal external cost curve (MEC) in

panel A. This shows the additional environmental cost to others from an additional unit of output and it is assumed, that it rises as the firm's output rises (Hope, 1999:445).

The addition of the marginal external cost to the firm's marginal private cost (MPC) gives the marginal social cost (MSC). The marginal cost of production to the firm, therefore, understates the marginal cost to society, which is represented by the vertical distance between the MPC and the MSC curves in panel A. If the external cost of this one firm is typical of others in the industry, then the MSC for an industry will lie above the supply curve and this case is represented in panel B (Hope, 1999:445).

The socially-efficient level of output is determined by the intersection of the MSC_{IND} curve and the industry demand curve Q^D . The welfare cost to industry is thus given by the triangle EFG. This cost is a result of the private decisions of individual firms, who ignores the social costs of pollution and which then leads to an inefficiently high level of production. For the individual firm, this is shown by the distance $Q_0^F - Q_1^F$ (Hope, 1999:445).

Based on the abovementioned analysis, the following four types of externalities are evident. (Hope, 1999:446):

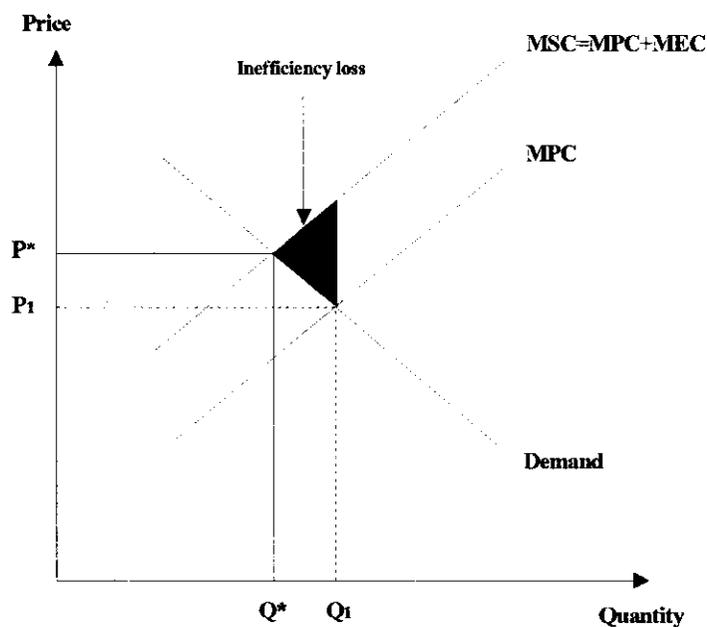
- Negative production externalities, where the marginal private cost is less than the marginal social cost.
- Negative consumption externalities, where the marginal social benefit is less than the marginal private benefit.
- Positive production externalities, where the marginal private costs is more than the marginal social costs.
- Positive consumption externalities, where the marginal social is more than marginal the private benefit.

4.4.3 INEFFICIENCY LOSS AND EXTERNALITIES

These negative and positive externalities can further be explained by looking at examples of over- and under-utilisation of resources because of external costs, to show the inefficiency loss in the case of externalities (Nas, 1996:37).

Nas (1996:37) indicates with a production function, $Q = f(K, L, E)$ where K is capital, L is labour and E is a resource (such as air that is freely available to producers), that because E is free, it is over-utilised. This is explained in Figure 4.8.

Figure 4.8 Over-utilisation of resources because of external costs



Source: Slabbert & Bråthen (2003:26)

To analyse the over-utilization of resources because of external costs, production function $Q = f(K, L, E)$ in Figure 4.8 it is assumed that:

Q = Quantum produced

K = Capital

L = Labour

E = Resource (such as air) that is freely available

MPC = Marginal private costs

MSC = Marginal social costs

MSB = Marginal social benefit

MEB = Marginal external benefit

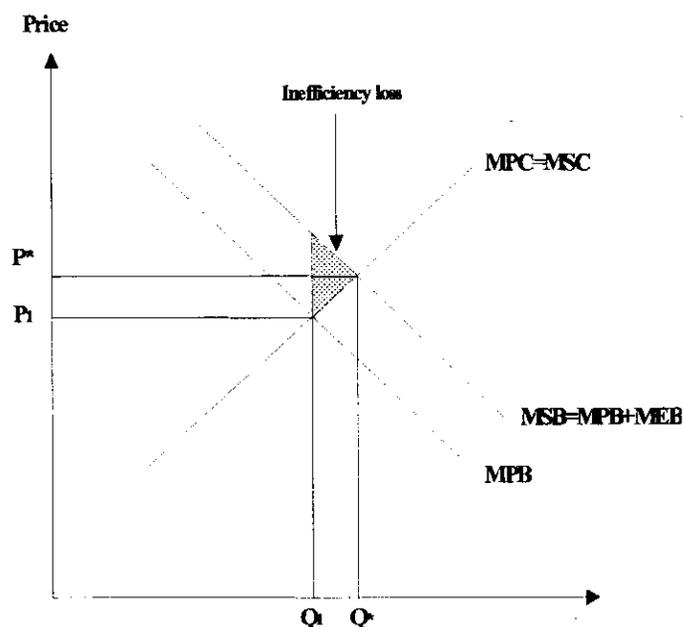
MEC = Marginal external costs

In Figure 4.8 the marginal private cost (MPC) includes the cost of K and L. The cost associated with E is not included in the marginal external cost (MEC). Marginal social cost includes both MPC and MEC. To symbolise the damage imposed on third parties that results from the utilisation of E, MEC is included in the marginal social cost (MSC). Therefore, the MSC is equal to MPC plus MEC (Nas, 1996:37).

It is assumed that the optimal output level from the firm's perspective, is Q_1 . This is the output level where Marginal Private Cost (MPC) equals the marginal social benefit Marginal Social Benefit (MSB) but it is also the output where Marginal Social Cost (MSC) exceeds MSB, which causes inefficiency in resource allocation. At an output level of Q where MSC intersects MSB, an equilibrium is reached where producers are made liable for the damage caused. In this case the inefficiency loss is indicated by the shaded area (Nas, 1996:37). This example is also applicable when determining inefficiency losses in the case of this study, where the marginal social costs may be greater than private costs in the case of the incorporation of VUSC.

In the case of a positive externality, the source of inefficiency is the under-utilisation of resources. In Figure 4.9 the marginal social benefit (MSB) incorporating both private and external benefit, exceeds marginal private cost (MPC) at output level Q_1 which causes an inefficient allocation of resources (Nas, 1996:37).

Figure 4.9 Under-utilisation of resources because of external benefits



Source: Slabbert & Bråthen (2003:27)

It is assumed in Figure 4.9, that:

Q_1 = Optimal output from the firm's perspective

Q^* = Optimal output from society's perspective

MPC = Marginal private costs

MSC = Marginal social costs

MSB = Marginal private benefit

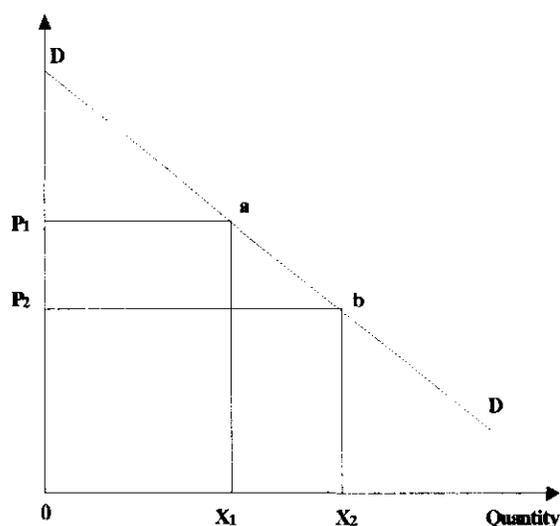
In this case the inefficiency loss is indicated as a shaded area in Figure 4.9.

The following concept that must be discussed, is changes in consumer surplus and producer surplus. Layard and Glaister (1996:5) refer to the change in consumer and producer surplus to measure a welfare change.

4.5 CONSUMER SURPLUS

Consumer surplus can be defined as the difference between the maximum amount that an individual would be willing to pay for a good and the actual amount paid (Nas, 1996:67). This concept can be explained in the following manner (Nas, 1996:68). Consider Figure 4.10 which demand curve DD where ODa X_1 indicates the maximum amount that the individual is willing to pay for X_1 units and $OP_1 aX_1$ is the amount that he actually pays at the market price P_1 .

Figure 4.10 Consumer surplus



Source: Slabbert & Bråthen (2003:36)

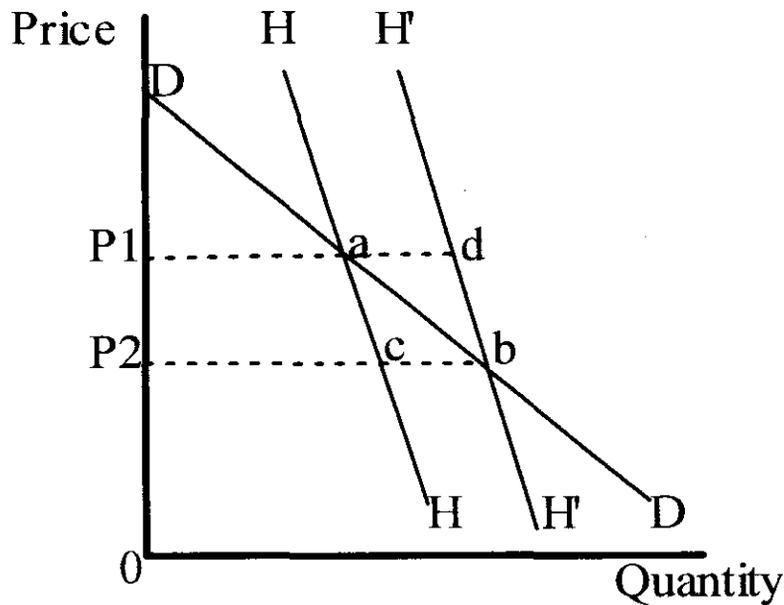
The difference is the area P_1Da , which represents the total value of the consumer surplus gained at X_1 . At a lower price P_2 the consumer surplus will be P_2Db and the additional consumer surplus will be P_1P_2ba . This concept of consumer surplus can be used to determine the effects of a project like the incorporation of VUSC into NWUVTC; if student fees were at P_2 at VUSC and the fee structure at NWUVTC are at P_1 , it means that according to this consumer surplus concept the consumer surplus of students have decreased with the area P_1abP_2 . According to Dinwiddy and Teal, (1996:6), it effectively means a reduction in welfare.

The consumer surplus derived from the ordinary demand curve, is not an exact measure of the welfare effect of the price change, because the demand curve assumes money income being constant. By definition, a movement along the curve involves both substitution and real income effects, and when prices decrease, both effects allow the individual to move to a higher indifference curve. To obtain a more exact measure of the welfare effect of a price change, we need to eliminate the real income effect and measure only the pure substitution effect of the price change (Nas, 1996:69).

To remove the income effect, we must draw compensated demand curves HH and H^1H^1 by allowing the individual to remain at the pre- and post-price change utility level (Figure 4.11.) These curves assume income to be constant and account for the substitution effect of a price change only (Nas, 1996:69).

For a normal good, the demand curve will be steeper in terms of slope than the ordinary demand curve DD. The area under $P_1ab P_2$ represents the individual's real income in Figure 4.11. The area below HH, namely $P_1ac P_2$, and the area below H^1H^1 , $P_1db P_2$, account for the substitution effect and they can be assumed as precise measures of the variation in consumer welfare caused by the price change. In other words, if compensated demand curves are used, it means that the actual welfare change of students can be measured by the area $P_1db P_2$.

Figure 4.11 Compensated variation and equivalent variation



Source: Nas (1996:70)

Nas (1996:71) also discusses the concept “compensating variation” (CV). This indicates the amount that the individual would be willing to pay (accept) for a price reduction (increase) while maintaining on the same level of utility. It may be that students pay higher fees, but on the other hand, that they may be willing to pay (WTP) a higher fee to receive a certificate from NWUVTTC (willingness to accept).

For a price increase from P_2 to P_1 compensated variation is shown as the area $P_1db P_2$ below H^1H^1 .

Equivalent variation (EV) on the other hand, is the amount needed to compensate the individual who refrains from buying the good at the lower price or the maximum amount that an individual is willing to pay to be exempted from the higher price and so remains at the pre price change real income level.

The area $P_1db P_2$ is the amount of money needed to compensate the individual who refrains from buying the good at the lower price, so that he/she will not be worse off.

The individual is willing to forego the opportunity of buying the good at the lower price P_2 , as long as he or she receives a sum of money that would keep him or her as well off as before the price change. Equivalent variation in the case of a price change, becomes P_1 to P_2 , which indicates the maximum amount that the individual will be willing to pay to be exempted from the higher price P_1 (Nas, 1996:71).

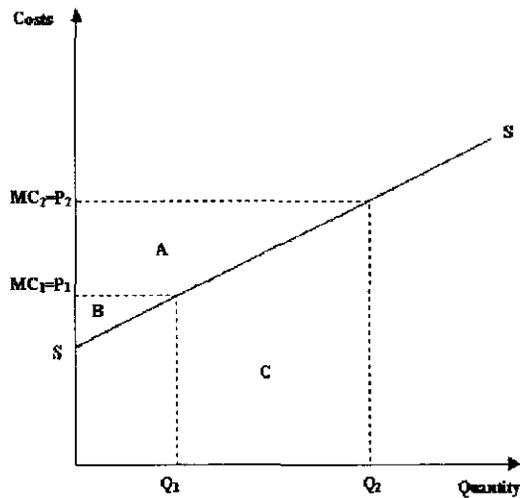
According to Nas (1996:71) either EV (WTA) or CV (WTP) could be used to determine a welfare gain and for a welfare loss, either EV (WTP) or CV (WTA) can be used.

4.6 PRODUCER SURPLUS

In the discussion on consumer surplus, it was assumed that costs are constant, but costs increase as production increase. Nas (1996:76) explains this concept as follows. In Figure 4.12 SS represents the supply curve with a positive slope. SS also represents the opportunity cost of a factor. At P_1 , marginal costs equal P_1 at output level Q_1 and when prices increase, output increases until MC again equals price. At price P_1 , all units within the output range from the origin to Q_1 are supplied at price P_1 ; therefore the supplier earns additional sums above the respective marginal cost up to Q_1 . This is called producer surplus as shown in Figure 4.12 by area B, and is the difference between the actual price and the amount that the supplier is willing to accept to provide the good. When the price increases, producer surplus increases by area A.

The producer surplus is the difference between the market value of the factor and its opportunity cost.

Figure 4.12 Producer surplus



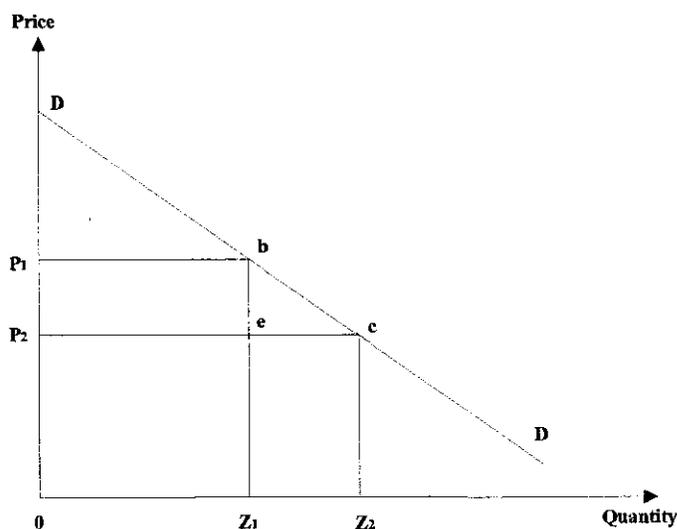
Source: Slabbert & Bråthen (2003:42)

4.7 COSTS AND BENEFITS OF A PROJECT USING CONSUMER AND PRODUCER SURPLUS

4.7.1 CONSTANT COSTS

If it is assumed, that there are no market imperfections and that output is produced in a constant cost environment, the real effect can be explained with an ordinary demand curve (Bråthen, 2000:25). In Figure 4.13 the total benefit of a project provided at Z_1 , is the area $ODbZ_1$. The total costs amount to the rectangle OP_1bZ_1 and the net benefit is shown by triangle P_1Db .

Figure 4.13 Real direct effect of a project (constant costs)



Source: Slabbert & Bråthen (2003:41)

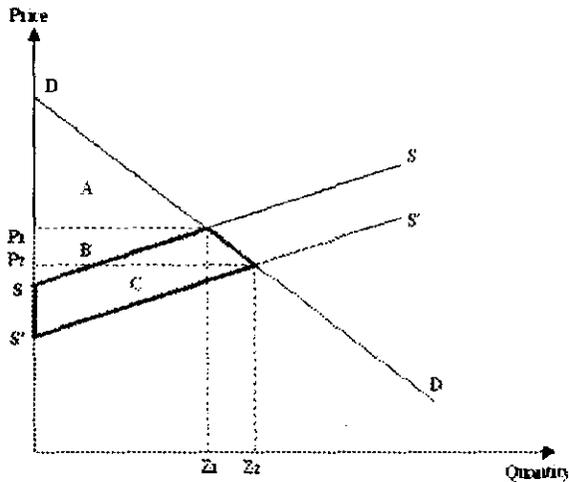
If a new project is proposed to lower the cost of an existing public program from P_1 to P_2 , then area P_1bcP_2 becomes the measure of project benefits.

4.7.2 INCREASING COSTS

When supply is upward-sloping (increasing costs), the project benefit must be measured by using both consumer and producer surplus. This case is illustrated in Figure 4.14 where DD represents the demand curve and SS and S^1S^1 the supply curves (Bråthen, 2000:26).

A cost-saving project will shift the supply curve from SS to S^1S^1 , which will result in an increase in both consumer and producer surplus (Bråthen, 2000:26).

Figure 4.14 Producers surplus and increasing costs



Source: Slabbert & Bråthen (2003:42)

The project benefits then consist of both consumer and producer surplus, indicated by areas A and B respectively. The sum of this is depicted by area C. This corresponds with Dinwiddy and Teal (1996:7), who indicate, that a change in welfare can be expressed as:

$$\Delta W = \Delta CS + \Delta PS$$

where: ΔW = Change in welfare

ΔCS = Change in consumer surplus

ΔPS = Change in producer surplus

Dinwiddy and Teal (1996:8) also indicate, that this change in welfare can be seen as a net gain/loss to society.

4.8 CONCLUSION

As was stated in the introduction of this chapter, any attempt to determine the net social welfare impact of a project, requires a general theoretical framework within which costs and benefits can be identified and analysed (Nas, 1996:3).

This theoretical framework includes an understanding of what is meant by society's net utility gain of a project as discussed under welfare economics. Miller (1982:422) states that it must be decided what is "best" or "optimum" from among the alternative solutions available. This statement must be kept in mind when the incorporation of VUSC is analysed in terms of social utility, costs and benefits. It will also be necessary to determine whether economic efficiency was reached with the incorporation process of VUSC.

To do this, it will be necessary to use the pareto condition and Kaldor-Hicks criterion discussed earlier in this chapter. In other words, is there " ... a state of economic affairs where no one can be made better off without simultaneously making at least one person worse off", in other words, who will benefit from the incorporation of VUSC into NWUVTTC in terms of probably higher cost etc. and who will lose?

As was mentioned earlier in this chapter, with the assumptions of welfare economics in mind, it will be better to look at a group of individuals who will be affected rather than at individuals. This means that the change in welfare, as stated by Bråthen (2000:6), and the change in welfare, as stated by Dinwiddy and Teal (1996:6), can be used. In this regard Bråthen sees a change in welfare as the sumtotal of benefits, minus the sumtotal of costs, while Dinwiddy and Teal see a welfare change as the change in consumer surplus, plus the change in producer surplus. This will be dealt with in chapter 6.

CHAPTER 5 METHODOLOGY APPLIED FOR AN IMPACT ASSESSMENT

5.1 INTRODUCTION

Any rational decision-making process involves weighing up the advantages and disadvantages of a policy action. The way in which these advantages and disadvantages are compared, vary according to the type of decision rule or framework (Odeck, 2000:46). It is thus necessary to discuss the methodology or framework that can be used to weigh up advantages and disadvantages of a policy action. The weighing up of advantages and disadvantages of the policy action to incorporate VUSC into NWUVTC, will also need a methodology which will be discussed in this chapter.

In this chapter, economic impact assessment and the differences with financial analysis types of impact assessment, as well as the practical steps and methods to value impacts for cost benefit analysis (CBA) are discussed.

5.2 ECONOMIC IMPACT ASSESSMENT

In this part of the study, the concept impact assessment and the difference between a financial analysis and economic impact assessment (EIA) are shown.

5.2.1 DEFINITION OF ECONOMIC IMPACT ASSESSMENT

Bråthen (2000:1) defines economic impact assessment as the use of methods and processes to comprehensively describe advantages and disadvantages (pros and cons) from different actions (project). Impact assessment again, implies a systematic practice where assumptions, methods and results are presented in such a way that they can be tested by other analysts.”

Odeck (2000:4) sees economic impact assessment as the process of weighing up advantages and disadvantages in order to decide whether a project is desirable. Mullins (2002:18) states, that financial analysis, economic analysis and social analysis

form the ingredients of a comprehensive economic analysis to weigh up the advantages and disadvantages of a project.

Economic impact assessment thus includes all methods to weigh up the advantages and disadvantages of a project.

5.2.2 DIFFERENCE BETWEEN A FINANCIAL ANALYSIS AND ECONOMIC IMPACT ASSESSMENT

Financial analysis is used primarily in the private sector in order to determine which outcomes are best from the perspective of private interest. The streams of expected cash and revenues are considered as benefits, and direct payment to factors of production are viewed as costs, regardless of their output effects on third parties (NAS, 1996:2).

Mullins (2002:18) states, that a financial analysis refers to one or more accounting techniques, e.g. cash flow analysis, profit determination or the analysis of the source and application of funds where market prices are used. Dixon and Sherman (1990:204) state, that a financial analysis uses only market values, but excludes economic externalities. Bråthen (2000:1) sees a financial analysis as a process to determine profitability from a private interest viewpoint, revenues as benefits and payment to factors of production as costs.

Economic impact assessment (EIA) on the other hand, takes the potential gains and losses of the public viewpoint into account and converts them into monetary units to see if projects are profitable (Bråthen, 2000:1).

Dixon and Sherman (1990:204) see economic analysis as an analysis to determine social welfare. Davies (1993:14) refers to a cost benefit analysis that includes social issues as a "social cost benefit analysis".

One of the methodologies used in impact assessment, is cost benefit analysis (CBA) and this is a method that also evaluates from the basis of public interest (Nas, 1996:2). Mullins (2002:19) states, that with the help of a social analysis the consequences of a project for the distribution of welfare in the community, can be analysed and evaluated.

It is evident from the concepts above, that the analysis of the incorporation of VUSC into NWUVTTC can not be restricted to a financial analysis, but it will also be important to look at a wider concept such as economic impact assessment (EIA), so that society's perspective could be included into the analysis.

