

# **HESA INFRASTRUCTURE STUDY**

**March 2012**

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## **FOREWORD**

The South African higher education system has been expanding rapidly, yet no clear process for funding the required additional infrastructure and equipment exists. In recent years, the Department of Higher Education and Training has responded to the need for expansion by providing “infrastructure and efficiency funding” in priority areas, but no mechanism for dealing with the basic provision of facilities for teaching and research has been established. Accordingly, HESA’s Funding Strategy Group, with the approval of the HESA Board, undertook a study of institutional needs in these areas. A Steering Committee and Task Team were appointed for this purpose. It is hoped that the results will contribute to the debate on these topics and possibly lead to the solution of some of the current difficulties in future.

The study was complicated by the lack and quality of data. Even though higher education institutions are required to submit data on their buildings to the Department as part of their HEMIS returns, the quality is not uniform. In the case of equipment, no data are provided systematically to the Department with the result that a survey had to be undertaken. Even though questions may exist on the accuracy of some of the detailed data, and particularly on the comparability of the information supplied by institutions on the condition of their buildings and equipment, significant conclusions can be drawn on the current state of the higher education sector’s infrastructure and equipment.

The Task Team were asked to suggest ways of dealing with the provision of infrastructure and equipment rationally in future - in addition to an analysis of the current state. This led to a debate on the advisability of using a ‘developmental approach’ to the application of norms for the provision and financing of infrastructure and equipment, i.e. using a differentiated and phased way of addressing backlogs. Unanimity was not reached on this important policy issue. On the one hand, detailed HEMIS space and costs norms exist for buildings and land improvements other than buildings; on the other, no HEMIS norms exist for equipment. The majority of the Steering Group and Task Team members therefore were of the opinion that further differentiation in the case of infrastructure is not desirable: the existing norms applied to the activities of an institution as defined in its particular ‘programme and qualification mix (PQM)’ should be used. Furthermore, a phased approach to constructing buildings is often problematic. However, in the case of equipment, differentiation and phasing in is practically feasible. Accordingly, a way of introducing a developmental approach to equipment is suggested in the report.

The report was finalised in October 2011 and then sent to all higher education institutions for comments. From the comments received by 29 February 2012 it was clear that broad acceptance exists under institutions that the information contained in the report is valuable and should be used by the DHET in the future allocation of HE funding for infrastructure at institutions. Furthermore, since a ministerial committee was appointed in May 2011 to review the State’s funding framework for higher education, the proposals in this report should also inform the ministerial committee’s review.

The FSG would like to thank the members of the Steering Committee, the Task Team, as well as all higher education institutions that provided detailed information on the utilisation of equipment, for their endeavours to complete this study successfully.

**Dr S Badat**

**Chairperson: Funding Strategy Group**

## EXECUTIVE SUMMARY

### Part 1: Background and introduction

With the advent of the new democratic government in 1994 there were 325 527 FTE students enrolled at higher education institutions in South Africa. This number increased to 542942 in 2009, an increase of 67% in 15 years, or an annual growth rate of 3.46%. In the past few years it has become increasingly evident that the maintenance of fixed assets, as well as the acquisition of new fixed assets, is neglected at many higher education institutions.

As indicated above, two types of cost regarding fixed assets at universities (mainly buildings, equipment, and library collections) can be clearly distinguished. Firstly, the cost of maintaining existing fixed assets from year to year and secondly, the cost of new fixed assets which should be added to the stock of fixed assets at universities as and when the FTE students increase from year to year.

Previously, the Department of Education allocated, according to the so-called SAPSE capital allocation formula, earmarked amounts of (in nominal value) respectively R60 million, R95 million and R150 million for new building projects for universities and technikons for the financial years 1994/95, 1995/96 and 1996/97. No earmarked allocations for new buildings at universities and technikons were, however, made by the Department of Education during the period 1997/98 to 2007/08. Without taking the growth in students since 1999 into account the estimated amount to eliminate the 1999 backlog in buildings was (using the BER building cost index) R18.7 billion in the rand of 2010. This figure has, with the exception of one institution, excluded the cost to eliminate the building backlogs at higher education institutions (HEIs) in the so-called TBVC-states before 1994. No information on backlogs/surpluses in buildings was available for these HEIs since the funding of these HEIs was not in accordance with the SAPSE funding framework. As a result of the lack of state funding for new buildings, as well as the termination of the SAPSE information system in 1998, which includes the necessary information for the application of the capital allocation formula, the formula for the provision of new buildings became dormant without being officially scrapped.

After a drought of eleven years in funds from the side of government for new capital projects at HEIs the JIPSA initiative of government suddenly sparked off a series of annual earmarked allocations to HEIs for, inter alia, new buildings in 2008/09. These allocations were identified as "Improving infrastructure and output efficiencies" at HEIs. The amounts allocated to HEIs for 2008/09, 2009/10, 2010/11 and 2011/12 were respectively R1095 million, R1462 million, R1585 million and R1577 million. Although the amounts allocated to HEIs for new buildings, as well as for renovations of buildings, were desperately needed by most institutions, many questions were raised about the criteria used in the allocation of these funds. This was hardly surprising since a vacuum in national policy on the state funding of new buildings at HEIs had existed since 2003 when the SAPSE funding framework was terminated.

The SAPSE subsidy formula amounts allocated to HEIs in South Africa during 1984 to 2003 (as opposed to the capital formula amounts referred to above) could be considered to be non-

earmarked block grant allocations to these institutions. From the drivers (subsidy students, growth in subsidy students, as well as 10 cost factors) of the SAPSE formula it is clear that the SAPSE formula amounts, inter alia, provided for the renewal and replacement of equipment and library collections, for the maintenance of existing buildings, as well as for the provision of new equipment and library collections associated with the annual increasing number of students at the respective institutions.

The current HE funding framework used in South Africa was introduced with effect from the 2004/05 financial year. The policy document outlining the framework (see Ministry of Education (2004)) identifies two major components of funding to HEIs, namely a block grant allocation consisting of 4 separately calculated and undesignated (non-earmarked) grants and a battery of earmarked grants designated for specific purposes. As far as the non-earmarked block grant allocation to each HEI was concerned, no indication was given by the Minister of Education as to what types of expenditure should be subsidised by this allocation.

From the discussion above and as far as this HESA infrastructure study is concerned the following are evident:

- i. The current block grant allocations to HEIs do not normally provide for the partial or full funding of new buildings, land improvements other than buildings or the acquisition of land. Using block grant funding for capital expenditure on buildings is, however, not precluded.
- ii. Although nowhere specifically stated, the most probable assumption has to be that the current block grant formula does provide for the renewal and replacement of the existing stock of equipment, as well as for the annual maintenance of buildings and land improvements other than buildings.
- iii. In the face of a relatively fast growing HE sector in South Africa there is a definite need for additional funding for the erection of new buildings and new land improvements other than buildings to accommodate additional students from year to year, as well as for the necessary additional equipment (especially for teaching and research purposes) associated with the growing student numbers. In the face of increasingly insufficient block grant allocations, escalating current expenditure as a result of an increasing number of students can, within reasonable limits, mostly be absorbed by institutions by increasing student-lecturer ratios. A shortage of equipment and space, however, directly compromise academic standards.
- iv. Earmarked funding provides the obvious vehicle for additional strategic funding to HEIs for subsidising:
  - new buildings, new land improvements other than buildings and the acquisition of land;
  - the provision of additional equipment (and library collections) as a result of sustained student growth in efficiently offered undergraduate and post graduate academic programmes of national importance; and



- the erection of additional accommodation in residences to provide better living conditions, especially for disadvantaged students, to enhance their study success.

It is important to note that a system of earmarked competitive funding is already well established in the HE sector in South Africa, especially DST/NRF funding of research projects of national importance (including state of the art equipment), research bursaries, etc. These funds are mostly allocated on the grounds of well motivated proposals from HEIs which are peer reviewed according to stringent criteria. This system could well be extended by the Department of Education to provide the funding outlined in par (iv) above.

The block grant allocation to HEIs has decreased from 86.7% of the total government funding of HE in 2004/05 to only 75.8% in the 2009/10 financial year (See DHET 2010b). This percentage has increased slightly since 2009/10 and is 76.8% for the 2011/12 financial year. The relative increase in the earmarked funds for higher education since 2004 was also accompanied by an increase in the categories of earmarked funding for HEIs since 2004. This trend of cascading earmarked government funding of higher education is not without difficulties and generates many problems in the HE sector.

Apart from the vagueness in national policy regarding the state funding of buildings and equipment there is currently also a lack of information on the backlogs or needs as far as buildings and equipment at HEIs are concerned. Sections 5 and 6 of the former SAPSE information system for higher education, which dealt respectively with fixed assets statements (including buildings and equipment statements) and building and space statistics, were terminated in 1998 when the SAPSE information system was replaced by the current HEMIS information system. A HEMIS space data system was, however, introduced in 2008 and in 2008 HEIs had to submit data in respect of 2007 on the utilisation of institutional space to the Department of Education (DE). Since then information in respect of 2008 and 2009 was also submitted to the DHET, in respectively 2009 and 2010. Since the termination of Sections 5 and 6 of the SAPSE information system, absolutely no information on the availability of equipment at HEIs has been available to inform the DE (and now the DHET) on possible backlogs in equipment for teaching and research purposes at HEIs.

Against the background outlined above the Funding Strategy Group (FSG) of HESA proposed a higher education infrastructure study with a view to determining the backlogs/surpluses in buildings at HEIs, as well as possible backlogs in equipment needed for teaching and research purposes at HEIs. The development of some specific guidelines for higher education policy regarding the state funding of new buildings and equipment for teaching and research purposes was also seen as an important part of this study.

After the Terms of Reference for the study were approved by the Board of Directors of HESA in October 2008, the FSG appointed, at its meeting on 20 February 2009, a Committee to steer the study, as well as a Task Team to perform the study (See Part 1 for the names of the members of the Committee and the Task team).

It was decided that a developmental approach to norms for and gaps in the provision of buildings and equipment will as far as possible be followed in the study (See Section 1.4.1 of Part 1).

#### The higher education building study (Part 2 of the report)

This study has three areas of focus:

- a. Using the existing space and cost norms for buildings and other land improvements, determine the current backlog/surplus in building facilities at each of the HEIs, both in terms of space available and current replacement cost.
- b. Determining the condition of the current building facilities at HEIs.
- c. Formulating proposals for the criteria to be used in allocating earmarked government funding to HEIs (preferably on a competitive basis) for the erection of new buildings and for land improvements other than buildings. The proposals should also include criteria to be used when major renovations of existing buildings at HEIs are needed.

The HEMIS space data for 2009, as submitted by all HEIs in 2010, formed the main source of information for this part of the infrastructure study.

#### The higher education equipment study (Part 3 of the report)

The Steering Committee suggested that this part of the study should have two areas of focus:

- a. An investigation into the availability and condition of equipment used in the teaching and research programmes at HEIs.
- b. Formulating proposals for the enhancement of (earmarked) funding for equipment at HEIs if significant needs (backlogs) especially in teaching equipment are proven.

Since no comparable information on the availability and condition of equipment was available, it was decided that the information will have to be collected at all HEIs by means of a survey of all teaching and research equipment.