5.3 TYPES OF IMPACT ASSESMENTS

Odeck (2000:31) states, that the systematic frameworks that are advocated and used in many countries, include the following.

- Cost benefit analysis (CBA).
- Cost effectiveness analysis (CEA).
- Multi criteria analysis (MCA).
- Risk benefit analysis (RBA).

For the purpose of this study to analyse all relevant impacts of the incorporation of VUSC into NWUVTTC, CBA will be assumed as a comprehensive procedure to include all impacts on the North-West University, Vaal Triangle Campus (NWUVTTC), as well as on society, the students and staff of Vista University, Sebokeng Campus (VUSC).

The last three types will be briefly discussed, while cost benefit analysis will be discussed in detail.

5.3.1 COST EFFECTIVENESS ANALYSIS

Cost effectiveness deals with benefits that are not easily quantified or for which there are no easily defined money units. There is thus no formal rule for determining whether a policy is desirable or not. The principle of cost effectiveness analysis (CEA) is to obtain a money-based index that is helpful in comparing alternatives that are intended to reach the same general type of objective. Such an index can be obtained as follows.

$$\text{Cost effective index} = \frac{\text{Units that measure consequence}}{\text{Cost in monetary units}}$$

Thus, a project with the highest index is preferred (Odeck, 2000:33). This method is primarily used in health services where it is difficult to identify and quantify benefits and costs. This method was applied by Birch and Gafni (1992:279) and Peele (1993:205), to investigate welfare losses in the health market. But there are also studies in health care, for example Holtgrave *et al.* (1993), who have used cost benefit analysis (CBA) to determine and compare the economic costs and benefits of HIV counselling and testing.

5.3.2 MULTI-CRITERIA ANALYSIS (MCA)

Multi-criteria analysis (MCA) uses both the effects that have been given monetary value and other effects considered to be of interest. In relation to CEA, multi-criteria analysis tackles the problem of several effects arising from a policy, while CEA cannot. Since effects of a policy cannot be directly added together, because of lack of a common unit (which would be money, in the case of CBA), MCA places some weighting factor on the individual effects. If, for example, reduced accidents are more important than gains in scenic beauty, they would attract a higher importance weight. The various benefits may then be summed up in their weighted form. For example, if benefits are accident reduction (A), scenic beauty (S) and savings in travel time (T), and each has an importance weight a, s and t respectively, the overall benefit is B'.

$$B' = aA + sS + tT$$

The weights are in fact prices, since they reflect the relative importance of each of the objectives. They are, however, derived in a number of ways – by asking stakeholders such as experts, individuals and decision-makers. Multi-criteria analysis is a more complex process than described here. This description gives only its essential features (Odeck, 2000:34).

One advantage of multi-criterion analysis is, that it describes and shows the multiple objectives that decision-makers generally have, and if the importance weights can be derived, it enables diverse objectives to be integrated. As compared to the CEA, the fundamental difference is, that MCA recognises that economic efficiency is not the sole objectivity of a policy (Odeck, 2000:34). This method was used by Stewart *et al.*, (1997) for natural resource management in South Africa.

5.3.3 RISK BENEFIT ANALYSIS (RBA)

The application of decision rules to risky events has led to the emergence of risk benefit analysis (RBA). RBA is nothing but CBA in the context of risky events. To see the formal equivalence, consider a transportation project that will increase the level of pollution and hence the risk of becoming sick. The risk of such a policy is the number of people becoming sick due to pollution. Risk can, therefore, be compared to the benefit to get "risk benefit analysis". The similarity with CBA is, that RBA takes the number of sick people to be the cost and the foregone resource cost to be the benefit (Odeck, 2000:35).

5.3.4 COST BENEFIT ANALYSIS (CBA)

The cost benefit analysis methodology has evolved over the years with increased acceptance by numerous disciplines and government agencies (Nas, 1996:4). South Africa is no exception, as Mullins (2002:2) states, that the concept and practice of Cost benefit analysis (CBA) was steadily promoted for use in state departments with the backing of the finance department. Davies (1993:12) also states that, CBA has increased in popularity in recent years.

Cost benefit analysis (CBA) has also been criticised by many authors (Adams, 1992:65; Bowers, 1990:17 and Söderbaum, 1990:36). Adams (1992:67) criticises cost benefit analysis, in that the latter is piecemeal in approach. These pieces have linkages between them and these could be overlooked. Common (1988:306) argues, that this criticism is valid, but it is not always practical to apply a holistic view.

Although there is criticism, CBA is used over a wide spectrum, as many researchers have used CBA in environmental studies (Cropper & Oates, 1992). In South Africa, CBA was used in a study conducted by Conningart Consultants (2000) for the Water Research Commission.

The Development Bank of Southern Africa (DBSA) suggests steps that will be discussed in Section 5.4 and Table 5.1 in executing CBA where provision is made to include all possible impacts of a project (DBSA, 2000).

5.4 APPROACHES TO COST BENEFIT ANALYSIS

Cost benefit analysis involves a number of distinct stages. According to Bojo *et al.*, (1990:60) and Nas (1996:60), these stages are:

- identification of costs and benefits,
- measurement of costs and benefits,
- comparison of cost and benefit streams accruing during the life time of a project, and
- project selection.

The Development Bank of Southern Africa (DBSA, 2000) extends these stages to eight distinct stages that are more comprehensive than the stages mentioned by the foregone authors.

These distinct stages that will be used in this study, are shown in Table 5.1.

Table 5.1 Steps in execution of a CBA as suggested by the Development Bank of South Africa (DBSA)

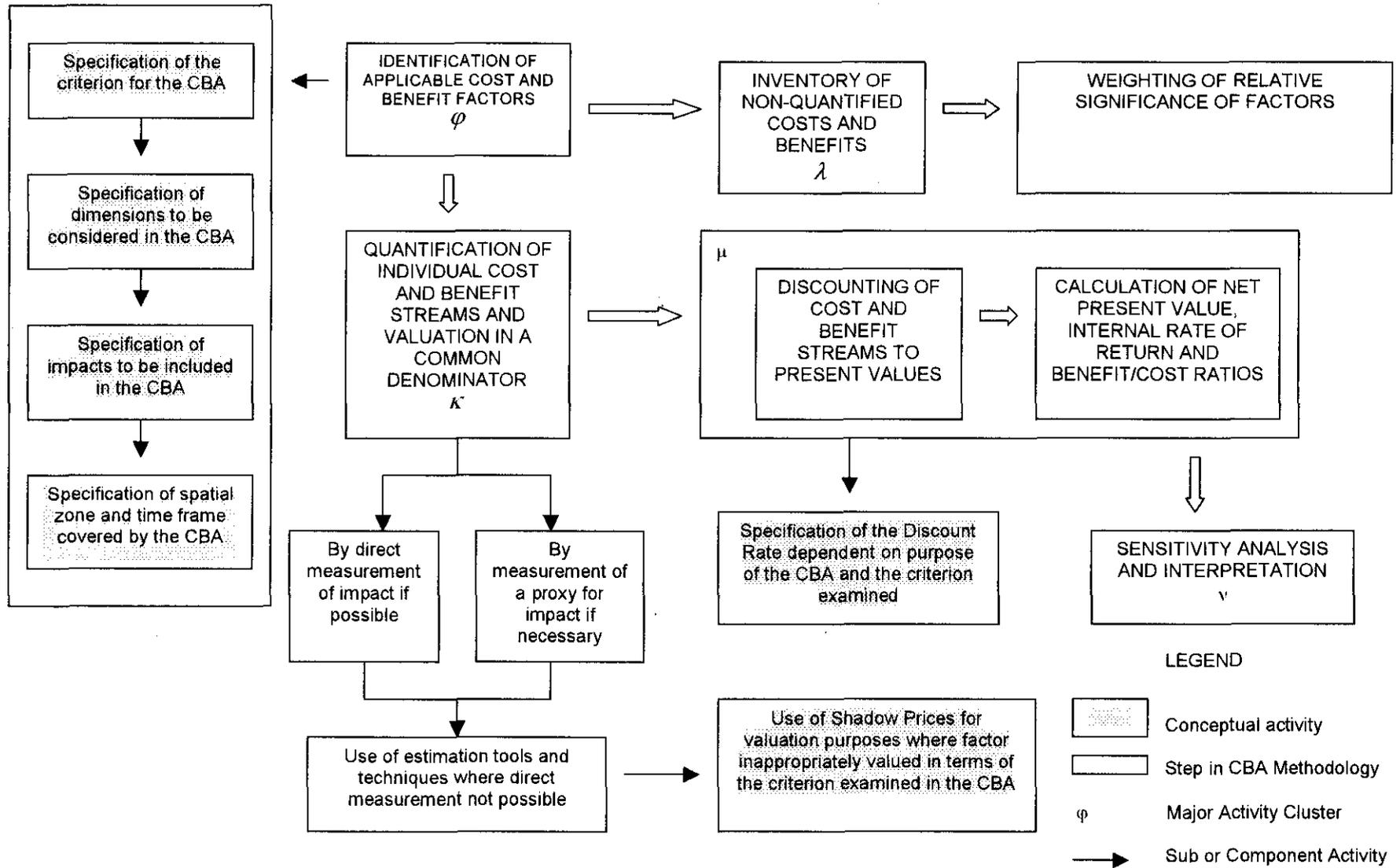
Step	Activity
1	<p>Specification of purpose of the CBA and specification of project boundaries within which the analysis is to be conducted.</p> <p>By the setting of a perspective it is important that the analyst will acquaint her/himself with all the relevant facts in order to develop a feeling for the problem, the proposed solutions and the milieu within which a recommendation is to be made.</p>
2	<p>Identification of all impacts i.e. costs and benefits generated by a project within the boundaries specified for analysis. It must once again be emphasised that the analyst should measure the costs and benefits relative to the nil alternative. Further, it is important that the analysis should not be done in terms of only a single set of parameters, but that a whole number of critical scenarios should be investigated with the aid of sensitivity analysis.</p>
3	<p>Quantification of cost and benefit streams via direct measurement of the impact itself or, if necessary, measurement of an appropriate proxy for the impact. If direct measurement of the impact or proxy is not possible, the impact or proxy should be estimated using appropriate estimation tools and techniques.</p>
4	<p>Impacts, which are difficult to measure, should nevertheless be recorded in qualitative terms and if possible ranked in order of importance.</p> <p>The analyst should also, as far as possible, quantify the social consequences of a project, and where such quantification is not possible they should be reported qualitatively. The following social consequences of a project should be addressed</p>
	<ul style="list-style-type: none"> (i) Distributional effects between income groups, population groups or geographical regions. (ii) Welfare consequences. (iii) Political and constitutional implications. (iv) Strategic consequences. (v) Prestige. (vi) The creation of job opportunities. (vii) The achievement of economic independence. (viii) Population movements.
5	Discounting of project cost and benefit streams to present values.
6	Calculation of Net Present Value (NPV), Internal Rate of Return (IRR) and Benefit Cost Ratio (BCR) to define the value of the project in economic terms.
7	Sensitivity analysis on the cost and benefit streams. The analysis should be based on risk factors, which have been identified in the project setting.
8	Interpretation and reporting of the results of the analysis.

Source: Development Bank of Southern Africa (2000:20)

The discussion of the stages in CBA will be done according to these stages.

Figure 5.1 gives a visual presentation of these stages that can be used as a conceptual framework for the development of cost benefit analysis practice.

Figure 5.1 Conceptual framework for development of cost benefit analysis practice



Source: Development Bank of Southern Africa, 2000:21

The conceptual framework given in Figure 5.1 includes the following.

- Firstly, the specification of criteria that will be used in the CBA, must be laid down; specifications of dimensions to consider must be laid down; specifications of impacts to be included in the study must be laid down and a time-frame covered by the CBA, must be laid down.
- Secondly, an inventory of non-quantified costs and benefits must be done.
- Thirdly, a quantification of individual cost and benefit streams and valuation in terms of common denominator must be decided on and executed.
- Fourthly, all quantified costs and benefits must be discounted to present values and the internal rate of return and cost benefit ratios must be calculated.

These stages and conceptual framework will now be discussed in more detail.

5.5 STAGES OF COST BENEFIT ANALYSIS

5.5.1 PURPOSE OF COST BENEFIT ANALYSIS

According to Mullins (2002:68), the first stage of cost benefit analysis, is to give a short specification of the purpose of the CBA, formulated as a problem statement. The problem statement in chapter 1 serves this purpose.

Mullins (2002:68) divides this stage into the following four parts.

- An introductory paragraph that covers the most important financial, economic and social implications of the project.
- The project identifications which include the nature of the problem that gives rise to the need for a solution.
- The aim of the analysis, namely the analysis to identify the financial, economic and social implications of the alternatives and an explanation of the costs and benefits included in and excluded from the analysis.

- The limitations of the analysis.

5.5.2 IDENTIFICATION OF ALL IMPACTS

Nas (1996:60) states, that all related costs and benefits must be identified, and their relevance to a project must be justified in this stage of CBA.

The main reference in identifying costs and benefits is the Kaldor-Hicks efficiency standard as discussed in Section 4.3.3. This standard is satisfied as long as a policy change maximises net social benefits. According to this rule, those who benefit from an increase in output could compensate those who suffer from output losses and still remain better off (Nas, 1996:61).

It is necessary in this stage to use one of the following approaches to assess net benefits.

- The before-after approach, which is based on historical records of what costs and benefits were before the project and what they will be after the project. This approach will be used in this study.
- The with-without approach, where a comparison is drawn on the net marginal social utility that would have been gained with and without the project (Bråthen, 2000:10).

Bråthen (2000:10) also distinguishes between real output effects and pecuniary effects.

- Real output effects are changes in total physical production possibilities, with an ensuing change in society's welfare.
- Pecuniary effects are distributional and create no real welfare gains to society.

5.5.3 VALUING COSTS AND BENEFITS

In this stage it is important to generate values for tangible and intangible elements of a project. Tangible elements such as capital equipment, labour, land and so on, must be priced and values for intangibles for which no price information exist, must be found

(Nas, 1996:62). According to Odeck (2000:36), this can be divided into the following four categories.

- Impacts for which prices exist in the market.
- Impacts for which prices can be imputed from quasi-market observations.
- Impacts that can be indicated only by using weights.
- Impacts which can be indicated only by applying qualitative description.

5.5.3.1 Impacts for which prices exist in the market

In a perfectly competitive market economy all goods for which consumers are willing to pay the costs, will be produced and prices will be equal to the marginal cost of production. In such a market the resource values of goods will be reflected in their prices (Odeck, 2000:37). Examples where market prices can be taken to represent the true cost of resources, include construction, maintenance and operating costs of a project (Odeck, 2000:37). The operational costs and expenditure on personnel (chapter 6) fall within this category.

5.5.3.2 Impacts for which prices can be derived from quasi-market observations

Many costs and benefits of a project, like time saving/loss, pain and grief resulting from accidents, do not have direct market prices (Odeck, 2000:37).

Principal methods that could be used to value these impacts include the following.

- Revealed preferences (RP).
- Hedonic pricing (HP).
- Travel cost method (TCM).
- Stated preferences (SP).
- Contingent valuation.

- Replacement cost method.
- Dose-response method. (Odeck, 2000:38).

5.5.3.2.1 Revealed preferences (RP)

Revealed preferences (RP) methods rely on finding a market in which people reveal the value they attach to an attribute in question in terms of willingness to pay for it or to accept compensation for its loss, by observing actual behaviour. The RP method implicitly assumes, that individuals know the value of the good in question and are aware of the effect on their utility that an increase or a decrease in the goods in question would bring. Revealed preference has been applied widely in transport, for example in the valuation of travel time. The calculation of travel time value and the value of travel time of VUSC students and staff will not be based on this method but the guidelines of Mullins (2002:99) will be used in this regard.

The approach has been used to elicit that which people are willing to pay to save time. The most popular case is that of the choice of travel mode, where people may have a choice between two modes, one of which is faster and more expensive than the other (Odeck, 2000:38).

RP is useful, but has also its weaknesses. To estimate the value of time to a reasonable degree, samples running into thousands of observations are needed and the data usually have to be collected specifically for this purpose by means of a questionnaire to elicit why people choose as they actually do. (Odeck, 2000:38.)

5.5.3.2.2 Hedonic pricing (HP)

Hedonic pricing (HP) is a form of revealed preference analysis. Its main preposition is that the price of a good is related to its characteristics and that thus the consumers' preference for attributes of a good can, therefore, be derived from consumption decisions. HP is used mostly in the context of house price models to derive amenity/environmental benefits associated with a particular area. Scotchmer (1985) has used this method to evaluate the degree of willingness to pay in terms of prices on housing. The approach is, to estimate the relationship between house prices and the

environmental characteristics of houses, while controlling other factors such as the physical characteristics of the house and its accessibility. The estimated effect on the price of the environmental factors such as the level of noise and air pollution and often taken as some sort of mean valuation of the characteristics in question, although more complex methods may be applied (Odeck, 2000:38).

The HP approach has several shortcomings. For instance, as usually applied, it assumes a perfect market in which buyers with perfect knowledge can obtain any combination of characteristics they wish. At best it can only be used to value attributes experienced in the home and where people correctly perceive the effects themselves. Thus it is likely to be more appropriate in valuing noise nuisance than valuing the health impacts of air pollution. Further, HP has limited application where housing is rented, and it cannot provide the values held by people who have no interests in the particular housing market. Moreover, there is no clear relationship between willingness to pay as is normally indicated by sales prices and the social costs or benefits. Data requirements are also very high and there may be problems in finding a suitable sample population (Odeck, 2000:38).

5.5.3.2.3 Travel cost method (TCM)

The travel cost (or the Clawson method) approach, as contrasted to the HP method, is applicable only for valuing the benefits of visiting facilities. It relies solely on estimating a demand curve relating the frequency of visits to the travel costs involved. TCM in transport has been used to provide estimates of the value of recreational sites that are severed or damaged, due to road construction (Odeck, 2000:39).

Again there are some limitations with TCM. The most common is, that most leisure trips are multipurpose, and it may not be clear to what extent the cost is incurred in visiting single facilities, such as a beach or a stretch of woodland as opposed to other components of the trip. TCM is a partial technique because it measures only the benefit people get from visiting sites rather than the value the site may hold in terms of scientific research or people's willingness to pay to preserve it (Hanley & Spash, 1993:83).

5.5.3.2.4 Stated preference (SP)

An alternative to finding markets, in which people reveal their valuation by choices they make, is to use surveys to ask them about hypothetical decisions. Such hypothetical methods are normally referred to as stated preference (SP). In recent years, SP methods have taken over from revealed preference as the dominant method used in overcoming valuation problems in cost-benefit analysis. In some context such as the value of timesavings, the reason is cost effectiveness in data collection. By asking respondents to choose between a number of hypothetical alternative pairs of options, estimates may be obtained of the relative value they attach to different attributes of the options. Stated preference exists in a number of different forms, the most popular being the contingent valuation method (CVM) that will subsequently be discussed (Odeck, 2000:39).

5.5.3.2.5 Contingent valuation method (CVM)

The contingent valuation method has become popular especially in the environmental field. CVM involves actually asking direct questions about an individuals' "willingness to pay" (WTP) or "willingness to accept" (WTA) in order to achieve or to avoid a particular result, such as reducing the level of noise nuisance in a given area or to protect forests from destruction (Odeck, 2000:40). King and Mazzotta (2003:1) state, that CVM can be used where no market price exists. King and Mazzotta (2003:6) divide this into the following.

- Contingent ranking. In this method individuals are asked by way of surveys to compare and rank alternate programme outcomes with various costs.
- Discrete choice. In the discrete choice approach, respondents are simultaneously shown two or more different alternatives and their characteristics and asked to identify the most preferred alternative.

There is, however, criticism against the contingent valuation method, because it is biased in the sense, that respondents may over- or underestimate their willingness to accept or to show willingness to pay should it suit them (Whittington *et al.*, 1990:219).

According to King and Mazzotta (2003:10), this can be overcome by asking both open-ended and closed-ended questions in a survey. Vaughan *et al.*, (1999:1) classify these as follows.

- Open-ended questions in which respondents can name any amount he/she wishes when asked "what are you willing to pay".
- Dichotomous choice (referendum) or closed-ended questions, for example: "Indicate below (on a scale) what are you willing to pay".

This method will be used in the October 2003 questionnaire in order to determine the expected benefits of the incorporation for students from VUSC.

5.5.3.2.6 Replacement cost method

The cost of replacing goods which have been damaged or destroyed by a particular impact, can be used as a proxy for the benefit to society of eliminating certain externalities resulting from, for instance, road investments. An example could be the planting of trees replacing those felled during construction. A weakness of the replacement cost method is, that replacements may not actually take place. In such a case, the replacement cost is a poor guide to the loss of benefit (Odeck, 2000:39).

5.5.3.2.7 Dose response relationship

This method (dose response relationship) involves obtaining money values, for instance, of pollution. Two stages are involved. Firstly, the general relationship between physical damage and level of pollution is identified. Secondly, the specific level of pollution is used to estimate the physical damage. Multiplying the physical damage in quantity by the price per unit of damage, gives the cost of pollution. Dose response has been used in the study of pollution health, metal corrosion and vegetation damage. The problem with dose response is, that the data requirement is high and there are problems of interdependence between causal variables. Further, there are doubts as to whether the alternative cost fully reflects the cost of the externality (Odeck, 2000:40).

5.5.3.3 Impacts that can only be indicated by use of weights

Another approach to determine impact values, is to seek to derive values directly by assigning weights to each impact, stating the impact's importance relative to all other impacts under consideration. The weights are derived in a number of ways; by asking experts, individuals, decision-makers and other stakeholders. There are several techniques under this category generally termed "multi-criteria". These categories include lexicographic approaches, consensus-maximising approaches, aggregational techniques, graphical techniques and concordance techniques. Common to these techniques is, that they try to overcome the basic problem which occurs when alternative schemes have to be evaluated by using a range of apparently non-comparable criteria. They seek to describe the diverse scheme impacts in similar terms, so that trade-offs and comparisons can be made more easily. These techniques reduce the information about impacts to a set of single number scores (or grand index) and to determine the best solution or to produce a complete or partial ranking of alternative, following a series of pair wise comparisons (Odeck, 2000:40).

5.5.3.4 Impacts which can be indicated only by using qualitative description

Impacts that belong to this category, are divided into two groups: (1) those that cannot be valued mainly because no adequate study of the effects exists, and (2) those where valuation might be wrong in principle, because they are irreplaceable or their effects may be irreversible (Odeck, 2000:41).

For those in group (1), impacts can be dealt with by expert opinion. In the second group it may be inappropriate to use the monetary value of impacts. These considerations should be thoroughly described for political judgements.

Whenever these types of impacts arise, they are best dealt with by explicit descriptions and/or measurements rather than by valuation. However, a set of rules and procedures determining what should be described, the level of detail and the bodies to be consulted is necessary (Odeck, 2000:42). These qualitative possible benefits will be measured using statements in the October 2001 and October 2003 questionnaire on the expected

improvement in quality, standard of education, opinion on a name change of the university etc.

5.5.3.5 Valuation of time

Against the background of extra travel time for students which may arise in this study on the incorporation of VUSC, it is necessary to discuss the valuation of time into monetary units in more detail.

Nas (1996:109) states, that the value of time can be approximated by using hourly market wages, considering that individuals choose between work and leisure on the basis of benefits they receive from each additional unit of time devoted to each activity, and assuming that the market hourly wage forms a basis for such comparisons (Nas, 1996:109). At the margin, individuals compare the monetary return from an additional unit of work time to subjective benefits that they expect from pursuing an additional unit of leisure time (Bråthen, 2000:43).

Nas (1996:109) states that the value of time can be expressed as follows:

$SVMP_W = W = MB_L$, if the marginal disutility of work has already been internalised in the determination of market wages, where:

$SVMP_W$ = The individual's subjective evaluation of an additional hour of work

W = Market wage rate

MB_L = Subjective marginal benefit that an individual derives from an additional hour of leisure

Mullins (2002:82) provides estimates for the value of time per working hour and recreational hour, as indicated in Table 5.2.

The figures in Table 5.2 were calculated by Mullins (2002:92) and the methodology used by him, is discussed below.

The average provincial annual remuneration for 13 occupational categories was used as the basis for the calculations for Table 5.2. The figures for these 13 categories were aggregated to represent high, middle and low remuneration groups. In this regard, the “professional” and “manager executive” categories were classified to be the high income group, whereas the category “workers” were assumed to represent the low income groups. The remaining categories were then aggregated to form the middle income group.

The value of a working hour per income group (see column 1 in Table 5.2.) was obtained by dividing the average for a specific income group by the total number of working hours per annum. The total number of working hours, per year was calculated as the product of the total number of weeks (52) and the average number of working hours per week (40). The result was 2 080 hours, rounded off to 2 000 hours. This was done in order to take into account that not all workers are fully employed on a year basis.

In order to calculate the value of a recreational hour for all persons (see column 2 of Table 5.2) the labour force dependency ratio as published by the DBSA (2000:121) was used. The value per recreational hour was obtained by dividing the value of a recreational hour for workers for the total population by the dependency rate.

Table 5.2 Estimated time cost according to income group in 2000 prices

Income group	Value of a working hour	Value of recreational hour for all persons	Value of recreation hour for workers
Low (R0 – R22 688)	R9.44	R0.65	R2.15
Medium (R22 688 - R104 841)	R21.41	R2.61	R4.90
High (more than R104 841)	R62.19	R9.62	R14.19

Source: Mullins 2002:99

The information in Table 5.2 will be used to calculate in monetary terms the value of extra time spent on the road by students and staff of VUSC after incorporation.

5.5.4 IMPACTS IN QUALITATIVE TERMS

According to DBSA (2000:22), impacts which are difficult to measure, should nevertheless be recorded in qualitative terms and if possible, ranked in order of importance. Where social consequences of a project are difficult to quantify, they should be reported qualitatively. The DBSA (2000:22) stated, that the following consequences can be addressed.

- Distributional effects between income groups.
- Welfare consequences.
- Political and constitutional consequences.
- Strategic consequences.
- Prestige.
- Creation of job opportunities.
- Achievement of economic independence.

- Population movements.

Bråthen (2001:82) states that one of the main advantages of impact assessment is that impacts in non-monetary terms are also included. The extended CBA framework suggested by the DBSA (2000), makes provision for this, while the above framework can be seen as an impact assessment in the wider context.

5.5.5 DISCOUNTING COSTS AND BENEFITS

Once the costs and benefits of a project have been identified and properly quantified, the next step in project analysis, is to evaluate these costs and benefits in a time dimension (Nas, 1996:117).

According to Mullins (2002:44), project assessment criteria can be divided into the net present value method (NPV), internal rate of return (IRR) and the discounted benefit-cost ratio (BCR). Nas (1996:117), however, indicates, that care must be taken in the choice of the discount rate and the decision rule (method) for project selection. These methods will be discussed in detail.

5.5.5.1 Net present value method

Odeck (2000:31) states, that the basic rule in CBA can be formulated as follows:

$$NSB = B - C > 0$$

In this equation NSB denotes net social benefits, B is the benefit and C is cost. The basic rule above, implies that a policy is desirable if the net social benefits are positive, i.e. benefits are greater than costs.

According to this method, the difference between the benefits and costs (the net benefit) in the specified year, are discounted to the present, by using the social discount rate. The discounted sum of all these net benefits over the economic project life, is defined as the net present value (NPV). In terms of the terminology set out above, this can be formulated as follows.

$$NPV = \sum B_j / (1+i)^j - \sum C_j / (1+i)^j.$$

where: NPV = Net present value

B = Benefit

C = Cost

i = Discount rate

j = Time period

The criterion for the acceptance of a project is that the net present value must be positive; in other words, funds will be voted for a project only if the analysis produces a positive net present value (Mullins, 2002:44).

5.5.5.2 Internal rate of return

Odeck (2000:32) defines internal rate of return (IRR) as the discount rate which would produce an NPV equal to zero, in other words, it is the discount rate at which the present values of cost and benefits are equal. It is, therefore, the value of the discount rate r which satisfies the following equation.

$$\sum B^j / (1+r)^j - \sum C^j / (1+r)^j = 0.$$

Only projects with an internal rate of return higher than the social discount rate, which forms a lower limit, will be considered for funding (Mullins, 2002:45).

5.5.5.3 Discounted benefit cost ratio

Another method closely related to the NPV, is the profitability index, commonly known as a benefit cost ratio (BCR). A benefit cost ratio is used to determine the feasibility of a project during any given year or over a time-span (NAS, 1996:122).

Odeck (2000:32) defines the benefit cost ratio as follows.

$$\frac{B}{C} = \frac{\sum_{t=0}^T B_t(1+r)^{-t}}{\sum_{t=0}^T C_t(1+r)^{-t}}$$

where: B = Benefits

C = Costs

r = Discount rate

t = Time span

The decision rule is, that B/C equal to or greater than one, is acceptable (NAS, 1996:123). For the purpose of this study, it will be necessary to compare the BCR before the incorporation of VUSC into NWUVTC.

5.5.5.4 Discount rate to use

Sassone and Scaffer (1978:237) state, that the discount rate to use in cost benefit analysis is one of the most widely investigated issues. Mullins (2002:71) suggests, that the official (2001) real discount rate of 8 percent can be used for purposes of CBA in South Africa.

The reasons given by Mullins (2002:72) are, that this discount rate is well above the theoretical discount rates, calculated by using the underlying theory of the long-term real interest rates (cost of funding to the state) and the social time preference rate. Mullins (2002:72) argues, that the average long-term real interest rate of South Africa over the long term (last 15 years) is approximately 5 percent. Kirkpatrick and Weiss (1996:11) estimate the social time preference rate to be between 1 to 5 percent for developing countries.

For the purpose of this study, a discount rate of 8 percent will be used.

5.5.6 INTERPRETATION AND REPORTING OF THE RESULTS OF THE ANALYSIS

Bråthen (2000:67) suggests, that a planned balance sheet (PBS) can be used as a structured way of presenting the results of the impact assessment (CBA as well as other methods) to show the impacts on the various groups in society. It must be stated that a PBS is used in cost benefit analysis and must not be confused with a balance sheet used in accountancy.

The technique involves setting down, in tabular form, all the pros and cons associated with the project. These socio-economic accounts are then expressed in monetary values, whenever possible.

This method was used by Bråthen (2000:29) to document economic impacts and financial cash flow in an economic impact assessment. Table 5.3 gives an example of the planned balance sheet method used by Brathen (2000:29) to determine the economic impact of a new airport.

Table 5.3 Example of planned balance sheet for an airport

Costs and benefits SVG example	Economic impacts		Financial cashflow	
	Benefits	Costs	Revenue	Cost
CI Passenger benefits				
C1.1 Business travels	370			
C1.2 Others	0			
C1.3 Delays	54			
C1.4 Ticket costs				1 550
S1 Accident costs	137			
S1.1 Statistical lives	n.a.			
S1.2 Injuries	n.a.			
S1.3 Material damage and administration	n.a.			
E1 The environment				
E1.1 Local and regional emissions (NO _x , VOC, particles)		6		
E1.2 Global emissions (CO ₂)		36		
P1 The State/general taxes				
P1.1 Fiscal aviation taxes			92	
P1.2 VAT on NCAA investments and operating costs			62	
P2 Operators/airlines				
P2.1 Operating costs		122		122
P2.2 Aviation charges to the NCAA				95
P2.3 Fiscal aviation taxes				92
P2.4 Ticket revenues			1 500	
P2.5 Delay costs	21		21	
<i>Sum financial cashflow operators/airlines</i>			1 571	309
P3 Other commercial activities (shops, tax-free)			n.a.	22
P4 NCAA				
P4.1 Investments		223		275
P4.2 Residual value		-7		
P4.3 Maintenance and operations		161		171
P4.4 Revenues from aviation taxes			95	
P4.5 Other commercial activities			22	
<i>SUM financial cashflow NCAA</i>			177	446
<i>SUM economic impacts</i>	582	541		
Net present value (NPV)		41		
NPV/Cost ratio		41/446 = 0,1		

Source: Bråthen (2000:29)

A similar planned balance sheet will be used to document monetary costs and benefits of all roleplayers of the incorporation of VUSC into NWUVTG.

Odeck (2000:56) gives an explanation of how non-monetised impacts can be summarized together. He gave a common procedure to evaluate each of the non-monetised impacts, so that these could be considered together with, or compared to, the monetised impacts. The procedure is based on the following three terms: value, magnitude and importance.

For evaluating each non-monetised impact, the following steps apply.

- The values of areas influenced by the project, are characterized with respect to the most important impacts.
- The magnitude of the impacts on these themes is determined through qualitative and verbal descriptions.
- The importance of the impacts is determined by an overall assessment.

The value and magnitude of impacts caused by the project are described by using a sliding qualitative scale. The value of an impact is described on a sliding scale ranging from "small" or "no value" to "very large" values. The magnitude of an impact is also described on a sliding, scale ranging from "small" or "no value" to "very large" values. The magnitude of an impact is also described on a sliding scale varying between "very large negative magnitude" and "very large positive magnitude" as the extremes (Odeck, 2000:56).

By combining the value and magnitude of an impact, the importance of the impact can be calculated.

The scale used to determine importance, has nine intervals ranging from very negative (---) to very positive (++++) and indeed as follows.

Table 5.4 Scale used to interpret non-monetised impacts

+++++	Very large positive impact
+++	Large positive impact
++	Average positive impact
+	Small positive impact
0	Little/no impact
-	Small
--	Average negative impact
---	Large negative impact
----	Very large negative impact

Source: Odeck (2000:56)

5.6 SUMMARY AND CONCLUSION

It is stated in the introduction of this chapter, that the way in which advantages and disadvantages are compared, vary according to the type of decision rule or framework used. It is thus necessary to discuss the methodology or framework that can be used to weigh up the advantages and disadvantages of a policy. This methodology and framework is discussed in this chapter. It is stated in this chapter, that a difference exists between economic impact assessment and a financial analysis. In this regard it is stated, that economic impact assessment (EIA) takes the potential gains and losses of the public viewpoint into account and converts them into monetary units to see if projects are profitable, whereas a financial analysis excludes the potential gains and losses of the public.

Cost benefit analysis (CBA) is identified in this chapter as the method that will be used to analyse possible positive and negative impacts on the students and staff of VUSC and positive and negative impacts on the NWUUTC.

The approach to follow in cost benefit analysis (CBA), is discussed in this chapter and can be divided into steps suggested by the Development Bank of Southern Africa (DBSA).

These steps include that a detailed analysis must be done of possible costs and benefits to students and staff of VUSC and NWUVTC.

Secondly, it is suggested, that these identified costs and benefits should be measured in terms of the possible costs and benefits, methods to use to value time, tuition fees, travel costs, etc.

Potential costs and benefits that can not be expressed in monetary terms must be identified, and a scale to measure these impacts, is discussed in this chapter.

Thirdly, a comparison must be drawn between the cost and the benefits over time and methods to determine this, e.g. the use of a discount rate and cost benefit ratio as discussed in this chapter.

Fourthly, it is suggested in this chapter, that based on the above, a project must be selected, or the desirability of a project can be stated.

It is suggested in this chapter, that the foregone steps suggested by DBSA, must be documented in a planned balance sheet. Two approaches can be used to evaluate potential impacts of projects, namely a before-after approach, where costs and benefits before incorporation of VUSC into NUWVTC are compared with costs and benefits after the incorporation of VUSC into NWUVTC. The second approach, namely a with-without approach, will not be used in this chapter.

In the next chapter the steps of CBA will be used to identify and quantify potential costs and benefits to students and staff of VUSC and NWUVTC. The methodology stated in this chapter, will be used in the quantification of potential benefits and costs. The costs and benefits to students and staff of VUSC and NUWVTC will then be documented in a planned balance sheet, while criteria stated in this chapter will be used to draw a comparison and will be analysed according to methods discussed in this chapter. In this respect it is difficult to express impacts in monetary terms.

CHAPTER 6 ECONOMIC IMPACT ASSESSMENT OF THE INCORPORATION OF VUSC INTO NWUVTC

6.1 INTRODUCTION

Odeck (2000:46) indicates that any rational decision-making process involves weighing up the advantages and disadvantages of a policy action. The policy action in this study, is the incorporation of VUSC into NWUVTC.

As stated in the research problem, Section 1.2, this research study will determine whether or not the incorporation will benefit the existing North-West University, the Vaal Triangle Campus (NWUVTC), as well as the students and staff of Vista University, Sebokeng Campus (VUSC).

Specific questions that must be answered in this chapter, are the following.

- Will the new merged institution be able to address the needs of the Vaal Triangle's African population? In other words, will the new incorporated university be able to increase the participation rate of African and coloured students?
- To what extent will the new merged institution be able to attract students from the previously disadvantaged communities?
- To what extent will the financial viability of the new merged institution be affected?
- To what extent will the incorporation enable the efficient use of buildings, facilities and human resources, and if not, what will the cost/financial implications be?

These questions will be answered in this chapter by looking at the monetised (travel cost, operation cost, etc.) as well as non-monetised impacts (accessibility, racial composition, etc.)

This chapter is based on:

- a research questionnaire (Annexure C and D) distributed to 390 students and all staff members of VUSC in October 2001;

- a research questionnaire (Annexure E) completed by 450 students (VUSC) at the end of October 2003 when the decision to incorporate VUSC had already been promulgated by law; and
- forecasts for 2004, 2005 and 2006 of operational income and expenditure for the North-West University, Vaal Triangle Campus (NWUVTVC) by Lucouw (2003:1).

6.2 BACKGROUND OF VUSC STUDENTS

6.2.1 GEOGRAPHIC PROFILE OF STUDENTS FROM VUSC

Before the impact on students and staff of VUSC is discussed, it is necessary to determine the domicile of students and staff of VUSC. This is necessary, because it will be used in calculations to determine travel costs and possible benefits of students and staff of VUSC.

This information was obtained by means of a questionnaire handed out to students and staff in the last two weeks of October 2001. A questionnaire was also handed out in the last two weeks of October 2003, asking the same information (for example: to indicate the residential area where students stay).

At the end of 2001 (October) 46.5% of the students indicated that they were staying in areas (extensions) in Sebokeng. Compared to this figure, 52.8% of students indicated in the October 2003 questionnaire that they were staying in residential areas in Sebokeng. In October 2001, 18.9% of students indicated that they were staying in residential areas of Evaton, as compared to 15.9% of the students in October 2003.

A comparison of the residential areas where students of VUSC stay, is given in Table 6.1 and Figures 6.1 and 6.2.

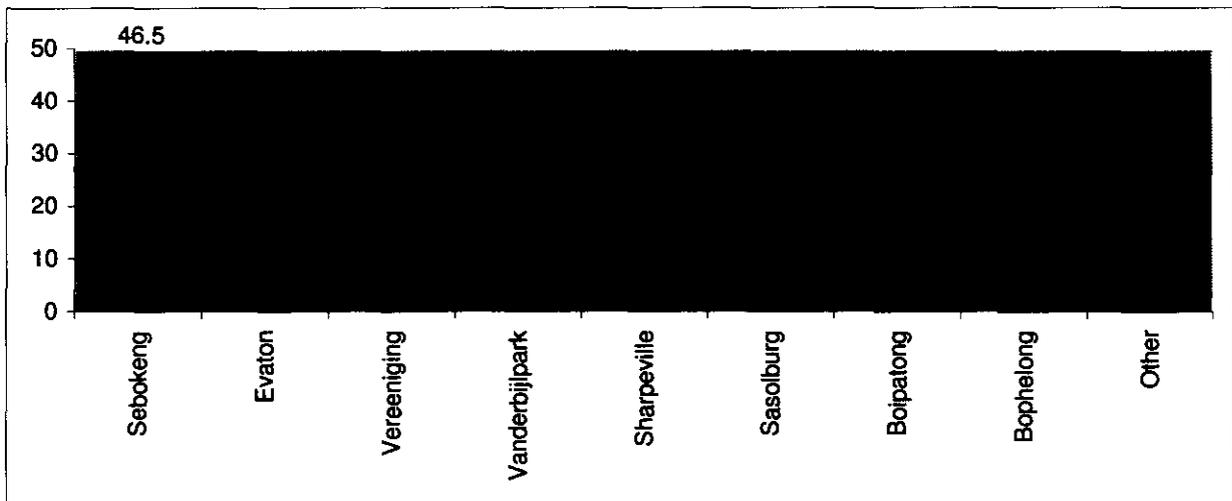
It is evident from Table 6.1, that hardly any changes have taken place in the residential area where students indicated that they stay. In October 2003 almost 68.7% of students of VUSC stayed in areas of Sebokeng and Evaton near the VUSC situated in Zone 10 of Sebokeng. This information is portrayed in Figure 6.1 and 6.2.

**Table 6.1 Comparison of residential areas where students of VUSC stay:
October 2001 and October 2003**

Residential area	Percentage of students October 2001	Percentage of students October 2003
Sebokeng	46.5	52.8
Evaton	18.9	15.9
Vereeniging	6.4	5.2
Vanderbijlpark	5.4	3.2
Sharpeville	4.5	3.6
Sasolburg	4.8	4.4
Boipatong	2.9	2.4
Bophelong	3.2	5.2
Other residential areas	7.4	7.3

Source: Grobler (2001 & 2003)

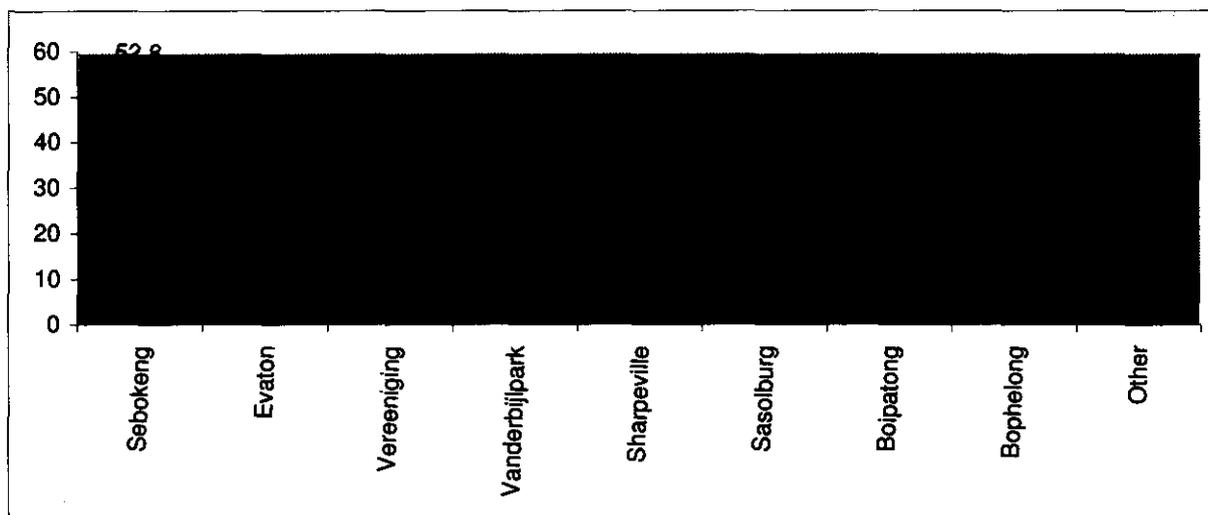
Figure 6.1 Residential areas indicated by students of VUSC: October 2001



Source: Grobler (2001)

It is seen from Figure 6.1, that almost 65.4% of students of VUSC have indicated areas in Sebokeng and Evaton. If this is compared with Figure 6.2, where the residential areas were indicated in October 2003, there are still almost 68.7% of VUSC students who stay in the same areas (Sebokeng and Evaton).

Figure 6.2 Residential areas indicated by students of VUSC: October 2003



Source: Grobler (2003)

6.2.2 Mode of transport used by VUSC students

VUSC students primarily make use of taxi transport. In October 2003, 76.3% of the students who completed the questionnaire, indicated that they made use of taxi transport as compared to 73.7% of students in the October 2001 survey. In October 2003, 16.1% of the students indicated, that they walk to the campus as compared to 20.6% in October 2001 survey.

Table 6.2 gives a comparison of the modes of transport indicated by students in the October 2001 and October 2003 surveys.

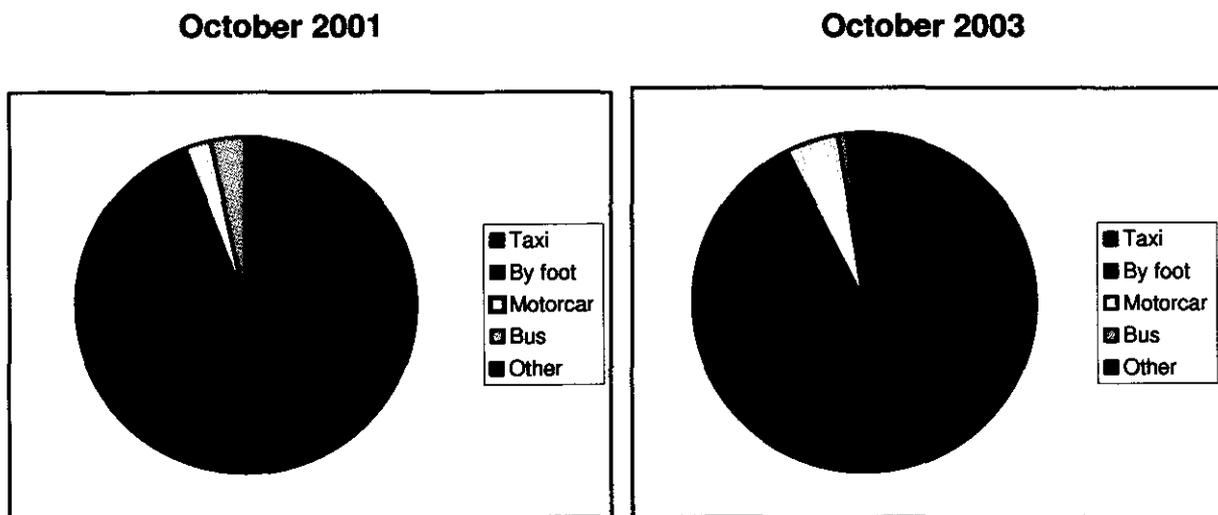
Table 6.2 Comparison of the modes of transport indicated by students in October 2001 and October 2003

Mode of transport	Percentage students in October 2001	Percentage students in October 2003
Taxi	73.7	76.3
Walking by foot	20.6	16.1
Motorcar	2.5	5.2
Bus	3.2	0.8
Other (including bicycle)	0	1.6

Source: Grobler (2001 & 2003)

It is evident from Table 6.2, that a very large percentage of students make use of inexpensive modes of transport (for example: 20.6% and 16.1% who walk to the university: October 2001 and October 2003). Figure 6.3 gives a visual comparison of modes of transport used by students of VUSC in October 2001 and October 2003.