## **Part 2: The Higher Education Building Study**

### Determining backlogs/surpluses in building facilities at higher education institutions in South Africa in 2009

The following methodology was used in this study in determining the backlogs/surpluses in respect of each institution:

- Step 1: Determine the norm provision of assignable square metres (ASM) of building space and building cost units for the institution (See Department of Education 2009b)
- Step 2: Determine the actual utilisation or availability of building space (ASM) and building cost units for the institution (Using HEMIS space data for 2009)
- Step 3: Determine the ASM and building cost units included in buildings under construction for the institution

- Step 4: Calculate the backlog/surplus in the provision of building space for the institution

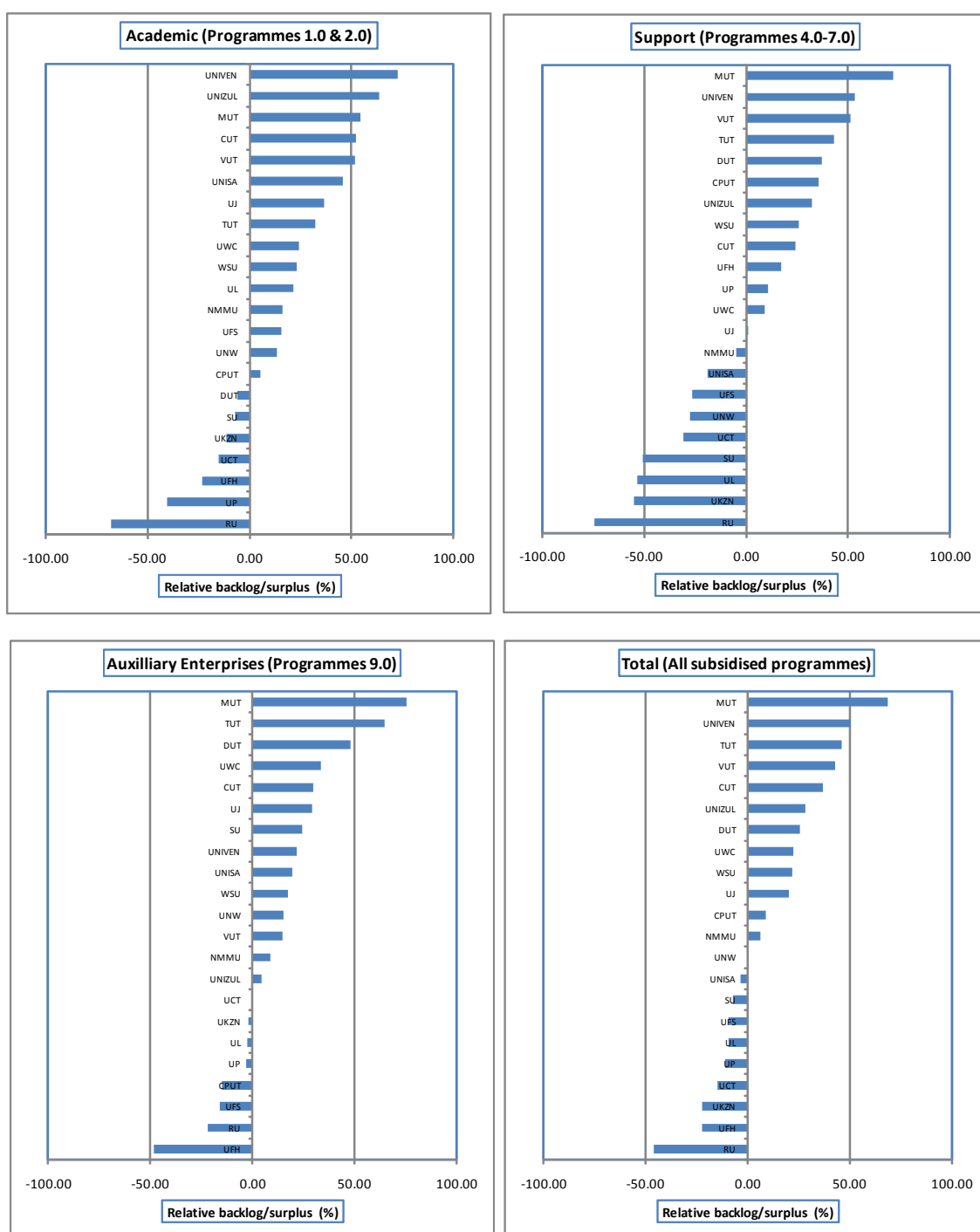
Since the University of the Witwatersrand's HEMIS space data for 2009 was not available when this study was completed this institution was excluded from the analysis. Without altering the total ASM space available at each institution, some adjustments in the actual utilisation of space according to programme (activity) and space-use category had to be effected in the HEMIS information of most institutions, in order to calculate the backlogs/surpluses in a systematic and comparable way. Table 2.8 (See Section 2.1.4 of the report) shows the outcome of the investigation into backlogs/surpluses at HEIs in 2009. The actual provision of space, as well as the actual provision of building cost units, according to programme (activities in terms of PCS) group is subtracted from the respective norm provisions in the case of each of the 22 HEIs. A positive value indicates a backlog while a negative one indicates a surplus. Considering only the institutions with backlogs this table shows that the total backlog in ASM building space was 838 198 and the backlog in building cost units was 993 830. The total Rand value (Rand of 2010) of the backlog in the building cost units was R10 776 million in 2009. Detailed information on the norm provision and actual utilisation of ASM building space and building cost units at all HEIs in 2009 is included in **Appendix C** of the report.

Figure 2.1 (appearing in Section 2.1.5 of the report but shown here for ease of reference) shows by means of an ordered bar chart the relative backlogs/surpluses (calculated as a percentage of the norm provision) in 2009 according to group of programmes and institution. This figure shows that as far as total ASM building space was concerned 13 HEIs had relative backlogs, some as high as 68%.

It is clear from Table 2.8 that the universities of technology all have huge backlogs in both ASM and building cost units. Many of these institutions' buildings were erected according to the SAPSE 101-norms for technikons (See Department of National Education (1985a)). The SAPSE 101 norms for ASM per FTE enrolled student, as well as building cost units per FTE enrolled student for technikons, were substantially lower for all programmes than the corresponding SAPSE 101 norms for universities. The current norms (used in the calculation of the norm values in Table 2.8) were compiled in 1996 with the specific purpose of creating similar norms for all higher education institutions. In this process the previous SAPSE 101 norms for technikons were mostly increased while the university norms were decreased. As a result of the big slump in the erection of new buildings at HEIs between 1997 and 2007 and no state funding for this purpose, the current norms have never or seldom been used since 1996 in the erection of new buildings. The big backlogs in the building stock at universities of technology are therefore not surprising.

The present space and cost norms for buildings and other land improvements, which, apart from small adjustments in terminology to bring them in line with current higher education policy, are the same as those determined in 1996. Many significant changes have taken place since 1996 in building practices. Technological advances over the last two decades have influenced space-use for instruction and research purposes at HEIs. New staff positions and staff activities, especially relating to the academic support, student support and institutional support programmes, have been established at all HEIs as a result of the higher education

**FIGURE 2.1: ORDERED BAR CHARTS OF RELATIVE BACKLOGS/SURPLUSES IN ASM IN 2009 FOR THE HEIs ACCORDING TO GROUPED PCS PROGRAMMES**



transformation initiatives of government since 1996. This was a direct result of Education White Paper 3: *A Programme for the Transformation of Higher Education* (Department of Education 1997), the *Higher Education Act (Act No 101 of 1997)* and its subsequent amendments, as well as the *National Plan for Higher Education* (Ministry of Education 2001). The Programme Classification Structure (PCS), especially on the second order (subprogramme) level, which is implicitly still important in the HEMIS staff reporting system, but also forms the basis for the breakdown of ASM in the HEMIS space system, is completely outdated and should be revised.

### Condition of buildings at higher education institutions in 2009

The classification of the condition (according to a 7 point scale) of each building at an institution forms part of the HEMIS space data which is submitted annually to the DHET. The 7 point scale (according to the HEMIS system) is the following:

1. Minimal Renovation needed (Good)
2. Limited Renovation needed (Satisfactory)
3. Moderate renovation needed (Fair)
4. Significant renovation needed (Poor)
5. Major renovation needed (Unsatisfactory)
6. Replace/Demolition of building
7. Vacating the building

In the case of 5 institutions the submitted HEMIS space data on condition of buildings is either “unknown” or only one building condition scale point is used. Such data is obviously incorrect and therefore meaningless. Only 17 of the 22 HEIs’ information on the building condition had the necessary quality for making conclusions. As far as these institutions are concerned, Unisa’s buildings seem to be on average in the best condition with a non weighted average condition scale point of 1.56 and a weighted (according to the respective inventory values of the buildings) average condition scale point of 1.84, although 4.2% of the buildings of Unisa are in a poor or even worse condition. On the other hand, the University of Pretoria’s average building condition, as well as the University of Johannesburg’s average building condition, is only “fair”. The high percentages of buildings at the University of Pretoria and the University of North West classified as poor or even worse than poor, namely respectively 39.9% and 17.3% are a matter of concern.

The analyses in Section 2.2.2 of the report of the building condition of HEIs’ buildings in 2009 show that in the case of many institutions more accurate and more reliable information will be needed by the state before any allocation of funds can be made for the upgrading of buildings which apparently need significant or major renovations.

### Conclusions derived from the building study

During the era when the SAPSE subsidy formulas were used, namely the 20 year period 1984 to 2003, a very sophisticated system for government subsidisation of buildings (both for the erection of new buildings, as well as the renewal and maintenance of existing buildings) at higher education institutions existed. This system of subsidisation of buildings was supported by a comprehensive reporting system (Chapter 6 of the SAPSE information system) on building and space statistics which served as a monitoring system of not only the construction of new buildings subsidised by the state, but also the institutional practices of renewal and maintenance of their building stock.

The system referred to above slowly petered out towards 2003 and was apparently scrapped in 2004 as a result of, inter alia, the lack of state funding for new buildings between 1996 and 2004; the revision of the 1985 space and cost norms for buildings in 1996 without the

necessary changes to the capital allocation formula; and the termination of Chapters 5 and 6 of the SAPSE information system in 1998 without the inclusion of similar information in the HEMIS information system, whereby, for example, crucial information regarding the building stock in the HEIs in the former TBVC countries never became available. The present situation is therefore that no national policy on the state funding of new buildings, as well as the maintenance of existing buildings, exists.

As mentioned above, during the 2008/09, 2009/10, 2010/11 and 2011/12 financial years amounts of respectively R1095m, R1562m, R1585m and R1615m were allocated by the Minister of Education and later the Minister of Higher Education and Training for improving infrastructure and efficiency at HEIs. The amounts to be allocated and the priorities and criteria for the next round of funding for 2012/13 and 2013/14 are not yet finalised. All the allocations for 2008/09 to 2011/12 have already been made. It is unknown what portions of these funds were actually allocated respectively to new capital projects and the renewal or refurbishment of existing buildings. It is, however, clear that possible existing backlogs/surpluses in ASM or building cost units did not feature officially in any of the decisions leading to these allocations. Furthermore, no condition was laid down that new buildings, subsidised by means of these allocations, should be constructed according to the space and cost norms published by the Department of Education in 2009.