Figure 6.3 A comparison of modes of transport used by VUSC students: October 2001 and October 2003



Source: Grobler (2001 & 2003)

6.2.3 Geographic changes expected in future

In the October 2003 questionnaire, the following question was asked to students (Question 2.4): "If the University would close down Vista Sebokeng Campus as from next year, 2004, will you move closer to the new incorporated university (old Vaal Pukke Campus near Sharpeville)?" A total of 71.9% of the students who completed the questionnaire, indicated that they would not move closer, while 27.7% indicated that they would move closer, and 0.4% were unsure whether they would move closer. In respect of Question 2.5, "Do you expect to pay more for accommodation if you would move closer to the new campus?" 18.3% of students who completed the questionnaire, indicated that they expected to pay more, 60.6% indicated that they did not expect to pay more, while 21.1% of students were unsure whether they would pay more for accommodation if they moved closer to the NWUVTTC.

On Question 5.1 of the of October 2003 questionnaire, students were asked, "If the Vaal Triangle Technikon takes over the buildings of VUSC, will you consider rather studying at the Technikon?" Of the students who completed the questionnaire, 94% indicated that they would not study at the Vaal Triangle Technikon while 6% indicated that they would consider to study at the Technikon. Of this 6%, more than 90% give as a reason, that the transportation costs would be too high and they would have no other choice than to study at the Technikon.

6.3 IDENTIFICATION OF IMPACTS ON THE NWUVTC AND STUDENTS AND STAFF OF VUSC

In this section the impacts of the incorporation of VUSC into NWUVTC and the impacts on students and staff of VUSC, are identified. It is not the purpose in this section to analyse costs and benefits in figures, but only to identify potential costs and benefits. This will be documented in a preliminary planned balance sheet, as part of the step in respect of the identification of costs and benefits as discussed in the previous chapter.

6.3.1 IDENTIFICATION OF IMPACTS ON THE NWUVTC

The impacts on the NWUVTC can be divided into benefits from additional students of former VUSC, in terms of extra subsidies from Government and extra income from student fees. The additional costs (personnel costs and operating costs) from the additional personnel from VUSC that must be incorporated, can be classified into faculty costs and support costs (Lucouw, 2003:1).

6.3.2 IDENTIFICATION OF IMPACTS ON STUDENTS AND STAFF OF VUSC

Most students from VUSC (52.8% in October 2003) stay in suburbs situated near Zone 10, Sebokeng and walk to campus. With this in mind, it can be expected that the closure of VUSC will have a negative impact on students in terms of transport costs. A student who for example stayed in Zone 17, Sebokeng, and who travelled by taxi or who walked to the campus, will probably incur extra travelling costs if he/she attends class at NWUVTC.

This will also result in extra travelling time, as NWUVTC is approximately 30 kilometres from Sebokeng, while VUSC is situated in Sebokeng.

It is thus evident, that extra travelling costs and extra travelling time can be expected. It is also true, that some students will benefit in terms of travelling costs and travelling time. NWUVTC is nearer to Sharpeville, Sasolburg, Bophelong etc., than is VUSC. A student from Sharpeville who travels to VUSC, will experience a reduction in travelling costs and travelling time because NWUVTC is nearer to Sharpeville.

Students from VUSC will also pay more in terms of student fees at NWUVTC, than at VUSC. (See Table 2.5 as compared to Table 2.4 in Chapter 2.)

On the other hand, it can also be expected, that some students may value a qualification obtained from NWUVTC higher than a qualification obtained from VUSC. In such a case, it can be argued, that some students can also benefit from an incorporation of VUSC into NWUVTC. This possible benefit will be measured in this chapter by using the concept of willingness to pay (WTP). In other words, how much extra, students are willing to pay (WTP). (Questions 5.4, 5.5 and 5.6 of the October 2003 questionnaire, are used to determine this expected benefit for students.)

6.3.3 SUMMARY OF IMPACTS USING A PRELIMINARY PLANNED BALANCE SHEET (PBS)

In this section, a preliminary planned balance sheet (PBS) will be used as a planning tool, which will also be applied in the rest of the chapter. The impacts on the NWUVTC, as well as students and staff of VUSC, can be divided into monetised and non-monetised impacts. The approach that will be used to determine the change in welfare, is the before-after approach discussed in Section 5.5.2.

A planned balance sheet, before the incorporation of VUSC into NWUVTC (Table 6.3) will therefore, be compared with a planned balance sheet after the incorporation of VUSC into NWUVTC (Table 6.4). Tables 6.3 and 6.4 are divided into impacts on the NWUVTC and impacts on students and staff of VUSC. According to Lucouw (2003:1), the impact on the NWUVTC is divided into faculty (academic departments) costs and revenue and support staff (support/administrative department) costs and revenue. It must be stated, that Tables 6.3 and 6.4 at this stage only serve the purpose of planning.

The impact on students and staff of VUSC is divided into travelling costs, time and student fees as costs and benefits (this benefit can be the benefit of obtaining a

qualification from NWUVTC instead of a qualification from VUSC, will be determined at a later stage by using the questionnaire of October 2003.

Table 6.3 shows how the preliminary planned balance sheet (PBS) of costs and benefits before the incorporation of VUSC into NWUVTC are compiled, where the crosses indicate potential monetary flows (costs or revenue/benefits). It also shows, that a difference exists between what is seen as economic impacts (impacts on students and staff) and financial flows (costs and income/revenue of NWUVTC).

Table 6.3 Preliminary planned balance sheet (PBS) of costs and benefits before the incorporation of VUSC into NWUVTc

Costs and benefits	Economic impacts		Financial cashflow	
	Benefits	Costs	Revenue	Cost
NORTH-WEST UNIVERSITY, VAAL TRIANGLE CAMPUS (NWUVTc)				
Faculty income/revenue				
Subsidy from Government			X	
Tuition fees from students			X	
Other income			X	
Faculty expenditure				
Personnel				X
Operating expenses				X
Support income/revenue				
Income/revenue			X	
Support expenditure				
Personnel				X
Operating				X
STUDENTS AND STAFF				
Costs to students and staff				
Student fees		X		
Travelling expenses		X		
Time		X		
Benefits to students and staff				
Willingness to pay	X			
SUM financial cashflow				
SUM of economic impacts				
	X	X		
Net present value (NPV)				
		X		
NPV/Cost ratio				
		X		

Table 6.4 shows the preliminary PBS of costs and benefits of NWUVTc and costs and benefits of students and staff after incorporation.

Table 6.4 Preliminary planned balance sheet of costs and benefits after the incorporation of VUSC into NWUVTTC

Costs and benefits	Economic impacts		Financial cashflow	
	Benefits	Costs	Revenue	Cost
NORTH-WEST UNIVERSITY, VAAL TRIANGLE CAMPUS (NWUVTTC)				
Faculty income/revenue				
Subsidy from Government			X	
Tuition fees from students			X	
Other income			X	
Faculty expenditure				
Personnel				X
Operating expenses				X
Support income/revenue				
Income/revenue			X	
Support expenditure				
Personnel				X
Operating				X
STUDENTS AND STAFF				
Costs to students and staff				
Student fees		X		
Travelling expenses		X		
Time		X		
Benefits to students and staff				
Willingness to pay	X			
SUM financial cashflow				
SUM of economic impacts	X	X		
Net present value (NPV)		X		
NPV/Cost ratio		X		

Non-monetised impacts will be discussed in Section 6.4.3 of this chapter.

6.4 QUANTIFICATION OF COSTS AND BENEFITS

The quantification of monetised and non-monetised costs and benefits of the NWUVTC and students and staff of VUSC on a before-after approach, will be done in this section. Figures are calculated for the period 2004-2006, assuming that no incorporation has taken place and will then be referred to as "before incorporation". This will be compared to figures for the period 2004-2006, assuming that incorporation has taken place and will then be referred to as "after incorporation".

6.4.1 QUANTIFICATION OF MONETISED COSTS AND BENEFITS OF NWUVTC

This section is divided into monetised costs and benefits of NWUVTC, before and after incorporation.

6.4.1.1 Costs and benefits of NWUVTC before incorporation

According to Lucouw (2003:1), costs of NWUVTC can be divided into faculty costs in terms of expenditure on personnel and operating costs of faculties and support departments (i.e. expenditure on personnel and operating costs of support departments). Benefits (income) can be divided into income in terms of subsidies from Government, tuition fees and other faculties' income and income from support departments. The costs and benefits of the NWUVTC are compiled by using data from Lucouw (2003). These costs and benefits are given in Table 6.5 for 2004, 2005 and 2006. If the faculty income (benefits) and support income (benefits) are added and the faculty expenses (costs) and support expenses (costs) subtracted, a net benefit of R870 259 for 2004, R629 166 for 2005 and R2 892 702 for 2006, is shown.

Table 6.5 Costs and benefits of NWUVTC before incorporation: rand per annum

	2004 Rand	2005 Rand	2006 Rand
Faculty income (benefits)			
Subsidy	22 184 218	24 644 299	29 600 171
Tuition	13 348 823	15 700 000	18 478 900
Other	239 000	250 000	280 000
Faculty expenses (costs)			
Personnel	20 496 063	24 269 104	28 514 658
Operating expenses	2 443 900	2 773 812	2 995 717
Support income (benefits)	6 055 725	6 485 383	7 004 213
Support expenses (costs)			
Personnel	7 747 970	8 367 808	9 037 232
Operating	10 269 574	11 039 792	11 922 975
Net benefit/Loss	870 259	629 166	2 892 702

Source: Compiled by using data obtained from Lucouw (2003:1)

6.4.1.2 Costs and benefits of NWUVTC after incorporation

The incorporation process of VUSC, according to Asmal (2001), includes the incorporation of students and staff into NWUVTC while the Vaal Triangle Technikon will take over the buildings of VUSC in Zone 10, Sebokeng (see chapter 3).

The incorporation of students and staff will lead therefore to additional expenditure and operating costs for NWUVTC. These extra costs and benefits are included in Table 6.6, where the costs and benefits of NWUVTC after incorporation are given. These calculations will be based primarily on data obtained from Lucouw (2003:1).

It is evident from Table 6.5 that a net benefit of R870 259 for 2004, R629 166 for 2005 and R2 892 702 for 2006 could be expected for the NWUVTC, should no incorporation took place. If incorporation does take place, a net loss of R1 671 534 for 2004, R3 034 098 for 2005 and R4 177 384 for 2006 could be expected (Table 6.6).

Table 6.6 Costs and benefits of NWUVTC after incorporation: rand per annum

	2004 Rand	2005 Rand	2006 Rand
Faculty income (benefits)			
Subsidy	28 916 605	31 009 464	34 116 990
Tuition	15 156 923	16 701 413	18 798 671
Other	239 000	250 000	280 000
Faculty expenses (costs)			
Personnel	25 860 818	29 156 521	33 793 068
Operating expenses	2 593 900	2 873 812	3 065 717
Support income (benefits)	6 055 725	6 485 383	7 004 213
Support expenses (costs)			
Personnel	11 840 605	12 787 854	13 810 882
Operating	11 744 464	12 662 171	13 707 591
Net benefit/Loss	(1 671 534)	(3 034 098)	(4 177 384)

Source: Compiled by using data obtained from Lucouw (2003:1)

6.4.2 Quantification of monetised costs and benefits of students and staff

In section 2.3.4 and 2.4.3 it is indicated, that the payable fees of NWUVTC differ considerably from the payable fees of VUSC. Study fees for a BA degree at VUSC for instance, are approximately 54.1% of the fees for a BA degree at NWUVTC. The payable fees for a BA or B Com degree at VUSC in 2003 was R4 900 per year as compared to R9 060 per year for a BA degree and R9 660 for a B Com degree in 2003 at NWUVTC (Table 2.4 and 2.5).

To determine the cost for students of VUSC before incorporation, the total number of BA, B Com etc., students are taken and multiplied with the tuition fee for that course. To determine the total cost for students of VUSC, the total number of BA, B Com etc., students of VUSC is taken and multiplied with tuition fees for a similar degree/qualification at NWUVTC. It is assumed that in the years to come, the same flow of students that would otherwise attended VUSC, will now attend NWUVTC. Whereas students would have paid less at VUSC, they will now and in the years to come pay more; thus an additional cost for especially the African students. The cost in

terms of tuition fees before and after incorporation is given in Table 6.7. It is evident from Table 6.7 that tuition fees will increase from R3 082 100 to R6 038 400 in 2004, from R3 328 668 to R6 521 472 in 2005 and R3 594 961 to R7 043 189 in 2006 after the incorporation of VUSC students and staff into NWUVTC.

Table 6.7 Tuition fees before and after incorporation for VUSC students

Costs/Tuition fees	2004	2005	2006
Before incorporation	3 082 100	3 328 668	3 594 961
After incorporation	6 038 400	6 521 472	7 043 189

Source: Compiled by using data from Lucouw (2003)

6.4.2.1 Travelling costs of students and staff

It can be expected, that students and staff of VUSC will experience an increase in travelling costs, since the majority of students (69% in October 2003) who study at VUSC, stay near Zone 10, Sebokeng, seeing that NWUVTC is situated approximately 30 km from Zone 10, Sebokeng.

To determine this expected increase in travelling costs it would be necessary to determine the travelling costs of students and staff of VUSC before the incorporation, and then to determine the travelling costs of the same students and staff after incorporation. The travelling costs of students and staff will be calculated before and after incorporation.

To determine the travelling costs of students and staff before incorporation, information obtained from the October 2003 questionnaire is used. The following methodology is used.

- In Question 2.4 students were asked whether they would move closer to NWUVTC in 2004 if the VUSC would close down. On this question, 27.7% of the students have indicated that they would move closer. The residential areas where this 27.7% of students stayed were taken into consideration, as well as the mode of transport that these students used. Where students indicated that they walked to the campus, it is assumed that they would move closer and then walk to the NWUVTC. Where students used taxi transport, the same taxi fee was assumed; in other words, if they

stayed near Zone 10, Sebokeng, and they spent R4.50 per trip to the VUSC, it was assumed that they would move closer to NWUVTC, for example, Sharpeville, and also spent R4.50 per trip to the NWUVTC.

- The 71.9% of students who indicated that they would not move closer to NWUVTC, were also taken into account. A total of 47.4% of this 71.9% of students indicated, that they would make use of a bus if NWUVTC instituted a bus service from Zone 10, Sebokeng, to NWUVTC at a fee of R10 per day (both ways). This was also taken into account in the calculation.
- To determine the travelling costs of students who would not make use of the bus service after incorporation, the taxi fees obtained from Hlomuka (2004), Letanta (2004) and Dhlamini (2004) were used for the calculations.
- The residential areas where students and staff of VUSC stayed, were taken into account. These data were used to calculate the transport costs and travel time to Zone 10, Sebokeng, where VUSC is situated. The number of students who made use of taxi transport etc., were taken into account. This was done to determine the travel costs and travel time before incorporation. To determine the travel cost and travel time of the same students to the NWUVTC, a similar method was used. That is, the residential area was taken into account and the travel costs and travel time were determined to NWUVTC instead of to VUSC. In other words the same student from Zone 17, Sebokeng who travelled to VUSC in the past, now had to travel to NWUVTC. This meant that a student who spent maybe R4.50 per day on travel costs (taxi fees, etc.) and a total of 20 minutes on the road, would spend maybe R9 and 60 minutes on the road after the incorporation to travel NWUVTC.
- Some students who stay in Sharpeville/Sasolburg etc. or near the university, would pay less in future. These reduced travel costs and travel time would also be taken into account.

Table 6.8 shows the travelling costs of students and staff as based on this method of calculation. It is evident from Table 6.8 that travelling costs to students and staff of VUSC, will increase by R191 662 in 2004, R206 995 in 2005 and R223 555 in 2006.

**Table 6.8 Travelling costs of students and staff before and after incorporation:
rand per annum**

	2004	2005	2006
Travelling costs before incorporation	570 086	615 693	664 948
Travelling costs after incorporation	761 748	822 688	888 503
Total increase in travelling costs	191 662	206 995	223 555

Source: (Grobler (2003))

6.4.2.2 Travelling time of students and staff to university before and after incorporation

The same method as described in Paragraph 6.4.2.1 was used to determine the travelling time of students and staff to the university campus before and after incorporation. Travelling time obtained from Hlomuka (2004), Letanta (2004) and Dhlamini (2004) and times indicated by students who walked to campus, were used to determine the travelling time in minutes for students and staff before and after incorporation.

In order to calculate the monetary value of time spent by students and staff, the estimated values in Table 5.2 were used. Based on this the monetary value of time of students and staff before and after incorporation, is given in Table 6.9.

**Table 6.9 Monetary value of time spent to travel to VUSC by students and staff:
rand per annum**

	2004	2005	2006
Monetary value of time spent to travel to VUSC before incorporation	41 045	44 329	47 875
Monetary value of time spent to travel to NWUVTC after incorporation	60 605	65 453	70 689
Increase in monetary value of time spent to travel to NWUVTC	19 560	21 124	22 814

Source: Grobler (2003)

6.4.2.3 Benefits for students

In the October 2003 questionnaire students were asked if they were willing to pay more for a qualification from NWUVTTC. A total of 59% of students had indicated, that they were willing to pay more for a qualification obtained from NWUVTTC. In Question 5.6 of the October 2003 questionnaire, students were asked: "If you have had the money, how much are you willing to pay extra in addition to what you pay for your studies at the moment (Rand) to study at the new institution (NWUVTTC)"?

Table 6.10 gives a presentation of how much students are willing to pay extra for a qualification.

Table 6.10 Percentage students willing to pay extra for a qualification obtained from NWUVTTC per category

Willingness to pay (rand per annum)	Percentage students
Less than 100	14.0
100 – 199	12.4
200 – 299	9.2
300 – 399	3.2
400 – 499	1.6
500	11.7
More than 500	6.8

Source: Grobler (2003)

The information in Table 6.10 was used to calculate the benefit of incorporation for students by using the total number of students of VUSC who indicated that they were willing to pay more per category, multiplied by the average willingness to pay (Rand). The total benefit in this respect amounts to R102 464 for 2004, R110 661 for 2005 and R119 514 for 2006. This is done by taking the midpoint of the willingness to pay category, multiplied by the number of students indicated a particular willingness to pay in that category.

6.4.3 IMPACTS ON STUDENTS IN NON-MONETARY TERMS

To measure the impact on students in non-monetary terms, twelve questions were asked in the October 2001 questionnaire, and four questions in the October 2003 questionnaire. Students were asked to indicate whether they agreed, agreed strongly, disagreed or disagreed strongly with statements made in the two questionnaires. The following statements obtained from Questionnaires 1 and 3 (Annexure C and D) will be discussed. These will then be analysed according to the scale of Odeck, as indicated in Table 5.4. The scale of Odeck (Table 5.4) is adjusted to allocate a specific scale to the possible positive or negative expected impact. Where between 50% and 55% of students agreed or strongly agreed (or disagreed or strongly disagreed), a small positive (negative) impact is expected. Where between 56% and 60% of students agreed or agreed strongly (or disagreed or disagreed strongly), an average (positive/negative) impact is expected. Between 61% and 65% a large impact was attached and for more than 66%, a very large impact was allocated. In Table 6.13 all these non-monetised impacts are summarised according to the adjusted scale of Odeck.

6.4.3.1 Statement 1: I am satisfied with the university where I study

This statement was included, so that students could indicate how they felt about the current situation at their campus. Vista University students were divided on this statement and 53.8% agreed or agreed strongly with the statement, while 46.2% were not satisfied with VUSC, for different reasons.

Students who disagreed or disagreed strongly with the statement, "I am satisfied with the university where I study", primarily gave the following two responses why they disagreed or disagreed strongly.

- "Not on standard" (18.1%)
- "Lack of resources, equipment, study materials, etc." (81.9%)

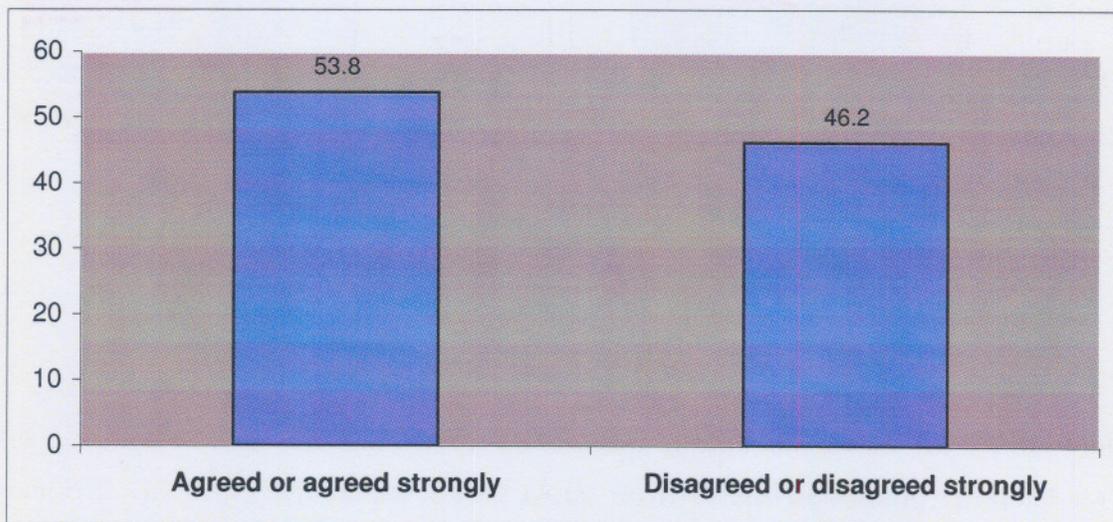
Students who agreed or agreed strongly with the statement, "I am satisfied with the university where I study", primarily said they were satisfied because of the following reasons.

- “Low fees at Vista University” (11.5%)
- “Transport related advantages” (88.4%)

Figure 6.4 gives a visual presentation of the opinion of students at VUSC on the statement “I am satisfied with the university where I study”.