A ministerial committee to review the existing funding framework, with very specific terms of reference, was appointed in May 2011. However, before a viable new framework can be produced consensus about the points of departure or agreement on the underlying principles as far as the state funding of buildings is concerned is needed. These points are:

- What is the status of the space and cost norms of 2009?
- Should the state contribute to the funding of all new buildings at HEIs or should buildings used for particular activities be excluded?
- What is the status of the existing programme classification structure (PCS) used in the space and cost norms of 2009?
- The need for an official investigation into backlogs/surpluses in building ASM and building cost units at HEIs to ensure a level playing field before state funds are allocated for new buildings.
- Should higher education institutions be reimbursed for buildings erected from own funds or by means of earmarked third stream income?
- The need for an investigation into the condition of the buildings at HEIs to ensure a level playing field before state funds are allocated for the renewal and maintenance of buildings.
- The need for the improvement in the quality of the HEMIS space data submitted annually by HEIs.
- The role of multi-year enrolment planning in the funding framework for new buildings.

A proposed framework for national policy on the funding of buildings at higher education institutions

In the light of the analyses of Sections 2.1 and 2.2, as well as the argumentation in Sections 2.3.1 and 2.3.2 of this report, the following steps in the development of a policy for the funding of new buildings and the renewal and maintenance of buildings are proposed:

1. Revise the PCS manual as set out in report SAPSE 002 as soon as possible. The classification should be according to programme and subprogramme with clear definitions for each subprogramme. (See **Appendix D** of this report).
2. Decide which programmes/subprogrammes in the revised PCS should be subsidised by the state as far as buildings are concerned, that is, for both current expenditure and new capital projects. This decision could also inform the development of a new or revised funding framework for higher education which is underway, as indicated above. The arguments underlying the SAPSE framework in which only Programmes 1.0, 2.0, 4.0, 5.0, 6.0, 7.0 and 9.0 were subsidised by the state still seem valid but should be revisited.
3. Develop policy regarding the state's position on the erection of subsidisable buildings (see step 2 above) from institutional own funds or earmarked third stream income.
4. Revise the existing space and cost norms for buildings and other land improvements at higher education institutions in accordance with steps 1 and 2 and also to accommodate the adjustment of the CESM categories with effect from 2010. Procedures should be laid down to ensure that only buildings planned and built (within approved limits) according to these norms can be considered for a state funding contribution. The Higher Education Facilities Management Association of Southern Africa (HEFMA) should be involved in the revision of the norms.
5. Revise the HEMIS space data system to eliminate all the problem areas indicated in Part 2 of this report. This should be done jointly with the revision of the space and cost norms as indicated in step 3. An application to the DHET for capital funding or funding for renewal of buildings by an institution should only be considered by the DHET if the institution's space data is submitted on time and an audit certificate is issued by the institution on certain crucial aspects of the data.
6. Once the space and cost norms, as well as the HEMIS space data, have been revised the norm ASM and building cost units generated by the FTE students in year  $n-1$  for each institution could, as a standard procedure, be compared with the available ASM and building cost units in year  $n-1$  at the respective institutions. The results of these comparisons should form very important background information when the allocation of funds for new buildings to each institution is determined in year  $n$  in respect of year  $n+1$ .
7. Many of the HEIs which are at present and will also over the next few years be important contributors towards increased student enrolments in the Ministerial PME target areas have at present (according to the 2009 norms) surplus building space and building cost units. See Tables 2.8 and 2.10 of Section 2.1 of this report in this regard. It is certainly true that even with surpluses in building space it could be

problematic or even impossible for an institution to increase student enrolments in certain programmes which are suddenly and sometimes somewhat unexpectedly of major importance to the state. For example, surplus space in one domain may be physically unsuitable for use in a second domain. Allocations to institutions for new buildings should therefore not exclude institutions with surplus capacity when measured against the space and cost norms. As far as buildings in the education and general programmes are concerned it is therefore suggested that firstly, the possible funding of a new building at a HEI should be viewed against the importance of the building within the multi-year student enrolment plan of the state and of the individual institution, and also against the priority academic areas or regional development initiatives identified by the state. Secondly, the state contribution percentage towards the funding of approved buildings in the education and general programmes should be determined on a sliding scale with higher state contribution percentages towards buildings at HEIs with building ASM backlog space than towards buildings at HEIs with an overall surplus in ASM building space.

8. In the light of the discussion in Section 2.1.5 of this report any elimination of backlogs in ASM building space should also take cognisance of the fact that the largest backlogs in 2009 were in respect of buildings used in the academic PCS programmes (Programmes 1.0 and 2.0). A first priority should therefore be to lower the relative backlogs in ASM space of individual HEIs in these two programmes to a more acceptable level.
9. The renewal of buildings for the educational and general programmes which are in a bad condition (scale points 4-7) is very important. These buildings constitute a risk to students and staff. It is proposed that the state funding of the renewal and maintenance of existing buildings at HEIs, as well as backlogs in the maintenance of roads, open-air parking areas, open-air recreational areas and utility distribution systems (jointly termed “land improvement other than buildings”) at HEIs, should be investigated by the Ministerial Committee appointed to revise the existing funding framework. If such funding does not form part of the block grant allocation to HEIs in the sense that input parameters associated with these funding needs are clearly identified and used in the calculation of the block grant, earmarked funding outside the block grant for renewal and maintenance purposes should be a feature of the revised funding framework. If this route is followed cost audits by a team of experts of the buildings in need of upgrading should annually precede any funding allocation process. For a start the state could allocate an earmarked amount to each HEI for the purpose of contracting such an expert audit team. A state contribution percentage determined on a sliding scale could also be used for the state funding of the renewal and maintenance of the buildings in the poorest condition. Institutions with big maintenance backlogs should receive a bigger state contribution than institutions with relatively small maintenance needs. In the revision of the HEMIS space data system (see step 5 above) attention should be given to the introduction of more detailed information on the funds spent on maintenance of buildings to improve the monitoring of the condition of buildings. Alternatively this type of information could form part of an additional HEMIS data focus dealing with expenditure on and investment in the various types of fixed assets (See also Section 3.3.2 of this report).



10. A Ministerial Committee was appointed in 2010 to review the provision of student housing. See Ministry of Higher Education and Training (2010) for the terms of reference of this Committee. Three of the terms of reference are the following: “Examine various models of securing physical accommodation”; “Explore the sources of finance available to universities”; and “Propose possible changes to the funding framework to obviate the financial problems created by the provision of more accommodation and owning additional buildings”. It is proposed that the Ministerial Committee’s report is awaited and studied jointly with HESA’s infrastructure study before the Minister of Higher Education and Training determines policy regarding the funding of new residential buildings or the renewal of existing residential buildings. It is important that national policy regarding the state funding of residences, which form part of Programme 9.0 *Auxiliary Enterprises*, should fit into a broader framework which also includes the funding of buildings in the educational and general programmes as outlined in Steps 7 and 9 above.
11. A process involving both the DHET and HESA should be put in place to build the capacity within HEIs to render complete, accurate and timeous HEMIS space data annually to the DHET.
12. A pre-requisite for the implementation of the proposed framework is the proper structuring and adequate staffing of the unit responsible for the estates and buildings at all HEIs.

### **Part 3: The higher education equipment study**

#### The equipment survey at higher education institutions in 2009/2010

Chapter 5 of the SAPSE information system, namely the fixed asset statements, submitted annually by institutions since 1984 until 1998, provided very useful information according to PCS programme regarding the balances and changes in the investment in the different types of fixed assets (including equipment). The balances at the end of the year in the inventory values of the equipment for formal instruction according to CESM category were also reported annually by HEIs. The information contained in Chapter 5 of the SAPSE information system was not included in the HEMIS system which replaced the SAPSE information system in 1999.

As a result of the non-availability of formal HEMIS information on the existing stock of equipment at HEIs other possible sources of information regarding different aspects of equipment used at HEIs were scrutinized with a view to establishing the replacement cost, the condition of the existing stock of equipment, as well as the annual level of spending on equipment at HEIs. These sources are:

- i. Annual HEMIS Financial Statements
- ii. Institutional inventories of fixed assets

- iii. Reports of previous studies by the Department of Science and Technology (DST), the National Research Foundation (NRF) and the National Advisory Council for Innovation (NACI)

It was found that these three sources do not nearly contain all the necessary information needed for the determination of the existing stock of equipment for teaching and research purposes at HEIs. The accuracy of the information included in institutional inventories of fixed assets was also suspect. In the light of this it was decided to establish the existing stock of equipment, as well as the annual level of spending on equipment for teaching and research at HEIs, by means of a comprehensive survey at all HEIs.

An instrument was developed for the survey of the equipment used in 2009 at all HEIs. This instrument was piloted at two institutions in September 2009. After some adjustments the survey instrument was finalised by the HESA Task Team after a workshop, attended by representatives of all, but one, HEIs, which was held in October 2009. A letter requesting all institutions to complete the survey forms was sent by the Chairman of the HESA Board of Directors to the Vice-Chancellors of all HEIs on 11 November 2009. A copy of this letter, as well as the survey documentation which accompanied the letter, is attached to this report as **Appendix E**.

The deadline for the completion of the survey was set for 31 March 2010. After various requests for an extension of the due date were received the date was extended to 31 May 2010. In the light of the very complicated nature of the survey a HESA helpline was established to support institutions which encountered problems (especially with the interpretation of definitions and the format of the data collection sheets) during the data collection process. Many such requests for help were handled by Task Team members.

Thirteen institutions had submitted their survey results by 31 May 2010. By 8 February 2011 all institutions except one had submitted some data. In the case of most of the institutions a second or third revised submission was needed before the survey results were ready for analysis. The situation at the time when the analyses of the survey data were concluded (31 August 2011) was that 21 HEIs had submitted final survey data. Although UCT submitted some information in 2010, the institution indicated in July 2011 that, as a result of insufficient capacity, it was impossible for them to submit the survey data in the required format. CPUT had, since November 2009, not responded to any request for survey information. The information submitted by two institutions, namely DUT and UNIZUL, is incomplete in some respects with the result that some analyses could not be performed on their data.

Table 3.4 (which appears in Section 3.1.5 of the report) shows a summary of the equipment survey information regarding *Section A*, namely the real expenditure (rand of 2009) on equipment for teaching and research of each HEI for the time period 2006-2009 according to type of funding (council controlled or other), programme (academic programme or support programme) and year. This table also shows the annual real expenditure on equipment per FTE student and per teaching input unit (TIU). The last 5 rows of Table 3.4, namely an aggregation of the real annual expenditure on equipment for teaching and research of 20 HEIs for 2006-2009 are of special interest. Three conclusions from these 5 rows are:

- The real annual expenditure per FTE student, as well as the real annual expenditure per teaching input unit (TIU) for the HE system increased from 2006 to 2008, but significantly declined in 2009. See also Figure 3.2 (below) in this regard.
- Over the period 2006-2009 a percentage of 63.6 of total expenditure on teaching and research equipment originated from council controlled funds.
- About 70.7% of all expenditure on teaching and research equipment was on equipment used by academic organisational units (OUs).

Another, but related way, to establish the pattern of expenditure on teaching and research equipment over the period 2006-2009 is to express all the annual expenditures (as included in Table 3.4) as a percentage of the total expenditure on educational and general programmes (PCS programmes 1.0-8.0). This information is shown in Table 3.5 (below) (also drawn from Section 3.1.5 of the report) for all 20 HEIs. The aggregate percentages for the 20 HEIs are also represented in Figure 3.2 (below) (Section 3.1.5 of the report). The expenditure pattern for the years 2006-2009 for this measure is similar to the patterns of the other two per capita measures. Table 3.5 shows the budget priority of equipment for teaching and research of each university for the years 2006 to 2009. It is clear that the relative average annual expenditure on equipment varies significantly between institutions.

**TABLE 3.5: EXPENDITURE ON EQUIPMENT FOR TEACHING AND RESEARCH AS PERCENTAGE OF TOTAL EXPENDITURE ON EDUCATIONAL AND GENERAL PROGRAMMES ACCORDING TO INSTITUTION AND YEAR**

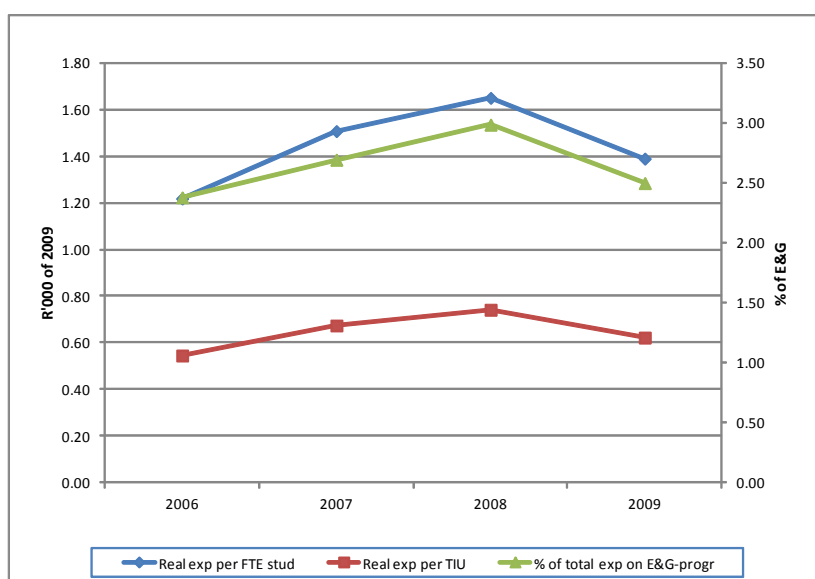
Institution	2006	2007	2008	2009	Average annual percentage
Cape Peninsula University of Technology					
University of Cape Town					
Central University of Technology, Free State	2.52	1.95	3.08	1.83	2.34
Durban Institute of Technology					
University of Fort Hare	1.02	1.91	1.36	2.89	1.79
University of the Free State	2.90	3.25	6.26	6.59	4.75
University of Johannesburg	2.10	2.63	3.50	2.42	2.66
University of KwaZulu-Natal	1.62	2.31	2.55	1.66	2.04
University of Limpopo	1.34	0.52	0.52	1.21	0.90
Nelson Mandela Metropolitan University	1.61	1.96	4.15	1.60	2.33
North West University	3.30	3.73	2.55	2.99	3.14
University of Pretoria	2.98	4.16	3.40	2.66	3.30
Rhodes University	7.12	3.70	2.76	2.95	4.13
University of South Africa	0.89	0.90	0.55	1.47	0.95
University of Stellenbosch	3.69	5.38	4.32	3.13	4.13
Tshwane University of Technology	1.05	1.07	0.73	0.36	0.81
University of Venda	1.33	3.86	4.11	6.02	3.83
Vaal University of Technology	1.35	2.92	2.42	2.99	2.42
Walter Sisulu University for Technology	0.27	0.91	1.00	1.13	0.83
University of Western Cape	5.24	3.33	5.52	5.95	5.01
University of Witwatersrand	2.33	2.91	3.87	2.99	3.02
University of Zululand	0.07	0.10	0.27	0.13	0.14
Mangosuthu Technikon	0.16	2.39	3.49	2.14	2.05
Total <sup>1)</sup>	2.38	2.69	2.98	2.50	2.64

1) Excluding CPUT, UCT and DUT

Section B of each institution's survey data comprises an inventory of equipment for teaching and research purposes for each separate academic organisational unit. At most universities academic departments were used as reporting entities, but in some institutions the inventories were done for schools. Two tables appear in this inventory (See Section B of Appendix E attached to the report). The first, namely Table B1, includes equipment items (or

a cluster of similar equipment items) with a replacement value of more than R15 000 but less than R100 000 per item, while the second table, namely Table B2, includes all equipment items with replacement values more than R100 000 per item. Apart from the replacement cost of each equipment item reported in the two tables, the distribution of the time for which it is utilised at the different teaching/research level(s), as well as the condition (3 point scale - see Section 3.2.4 of the report) of the equipment item, was also reported.

FIGURE 3.2: ALL INSTITUTIONS (EXCLUDING CPUT, UCT AND DUT) - TOTAL REAL EXP. ON EQUIPMENT PER FTE STUDENT AND PER TIU, AS WELL AS EQUIPMENT EXP. AS % OF E&G EXP ACCORDING TO YEAR



The aggregated inventories (e. g. total replacement cost in 2009 of all equipment) in Tables B1 and B2 for each OU provide important information. However, for the purpose of this study a summary (including the information in Tables B1 and B2 of all OUs) of the replacement costs of equipment according to study field (CESM category), FTE student enrolments on respectively undergraduate and post graduate levels and FTE numbers of academic and other departmental (school) support staff (excluding service workers) was used for each HEI. The replacement cost of staff computers and printers at each OU was also included in this summary. These summary tables for the 21 HEIs appear in Table 3.6 (see Section 3.1.5 of the report). The weighted (by replacement cost) average condition of all the equipment used in the respective CESM categories, as well as the total replacement cost (and percentage) of the “outdated equipment still in use” (condition 3 in survey Tables B1 and B2) in the respective CESM categories are also shown in all these summary tables.

Different equipment replacement cost measures (usually per FTE student or FTE staff) are indicated in columns 15 to 19 in each of the institutional tables in Table 3.6. They are the replacement cost of equipment used at undergraduate level per FTE undergraduate student, the replacement cost of equipment used at post-graduate level per FTE post-graduate student, the replacement cost of equipment used for academic staff research per FTE academic staff member, as well as the computer and printer replacement cost per academic

staff member and per other support staff member. An overall measure of provision of equipment is the replacement cost of all equipment used on the different levels per FTE student. These aggregated per CESM indicators are of the utmost importance, especially when different HEIs are compared as far as the availability (replacement cost) of equipment at the different teaching/research levels and study fields are concerned. These per capita values for all institutions form the basis for determining differentiated norms and standards in the provision of equipment at HEIs. See Section 3.2 of the report in this regard.

In the case of Rhodes University (see Table 3.6), for example, the value in the last (total) row and third last column shows an equipment replacement cost of R19 102 per FTE student. Very large discrepancies between the different CESM categories are, however, evident. The equipment replacement costs in CESMs 09, 15 and 19 are the largest. Furthermore, the replacement cost of all outdated equipment still in use at Rhodes University represented 11.75% of the total replacement cost of equipment for teaching and research in 2009.

*Section C* of each institution's survey data comprises an inventory of equipment for teaching and research purposes managed centrally. Most of the equipment included by the HEIs in Section C relates to the provision of audiovisual equipment in centralised class rooms, to computer equipment for students' use in computer laboratories and to sophisticated laboratory equipment for research purposes used by more than one academic department, school or faculty. This survey data is summarised in Table 3.7 (see Section 3.1.5 of the report). The table clearly shows that HEIs differ in their approaches towards the centralisation of the management of these types of equipment items. The last column shows that although 18.35% of all equipment reported by the 20 HEIs included in both Sections B and C was centrally managed in 2009, the individual HEIs' percentages range from a very small 0.79% in the case of UP to an understandably very high percentage of 82.67% in the case of UNISA. Furthermore, the average condition of the centrally managed equipment was 1.58 on the 3-point condition scale, while 16.32% of all centrally managed equipment was of condition 3, namely outdated but still in use.

#### Determining norms and standards for the provision of equipment at higher education institutions in South Africa

In the absence of norms and standards for the availability of equipment for teaching and research the equipment survey data will be used to determine such norms. According to Section 1.4.1 of this report, norms and standards will be needed for at least undergraduate teaching, post-graduate teaching and for staff research.

The process described in this report for the derivation of the norms and standards, as well as the application of these norms to determine equipment provision priorities and an equipment funding formula, is the following:

- a. Select a few HEIs which could be considered as leading or benchmark institutions as far as their quality of teaching and research is concerned. These institutions' provision (funding), management and maintenance of equipment could therefore be considered as "ideal".

- b. Derive norms and standards of good practice for the replacement cost of equipment from *Section B* of the equipment survey data of these identified benchmark institutions.
- c. By applying these norms and standards to the data of each of the 21 HEIs determine backlogs/surpluses in each HEI as far as the availability of equipment for teaching and research is concerned.
- d. Use the benchmark institutions' actual expenditure for the period 2006-2009 jointly with the derived norms and standards to provide a viable higher education equipment funding formula which could be used annually by the state as well as each HEI.

Using the undergraduate contact tuition success rates (the FTE undergraduate degree credit students as a percentage of the undergraduate FTE enrolled students) during 2006-2009 for each of the 22 HEIs (excluding UNISA with only a small number of contact tuition students) as a measure of undergraduate efficiency, the 5 best or benchmark HEIs for undergraduate teaching were identified. See in this regard Table 3.8 (Section 3.2.2.1 of the report). Since the provision of equipment for post-graduate teaching (especially for masters' and doctoral study) is closely linked to the provision of equipment for academic staff research, it was decided to determine the best 5 (benchmark) post-graduate/research institutions by using only one efficiency measure. The measure used in the selection of the 5 benchmark institutions for post-graduate teaching and academic staff research was the average total research output per FTE academic (C1) staff member for the years 2006-2009. The total research output for a given year is defined as the weighted sum of the DHET approved publications (weight 1), the research masters degrees conferred (weight 1) and the doctoral degrees conferred (weight 3). Table 3.9 (Section 3.2.2.2 of the report) shows the calculation of these average values. In both cases, namely for undergraduate teaching and for post-graduate teaching/academic staff research the benchmark institutions turned out to be UKZN, UNW, UP, RU and SU. Note that UCT was disregarded in this choice since no equipment survey data had been submitted by this university.

Table 3.10 (Section 3.2.3 of the report) shows an aggregation of the summary tables (See Table 3.6) of the 5 benchmark universities. In Table 3.11 (Section 3.2.3 of the report) the rows (CESM categories of 2009) of Table 3.10 are also summarised according to two broad fields of study which are used in HEMIS reporting, namely human sciences and natural sciences (also referred to as SET). These two fields of study are defined as follows:

Human Sciences: CESMs 03, 04, 05, 07, 12, 13, 14, 18, 19, 20, 21 and 22

Natural Sciences: CESMs 01, 02, 06, 08, 09, 10, 11, 15, 16, 17

Furthermore, since Table 3.10 only contains equipment managed by academic departments, schools and faculties (*Section B* survey), the second sub-table in Table 3.11 provides similar information to that in Table 3.10 in the case of equipment which is centrally managed (*Section C* survey). Note that the information on centrally managed equipment was not surveyed according to CESM category since this equipment is usually utilised by students and staff across a wide spectrum of academic and research programmes.