If this statement is analysed i.r.o. Table 6.7, Table 6.8 and Table 6.9, it is clear that the anticipated increase in travelling costs and time correspond to the stated preference of students from VUSC where transport related advantages and low fees were indicated by a large number of students. A small negative impact can be expected in this regard.

Figure 6.4 VUSC student response to the statement: I am satisfied with the university where I study

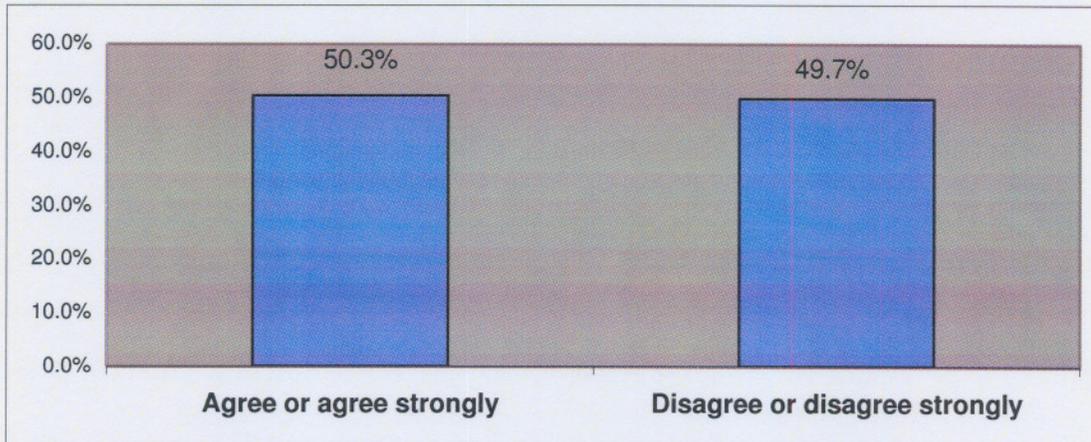


Source: Grobler (2001)

6.4.3.2 Statement 2: The name of the university must change

This statement was included in the questionnaire, so that students could indicate how strong they felt about the name of the university where they studied. A total of 50.3% students agreed or agreed strongly with this statement, while 49.7% of the students did not agree or disagree strongly that Vista’s name had to be changed.

Figure 6.5 VUSC student response to the statement: The name of the university must change



Source: Grobler (2001)

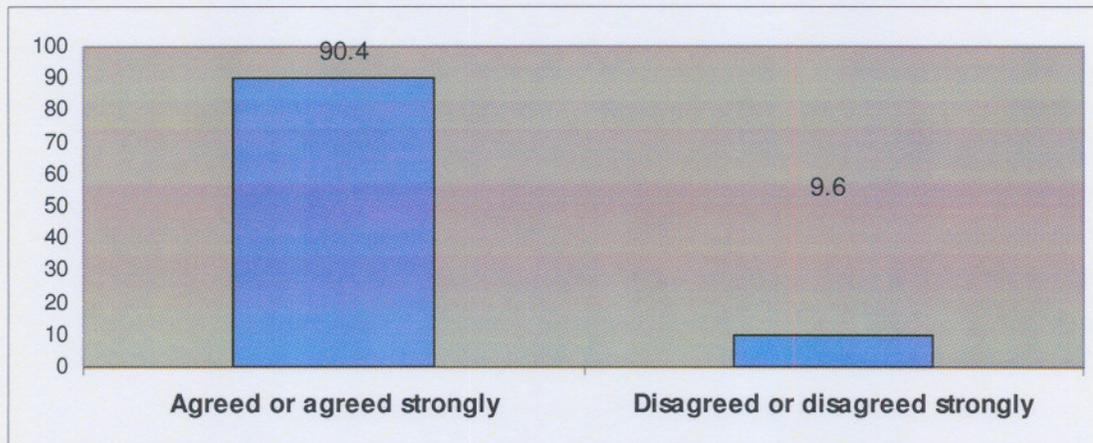
If this statement is compared i.r.o. Figure 6.17, it is evident, that a large number of students from Vista University, Sebokeng Campus felt, that a name change or moving away from the name “Vista University” would benefit them. As indicated in Section 6.4.2.3, it is evident, that almost 59% of students from Vista University, the Sebokeng Campus are willing to pay extra for a qualification of the North-West University. A small positive impact could be expected for students from Vista University, the Sebokeng Campus.

6.4.3.3 Statement 3: The fees at my university are the cheapest in the Vaal Triangle

This statement was included in the questionnaire, because of the fee structure that differed between the two campuses. The majority of students (90.4%) at VUSC indicated that they agreed or agreed strongly that fees at Vista were the cheapest in the Vaal Triangle. A total of 11.5% of the students who gave reasons for their answers to statement 1, indicated, that they were satisfied with Vista because of the low fee structure.

Figure 6.6 gives a visual presentation of student answers given for statement 3.

Figure 6.6 VUSC student response to the statement: The fees at my university are the cheapest in the Vaal Triangle



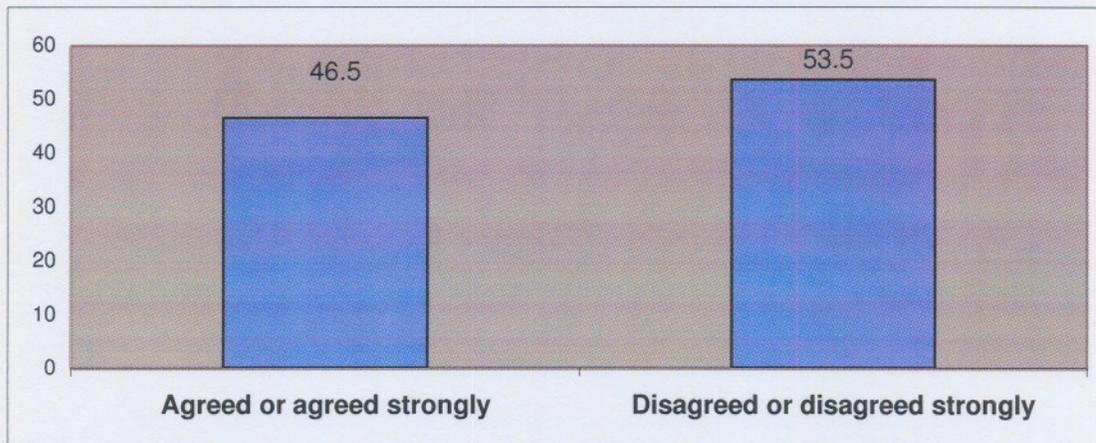
Source: Grobler (2001)

It is evident that students were aware that the fees at Vista University are cheap. On Question 5.3 in Questionnaire 2 (October 2003), almost 89.1% of students from Vista University indicated that they did not know the fees of North-West University. A very large negative impact could be expected on VUSC students.

6.4.3.4 Statement 4: The standard of education is the highest at my university in the Vaal Triangle

A significant number (53.5%) of students at VUSC believed, that the standard of education at VUSC is not the highest in the Vaal Triangle, while 46.5% agreed or agreed strongly with the statement, that “ ... the standard of education is the highest at my university in the Vaal Triangle”.

Figure 6.7 VUSC student response to the statement: The standard of education is the highest at my university in the Vaal Triangle



Source: Grobler (2001)

The large number of students who indicated (53.5%) that they disagreed or disagreed strongly, indicated that a positive impact could be expected.

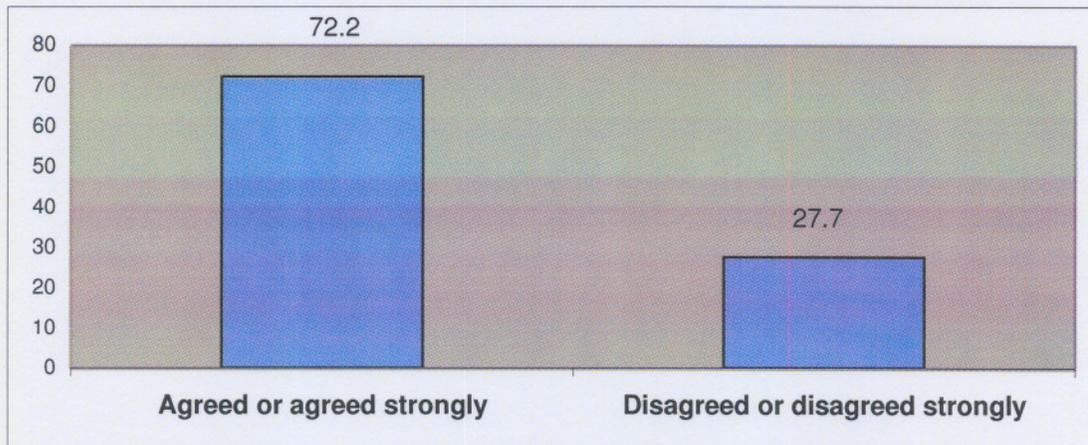
6.4.3.5 Statement 5: A merger between Vista University, the Sebokeng Campus and the Potchefstroom University, the Vaal Triangle Campus, must take place

The majority of students (72.2%) at Vista University, the Sebokeng Campus, felt that a merger between the Potchefstroom University, the Vaal Triangle Campus and Vista University, the Sebokeng Campus had to take place. Students who gave reasons, believed the standards of Vista University, the Sebokeng Campus would improve (59% of all reasons). A total of 81.9% of the students from Vista University, the Sebokeng Campus who gave reasons for their choice in Statement 1, were not satisfied with Vista because of the lack of resources, equipment, study material, etc.

Figure 6.8 gives a visual presentation of student answers to Statement 5.

With this in mind, it could be expected that a very large positive impact could be expected after incorporation (Table 5.5).

Figure 6.8 VUSC students who feel that a merger between the Potchefstroom University, the Vaal Triangle Campus and Vista University, the Sebokeng Campus, must take place

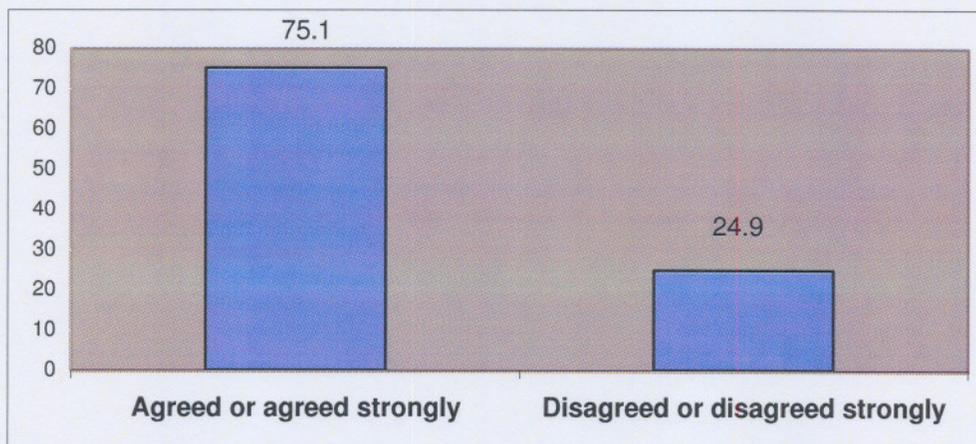


Source: Grobler (2001)

6.4.3.6 Statement 6: Such a merger will improve quality

The majority of students at Vista University (75.1%) felt, that a merger between the universities would improve quality. This is visually presented in Figure 6.9.

Figure 6.9 VUSC students who feel that a merger will improve quality



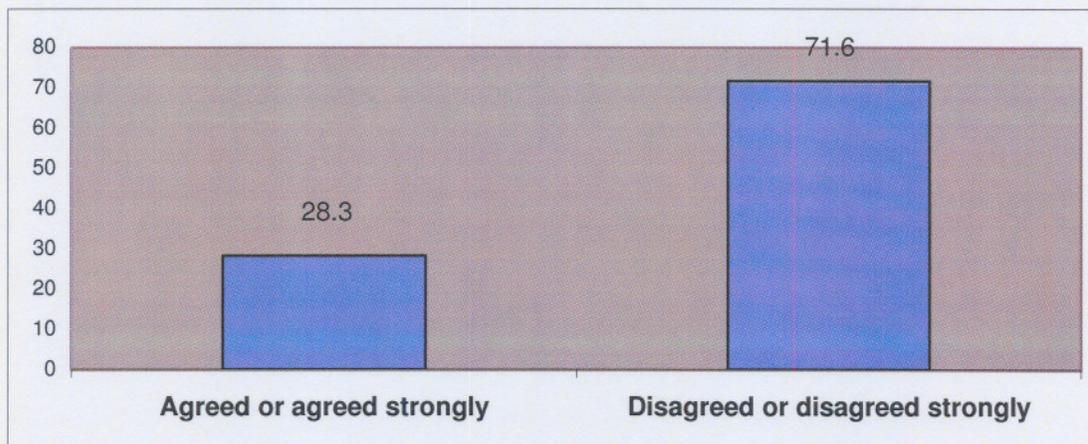
Source: Grobler (2001)

Because 75.1% of students agreed or agreed strongly, a very large positive impact on students of Vista University, the Sebokeng Campus, can be expected.

6.4.3.7 Statement 7: If such a merger takes place, the name of the institution must be Potchefstroom University for CHE

A total of 71.6% of the students from VUSC indicated, that they did not accept the name Potchefstroom University for CHE if a merger would take place. A significant number of students who agreed or agreed strongly with the statement (28.3% of Vista students) indicated that the name must be PU for CHE because it is a “well recognised name, even internationally”. This opinion of students on this statement is presented in Figure 6.10.

Figure 6.10 VUSC students who agreed or disagreed with the name Potchefstroom University for CHE after a merger



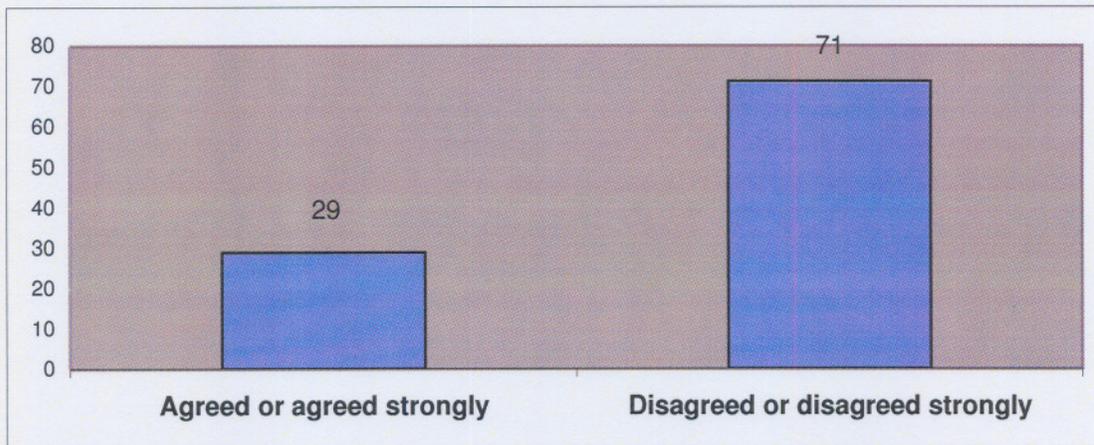
Source: Grobler (2001)

With the name of Potchefstroom University for CHE that had changed from the first of January 2004 to North-West University and the large percentage of VUSC students who objected to the name PU for CHE, a very large positive impact on students of Vista University, the Sebokeng Campus has taken place since the name was changed as from the first of January 2004.

6.4.3.8 Statement 8: If such a merger takes place, the name of the institution must be Vista University

Students from VUSC also disagreed (71.1%) with the name Vista University after a merger/combination). This is presented in Figure 6.11.

Figure 6.11 VUSC students who agreed or disagreed with the name Vista University after a merger/combination

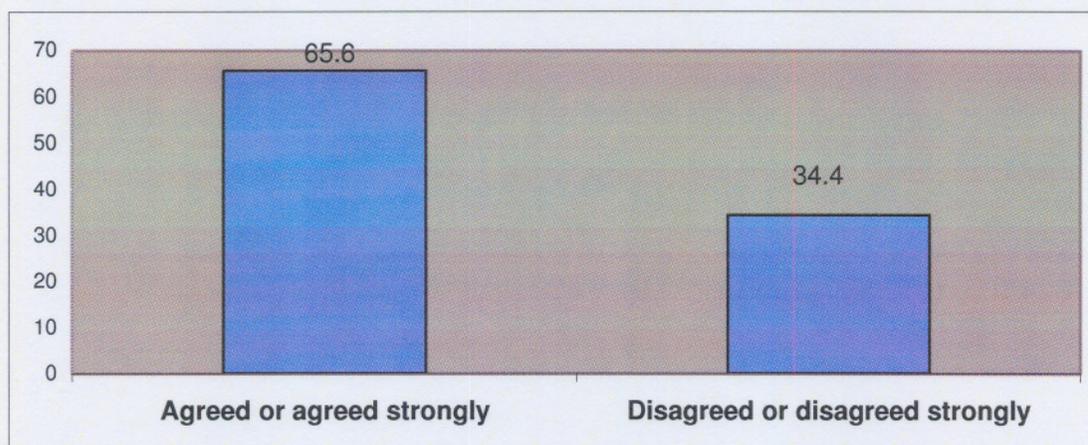


Source: Grobler (2001)

With the previous statement in mind and the large percentage of students who objected to the name Vista University, a very large positive impact can be expected (see Table 5.5).

6.4.3.9 Statement 9: If such a merger takes place, a new name must be found

Figure 6.12 VUSC students who agreed or disagreed that if a merger takes place, a new name must be found

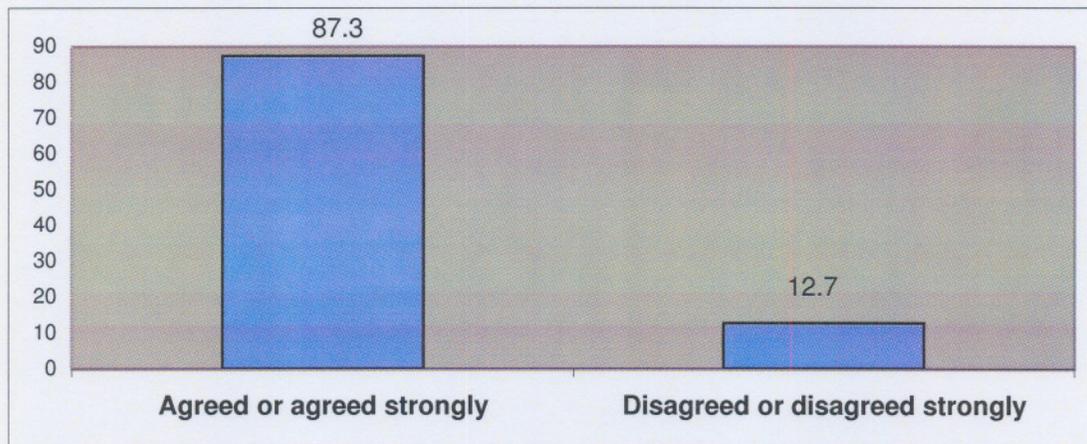


Source: Grobler (2001)

In Figure 6.12 it can be seen that the majority (65.6%) of VUSC students felt that a new name for the new university after incorporation must be found. If this is compared with Statement 8, which reads that the name must be Vista University, 71% of VUSC students disagreed with this statement. It is thus evident, that a very large positive impact could be expected in this regard, since a new name was found for the Potchefstroom University for CHE.

6.4.3.10 Statement 10: If a merger takes place, both campuses must be maintained

Figure 6.13 VUSC students who agreed or disagreed that if a merger takes place, both campuses must be maintained



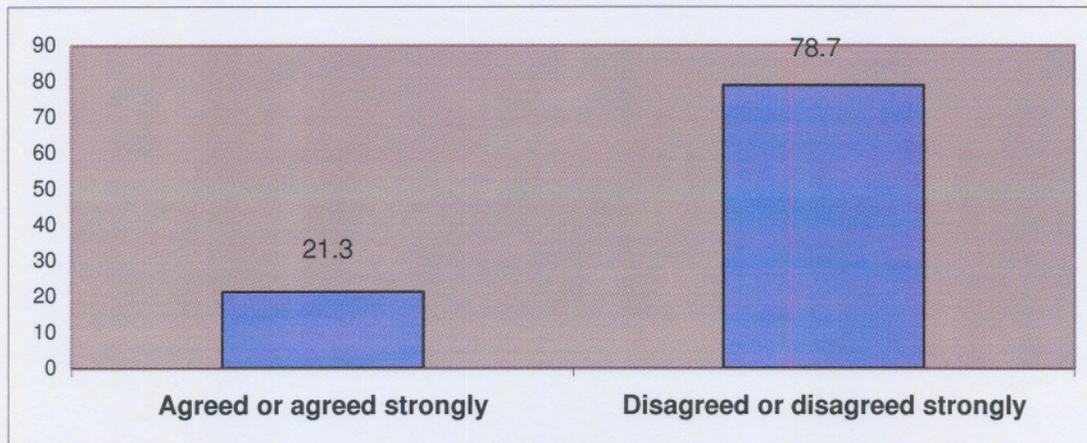
Source: Grobler (2001)

It is evident from Figure 6.13, that a total of 87.3% of students from VUSC indicated that both campuses should be maintained. This can be compared with Statements 1 and 3 where transport costs and fees were indicated as possible negative impacts. In this regard, a very large negative impact could be expected because of the closure of Vista University, the Sebokeng Campus.

6.4.3.11 Statement 11: If such a merger takes place, only the Vista Campus must be maintained

The majority of students (78.7%) from VUSC disagreed or strongly disagreed with the statement that only the Vista Campus must be maintained. This can be seen in Figure 6.13, where it is indicated, that 87.3% of the students agreed or agreed strongly that both VUSC and NWUVTC must be maintained, while only 12.7% disagreed or disagreed strongly that both campuses must be maintained.

Figure 6.14 VUSC students who agreed or disagreed with the statement that only the Vista Campus must be maintained



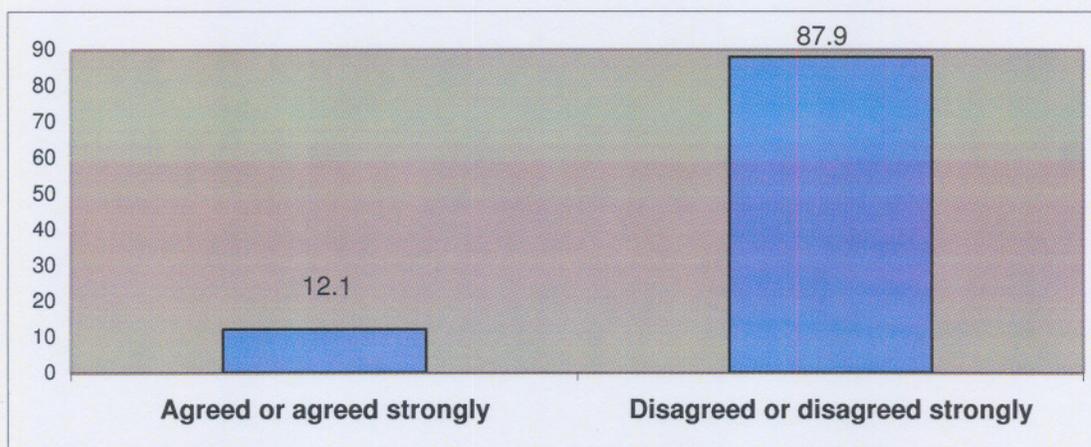
Source: Grobler (2001)

It is evident from Figure 6.14, where 78.7% disagreed or disagreed strongly, that only the Vista Campus must be maintained. Compared to Statement 12 it is evident that it is the opinion of students that both campuses must be maintained. It can be concluded, that VUSC students would prefer a situation where both campuses are maintained. If Statement 11 is compared with Statement 12 and the extra travelling costs in Table 6.8, it is clear, that the closure of Vista University (the Sebokeng Campus) will have a very large negative impact on students.