The 11 unit replacement costs, based on the replacement costs of the 5 benchmark institutions are highlighted in Table 3.11. In the light of the developmental approach to norms and standards in Section 1.4.1 of this report, these costs can be considered as benchmark norms and should be associated with the “Top standard norms”.

Using these unit replacement costs (differential) norms are proposed for 4 levels of equipment replacement costs, namely the undergraduate teaching level, the post-graduate teaching level, the academic staff research level, as well as the support staff (in academic OUs) level. Note that undifferentiated (uniform) norms are proposed for the replacement cost of equipment used in undergraduate teaching and for the replacement cost of equipment used by support staff. Differentiated norms are, however, proposed in the cases of replacement cost of equipment for post-graduate teaching and of replacement cost of equipment for academic staff research. The reason for this is that the particular mission and programme mix of some institutions restricts them to certain post-graduate programmes, usually only on the honours or equivalent level. The highest equipment replacement costs for post graduate teaching are associated with research masters’ and doctoral studies, especially in the natural sciences. Furthermore, the institutional mission in respect of the priority attached to academic staff research, as well as the institutional post-graduate programme mix, usually determines the intensity of research activities at the various HEIs. It is therefore, as in the case of the provision of equipment for post-graduate teaching, important to define different norms for HEIs as far as academic staff research is concerned. These norms are shown in the 4 tables below. Note that in the case of the second and third norm tables the “Minimum/basic standards” norms and the “Middle standards” norms are assumed to be respectively one third and two thirds of the respective benchmarks norms.

#### Equipment replacement cost norms (R of 2009) for UG teaching per UGFTE student

Different norms (levels of provision)	Managed by academic dept/schools/faculties		Centrally managed <sup>1)</sup>
	Human Sciences	Natural Sciences	
<i>Minimum/basic standards, norms</i>	R734	R10 119	R675
<i>Middle standards, norms</i>	R734	R10 119	R675
<i>Top standards, norms</i>	R734	R10 119	R675
<i>Frontier/advanced norms</i>	R734	R10 119	R675

- 1) This norm should be used with circumspection since the management model of equipment used by HEIs is also determined by institutional size and other factors

#### Equipment replacement cost norms (R of 2009) for PG teaching per PG FTE student

Different norms (levels of provision)	Managed by academic dept/schools/faculties		Centrally managed <sup>1)</sup>
	Human Sciences	Natural Sciences	
<i>Minimum/basic standards, norms</i>	R1 270	R29 306	R1 123
<i>Middle standards, norms</i>	R2 540	R58 612	R2 246
<i>Top standards, norms</i>	R3 810	R87 918	R3 369
<i>Frontier/advanced norms</i>	More than R3 810	More than R87 918	More than R3 369

- 1) This norm should be used with circumspection since the management model for equipment used by HEIs is also determined by institutional size and other factors

### Equipment replacement cost norms (R of 2009) for research per FTE academic staff member

Different norms (levels of provision) & gaps	Managed by academic dept/schools/faculties		Centrally managed <sup>1)</sup>
	Human Sciences	Natural Sciences	
<i>Minimum/basic standards, norms</i>	R5 839	R57 089	R3 103
<i>Middle standards, norms</i>	R11 677	R114 178	R6 207
<i>Top standards, norms</i>	R17 516	R171 267	R9 309
<i>Frontier/advanced norms</i>	More than R17 516	More than R171 267	More than R9 309

- 1) This norm should be used with circumspection since the management model of equipment used by HEIs is also determined by institutional size and other factors

### Equipment replacement cost norms (R of 2009) for academic administrative and technical support per FTE academic support staff member (excluding service workers)

Different norms (levels of provision) & gaps	Managed by academic dept/schools/faculties	
	Human Sciences	Natural Sciences
<i>Minimum/basic standards, norms</i>	R8000	R8000
<i>Middle standards, norms</i>	R8000	R8000
<i>Top standards, norms</i>	R8000	R8000
<i>Frontier/advanced norms</i>	R8000	R8000

Three sets of backlogs/surpluses in the replacement costs for teaching and research equipment can be calculated for each HEI by subtracting the actual provisions (as included in Table 3.6) from the respective minimum/basic standard norm provision, the middle standard norm provision and the top standard norm provision. Relative backlogs/surpluses, defined as the backlogs/surpluses expressed as a percentage of the norm provisions, are shown in Table 3.12 (Section 3.2.4 of the report) for all HEIs which submitted survey information according to the type of norm provision, the type of student/staff level and the broad field of study. Positive relative backlogs/surpluses percentages in Table 3.12 indicate backlogs, while negative percentages indicate surpluses. Obviously the most appropriate set of relative backlogs/surpluses for a specific HEI should be determined by inter alia taking cognisance of the teaching and research mission of each institution. For the 5 benchmark institutions, for example, the top standards norms should be used in determining their respective total relative backlogs/surpluses.

Table 3.12 could be regarded as a very important source of information for HESA, but also for the DHET, when annual allocations for equipment are made to HEIs in order to eliminate current backlogs in equipment for teaching and research.



### Norms for the condition of equipment for teaching and research

A 3-point scale was used for the classification of the condition of each piece of equipment included in *Sections B and C* the equipment survey. The scale points were defined in the following way:

- 1 = Fit for purpose and fully functional
- 2 = Fit for purpose but only partially functional and still in use
- 3 = Outdated but still in use

The average condition (on this 3-point scale), the replacement costs for equipment in condition 3, as well as the replacement costs of equipment in condition 3 as a percentage of the total replacement costs of equipment, are all shown in Tables 3.6 according to CESM category and in Table 3.7 in the case of centrally managed equipment. A summary according to broad field of study for each HEI is also shown in Table 3.13 (Section 3.2.5 of the report). The summarised values and percentages are also shown for the 5 benchmark universities in Table 3.13. These aggregate (weighted average) conditions of the 5 benchmark institutions are of special interest. The average condition of equipment at these 5 HEIs in academic units is 1.49. The average of the centrally managed equipment at these 5 benchmark institutions is only 1.29, which is significantly lower (indicating better condition) than the average condition for academic units.

The percentages of equipment used by the 5 benchmark HEIs in the various categories which is outdated but still in use (scale point 3) appearing in Table 3.11 make interesting reading. A percentage of 18.26% of equipment used in academic OUs is outdated, while only 10.40% of centrally managed equipment is outdated. This is a matter of concern because it means that even at the best teaching and research universities a large percentage of equipment should already have been replaced.

Although the individual HEIs' summary data in respect of the condition of their stock of equipment are shown in Table 3.13, it should be noted that many of the organisational units in institutions unfortunately frequently used scale point 1 as default value in their survey data and this skews the results.

### A viable higher education equipment funding formula for the provision of equipment for teaching and research which could be used annually by the state as well as HEIs.

As mentioned above, prior to 2004, the SAPSE subsidy formula provided funds to each HEI for the replacement and renewal of equipment used for teaching and research, as well as for new equipment used for teaching and research as a result of the increase in students. In the absence of such a formula in the current funding framework the question could therefore be posed whether the principles used in the SAPSE formula can still be used, even in an adjusted form, and applied under the current or future funding regime? This will be difficult. Existing higher education policy, as well as the results of the equipment survey described in Part 3 of this report can, however, be used to devise a funding formula for the sharing of the cost of

provision of equipment to HEIs between the state and institutions. This formula is based on the following points of departure:

- i. Ministerial student enrolment planning targets (the newest for the period 2011-2013) for each institution will ensure viable, responsible and systematic student growth at all HEIs over the next few years. Apart from funding the backlogs in the provision of equipment for teaching and research at many HEIs, the unforeseen need in a particular year at a HEI to significantly increase expenditure on equipment as a result of a sudden wave of new students is therefore an unlikely event.
- ii. Tables 3.4 and 3.14 (Section 3.2.6 of the report) show that HEIs with a high percentage of post-graduate students, as well as high research output, utilise substantial "Other funds" (non council controlled funds) for expenses on teaching and research equipment. This is not surprising since these funds are mostly provided by agencies like the NRF and the MRC, as well as by private sector companies in the form of earmarked project funding. The state's role should therefore be to subsidise council controlled funding of equipment to ensure minimum/basic standards of teaching and research.
- iii. The equipment replacement cost norms discussed above and which appear in Section 3.2.3 of the report, provide the necessary and obvious weights for the relative importance of equipment on the different teaching/research levels for a nuanced equipment provision funding formula.

The proposal for the annual state provision for equipment for teaching and research at a specific institution to ensure minimum/basic standards of teaching and research is the following:

$$\text{State provision} = 0.5279 \times \text{Total EPCU} \times \text{Rand value of EPCU}$$

The ratio 0.5279 represents the state contribution ratio and is calculated from Table 3.15 (Section 3.2.6) as the average benchmark institution's ratio of block grant income to total council controlled income in the educational and general programmes over the time period 2006-2009. Total equipment provision cost units (EPCU) in the formula is calculated as the total need for new equipment in a given year at a HEI given the FTE student and FTE staff numbers at the HEI in that year. The total EPCU can be converted to rand value by using the particular rand value of an EPCU in the year under consideration. The value of 1 EPCU in 2009 was calculated to be R1 581.

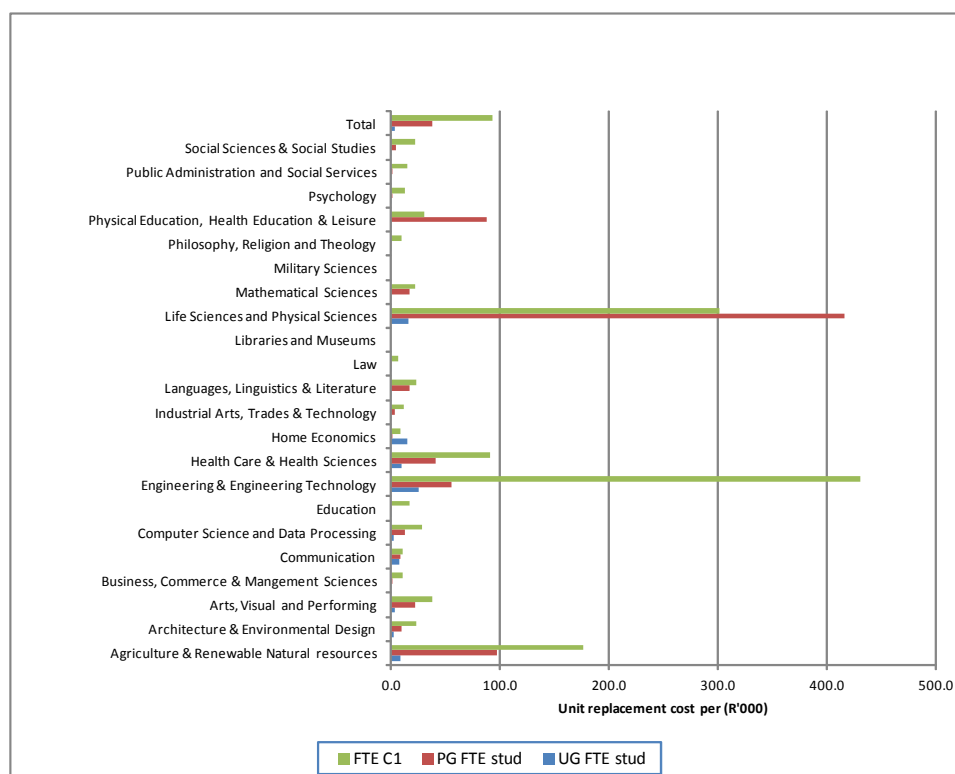
For the application of this formula for financial year  $n$  the most recent number of EPCUs, usually for year  $n-2$ , should be used. The rand value of the EPCU can be determined annually by using some of the components of the Production Price Index (PPI) which is published monthly by Statistics SA. This method was also used in the equipment survey to determine the replacement costs of equipment in 2009. (See last page of **Appendix E** attached to the report)

Conclusions derived from the equipment study

The following important conclusions can be made from the analyses of the institutional surveys:

1. The long and arduous processes involved in the completion of most of the institutional surveys suggest that no or very little systemised information regarding equipment is available at HEIs.
2. Table 3.10 shows that R1821million was invested in equipment for teaching and research purposes in 2009 at the 5 benchmark universities. This represented an equipment replacement cost of R15778 per FTE student. Figure 3.3 below (see Section 3.3.1 of the report) shows that Life Sciences and Physical Sciences, Engineering, as well as Agriculture and Renewable Natural Resources are the most expensive study fields for the provision of equipment, especially for post-graduate teaching and staff research.
3. Table 3.12 shows that 15 of the 20 HEIs have backlogs in the provision of undergraduate equipment for teaching when the uniform norms for human and natural sciences derived from the 5 benchmark universities are applied. When the minimum/basic standards norms are applied 8 HEIs have backlogs as far as post-graduate teaching is concerned and 9 institutions have backlogs as far as academic staff research is concerned.

**FIGURE 3.3: UNIT REPLACEMENT COST OF EQUIPMENT OF 5 BENCHMARK UNIVERSITIES IN 2009**



4. Table 3.5 shows that for the 4 years 2006-2009 on average 2.64% of total expenditure by 20 HEIs on education and general programmes was annually spent on

equipment for teaching and research. It is a matter of concern that the system average for 2009 was lower than for both 2007 and 2008. In the case of 5 of the 20 institutions the annual average expenditure over the four years was less than 1%. The relative expenditure on teaching and research equipment is decreasing at many HEIs, in all probability to fund “more important” types of expenditure such as remuneration of staff and services like electricity.

5. Table 3.7 shows that just more than 18% of total expenditure by reporting HEIs on teaching and research equipment was on equipment which was centrally managed. The percentages for individual institutions vary markedly with the UP percentage the lowest, namely 0.79% and the UNISA percentage of 82.67% the highest.
6. The funding of especially state of the art equipment by the NRF at HEIs makes it essential that more co-operation between the DHET and the DST is needed for the funding of large research equipment

#### Proposals for a national policy for the funding of equipment at higher education institutions

In the light of the foregoing analyses and conclusions three proposals are made:

##### *1. Development norms for the provision of equipment for teaching and research*

It is proposed that the norms set out in Section 3.2.3 of the report are used as guiding principles by both HEI management teams and the Ministry of Higher Education and Training, in the annual provision of equipment for teaching and research.

##### *2. A national reporting system for higher education equipment*

Although no institution doubted the necessity of the ad hoc equipment survey, the institutions found it difficult to complete the survey. It was even more difficult for the HESA infrastructure task team to coach, guide and motivate the responsible officials at HEIs on their way to the conclusion of the survey. Even with this huge effort from many people some of the collected survey information is suspect. However, the value of the 2009 survey information, the first that has become available since the last (incomplete) SAPSE submission (including Chapter 5: Fixed asset reporting) in 1998, should not be underestimated. It will be to the detriment of the HE sector if the next round of equipment information is only collected in a similar ad hoc way as this one in 10-15 years time.

It is abundantly clear that if information on the annual availability and expenditure on equipment for teaching and research at all HEIs is considered as an important part of the medium to long term financial planning in higher education, a national equipment reporting system (as an additional component of HEMIS) is needed. With this as point of departure, the following is proposed:

- a. The new reporting system should include equipment reporting in all PCS programmes. The 2009 survey concentrated on the most important PCS

programmes regarding the provision of equipment, namely 01 (Instruction/teaching), 02 (Research) and partly also 04 (Academic support).

- b. In compiling the new reporting system, Chapter 5 of the SAPSE system (Fixed assets reporting), as well as the 2009 survey formats in *Sections A, B and C* (See Appendix E to the report) could serve as points of departure. The 2009 formats were workshopped in October 2009 by 22 HEIs and worked reasonably well in the completion of the survey. These can perhaps be refined further and even be extended to also include all PCS programmes.
- c. Chapter 5 of the SAPSE system did not only include reporting on equipment, but also reporting on the other types of fixed assets, namely land, buildings, land improvements other than buildings and library collections. The inclusion of other types of fixed assets in the proposed new reporting system should therefore also be considered.
- d. Since the availability of equipment (replacement cost) at HEIs is a slowly changing phenomenon, biennial national HEMIS reporting on equipment (and other fixed assets) could be considered by the DHET.
- e. The implementation of the HEMIS space data system in 2007 had many problems. This is outlined in Part 2 of this study. The 2009 HEMIS space data submitted by many HEIs was still of inferior quality. Any new equipment (or fixed asset) reporting system will have to be thoroughly designed and workshopped with all HEIs. It will be important to ensure that the necessary capacity and expertise to collect and submit the equipment information will exist at all HEIs. The same holds for the DHET where the HEMIS reports will have to be scrutinised, summarised and eventually be used in financial planning processes.

### 3. *The funding of equipment*

The following is true of the HE sector as far as the provision of equipment for teaching and research is concerned:

- Most HEIs have backlogs in the per unit provision when the uniform undergraduate provision norm is considered;
- The available equipment is totally inadequate at most institutions when they endeavour to either significantly enhance their intake in post-graduate students or their staff research activities;
- The stock of equipment per student or per staff member in the HE system is not likely to increase since the real annual expenditure on equipment as percentage of all expenditure in the education and general programmes in the system is apparently decreasing.
- No indication has been given by the government since the SAPSE subsidy system was replaced by the current funding regime in 2004 of how equipment is funded by government.
- Although earmarked funds for equipment were apparently allocated to some HEIs from the *Infrastructure and Efficiency fund* for the 2010/11 and 2011/12 financial years, the names of the receiving institutions, as well as the extent of the funding, are unknown.

In order to amend and improve the situation set out above the following two tier funding process for teaching and research equipment is proposed:

*A. Eliminating backlogs by means of ad hoc funding*

With the information contained in this report, as well as all the other detailed information in the individual institutional surveys, it will be possible for HESA and the DHET to determine the HEIs with the most pressing needs as far as the provision of equipment is concerned. The emphasis should be on ensuring the attainment of the uniform norm provision of equipment on the undergraduate level at all HEIs. The study fields named in the PME targets should perhaps have priority. These backlogs should be funded as soon as possible from the annual earmarked *Infrastructure and Efficiency fund*. This should happen in a completely transparent way.

*B. A formula as part of the block grant allocation*

A formula for the state's annual contribution towards the funding of equipment for teaching and research at each HEI should form part of the block grant formula. Even if this formula amount is not earmarked, it will be a disciplinary measure. It will be possible from the proposed HEMIS equipment reporting system (See Section 3.3.2.2) to compare the state allocated amount with the actual institutional expenditure on equipment, especially when a funding formula for equipment, like the one proposed in Section 3.2.6, where the expenditure for equipment is shared by government and institutions, is used.

## **PART 1: BACKGROUND AND INTRODUCTION**

### **1.1 Background**

With the advent of the new democratic government in 1994 there were 490494 students enrolled at HE institutions in South Africa. This number increased to 837644 by 2009 (Department of Higher Education and Training (2010a, 2010b)), an increase of 71% in 15 years, or an average annual growth rate of 3.63%. Measured in terms of full-time equivalent (FTE) students (which is a better measure from an education provision point of view), the enrolled FTE students of 325527 in 1994 increased to 542942 FTE students in 2009, an increase of 67% in 15 years, or an annual growth rate of 3.46%.

Two types of cost regarding fixed assets at universities (mainly buildings, equipment, and library collections) can be clearly distinguished. Firstly, the cost of maintaining existing fixed assets from year to year and secondly, the cost of new fixed assets which should be added to the stock of fixed assets at universities as and when the FTE students increase from year to year.

Previously, the Department of Education allocated, according to the so-called SAPSE capital allocation formula, (nominal) earmarked amounts of respectively R60 million, R95 million and R150 million for new building projects for universities and technikons for the financial years 1994/95, 1995/96 and 1996/97. These amounts were allocated according to a so-called cost unit balance sheet (see Part 2, as well as Steyn & de Villiers (2006)) meaning that institutions with the most significant backlogs in buildings received the bulk of the allocations. Note that prescribed institutional contributions towards these new projects were a prerequisite for the funding of new building projects. Furthermore, all state subsidised building projects had to be in accordance with the national space and cost norms for buildings and land improvements other than buildings (see Department of National Education (1985a)). No earmarked allocations for new buildings at universities and technikons were made by the Department of Education during the period 1997/98 to 2007/08. According to Steyn & de Villiers (2006) the nominal cost to eliminate the backlogs in buildings at the 30 universities and technikons (former TBVC institutions excluded) in 1999 was about R7 billion. These building backlogs already existed in 1994, but were exacerbated by the relatively small annual allocations of state funding from 1994/95 to 1998/99. Without taking the growth in students since 1999 into account this amount to eliminate the 1999 backlog in buildings is R18.7 billion in 2010 (when inflated by using the BER building cost index). As was indicated above, the calculated cost to eliminate the building backlogs at higher education institutions (HEIs) in 1999 did not, with the exception of Fort Hare University, account for the HEIs situated in the so-called TBVC-states before 1994. No information on backlogs/surpluses in buildings was available for these HEIs since the funding of these HEIs was not in accordance with the SAPSE funding framework.

After a drought of eleven years in funds from the side of government for new capital projects at HEIs the JIPSA initiative of government suddenly sparked off a series of annual earmarked allocations to HEIs for inter alia new buildings in 2008/09. These allocations were identified

as “Improving infrastructure and output efficiencies” at HEIs. The amounts allocated to HEIs for 2008/09, 2009/10, 2010/11 and 2011/12 were respectively R1095 million, R1462 million, R1585 million and R1577 million. Although the amounts allocated to HEIs for new buildings, as well as renovations of buildings, were desperately needed by most institutions, many questions were raised about the criteria used in the allocation of these funds. This was hardly surprising since a vacuum in national policy on the state funding of new buildings at HEIs has existed since 2003 when the SAPSE funding framework was terminated.

The normal SAPSE subsidy formula amounts allocated to HEIs in South Africa during 1984 to 2003 (as opposed to the capital formula amounts referred to above) could be considered to be non-earmarked block grant allocations to these institutions. From the drivers (subsidy students, growth in subsidy students, as well as 10 cost factors) of the SAPSE formula it is clear that the SAPSE formula amounts inter alia provided for the renewal and replacement of equipment and library collections, for the maintenance of existing buildings, as well as for the provision of new equipment and library collections associated with the annual increasing number of students at the respective institutions.