6.4.3.12 Statement 12: If such a merger takes place, only the Potchefstroom University (the Vaal Triangle Campus) must be maintained

Almost all students (87.9%) from Vista University indicated, that they disagreed or disagreed strongly with the statement, that if a merger took place, only the Potchefstroom University, the Vaal Triangle Campus should be maintained (as indicated in Fig. 6.13). Students' reaction to this statement is probably because of transport related fears (further distance to travel, etc.). In this respect a very large negative impact can be expected.

Figure 6.15 VUSC students who agreed or disagreed with the statement: If a merger takes place only the Potchefstroom University, the Vaal Triangle Campus must be maintained



Source: Grobler (2001)

The following statements are based on the October 2003 survey and indicated as statements 13 to 16.

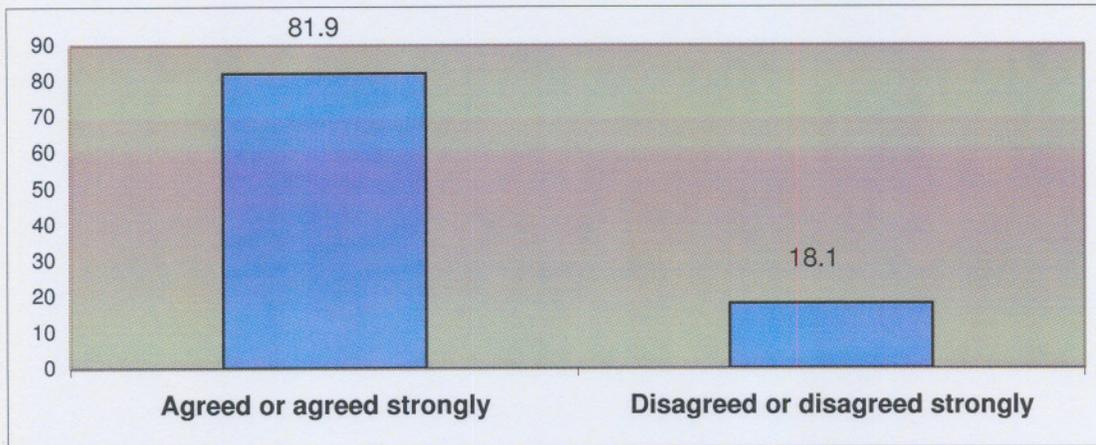
6.4.3.13 Statement 13: The standard of education at the new institution (North-West University) will be high

On this statement in the October 2003 survey, 81.9% of the students indicated, that they agreed or agreed strongly with this statement, while 18.1% indicated that they disagreed or disagreed strongly with the statement.

Figure 6.16 gives a visual presentation of the percentage students who indicated that they agreed or disagreed strongly as compared to the percentage students who indicated that they disagreed or disagreed strongly.

With this large number of students (81.9% who indicated that they agree or agree strongly) in mind, it can be expected, that the incorporation will have a very large positive impact on students in this respect.

Figure 6.16 Statement 13: The standard of education at the new institution (North-West University) will be high



Source: Grobler (2003)

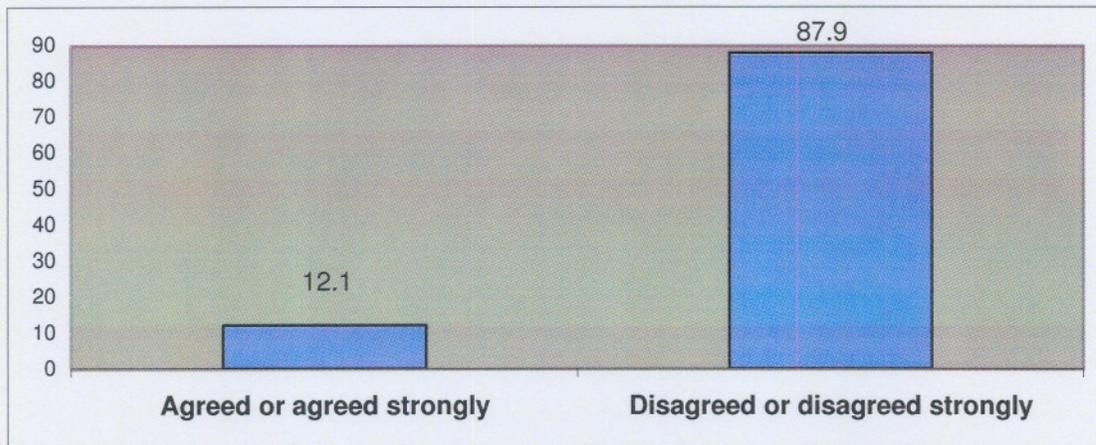
6.4.3.14 Statement 14: The incorporation of Vista, the Sebokeng Campus into the new institution (North-West University) will improve the quality of education

On this statement in the 2003 survey, 80.1% of students indicated, that they agreed or agreed strongly with this statement, while 19.9% of students indicated, that they disagreed or disagreed strongly with this statement.

Figure 6.17 gives a visual presentation of the percentage students who indicated, that they agreed or agreed strongly with this statement compared to students who indicated, that they disagreed or disagreed strongly.

A very large positive impact in this regard can be expected, because 80.1% of students indicated, that they agreed or agreed strongly with this statement.

Figure 6.17 Statement 14: The incorporation will improve quality of education



Source: Grobler (2003)

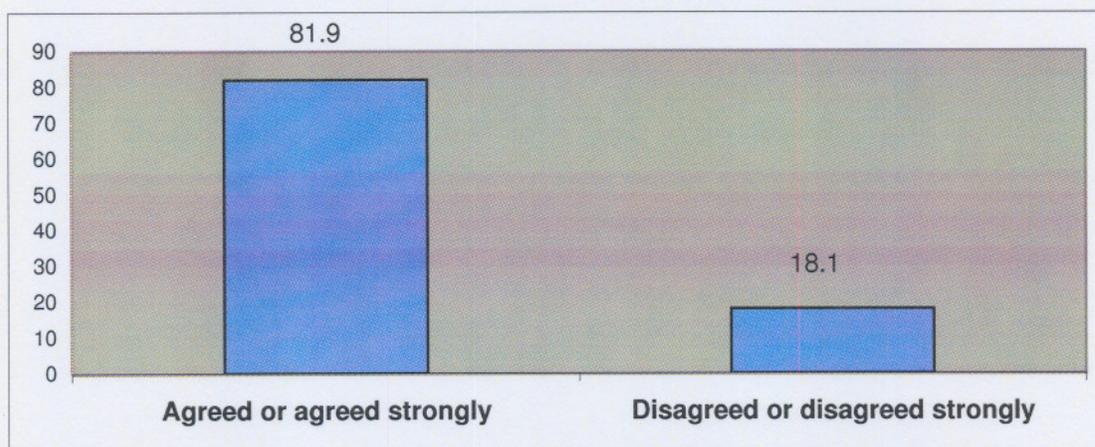
6.4.3.15 Statement 15: The qualification that I will receive at the new institution, will be of a higher quality (as seen by the employers) than a Vista qualification

On this statement in the 2003 survey, 60.2% of students indicated, that they agreed or agreed strongly with this statement as compared to 29.8% of students who indicated, that they disagreed or disagreed strongly with this statement.

Figure 6.18 gives a visual presentation of the percentage student who indicated that they agreed or agreed strongly as compared to students who indicated, that they disagree of disagreed strongly with this statement.

A very large positive impact in this regard can be expected.

Figure 6.18 Statement 15: The qualification that I will receive at the new institution, will be of a higher quality (as seen by the employers) than a Vista qualification

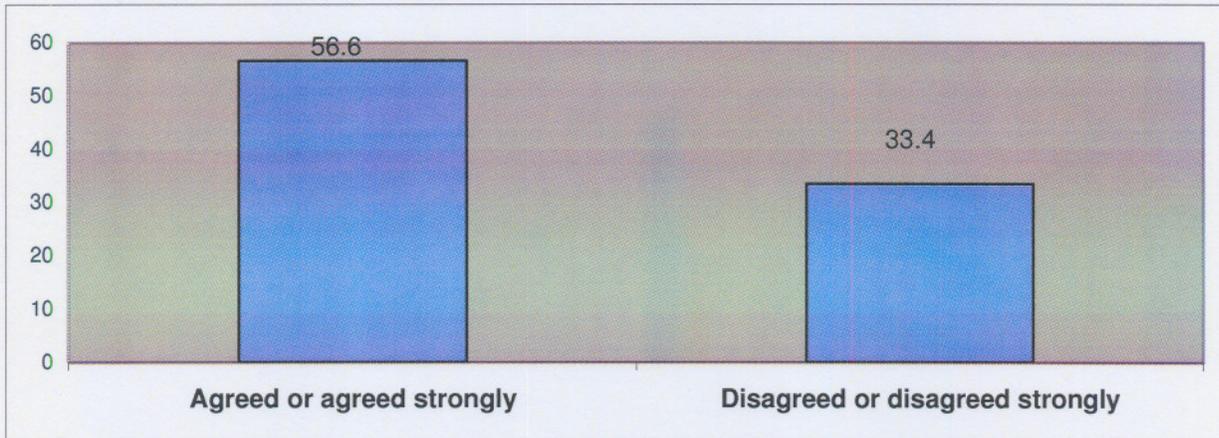


Source: Grobler (2003)

6.4.3.16 Statement 16: I will have a better chance to find a job with a qualification from the new institution (compared to a Vista qualification)

On this statement, 65.6% of VUSC students indicated, that they agreed or agreed strongly with the statement, “I will have a better chance to find a job with a qualification from the new institution (compared to a Vista qualification)” an average positive impact is expected in this regard. This is visually presented in Figure 6.19.

Figure 6.19 Statement 16: I will have a better chance to find a job with a qualification from the new institution (compared to a Vista qualification)



Source: Grobler (2003)

6.5 DISCOUNTING COSTS AND BENEFITS

Once the costs and benefits of a project have been identified and properly quantified, the next step in project analysis is to evaluate these costs and benefits in a time dimension (see Section 5.5.5). The costs and benefits were identified in Section 6.3 of this chapter and have been quantified in Section 6.4 of this chapter.

The next step is to evaluate the costs and benefits identified and quantified for students and staff of VUSC as well as the NWUVTC in a time dimension. To do this, it will be necessary to quantify the costs and benefits before incorporation (see Table 6.3) and after incorporation (see Table 6.4) in a planned balance sheet (PBS) form.

The costs and benefits quantified in Table 6.5, Table 6.6, Table 6.7, Table 6.8, Table 6.9 and Table 6.10 are, therefore, expressed in the form of a planned balance sheet in Table 6.11 and Table 6.12. The planned balance sheet (PBS) in Table 6.11 and Table 6.12 is divided into four parts, namely economic impacts i.t.o. benefits, economic impacts i.t.o. costs, financial cashflows i.t.o. revenue and financial cashflow i.t.o. costs. The economic impacts i.t.o. benefits refer to benefits to students and staff of VUSC and calculations are based on Table 6.10. The economic impacts i.t.o. costs can be divided in terms of extra travelling costs to students and staff of VUSC and calculations are

based on Table 6.8, extra tuition fees to VUSC students based on Table 6.7 and extra travel time in monetary units based on Table 6.9. The financial cashflows i.t.o. revenue and costs are based on Table 6.5 and Table 6.6. In the last rows of the PBS the present value is documented and the cost/benefit ratio is shown. In Figure 6.12 provision is made for extra buildings and equipment that will be needed to accommodate the expected extra inflow of students and to accommodate the staff from VUSC.

Table 6.11 Planned balance sheet of costs and benefits before incorporation of VUSC into NWUVTC

	Economic impacts						Financial cashflow					
	Benefits			Costs			Revenue			Costs		
	2004	2005	2006	2004	2005	2006	2004	2005	2006	2004	2005	2006
NORTH-WEST UNIVERSITY, VAAL TRIANGLE CAMPUS												
Faculty income												
Subsidy from Government							22 184 218	24 644 299	29 600 171			
Tuition fees from students							13 348 823	1 570 000	18 478 900			
Other income							239 000	250 000	280 000			
Faculty expenditure												
Personnel										20 496 063	24 269 104	28 514 658
Operating expenses										2 443 900	2 773 812	2 995 717
Support income												
Income							6 055 725	6 485 383	7 004 213			
Support expenditure												
Personnel										7 747 970	8 367 808	9 037 232
Operating										10 269 574	11 039 792	11 922 975
STUDENTS AND STAFF												
Costs to students and staff												
Student fees				3 082 100	3 328 668	3 594 961						
Travelling expenses				570 086	615 693	664 948						
Time				41 045	44 329	47 875						
Benefits to students												
Willingness to pay												
Sum of financial cashflows				3 693 231	3 988 690	4 307 784	41 827 766	47 079 682	55 363 284	40 957 507	46 450 516	52 470 582
Sum of economic impacts												
Present value of costs and benefits				10 258 974.94			123 041 811.8			119 400 287.9		
Benefit cost ratio before incorporation							0.9489					

Table 6.12 Planned balance sheet of costs and benefits after incorporation of VUSC into NWUVT

	Economic impacts						Financial cashflow					
	Benefits			Costs			Revenue			Costs		
	2004	2005	2006	2004	2005	2006	2004	2005	2006	2004	2005	2006
NORTH-WEST UNIVERSITY, VAAL TRIANGLE CAMPUS												
Faculty income												
Subsidy from Government							28 916 605	31 009 464	34 116 990			
Tuition fees from students							15 156 923	16 701 413	187 918 671			
Other income							239 000	250 000	280 000			
Faculty expenditure												
Personnel										25 860 818	29 156 521	33 793 068
Operating expenses										2 593 900	2 873 812	3 065 717
Support income												
Income							6 055 725	6 485 383	7 004 213			
Support expenditure												
Personnel										11 840 605	12 787 854	13 810 882
Operating and capital cost										11 744 464	39 662 171	13 707 591
STUDENTS AND STAFF												
Costs to students and staff												
Student fees				6 038 400	6 521 472	7 043 189						
Travelling expenses				761 748	822 688	888 503						
Time				60 605	65 453	70 689						
Benefits to students												
Willingness to pay	102 464	110 661	119 514									
Sum of financial cashflows	102 464	110 661	119 514	6 860 753	7 409 613	8 002 381	50 368 253	54 446 260	60 199 874	52 039 787	84 480 358	64 377 258
Sum of economic impacts												
Present value of costs and benefits	284 622,21			19 057 647			141 104 764,5			171 718 021,5		
Benefit cost ratio before incorporation	0,7411											

6.5.1 Present value of costs and benefits before incorporation

Chapter 5 (Section 5.5.5.1) states, that the benefits and costs of a specific year are discounted to the present, by using the discount rate. In Section 5.5.5.4 it is indicated, that the official discount rate for South Africa is 8%. In Table 6.11 the sum of financial cashflows and the sum of economic impacts must be discounted to a present value. This is done as follows (see Section 5.5.5.1).

- Present value of revenue before incorporation

The following formula is used.

$$PV = \sum B_j / (1 + i)^j$$

where PV = Present value

$\sum B_j$ = Sumtotal of NWUVTC revenue (before incorporation)

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$\begin{aligned} &= \frac{41\,827\,766}{(1+0.08)^1} + \frac{47\,079\,682}{(1+0.08)^2} + \frac{55\,363\,284}{(1+0.08)^3} \\ &= 38\,729\,412.96 + 40\,363\,239.03 + 43\,949\,159.81 \\ &= 123\,041\,811.8 \end{aligned} \quad (1)$$

- Present value of financial cost before incorporation

The following formula is used.

$$PV = \sum C_j / (1 + i)^j$$

where PV = Present value

$\sum C_j$ = Sumtotal of NWUVTC revenue (before incorporation)

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$= \frac{40\,957\,507}{(1+0.08)^1} + \frac{46\,450\,516}{(1+0.08)^2} + \frac{52\,470\,582}{(1+0.8)^3}$$

$$= 37\,923\,617.59 + 39\,823\,830.59 + 41\,652\,839.7$$

$$= 119\,400\,287.9 \quad (2)$$

- Present value of economic costs before incorporation

The following formula is used.

$$PV = \sum C_j / (1 + i)^j$$

where PV = Present value

$\sum C_j$ = Sumtotal of economic costs to VUSC students and staff

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$= \frac{3\,693\,231}{(1+0.08)^1} + \frac{3\,988\,690}{(1+0.08)^2} + \frac{4\,307\,784}{(1+0.08)^3}$$

$$= 3\,419\,658.33 + 3\,419\,658.78 + 3\,419\,657.83$$

$$= 10\,258\,974.94 \quad (3)$$

After the present value (PV) of costs and benefits has been determined, the costs/benefit ratio must be determined, which is as follows.

$$\text{Cost/benefit ratio before incorporation} = \frac{\text{PV of benefits}}{\text{PV of costs}}$$

$$= \frac{(1)}{(2)+(3)}$$

$$= \frac{123\,041\,811.8}{129\,659\,262.9}$$

$$= 0.9489$$

6.5.2 Present value of costs and benefits after incorporation

The costs and benefits after incorporation is determined in a planned balance sheet form in Table 6.12.

Based on information in Table 6.12, the present values of costs and benefits after incorporation, are calculated as follows.

- Present value of revenue after incorporation

The following formula is used.

$$PV = \sum B_j / (1 + i)^j$$

where PV = Present value

$\sum B_j$ = Sumtotal of benefits to NWUVTC after incorporation

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$\frac{50\,368\,253}{(1+0.08)^1} + \frac{54\,446\,260}{(1+0.08)^2} + \frac{60\,199\,874}{(1+0.08)^3}$$

$$= 46\,637\,271.3 + 46\,678\,892.3 + 47\,788\,600.9$$

$$= 141\,104\,764.5 \quad (4)$$

- Present value of financial costs after incorporation (including capital costs for extra buildings and equipment, computers etc., to accommodate staff from VUSC of R27 million)

The following formula is used.

$$PV = \sum C_j / (1 + i)^j$$

where PV = Present value

$\sum C_j$ = Sumtotal of benefits to NWUVTC after incorporation

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$= \frac{52\,039\,787}{(1+0.08)^1} + \frac{84\,480\,358}{(1+0.08)^2} + \frac{64\,377\,258}{(1+0.08)^3}$$

$$= 48\,184\,988.0 + 72\,428\,290.47 + 5\,1104\,743.0$$

$$= 171\,718\,021.5 \quad (5)$$

- Present value of costs to students and staff after incorporation

The following formula is used.

$$PV = \sum C_j / (1 + i)^j$$

where PV = Present value

$\sum C_j$ = Sumtotal of costs to NWUVTC after incorporation

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$\begin{aligned}
 &= \frac{6\,860\,753}{(1+0.08)^1} + \frac{7\,409\,613}{(1+0.08)^2} + \frac{8\,002\,381}{(1+0.08)^3} \\
 &= 6\,352\,549.0 + 6\,352\,549.0 + 6\,352\,549.0 \\
 &= 19\,057\,647 \qquad (6)
 \end{aligned}$$

- Present value of benefits to students and staff after incorporation

The following formula is used.

$$PV = \sum B_j / (1 + i)^j$$

where PV = Present value

$\sum B_j$ = Sumtotal of benefits to students and staff of VUSC after incorporation

i = Discount rate of 8%

j = 2004, 2005 and 2006

$$\begin{aligned}
 &= \frac{102\,464}{(1+0.08)^1} + \frac{110\,661}{(1+0.08)^2} + \frac{119\,514}{(1+0.08)^3} \\
 &= 94\,874.07 + 94\,874.07 + 94\,874.07 \\
 &= 284\,622.21 \qquad (7)
 \end{aligned}$$

- The cost/benefit ratio after incorporation is equal to:

$$= \frac{(4) + (7)}{(5) + (6)}$$

$$\begin{aligned} \text{Cost/benefit ratio after incorporation} &= \frac{141\,389\,386.7}{190\,775\,668.5} \\ &= 0.7411 \end{aligned}$$

6.6 INTERPRETATION OF RESULTS

Chapter 4 (Section 4.2.3) states, that a change in social welfare is equal to the sum of benefits, minus the sum of costs. This calculation can be done by comparing Table 6.11 with Table 6.12. If the total costs and benefits in Table 6.12 are taken and the total costs and benefits in Table 6.11 are deducted, the social welfare change can be shown as follows.

Social welfare change = change in benefits, minus change in costs

$$\begin{aligned} = \Delta SW &= \{[(\text{Present value of revenue after incorporation}) + (\text{Present value of benefits to students and staff of VUSC})] - [(\text{Present value of revenue before incorporation})]\} - \\ &\{[(\text{Present value of financial costs after incorporation}) + (\text{Present value of costs to students and staff after incorporation})] - [(\text{Present value of financial costs before incorporation}) - (\text{Present value of economic costs before incorporation})]\} \end{aligned}$$

$$= \{[(4) + (7)] - [(1)]\} - \{[(5) + (6)] - [(2) - (3)]\}$$

$$\begin{aligned} = & \{[(141\,104\,764.5 + 284\,622.21) - (123\,041\,811.80)] - [(171\,718\,021.5 + 19\,057\,647) \\ & - (119\,400\,287.9 + 10\,258\,974.94)]\} \end{aligned}$$

$$= [18\,347\,574.91] - [61\,116\,05.66]$$

$$= -42\,768\,830.75$$

This means, that a social welfare loss of R42.77 million (including the cost of new buildings) can be expected in the period 2004 to 2006 because of the incorporation. This welfare loss includes the loss to the NWUVTC, as well as to students and staff of VUSC.

If the costs and benefits of the NWUVTTC should be excluded, the welfare loss/gain could be calculated for students and staff of VUSC:

Social welfare change for students and staff of VUSC

= Change in benefits minus change in cost

= [(7)] – [(6) – (3)]

= [284622.21] – [19 057 647 – 10 258 974.94]

= -8 514 049.8

This means, that students and staff of VUSC would experience a welfare loss of R8.51 million for the period 2004 to 2006.

This estimated welfare loss is also an indication that pareto optimality will, as described in Section 4.3 is not be achieved.