The current HE funding framework used in South Africa was introduced with effect from the 2004/05 financial year. The policy document outlining the framework (see Ministry of Education (2004)) identifies two major components of funding to HEIs, namely a block grant allocation consisting of 4 separately calculated and undesignated (non-earmarked) grants and a battery of earmarked grants designated for specific purposes. As far as the non-earmarked block grant allocation to each HEI was concerned, no indication was given by the Minister of Education as to what types of expenditure should be subsidised by this allocation. The initial policy document of 2004 and *Ministerial Statement on Higher Education Funding: 2004/05 to 2006/07* (2004a) indicated that earmarked grants would be allocated to HEIs for student financial aid from their institutional share of NSFAS, foundation programmes, interest and redemption payments on loans approved and guaranteed earlier by the state, as well as institutional restructuring.

It is also important to note that contrary to the SAPSE subsidy allocations, which also provided for the renewal and replacement of equipment for the auxiliary enterprises programme (mostly involving residences), as well as for the provision of new equipment due to an increase in the number of residential students, the current block grant allocation clearly does not provide any specific funding for these purposes.

From the discussion above and as far as the HESA infrastructure study is concerned the following are evident:

- i. The current block grant allocations to HEIs do not normally provide for the partial or full funding of new buildings, land improvements other than buildings or the acquisition of land. Using block grant funding for capital expenditure on buildings is, however, not precluded.
- ii. Although nowhere specifically stated, the most probable assumption has to be that the current block grant formula does provide for the renewal and replacement of the existing stock of equipment, as well as for the annual maintenance of buildings and land improvements other than buildings.



- iii. In the face of a fast growing HE sector in South Africa there is a definite need for additional funding for the acquisition of land, the erection of new buildings and new land improvements other than buildings to accommodate additional students from year to year, as well as for the necessary additional equipment (especially for teaching and research purposes) associated with the growing student numbers. In the face of increasingly insufficient block grant allocations, escalating current expenditure as a result of an increasing number of students can, within reasonable limits, mostly be absorbed by institutions by increasing student-lecturer ratios. A shortage of equipment and space, however, directly compromises academic standards
- iv. Earmarked funding provides the obvious vehicle for additional strategic funding to HEIs for subsidising:
  - new buildings, new land improvements other than buildings and the acquisition of land;
  - the provision of additional equipment (and library collections) as a result of sustained student growth in efficiently offered undergraduate and post-graduate academic programmes of national importance; and
  - the erection of additional accommodation in residences to provide better living conditions, especially for disadvantaged students, to enhance their study success.

It is important to note that a system of earmarked competitive funding is already well established in the HE sector in South Africa, especially DST/NRF funding of research projects of national importance (including state of the art equipment), research bursaries, etc. These funds are mostly allocated on the grounds of well motivated proposals from HEIs which are peer reviewed according to stringent criteria. This system could well be extended by the Department of Education to provide the funding outlined in par (iv) above.

The block grant allocation to HEIs has decreased from 86.7% of the total government funding of HE in 2004/05 to only 75.8% in the 2009/10 financial year (See DHET 2010b). This percentage has increased slightly since 2009/10 and is 76.8% for the 2011/12 financial year. The relative increase in the earmarked funds for higher education since 2004 was also accompanied by an increase in the categories of earmarked funding for HEIs since 2004. This trend of cascading earmarked government funding of higher education is not without difficulties and could generate two problems:

- The undesigned block grant becomes, relatively speaking, smaller each year. The institutional difficulties associated with the curtailing of remuneration of staff and related operational expenditures open the door for decreasing the expenditure on fixed assets. Allocations for the maintenance of buildings and the renewal and replacement of equipment are the first to be cut.
- Some HEIs benefit to a larger extent than others from the increasing (both as far as type and size are concerned) earmarked funding allocations.

As was already indicated above, in 2008 the Minister of Education announced the allocation of an earmarked amount of R3162 million to HEIs to be distributed in the 2010/11 and 2011/12 financial years. This amount was earmarked for “Infrastructure and output efficiency”. This amount was distributed between HEIs for different purposes, namely for new buildings (including residences), extension of buildings, renewal of rooms in buildings, teaching equipment, research equipment, additional staff, as well as for bursaries. Furthermore, these ad hoc earmarked funds were only allocated for selected study fields of national priority. Although HEIs were requested to submit projects for funding within the above-described allocation framework, no funding allocation criteria or clear information on the sizes of the state contributions to the total projected costs of projects being submitted by the individual HEIs were made available beforehand. The Minister notified HEIs in April 2009 of their individual earmarked amounts for the selected projects. Although additional funding initiatives of the Minister of Education are certainly welcome, this initiative clearly did not comply with the internationally accepted structure of earmarked project funding on a competitive basis. It also has provided HEIs with the opportunity to gain additional funding for operational expenses which are already subsidised by means of the non-earmarked block grant allocation.

## **1.2 What is the magnitude of backlogs in buildings and equipment at HEIs?**

Apart from the vagueness in national policy regarding the state funding of buildings and equipment there is currently also a lack of information on the backlogs or needs as far as buildings and equipment at HEIs are concerned. Sections 5 and 6 of the SAPSE information system for higher education, which dealt respectively with fixed assets statements (including buildings and equipment statements) and building and space statistics, were terminated in 1998 when the SAPSE information system was replaced by the current HEMIS information system. A HEMIS space data system was introduced in 2008 and in 2008 HEIs had to submit data in respect of 2007 on the utilisation of institutional space to the Department of Education (DE). Since then information in respect of 2008 and 2009 was also submitted to the DHET, in respectively 2009 and 2010. As will be discussed in Part 2 of this report, the quality of the institutional submissions of the HEMIS space data was substandard in all three years. Unfortunately, the HEMIS space data has to date not been utilised in any way to steer decisions regarding ad hoc allocations to HEIs for new buildings. Since the termination of Sections 5 and 6 of the SAPSE information system, absolutely no information on the availability of equipment at HEIs has been available to inform the DE (and now the DHET) on possible backlogs in equipment for teaching and research purposes at HEIs.

## **1.3 The HESA infrastructure study**

Against this background the Funding Strategy Group (FSG) of HESA proposed a higher education infrastructure study with a view to determining the backlogs/surpluses in buildings at HEIs, as well as possible backlogs in equipment needed for teaching and research purposes at HEIs. The development of some specific guidelines for higher education policy regarding the state funding of new buildings and equipment for teaching and research purposes was also seen as an important part of this study.

After the Terms of Reference for the study were approved by the Board of Directors of HESA in October 2008, the FSG appointed at its meeting on 20 February 2009 a Committee to Steer the study, as well as a Task Team to perform the study. The respective members are:

#### Steering Committee

Prof Antony Melck (UP) (Chair)  
 Prof Frederick Fourie (UFS)  
 Dr Daniel Adams (DST)  
 Dr Romilla Maharaj (NRF)

#### Task Team

Dr Gert Steyn (SU) (Convenor)  
 Prof Pieter Vermeulen (UP)  
 Prof Terry Marsh (UFH)  
 Mr Tony Long (RU) (until September 2010)

The Steering Committee met with the Task Team and some guidelines on the methodology to be followed, as well as the work plan and time frame were finalised in July 2009.

### **1.4 Important guidelines for the infrastructure study**

#### **1.4.1 A developmental approach to norms and gaps in the provision of buildings and equipment**

In order to conceptualise norms and backlogs in the availability and provision of infrastructure (including equipment), the Steering Committee suggested that a matrix diagram be used to distinguish between different levels (or standards) of provision (for different academic and research programmes). Such conceptualisation of norms or benchmarks will prevent unconstrained, needs-based 'backlogs'.

In the matrix it is desirable to adopt a *developmental approach to norms and gaps* which distinguishes between different levels, or standards, of provision – whilst also distinguishing between different activities or programmes (for example undergraduate (UG), post-graduate (PG) and Research) – as follows:

<b>Different norms (levels of provision) &amp; gaps</b>	<b>UG</b>	<b>PG</b>	<b>Research</b>
<i>Minimum/basic standards, norms and gaps</i>			
<i>Middle standards, norms and gaps</i>			
<i>Top standards, norms and gaps</i>			
<i>Frontier/advanced gaps</i>			

<i>Sustainability norm: Sufficient maintenance including replacement and renewal</i>
--

The last line of the table suggests the adoption of a *sustainability approach* to complement the developmental approach.

Institutions, or parts of institutions (faculties, schools, departments), can be evaluated and positioned in this matrix. Stronger and/or better endowed institutions may only have gaps/backlogs at the top or frontier level, while worse endowed institutions may have gaps/backlogs at all levels, particularly at lower levels or even at the basic standards level. The particular mission and programme mix of an institution may restrict it to certain programmes (i.e. exclude it from certain columns/cells in the matrix), but not to lower standards of provision (except perhaps the frontier level).

Whilst keeping different programmes, focuses on different study fields, as well as different institutional missions in mind, these levels – and corresponding gaps identified at and within institutions – could then guide a funding and provisioning strategy and corresponding policy priorities.

*Illustration of possible applications of this developmental approach to the provision of equipment:*

- i. A first funding priority could be to get all HE institutions at least to the minimum or basic standards/level of provision with regard to equipment at the UG level.
- ii. Depending on programme mix, a second funding priority could be to get a specific group of HE institutions at least to the basic standard of provision of equipment also at PG level
- iii. Depending on programme mix, a next (perhaps simultaneous) funding priority could be to get a group of institutions to the middle standard of provision of equipment on UG, PG as well as research levels.
- iv. A long-term goal could be to get all HE institutions at least to the middle standard of provision for all their approved programmes.
- v. Depending on programme mix, another funding priority could be to get a group of institutions to the top standard of equipment provision for UG, PG and research.
- vi. Obtaining funding for frontier, highly advanced equipment for specific research or education programmes would be a separate category to be catered for in parallel with other processes.

Parallel to such a development strategy for the provision of equipment must be a programme of sufficient maintenance, replacement (provision for depreciation) and renewal to ensure at least sustainability at current as well as newly achieved levels of provision.

Different funding strategies or mixes (of government funding, own funding, partner funding, donor funding) could be considered for different categories or phases in the development process.

#### **1.4.2 The higher education building study (Part 2 of the report)**

The Steering Committee suggested that this part of the study should have three areas of focus:

- a. Using the existing space and cost norms for buildings and other land improvements, determine the current backlog/surplus in building facilities at each of the HEIs, both in terms of space available and current replacement value.
- b. Determining the condition of the current building facilities at HEIs.
- c. Formulating proposals for the criteria to be used in allocating earmarked government funding to HEIs (preferably on a competitive basis) for the erection of new buildings and for land improvements other than buildings. The proposals should also include criteria when major renovations of existing buildings at HEIs are needed.

It was also suggested that the most recent HEMIS space data submitted to the DHET by all HEIs should form the basis of foci a and b indicated above. The Task Team should approach the DHET to provide this information. The proposals for the criteria for the funding of new buildings by government should be compiled after the analyses in foci a and b have been completed. The principles inherent to the former capital funding formula used in the SAPSE funding era, as well as the developmental approach to norms and gaps described above should be considered in drafting these proposals.