In chapter 4 pareto optimality is described as an efficiency norm where a state of economic affairs exist, where no one can be made better off without simultaneously making at least one person worse off. In this case it is evident, that the student community and staff of VUSC and NWUVTTC will experience a welfare loss with no pareto optimality or pareto improvement (see Figure 4.1 and Figure 4.6). The production possibilities frontier (PPF) in Figure 4.1 show a pareto improvement area where no individual is worse off at the expense of others. In other words, it is a state of affairs where no one can be made better off without simultaneously making at least one other person worse off. In the case of the incorporation of VUSC students and staff, and taking into account the welfare loss in the case of students and staff of VUSC and the extra costs i.t.o. travelling, time and tuition, a pareto improvement will not take place. If the Kaldor-Hicks potential pareto improvement concept is used, it can be concluded that in Figure 4.6 a potential pareto improvement can take place. This means that a potential pareto improvement i.t.o. area cdb (Figure 4.6) will take effect if the government are prepared to compensate students for their welfare loss. This potential pareto improvement is also applicable to the NWUVTTC. The Kaldor-Hicks criteria of a potential pareto improvement can take place (see Figure 4.2) if the losers of a project can be compensated by the winners of the project. If the losers of the project

(NWUVTC) and students and staff of VUSC could be compensated for this loss, it could be said that a potential pareto improvement could take place.

It is evident from Tables 6.11 and 6.12, that negative externalities exist after incorporation in the sense that marginal social cost experiences by students after incorporation exist and that an efficiency loss exists (see Figure 4.8 and Figure 4.9). If Figure 4.8 and 4.9 are considered, a similar inefficiency loss indicated by the shaded areas can be expected i.t.o. VUSC students and staff and NWUVTC. It can also be expected that fewer students from the previous VUSC will be in a position to attend classes at NWUVTC because of the extra costs. These extra costs can be shown as follows.

$$\begin{aligned} \text{Extra costs to students and staff} &= [\text{Cost to students and staff (travel, time tuition) after} \\ &\text{incorporation}] - [\text{Costs to students and staff (travel, time, tuition) before incorporation}] \\ &= [(6)] - [(3)] \\ &= [19\ 057\ 647] - [10\ 258\ 974.99] \\ &= 8\ 798\ 672.01 \end{aligned}$$

An additional cost to students and staff of VUSC of R8.8 million can be expected. If travel cost alone is considered, the following costs exist.

$$\begin{aligned} \text{Extra travelling costs to students and staff} &= [\text{Travelling costs to students and staff after} \\ &\text{incorporation}] - [\text{Travelling costs to students and staff before incorporation}] \\ &= [2\ 115\ 966.66] - [1\ 583\ 572.22] \\ &= 532\ 394.44 \end{aligned}$$

Extra travelling costs of 532 384.44 for students and staff for the period 2004 to 2006 can be expected.

It can thus be expected, that consumer surplus (see Section 4.4.4) will decline, in the sense that it can be expected that a few students will actually travel to NWUVTC and that the price (costs) of tuition to students will be higher. If Figure 4.10 is considered with an assumption that the extra travelling costs, extra travel time and higher tuition of VUSC students and staff will increase costs from P_1 to P_2 in Figure 4.10. In such a case consumer surplus will shrink from the area DP_2b to the area DP_1a .

The same can be said of producer surplus where the costs of NWUVTC will be higher and that a decline in producer surplus can also be expected (see Section 4.6). If Figure 4.12 is considered, it can be assumed that NWUVTC costs will increase from P_1 to P_2 in Figure 4.12 which will result in an increase in producer surplus.

If producer and consumer surplus is added (after incorporation), it can be expected that there will be a negative welfare change (see Section 4.7).

When the criteria of cost/benefit ratio are applied, it is evident that the ratio will decrease from 0.9489 to 0.7411 in the period 2004 to 2006. This is also an indication of the expected efficiency loss.

When the non-monetised impacts on students are analysed, it is seen that positive impacts also exist. This is indicated in Table 6.13, which is based on the analysis of Section 6.4.3.

These non-monetised impacts include:

- A positive impact on students of VUSC is expected i.t.o. an expected improvement in quality, the name change of Potchefstroom University for CHE to North-West University, expected increase in the standard of education at North-West University and a perception that employers value a North-West University qualification higher than a VUSC qualification, making it easier to find a job with a North-West University qualification.
- A negative impact on students of VUSC i.t.o. expected higher tuition fees and the expected higher travelling costs do the closure of VUSC and a further distance to travel to attend classes at NWUVTC.

Table 6.13 Non-monetised impacts

Statements	Positive/negative impact
Statement 1 I am satisfied with the university where I stay	-
Statement 2 The name of the university must change	+
Statement 3 The fees at my university are the cheapest in the Vaal Triangle	---
Statement 4 The standard of education is the highest at my university in the Vaal Triangle	+
Statement 5 A merger between Vista University, the Sebokeng Campus and the Potchefstroom University, the Vaal Triangle Campus must take place	++++
Statement 6 Such a merger will improve quality	++++
Statement 7 If such a merger takes place, the name of the institution must be Potchefstroom University for CHE	++++
Statement 8 If such a merger takes place, the name of the institution must be Vista University	++++
Statement 9 If such a merger takes place, a new name must be found	++++
Statement 10 If a merger takes place, both campuses must be maintained	---
Statement 11 If such a merger takes place, only the Vista must be maintained	---
Statement 12 If such a merger takes place, only the Potchefstroom University (Vaal Triangle Campus) must be maintained	---
Statement 13 The standard of education at the new institution (North-West University) will be high	++++
Statement 14 The incorporation of Vista (Sebokeng Campus) into the new institution (North-West University) will improve the quality of education	++++
Statement 15 The qualification that I will receive at the new institution will be of a higher quality (as seen by the employers than a Vista qualification)	+++
Statement 16 I will have a better chance to find a job with a qualification from the new institution (compared to a Vista qualification)	++

Source: Compiled using the criteria of Odeck (2000:56) and survey results discussed in Section 6.4.3

It is evident from Table 6.13, that positive impacts exist in the sense of higher quality education but negative impacts exist in terms of expected higher fees, extra travelling costs, extra travelling time and requirements to enter the new institution. If the questions, stated in Section 6.1 are considered, the following can be said.

- Will this new merged institution be able to address the needs of the Vaal Triangle's African population? In other words, will the new incorporated university be able to increase the participation rate of African and Coloured students? The answer to this

is that it will be difficult, if not impossible, to address these needs as 68.7% of VUSC students stay near VUSC which is closed now and an expected increase in travelling costs, tuition fees and travelling time will result in a welfare loss of R8.5 million for the period 2004 to 2006. In other words, if Government do not compensate these students i.t.o. free transport, it can be expected that a very low percentage of these students will attend classes at NWUVTC in future.

- To what extent will the new merged institution be able to attract students from previously disadvantaged communities? If the demographic profile of VUSC students is considered, it is evident that the majority of students who attend classes at VUSC came from Sebokeng and Evaton (68.7% in October 2003). If the increase in travelling costs, extra tuition fees, extra travelling time and the general economic condition of the VT, where 51.3% are unemployed and 74% of persons in the Emfuleni local municipal area earn less than R1 500 per month, are taken into account, it can be expected that the success of NWUVTC to attract students from Sebokeng and Evaton, will be low.
- To what extent will the financial viability of the new institution be affected? It is seen in Table 6.5 and 6.6 that a loss of R1 671 534 in 2004, R3 034 098 in 2005 and R4 177 384 in 2006 will be made as a result of the incorporation of VUSC students and staff into NWUVTC.
- If the efficient use of buildings is considered, an extra R27 million (included in Table 6.12) will be needed to build extra buildings to accommodate staff from VUSC. It is thus evident that if Government do not compensate the NWUVTC i.t.o. this extra costs, the financial viability of NWUVTC will be affected.

6.7 SUMMARY AND CONCLUSION

In the introduction of this chapter it is stated that specific questions that must be answered, include the following.

- Will the new institution be able to address the needs of the VT African population?
- Will the newly merged institution be able to attract students from previously disadvantaged communities?

- Will the financial viability of the new institution be affected?
- Will the new institution be accessible for students from previously disadvantaged communities i.t.o. entry requirements and transport costs?
- Will the incorporation enable the efficient use of buildings, facilities and what will the cost/financial implications be?

To answer these questions, a detailed analysis of the monetised and non-monetised impacts is done.

In a survey in October 2001, most students from Vista University, the Sebokeng Campus (VUSC), indicated that they stay in residential areas of Sebokeng and Evaton (65.4%). In a similar survey in October 2003, a total of 68.7% indicated that they stay in Sebokeng and Evaton. From this, it is evident that the majority of VUSC students still stay in Sebokeng and Evaton, near the VUSC. The majority of VUSC students make use of taxi transport (76.3% in the October 2003 survey). In October 2003, 16.1% of the students indicated that they walk to campus as compared to 20.6% in the October 2001 survey. In the October 2003 questionnaire, VUSC students were asked if they would move closer to the NWUVTC if VUSC closed down and 71.9% of the students who completed the questionnaire indicated that they would not move closer to NWUVTC. With this in mind, an identification of impacts on the NWUVTC and students and staff of VUSC is done.

The impacts on the NWUVTC can be divided into benefits from the additional inflow of former VUSC students in terms of extra subsidies from government and extra income from student fees. The additional costs expected for NWUVTC after incorporation, include extra costs in terms of personnel and extra operating costs. It is also expected that extra buildings and facilities would be needed to accommodate the staff from the former VUSC after incorporation. It is expected that students and staff will incur extra costs in terms of extra travelling costs, extra travelling time and extra tuition fees since VUSC is situated in Zone 10, Sebokeng where about 68.7% of VUSC students stay. The new university is approximately 30 kilometres from VUSC in Vanderbijlpark.

These anticipated costs and benefits are quantified in this chapter and presented in a planned balance sheet (PBS), as discussed in chapter 5. This quantification of costs is done by looking at the monetised and non-monetised impacts of the incorporation of

VUSC into NWUVTC. The monetised impact of the incorporation of VUSC into NWVTC is a net benefit for the NWUVTC of R870 259 is expected for 2004, R629 166 for 2005 and R2 892 702 for 2006, if VUSC students and staff are not incorporated into the NWUVTC. If the incorporation of VUSC students and staff into NWUVTC took place, this net benefit would be changed into a net loss of R1 671 534 for 2004, R3 034 098 for 2005 and R4 177 384 for 2006.

The monetised impacts of students and staff of VUSC are divided into extra tuition fees, extra travelling costs and extra travelling time. It is expected, that students will pay extra tuition fees of R2 956 300 in 2004, R3 192 804 in 2005 and R3 448 228 in 2006 if the tuition fee structure of NWUVTC does not change. It is expected, that the total travelling costs of VUSC students and staff, expressed in monetary terms, will increase by R19 560 in 2004, R21 124 in 2005 and R22 814 in 2006. It is also expected, that students will benefit from the incorporation of VUSC into NWUVTC in terms of willingness to move in order to obtain a qualification of NWUVTC and in this regard it is expected that a benefit of R102 464 for 2004, R110 661 for 2005 and R119 514 for 2006 could be expected.

These monetised impacts are presented in a planned balance sheet (PBS) and the discounted values are calculated. If these values are expressed in a cost/benefit ratio, it shows that this ratio will come down from 0.9489 to 0.7411 if the incorporation of VUSC into NWUVTC is taken into consideration. If these figures are expressed in terms of the theory of chapter 4, a social welfare loss of R42.77 million can be expected in the period 2004 to 2006. If the costs and benefits of the NWUVTC are excluded, a welfare loss of R8.5 million can be expected i.r.o. students and staff of VUSC in the period 2004 to 2006.

The impacts on students in non-monetary terms are also considered. A total of 53.8% of VUSC students are not satisfied with VUSC. In this regard a number of students (18.1%) indicated that VUSC is not on standard, while (81.9%) indicated a "lack of resources, equipment and study material" as reason for their opinion. Considering a name change, it is shown that VUSC students are not satisfied with Vista University as a possible name for the institution (71% disagreed or disagreed strongly, that the name must be Vista University after incorporation), while VUSC students also indicated that

Potchefstroom University for CHE is not acceptable as a name (71.6% of VUSC students disagreed or disagreed strongly with Potchefstroom University for CHE as a possible name). In this regard, 65.6% of VUSC students indicated, that a new name must be found. It is expected, that since the name Potchefstroom University for CHE was changed to the North-West University from January 1, 2004, a positive impact in this regard could be expected. Students indicated, that after incorporation, it could be expected that the quality of education would improve, and it would be easier to find a job with a qualification from North-West University in stead of a VUSC qualification. A positive impact is expected in this regard. Students, however, indicated that both campuses (VUSC and NWUVTC) must be maintained. This can be seen against the background of the welfare loss to students and staff as shown in this chapter, which can be minimised in a situation where both campuses are maintained. The costs to the NWUVTC in such a case, will rise, thus increasing the NWUVTC welfare loss.

CHAPTER 7 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 SUMMARY

Several developments in the higher education arena have taken place since 1996. This includes the report released by the Commission on Higher Education (CHE) "towards a new higher education landscape", the National Plan for Higher Education (NPHE) released on 5 March 2001 by the former Minister of Education, Prof. Kader Asmal, the Green Paper and White Paper on the transformation of the higher education system in South Africa. Specific goals set out in these documents that must be reached in the process of mergers/combinations/incorporations, include the following.

- Attention must be given to meet local needs of society.
- A redress of geographical located institutions based on ideological and political considerations, must take place.
- The poor pattern of race and gender representations must be rectified.
- The decline in student enrolments within the public higher education sector must be rectified.
- The financial viability of institutions must be ensured.
- Access and equity must be promoted.
- The participation rate of African and Coloured students must be increased.

In the report of the former Minister of Education "Transformation and restructuring: a new institutional landscape for higher education", it was stated that:

- the students and staff of the Sebokeng Campus of Vista University (VUSC) should be incorporated into the Vaal Triangle Campus of the merged Potchefstroom University for CHE and the North-West University; and
- the infrastructure and facilities of the Vista University, the Sebokeng Campus, should be transferred to the Vaal Triangle Technikon.

Specific questions that must be answered against this background include:

- Will this new merged institution be able to address the needs of the Vaal Triangle African population? In other words, will the new incorporated university be able to increase the participation rate of African and Coloured students?
- To what extent will the new merged institution be able to attract students from the previously disadvantaged communities?
- To what extent will the financial viability of the new merged institution be affected?
- To what extent will the incorporation enable the efficient use of buildings, facilities and human resources, and if not, what will the cost/financial implications be?

To answer these questions, the monetised and non-monetised (positive or negative impacts) which can be expected on students and staff of VUSC and on the NWUVTTC are analysed.

The VUSC and NWUVTTC are both situated in the Vaal Triangle (VUSC is situated in Zone 10, Sebokeng and NWUVTTC is approximately 30 kilometres from Sebokeng, near Sharpeville in Vanderbijlpark). The Vaal Triangle (VT) consists of three municipal areas, namely Emfuleni, Midvaal and Metsimaholo municipalities, with a total population of 839 039 in 2001, of which about 81.7% are African. The economy of the VT depends to a great extent on the manufacturing of metal, fuel, petroleum and rubber products, where the manufacturing sector contributes approximately 42.8% in terms of gross geographical product (GGP). Economic features in the VT include:

- a large dependency on the manufacturing sector;
- an unemployment rate of 51.3%; and
- a low monthly individual income level where 74% of persons in the Emfuleni local municipal area earn less than R1 500 per month.

The history of VUSC can be traced back to a Report on University Needs for the South African Urban Black Population, which was submitted in 1980 by a commission of enquiry appointed by the Government. The VUSC started in 1985 and since then student numbers increased to a total of 1 194 students in 1999. Since then it decreased to 597 students in 2002. African students made up almost 100% of the student

numbers. A total of 15 permanent academic staff, 5 contract academic staff and 6 temporary academic staff and a total of 25 support staff were employed at VUSC in 2003.

The admission requirements of VUSC differ considerably from NWUVTC in the sense that Grade 12 subject symbols are used as selection model at VUSC, while an M-score model is used by NWUVTC. The payable fees at NWUVTC also differ considerably from the payable fees of VUSC (a BA Degree at VUSC constitutes approximately 54.1% of the fees for a BA Degree at NWUVTC).

The NWUVTC started in 1963 as the Vaal Campus of the former Potchefstroom University for Christian Higher Education (PU for CHE) on request from the business community in the Vaal Triangle (VT). By the year 1973 the student numbers had increased to 385 and a permanent office was established in the Vaal Triangle. In 1984 the activities of the Vaal Triangle Campus were transferred to the campus in Hendrik van Eck Boulevard, Vanderbijlpark, where student numbers increased to 1 140 in 1984. In 1992, English was instituted as additional medium of instruction and student numbers increased up to 2 177 in 2003. In contrast to VUSC, with almost 100% African students, 35.7% of NWUVTC students are African, 59% are White students and 5.3% Coloured and Indian students.

To measure the monetised and non-monetised impacts of the closure of VUSC on students and staff of VUSC and the NWUVTC, a theoretical framework of welfare measurement is needed, as the theory of welfare economics can be used to analyse the nature of impacts on the welfare of society at large. Welfare economics is defined as that part of the study of economics that explain how to identify and arrive at what are called socially efficient allocations of resources. In other words, it must be decided what is "best" or "optimum" among alternative solutions available. In this regard, the concept welfare maximisation is used, implying that a change in social welfare can be measured by subtracting the sum total of costs to VUSC (students and staff) and costs to NWUVTC from the benefits to VUSC (students and staff) and benefits of NWUVTC.

The theory of pareto optimality is used as a further criterion to see whether 'winners' and 'losers' exist as a result of the closure of VUSC and its incorporation into NWUVTC.

Pareto optimality is defined as an efficiency norm to describe conditions necessary to achieve optimality in resource allocation. In other words, to use the definition of Nas. " ... A state of economic affairs where no one can be made better off without simultaneously making at least one other person worse off". If no pareto optimality can be reached in the case of the incorporation of VUSC into NWUVTC, Kaldor Hicks refers to a "potential" pareto optimality stating that "improvement" or optimality can still be reached if the winners are prepared to compensate the losers in a project. On the other hand, there are possible positive/or negative spillovers on third parties (which are the students and staff of VUSC and on NWUVTC).

Against this background, it is necessary to determine whether an efficiency loss has taken place in the process to incorporate VUSC students and staff into NWUVTC. In this regard, the concepts "consumer surplus" and "producer surplus" can be used to determine theoretically whether a welfare loss has taken place. To look at the potential welfare loss, it is suggested to use the methodology for an impact assessment. A difference is drawn between a financial analysis and an economic impact assessment (EIA). Economic impact assessment (EIA) takes the potential gains and losses of the public viewpoint into account and converts these into monetary units to see whether projects are profitable (out of society's viewpoint and from private viewpoint), whereas a financial analysis excludes the potential gains and losses of the public.

Cost benefit analysis (CBA) is identified as the method to analyse possible positive and negative impacts on the student and staff of VUSC and the positive and negative impacts on the NWUVTC. The approach used by the Development Bank of Southern Africa (DBSA), is used to do the CBA, while a planned balance sheet (PBS) is used to document the monetised impacts of the incorporation of VUSC (on students and staff) into NWUVTC. The non-monetised impacts are done according to a scale indicating positive and negative impacts suggested by Odeck.

In a survey in October 2001 65.4% of the students from Vista University, Sebokeng Campus (VUSC) indicated that they stay in residential areas of Sebokeng and Evaton. In a similar survey in October 2003, 68.7% of the VUSC students indicated that they stay in Sebokeng and Evaton. It is evident that the majority of VUSC students still stay

in Sebokeng and Evaton near the VUSC in Zone 10, Sebokeng. The majority of VUSC students make use of taxi transport (76.3% of VUSC students of VUSC in the October 2003 survey). In October 2003, 16.1% of students indicated that they walk to campus compared to 20.6% in the October 2001 survey. In the October 2003 questionnaire, 71.9% of the students indicated that they will not move closer to the NWUVTTC if VUSC closes down.

With this in mind, an identification of impacts on the NWUVTTC and students and staff of VUSC is done. The impacts on the NWUVTTC can be divided into benefits from the additional inflow of former VUSC students in terms of extra subsidy from Government and extra income from student fees. The additional costs expected for NWUVTTC after incorporation include extra costs in terms of personnel and extra operating cost. Extra buildings and facilities are also needed to accommodate the staff from the former VUSC after incorporation. The anticipated costs and benefits are quantified in a before and after approach and is presented in a planned balance sheet (PBS). This quantification of costs is done by looking at the monetised and non-monetised impacts of the incorporation of VUSC into NWUVTTC.

If the monetised impacts of the incorporation of VUSC students and staff into NWUVTTC on the NWUVTTC are analysed, a net benefit of R870 259 for 2004, R629 166 for 2005 and R2 892 702 for 2006 for the NWUVTTC is expected if VUSC students and staff are not incorporated into the NWUVTTC. If the incorporation of VUSC students and staff into NWUVTTC takes place, this net benefit will be changed into a net loss of R1 671 535 for 2004, R3 034 098 for 2005 and R4 177 384 for 2006. If the cost of extra buildings and facilities that must be built to accommodate the staff and students of VUSC, another R27 million will be added to the loss/expenditure in 2006.

The monetised impacts on students and staff are divided into extra tuition fees, extra travelling costs and extra travelling time. It is expected that students will pay extra tuition fees of R2 956 300 in 2004, R3 192 804 in 2005 and R3 448 228 in 2006 if the tuition fee structure of NWUVTTC does not change. It is expected that the total travelling costs of VUSC students and staff expressed in monetary terms will increase by R191 662 in 2004, R206 995 in 2005 and R223 555 in 2006. If extra travel time in

monetary units is considered, R19 560 in 2004, R21 124 in 2005 and R22 814 in 2006 must be added. It is also expected that students will benefit from the incorporation of VUSC into NWUVTC in terms of willingness to pay more in order to obtain a qualification from North-West University and in this regard it is expected that a benefit of R102 464 for 2004, R110 661 for 2005 and R119 514 for 2006 can be expected.

These monetised impacts are presented in a planned balance sheet (PBS) and the discounted values are calculated. If these values are expressed in a cost/benefit ratio, it shows that this ratio will come down from 0.9489 to 0.7411 if the incorporation of VUSC into NWUVTC is taken into consideration. If these figures are expressed in terms of the theory of chapter 4, a social welfare loss of R42.77 million can be expected in the period 2004 to 2006. If the costs and benefits of the NWUVTC are excluded, a welfare loss of R8.5 million can be expected on students and staff of VUSC in the period 2004 to 2006.

Considering the impacts on students in non-monetary terms, 53.8% of VUSC students indicated that they are not satisfied with VUSC. In this regard, a number of students (18.1%) indicated that VUSC is not on standard, while 81.9% indicated a "lack of resources, equipment and study material" as reason for their opinion.

Considering a name-change, 71% of VUSC students are not satisfied with Vista University as a possible name for the institution after incorporation, while 71.6% indicated that Potchefstroom University for CHE is not acceptable as a name. 65.6% of VUSC students indicated that a new name must be found. It is expected that since the Potchefstroom University for CHE was changed to the North-West University from January 1, 2004, that a positive impact in this regard can be expected.

Students indicated, that after incorporation it can be expected that the quality of education will be improved, and it will be easier to find a job with a qualification from North-West University instead of a VUSC qualification. A positive impact is expected in this regard.

VUSC students, however, indicated that both campuses (VUSC and NWUVTC) must be maintained. This can be seen against the background of the welfare loss to students and staff shown in this chapter, which can be minimised in a situation where both

campuses are maintained. The costs to the NUWVTC in such a case will rise increasing the NWUVTC welfare loss.

With regard to the specific questions stated in the beginning of this chapter, the following can be said.

- NWUVTC will find it difficult to increase the participation rate of African and Coloured students, especially from Sebokeng and Evaton. The extra travelling costs of R191 62 in 2004, R206 995 in 2005 and R223 555 in 2006, seen against the background of the high unemployment rate in the VT is 51.3% and the fact that 74% of persons in the Emfuleni local municipal area earn less than R1 500 per month, will make it difficult for students from Sebokeng and Evaton to attend classes at NWUVTC, unless compensated i.t.o. free transport to NWUVTC
- The NWUVTC will find it difficult to attract students from the previously disadvantaged communities to enrol in future for qualifications at NWUVTC, because of the higher tuition fees at NWUVTC.
- The financial viability of NWUVTC will be affected negatively by the incorporation of VUSC students and staff into NWUVTC, since a net loss of R1 671 535 in 2004, R3 034 098 in 2005 and R4 177 384 in 2006 will take place. If the extra buildings and equipment which will be needed at an estimated cost of R27 million is added, the financial viability of NWUVTC will be affected negatively, if Government is not prepared to compensate NWUVTC for this welfare loss.

7.2 CONCLUSION

It can be concluded that.

- The majority of students of VUSC who came from previously disadvantaged communities will be affected negatively seen against the background of an increase in student fees. The goals of the National Plan on Higher Education will thus not be met in this regard.
- A large number of students will experience an increase in travelling costs, making it difficult to attend classes at NWUVTC in future. This will lower the chance of NUWVTC to attract more students from previously disadvantaged communities. In

this regard the goals set out in the National Plan on Higher Education will not be met.

- This incorporation implicates that the staff of VUSC must be incorporated into NWUVTC, which may affect the financial viability of NWUVTC. The financial viability was set out as a specific goal by the NPHE and this will not be met.
- The incorporation also implicates that extra buildings and facilities will be needed by NWUVTC so as to accommodate students and staff from VUSC, which may then also affect the financial viability of NWUVTC. This implicates that the goals set out by the NPHE in this regard will not be met.

7.3 RECOMMENDATIONS

It is shown in this study that pareto optimality will possibly not be reached and that negative externalities exist. In Chapter 4 it is indicated, that if pareto optimality is not reached, a welfare loss can be expected.

On the other hand, if compensation for 'losers' of the project can take place, according to the Kaldor-Hicks criterion/test, potential pareto optimality can still be reached. This means that –

- government must compensate/subsidise the NWUVTC for extra expenditure (costs) in terms of personnel and operating expenditure, at least for the period 2004 to 2006, if a welfare loss is to be avoided. This compensation that must take place adds up to the welfare loss of R34.27 million for the period 2004, 2005 and 2006.
- government must compensate/subsidise the NWUVTC, so that students can be receive free transport and financial assistance to avoid the extra costs. If not, a potential welfare loss can be expected. A compensation of R8.5 million must take place to cover this welfare loss for the period 2004, 2005 and 2006.

If this compensation by Government can take place, a potential pareto improvement is possible and in such a case the decision of the Minister will be for the better of the community of the Vaal Triangle.

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APPENDIX A

VAAL TRIANGLE CAMPUS OF THE PU FOR CHE

ADMISSION REQUIREMENTS

1. Minimum admission requirements

Matriculation exemption and an M-score, as indicated for each field of study.

2. Matriculation exemption

- Six subjects selected from at least four subject groups.
- Four subjects on higher grade, selected from three different subject groups.
- Two languages from Group A on higher grade.
- A minimum of 950 marks (for six subjects) must be obtained.
- A pass mark in at least five subjects (with a subminimum of 20% in the sixth subject).

3. Selection model: determining the M-score

Subject symbol	Percentage	Higher grade	Standard grade
A	80%+	5	4
B	70 – 79%	4	3
C	60 – 69%	3	2
D	50 – 59%	2	1
E	40 – 49%	1	0

A maximum of 6 subjects are used to determine the M-score.

N.B. The count of the most relevant subject in the Higher Grade for the selection direction of study carries a double weight, e.g. for the B.Com. degree a B-symbol in Accountancy in the Higher Grade will count 8 instead of 4.

4. Example to calculate the M-score

Subject	Symbol	M-value
Afrikaans HG	B	4
English HG	C	3
Mathematics HG	B	4
Accountancy HG	B	*4
Biology SG	C	2
History SG	B	3
Bonus point		4
M-Score		24

Vista University Sebokeng Campus

Admission requirements

1. **Minimum admission requirements**
 (Please note that the language of instruction and examination at Vista University is **English**. Certain courses of study may have additional specific requirements; these are listed under "*Additional Requirements*" in the respective cases.

Applicants for Foundation and Bachelor's Degree courses are required to write an Admission Test. (Further information about the test will be provided to applicants).
2. **Foundation courses**
A South African Senior Certificate, or General Certificate in Education (GCE) "O" Level with credits in five (5) subjects, including English Language or an equivalent qualification.
 NB: Students who successfully complete a Foundation Course, will be granted admission into the relevant Bachelor's Degree course.
3. **Undergraduate Diploma/Certificate courses**
A senior or school-leaving certificate, or equivalent qualification.
4. **Bachelor's Degree**
 A person shall be considered for registration for a Bachelor's degree on the basis of the following:
 - a) possession of the *matriculation certificate* of the Matriculation Board, or a *certificate of exemption* issued by the Matriculation Board (or the Joint Matriculation Board); or
 - b) possession of a *senior certificate* with matriculation endorsement; or
 - c) possession of a *valid certificate of conditional exemption* issued by the Matriculation Board; or
 - d) possession of a *National Diploma* of at least three (3) years duration; or
 - e) possession of a *Senior or school-leaving certificate* with matriculation conditional exemption;
 - f) successful completion of an approved Foundation course;
 - g) for **applicants aged 23 years or older**: possession of a *Senior Certificate* or equivalent, with a minimum of "e" symbol in four (4) subjects, at least one of which must be at higher grade (at least three of the four subjects must have been passed at the same examination sitting);
 - h) **in the case of certificates issued by examining bodies outside the Republic of South Africa**: possession of the *General Certificate or Education or Higher School Certificate* with credits in:
 - either** five (5) subjects including English Language, at least two (2) of which shall be at the "advanced" level;
 - or** (if the applicant is 23 years or older) four (4) subjects including English Language at least three of which must have been passed at the same examination sitting;
 - i) the attainment of the age of 45 years before or during the first year of study;
 - j) any other qualification and/or requirements approved by Senate.

NB: Applicants who satisfy requirements (d) to (j) above must apply for matriculation exemption (or conditional matriculation exemption) from the Matriculation Board on admission.

APPENDIX C

RESEARCH QUESTIONNAIRE

1. GENERAL INFORMATION (PLEASE FILL IN AS COMPLETE AS POSSIBLE)

NAME AND SURNAME

STUDENT NUMBER

UNIVERSITY (EXAMPLE: POTCHEFSTROOM OR VISTA)

DEGREE (EXAMPLE: B COM; BSc; BA)

LEVEL (EXAMPLE: FIRST YEAR, SECOND YEAR, THIRD YEAR, POST GRADUATE)

FINANCING OF STUDIES (BURSARY, LOAN, SELF)

WHEN WILL YOU COMPLETE YOUR STUDIES? (EXAMPLE 2002 OR 2003)?

2. RESIDENTIAL AREA

PLEASE INDICATE WITH A CROSS THE RESIDENTIAL AREA IN WHICH YOU STAY

X

VANDERBIJLPARK

CW 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
CW 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
CW 3	<input style="width: 40px; height: 15px;" type="checkbox"/>
CW 4	<input style="width: 40px; height: 15px;" type="checkbox"/>
CW 5	<input style="width: 40px; height: 15px;" type="checkbox"/>
CW 6	<input style="width: 40px; height: 15px;" type="checkbox"/>
SE 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
SE 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
SE 3	<input style="width: 40px; height: 15px;" type="checkbox"/>
SE 4	<input style="width: 40px; height: 15px;" type="checkbox"/>
SE 6	<input style="width: 40px; height: 15px;" type="checkbox"/>
SE 7	<input style="width: 40px; height: 15px;" type="checkbox"/>
SW 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
SW 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
SW 5	<input style="width: 40px; height: 15px;" type="checkbox"/>
Flora Gardens	<input style="width: 40px; height: 15px;" type="checkbox"/>
Bonanne	<input style="width: 40px; height: 15px;" type="checkbox"/>

SHARPEVILLE

EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
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BOIPATONG

EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 3	<input style="width: 40px; height: 15px;" type="checkbox"/>

BOPHELONG

(also known as Muvango)

EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 3	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 4	<input style="width: 40px; height: 15px;" type="checkbox"/>
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EXT. 7	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 8	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 9	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 10	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 11	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 12	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 13	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 14	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 15	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 16	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 17	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 18	<input style="width: 40px; height: 15px;" type="checkbox"/>

TSIEPISO

EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 2	<input style="width: 40px; height: 15px;" type="checkbox"/>

SEBOKENG

<input style="width: 40px; height: 15px;" type="checkbox"/>
<input style="width: 40px; height: 15px;" type="checkbox"/>

UNIT 11	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 12 EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 12 EXT. 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 12 EXT. 3	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 13	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 14	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 15	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 16	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 17	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 21 (Westside Park)	<input style="width: 40px; height: 15px;" type="checkbox"/>

JOHANDEO (Pholokong)

UNIT 3	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 6 EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 6 EXT. 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 6 EXT. 3	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 6 EXT. 5	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 7 EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
UNIT 8	<input style="width: 40px; height: 15px;" type="checkbox"/>

EVATON

EVATON SMALL FARMS	<input style="width: 40px; height: 15px;" type="checkbox"/>
EVATON NORTH	<input style="width: 40px; height: 15px;" type="checkbox"/>
EVATON WEST	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 1	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 2	<input style="width: 40px; height: 15px;" type="checkbox"/>
EXT. 3	<input style="width: 40px; height: 15px;" type="checkbox"/>

EXT. 4	<input type="checkbox"/>	UNIT 10 UNIT 10 EXT. 2 UNIT 10 EXT. 3	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	EXT. 4 EXT. 5 EXT. 6	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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EXT. 7 EXT. 8 EXT. 9 EXT. 10 EXT. 11	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	BUYCELIA LAKESIDE BEDWORTH PARK STEEL PARK WALDRIFT LEEUFHOF	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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BEVERLY HILLS GRACELAND STRETFORD LAKESIDE ANGOLA	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	SASOLBURG ZAMDELA VAALPARK CHRIS HANI	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
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VEREENIGING

SONLAND PARK THREE RIVERS THREE RIVERS EAST DADAVILLE ROSHNEE RUST TER VAAL VAALFONTEIN ARCON PARK RISIVILLE PEACEHAVEN HOMELANDS HOUTKOP FALCONRIDGE UNITAS PARK	<input type="checkbox"/> <input type="checkbox"/>	IF OTHER SPECIFY <input type="text"/>
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3. TRAVEL TIME AND MODE OF TRANSPORTATION

PLEASE INDICATE TRAVEL TIME AND MODE OF TRANSPORTATION FROM YOUR HOME TO THE UNIVERSITY (**ONE WAY**) BY INDICATING WITH A CROSS

3.1 MODE OF TRANSPORTATION

BY FOOT	<input type="checkbox"/>	3.1.1
BICYCLE	<input type="checkbox"/>	3.1.2
MOTORCYCLE	<input type="checkbox"/>	3.1.3
MOTORCAR	<input type="checkbox"/>	3.1.4
TAXI	<input type="checkbox"/>	3.1.5
BUS	<input type="checkbox"/>	

3.2 FOR THOSE WHO USE A TAXI, HOW MANY LINKS/INTERCHANGE DO YOU USE?

3.3 TRAVEL TIME (EXACT TRAVEL TIME IN MINUTES)

PLEASE INDICATE BELOW THE EXACT TRAVEL TIME IN MINUTES FROM HOME TO THE UNIVERSITY PER DAY (ONE WAY)

3.3.1 COST OF TRANSPORTATION

PLEASE INDICATE THE APPROXIMATE COST OF TRANSPORTATION FROM YOUR HOME TO THE UNIVERSITY PER DAY (EXACT) BELOW (ONE WAY TRANSPORTATION)

Per day

3.3.2 HOW MANY TIMES PER WEEK DO YOU TRAVEL TO THE UNIVERSITY?

- | | | |
|---------------------------|----------------------|-----------------------|
| 1 DAY | <input type="text"/> | 3.3.2.1 |
| 2 DAYS | <input type="text"/> | 3.3.2.2 |
| 3 DAYS | <input type="text"/> | 3.3.2.3 |
| 4 DAYS | <input type="text"/> | 3.3.2.4 |
| 5 DAYS | <input type="text"/> | 3.3.2.5 |
| Irregularly (appointment) | <input type="text"/> | (PhD's; Master's ...) |

4. STATEMENTS (PLEASE INDICATE WHETHER YOU AGREE, AGREE STRONGLY, DISAGREE OR DISAGREE STRONGLY)

		AGREE	AGREE STRONGLY	DISAGREE	DISAGREE STRONGLY
4.1.1	I am satisfied with the university where I study <i>Reason:</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.2	The name of the university must change	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.3	The fees of my university are the cheapest in the Vaal Triangle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.4	The standard of education is the highest at my university in the Vaal Triangle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.5	A merger between Vista (Sebokeng) and the Potchefstroom University (Vaal Triangle Campus) must take place <i>Reason:</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.6	Such a merger will improve quality <i>Reason:</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.7	If such a merger takes place, the name of the institution must be Potchefstroom University for CHE <i>Reason:</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.1.8	If such a merger takes place, the name of the institution must be Vista University <i>Reason:</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

4.1.9 If such a merger takes place, a new name must be found

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Reason:

4.1.10 If such a merger takes place, both campuses must be maintained

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Reason:

4.1.11 If such a merger takes place, only the Vista campus must be maintained

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Reason:

4.1.12 If such a merger takes place, only the Potchefstroom (Vaal Campus) must be maintained

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Reason:

APPENDIX D

RESEARCH QUESTIONNAIRE (STAFF)

1. GENERAL INFORMATION (PLEASE FILL IN AS COMPLETE AS POSSIBLE)

1.1 NAME AND SURNAME

1.2 UNIVERSITY (VISTA OR PUCHO)

1.3 JOB LEVEL (JUNIOR LECTURER, LECTURER, SENIOR LECTURER, PRINCIPAL LECTURER, PROFESSOR, ADMINISTRATIVE STAFF)

2. TRANSPORT COSTS

2.1.1 PLEASE INDICATE THE RESIDENTIAL ARE IN WHICH YOU STAY

2.1.2 PLEASE INDICATE MODE OF TRANSPORTATION

- BY FOOT 2.1.2.1
- BUS 2.1.2.2
- MOTORCAR 2.1.2.3
- MOTORCYCLE 2.1.2.4
- TAXI 2.1.2.5

2.2 PLEASE INDICATE THE DISTANCE IN KM FROM THE UNIVERSITY TO YOUR HOME (ONE WAY)

2.3 HOW MANY TIMES PER WEEK DO YOU TRAVEL TO THE UNIVERSITY? (FULL-TIME AND PART-TIME CLASSES)

3. TRAVEL TIME (PLEASE INDICATE THE TRAVEL TIME FROM HOME TO THE UNIVERSITY (ONE WAY) IN MINUTES)

4. STATEMENTS (PLEASE INDICATE WHETHER YOU AGREE, AGREE STRONGLY, DISAGREE OR DISAGREE STRONGLY)

	AGREE	AGREE STRONGLY	DISAGREE	DISAGREE STRONGLY
4.1.1 The standard of the University where I work, is the highest in the Vaal Triangle <i>Reason:</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.1.2 A merger between Vista (Sebokeng Campus) and the Potchefstroom University (Vaal Triangle Campus) must take place <i>Reason:</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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4.1.3 Such a merger will improve quality <i>Reason:</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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4.1.4	If such a merger takes place, the name of the institution must be Vista University <i>Reason:</i>				
4.1.5	If such a merger takes place, the name of the institution must be Potchefstroom University for CHE <i>Reason:</i>				
4.1.6	If such a merger takes place, a new name must be found <i>Reason:</i>	AGREE	AGREE STRONGLY	DISAGREE	DISAGREE STRONGLY
4.1.7	If such a merger takes place, both campuses must be maintained <i>Reason:</i>				
4.1.8	If such a merger takes place, only the Vista Campus must be maintained <i>Reason:</i>				
4.1.9	If such a merger takes place, only the Potchefstroom (Vaal Campus) must be maintained <i>Reason:</i>				
4.1.10	If feel that many staff members will loose their jobs if a merger takes place <i>Reason:</i>				
4.1.11	I feel that I will loose my job if a merger takes place <i>Reason:</i>				
4.1.12	A merger will lead to specialisation (name subjects) <i>Reason:</i>				
4.1.13	Administrative costs can be saved if a merger like this takes place <i>Reason:</i>				
4.1.14	If a merger takes place, curricula from Vista must be used for all academic programmes <i>Reason:</i>				
4.1.15	If a merger takes place, curricula from Potchefstroom University must be used for all academic programmes <i>Reason:</i>				
4.1.16	If a merger takes place, curricula selected from both institutions (best curricula/courses/modules) must be used <i>Reason:</i>				

RESEARCH QUESTIONNAIRE

INCORPORATION OF THE SEBOKENG CAMPUS OF VISTA UNIVERSITY INTO
NEW MERGED INSTITUTION: NORTH-WEST UNIVERSITY (POTCHEFSTROOM
UNIVERSITY FOR CHE AND UNIVERSITY OF NORTH WEST)

2. GENERAL INFORMATION (Please fill in as complete as possible)

- 1.1 Name and surname
- 1.2 Student number
- 1.3 Degree (Example: BCOM; BA)
- 1.4 Level (Example: first year, second year, third year, post graduate)
- 1.5 Number of outstanding subjects for degree
- 1.6 When will you complete your studies?

2. GEOGRAPHIC INFORMATION

- 2.1 Please indicate with a cross the residential area in which you stay

BOIPATONG

Please indicate Zone/Extension/Unit

BOPHELONG

Please indicate Zone/Extension/Unit

EVATON

Please indicate Zone/Extension/Unit

JOHANDEO

Please indicate Zone/Extension/Unit

MEYERTON

Please indicate Zone/Extension/Unit

SASOLBURG

Please indicate Zone/Extension/Unit

SEBOKENG

Please indicate Zone/Extension/Unit

SHARPEVILLE

Please indicate Zone/Extension/Unit

TSHEPISO

Please indicate Zone/Extension/Unit

VAN DER BIJLPARK

Please indicate Zone/Extension/Unit

VEREENIGING

Please indicate Zone/Extension/Unit

OTHER

Please indicate Zone/Extension/Unit

2.2 Do you rent a place in the Vaal Triangle?

(Indicate your home town, e.g. Heilbron.)

2.3 If you are from outside the Vaal Triangle, please indicate with whom you stay (example: family, friends, rented room, hostel)

2.4 If the university would close down Vista Sebokeng Campus as from next year 2004, will you move closer to the new incorporated university (old Vaal Pukke Campus near Sharpeville)?

YES	NO	NOT SURE
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2.5 Do you expect to pay more for accommodation if you would move closer to the new campus?

YES	NO	NOT SURE
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2.6 If you say yes in 2.5, please indicate the extra cost per year you expect.

3. TRAVEL INFORMATION

3.1 How many times do you travel to Vista University Sebokeng Campus per week?

<input type="checkbox"/>	1 day	
<input type="checkbox"/>	2 days	
<input type="checkbox"/>	3 days	
<input type="checkbox"/>	4 days	
<input type="checkbox"/>	5 days	
<input type="checkbox"/>	Irregular (PhD's & Masters)	How many times per month? <input type="text"/>

3.2 Please indicate how you travel to Vista University Sebokeng Campus.

Feet	<input type="checkbox"/>
Taxi	<input type="checkbox"/>
Bicycle	<input type="checkbox"/>
Car	<input type="checkbox"/>
Bus	<input type="checkbox"/>

3.3 Please indicate the cost to travel to Vista University, the Sebokeng Campus per week in (Rand).

3.4 Do you expect this travel cost to increase if the Sebokeng Campus would close and you have to attend classes at the new university campus (Vaal Pukke)?

YES	NO	UNCERTAIN
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3.5 If yes in question 3.4, please indicate the extra travelling cost expected per week.

3.6 If the new university institutes a bus service from Zone 10, Sebokeng [at a fee of R10 per day (both ways)] to the new university campus, will you make use of it.

YES	NO	UNCERTAIN
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3.7 If you would make use of the bus service from Zone 10, Sebokeng, do you still have to make use of a taxi etc. to Zone 10, Sebokeng?

YES	NO
-----	----

3.8 If yes in question 3.7, please indicate the expected cost of this other transport (taxi etc.) per week in Rand.

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4. TIME INFORMATION

4.1 Please indicate the total time you spend per trip to the Sebokeng Campus in minutes

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 minutes per trip

4.2 Do you work in your free time to pay for your studies?

YES	NO
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4.3 If yes in question 4.2, please indicate the wage/income per hour approximately.

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5. WILLINGNESS INFORMATION

5.1 If the Vaal Triangle Technikon takes over the buildings of Vista Sebokeng Campus, will you consider rather studying at the Technikon?

YES	NO	UNCERTAIN
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5.2 If yes, state the reason:

.....
.....

5.3 Do you know the fees of the new university (old "Vaal Pukke")?

YES	NO
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5.4 Please indicate whether you agree, agree strongly, disagree or disagree strongly with the following statements:

	AGREE	AGREE STRONGLY	DISAGREE	DISAGREE STRONGLY
5.4.1 The standard of education at the new institution (North West University) will be high				
5.4.2 The incorporation of Vista (Sebokeng Campus) into the new institution (PU for CHE and University of NW) will improve the quality of education.				
5.4.3 The qualification that I will receive at the new institution, will be of a higher quality (as seen by the employers) than a Vista qualification.				
5.4.4 I will have a better chance to find a job with a qualification from the new institution (compared to a Vista qualification).				

5.5 Will you be willing to pay more for a qualification from the new institution (North West University)?

YES	NO
-----	----

5.6 If you have had the money how much are you willing to pay extra in addition to what you pay for your studies at the moment (Rand) to study at the new institution (North West University)?

More than R500	R500	R499-400	R399-300	R299-200	R199-100	Less than R100	Nothing
<input type="text"/>							