#### **1.4.3 The higher education equipment study (Part 3 of the report)**

The Steering Committee suggested that this part of the study should have two areas of focus:

- a. An investigation into the availability and condition of equipment used in the teaching and research programmes at HEIs.
- b. Formulating proposals for the enhancement of earmarked funding for equipment at HEIs if significant needs (backlogs) especially in teaching equipment are proven.

Since it was clear that no comparable information on the availability and condition of equipment is available, the Steering Committee indicated that the information will have to be collected at all HEIs by means of a survey of all teaching and research equipment. With the results of the survey, norms and gaps in the provision of equipment should be established. This will, within the developmental framework formulated above in Section 1.4.1, lead to the draft proposals for the (earmarked) government funding of equipment needed for teaching and research at HEIs.

## PART 2: THE HIGHER EDUCATION BUILDING STUDY

### 2.1 BACKLOGS/SURPLUSES IN BUILDING FACILITIES AT HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA IN 2009

#### 2.1.1 Background

In the determination of backlogs or surpluses in the buildings at higher education institutions (HEIs) in the RSA in 2009, two HE policy documents are of primary importance, namely:

- *Building and Space Inventory and Classification Manual* (Department of Education 2009a);
- *Space and Cost Norms for Buildings and Other Land Improvements at Higher Education Institutions* (Department of Education 2009b)

The space and cost norms for buildings at HEIs in the policy document referred to above were determined in 1996. These norms replaced the initial norms determined by the Department of National Education in 1982 as part of the SAPSE system. The 1982 space and cost norms were set out in the manual SAPSE 101 under the title *Nation-wide space and cost norms for buildings and land improvements other than buildings*. (See Department of National Education 1985a) These norms distinguished between Residential Universities, Non-residential Universities, Residential Technikons, Non-residential Technikons, Teachers' Training Colleges, Nursing Colleges and Technical Colleges/Institutes. The 1996/2009 space and cost norms revised and pooled the 1982 norms for respectively universities and technikons, but still distinguish between norms for contact and distance tuition.

In 1987 capital provision formulas, which provided for the financing of buildings and land improvements at respectively universities and technikons, came into effect. These formulas formed part of the SAPSE subsidy framework for universities and technikons and were based on the annual increases in student numbers. (See the reports SAPSE 110 of the Department of National Education 1985b and NATED 131(89/01) of the Department of National Education 1989). In order to implement the capital provision formulas it was important first to determine the exact position of all universities and technikons as far as the provision of buildings was concerned. This was done in respect of the 1987 year by the Department of National Education and set out in the Report NATED-143 (90/08) (See Department of National Education 1990). The basic steps followed in the determination of the backlog/surplus in buildings for a specific institution were:

- Step 1: Determine the norm provision of assignable square metres (ASM) of building space and building cost units for the institution.
- Step 2: Determine the actual utilisation or availability of building space (ASM and building cost units) for the institution.
- Step 3: Determine ASM space and building cost units included in buildings under construction for the institution.

- Step 4: Calculate the backlog/surplus in the provision of buildings for the institution.

As a result of the detailed nature of the space and cost norms, as well as the same (possible) detail as far as the actual utilisation of the buildings is concerned, the overall backlog/surplus figure for a specific institution can be broken down into CESM category (for Programme 1.1: Formal instruction) and activity according to the Programme Classification System (PCS) (See Department of National Education 1982).

Using the results of the investigation described above and the actual allocations to the respective universities and technikons for the erection of new buildings during the years 1988 to 1999, a so-called building cost unit balance sheet was kept by the Department of National Education during the years 1988-1993, and post 1994 by the new Department of Education, of the backlogs/surpluses in buildings at each HEI. This balance sheet distinguished between buildings in respect of Academic and General Programmes (PCS Programmes 1.1, 2.0, 4.0, 5.0, 6.0 and 7.0), as well as the Auxiliary Enterprises programme (PCS Programme 9.0). For more detail in this regard see Section 2.2.1 in Steyn and de Villiers (2006).

The same methodology as set out above for the determination of the backlog/surplus in buildings at each HEI in respect of 2009 will be used in this study.

### **2.1.2 Space-use information of HEIs for 2009**

The SAPSE information system which was implemented in 1983 by the Department of National Education formed the backbone of the SAPSE funding framework (including the capital provision formulas) for the funding of universities and technikons during the years 1984 to 1998. Chapter 6 of the SAPSE information system, namely *Building and Space Statistics* provided a wealth of statistics. This information, as well as the FTE student enrolments in Chapter 2, namely *Student Statistics*, provided the necessary information to perform Steps 1-3 in the determination of the backlogs/surpluses at universities and technikons in 1987 (see Section 2.1.1).

In 1998 the SAPSE information system for HE was replaced by the Higher Education Management Information System (HEMIS). This system was built on the same platform as the SAPSE information system as far as structures and definitions were concerned, but was technologically more advanced than the SAPSE information system with its more than 300 fixed tables. Unfortunately the information in Chapter 5 (*Fixed Assets*) and Chapter 6 (*Building and space statistics*) of SAPSE was not deemed important at the time and was not included in the new HEMIS system. A contributing factor for the discontinuation of space statistics could have been the fact that apart from an annual ad hoc allocation towards the building cost of the new academic hospital at the University of Pretoria during the period 1998 to 2004, no “official” allocations were made by the state to any HEI for new building projects during the period 1997 to 2007.

Since 2008 ad hoc allocations were made by the Department of Education (DE) and the current Department of Higher Education and Training (DHET) to HEIs for “Infrastructure and

Efficiency” purposes. The respective amounts allocated under this category for the years 2008/09, 2009/10, 2010/11 and 2011/12 were R1095m, R1462m, R1585m and R1615m. According to the MTEF the projected amount for 2012/13 will be R1696m.

In 2006 the Department apparently realised that there is a need to reactivate the annual submission of space information, as well as a need for the re-introduction of the revised space and cost norms of 1996. The 1996 norms, which were approved by the Minister of Education in 1997, were never formally announced as national higher education policy.

The HEMIS space information system was developed on the basis of the *Building and Space Inventory and Classification Manual* (See Section 2.1.1) and all HEIs were requested to submit space information in respect of 2007 by 31 May 2008. The first submission of information in respect of 2007 was considered by the DE as a pilot exercise. The DE convened a national training workshop in March 2009 to discuss the problems encountered in the first submission in order to ensure that the HEMIS space information in respect of 2008, to be submitted by 31 May 2009, should be of higher standard.

Since the HESA Infrastructure Task team needed the HEMIS space data for 2008 in order to perform their brief as far as the buildings part of their study was concerned the team requested the DE in August 2009 to provide them with the space data submitted by HEIs in respect of 2008. The Task Team found that by 1 November 2009 seven HEIs’ information for 2008 was still outstanding. The Team also found that there were some structural problems with the HEMIS space information system, as well as a need to add important “missing” data fields. Their findings as set out in **Appendix A** were submitted to the DHET in November 2009. Although the shortcomings in the system were acknowledged by the DHET, it was indicated by the DHET in December 2009 that it would be impossible to effect any changes in the structure or the system for the next submission, namely at 31 May 2010 in respect of 2009. A new VALPAC editing program for the HEMIS system was, however, released in November 2010 by the DHET, still without any changes to the HEMIS space data system. Obviously the problems with the space data submitted annually by HEIs will therefore continue. This will devalue the space data collected in respect of 2010 and later years. The Task Team, in order to conclude their study as soon as possible, is therefore forced to use the incomplete and inaccurate HEMIS space data for 2009 to determine the backlogs/surpluses in buildings for all HEIs for 2009.

At the time when the analyses of this part of the study were finalised (May 2011) only one HEI’s HEMIS space data information was still outstanding. Although another one HEI’s submitted information is incomplete it was used after some general assumptions were made. As a result of insufficient instructions in the HEMIS manual regarding the relationship between space-use category and PCS category, as is indicated in Section 3 of the HESA comments to DHET (Appendix A), most HEIs’ ASM data according to PCS programme and space-use category had to be adjusted in some important respects by the Task Team during the analyses. These adjustments, however, do not alter the results as far as the total available ASM at a specific institution is concerned. Furthermore, since the total ASM has only (according to the HEMIS instructions) to be broken down into first order PCS programme and space-use category, it was impossible to calculate accurately for each PCS programme the associated building cost units (See Appendix A, Sections 4 and 5). The average building



cost unit norm per ASM for all second order programmes in a particular (first order) PCS programme was therefore used to translate the ASM for the respective PCS programmes and space-use category into building cost units.

Since the ASMs of buildings under construction are not included in the HEMIS space data information (See Section 6 of Appendix A), Step 3 (See Section 2.1.1) in the process for determining the backlog/surplus in buildings, cannot be performed. Resulting backlogs (in terms of both ASM and building cost units) should therefore be interpreted as maximum values and surpluses as minimum values. However, an attempt to rectify this unsatisfactory situation was made by utilising the ad hoc allocations to HEIs for “Infrastructure and Efficiency” for the years 2008/09 and 2009/10.

There are huge discrepancies in the space information of some institutions in respect of 2008 and 2009. Some HEIs’ data for 2009 show large decreases in ASMs when compared with the ASMs in 2008. This clearly indicates that the quality of the HEMIS space data at many HEIs is still suspect. The Task team has, however, decided that the 2009 data should be the most accurate since institutions had already had 3 years’ experience with the generation of the HEMIS space data records and should have devised sound institutional systems to facilitate this process. It is a matter of concern that, apart from the usual edits by the VALPAC system to check for completeness and field lengths, no other criteria are apparently used by the DHET to determine whether the data of a specific HEI are indeed credible. This matter will be addressed again later.

### **2.1.3 Methodology for the calculation of the backlog/surplus in buildings at a HEI in 2009**

Rhodes University is used as an example to describe the different steps in the calculations.

#### **Step 1: Determine the norm provision (ASM and building cost units) for Rhodes University in 2009**

Table 2.1 shows the FTE enrolled students in 2009 at Rhodes University according to CESM category, course level and mode of instruction. The course levels are defined as follows:

- Course level 1: Lower undergraduate/Lower pre-diplomate
- Course level 2: Intermediate undergraduate/Intermediate pre-diplomate
- Course level 3: Higher undergraduate
- Course level 4: Preparatory undergraduate/Preparatory post-diplomate
- Course level 5: Lower post-graduate/Lower post-diplomate
- Course level 6: Intermediate post-graduate (Non-research)/Intermediate post-diplomate (Non-research)
- Course level 7: Intermediate post-graduate (Research)/Intermediate post-diplomate (Research)
- Course level 8: Higher post-graduate (Non-research)/Higher post-diplomate (Non-research)
- Course level 9: Higher post-graduate (Research)/Higher post-diplomate (Research)

The space and cost norms used in the calculations described below, appear in the Annexure of the Space and Cost Norms policy document referred to in Section 2.1.1. For ease of reference the norm tables used in the calculations, namely Tables A.2, A.4, A.7 and A.8, are given in **Appendix B**. These tables are from the Department of Education (2009b).

*Space and building cost unit provision for the Formal Instruction (1.1) subprogramme*

Table 2.2 shows the calculated space and cost provision for this subprogramme. The space provision calculated for CESM 04 (for example) is derived by first calculating the classroom provision for contact students, then the class/open laboratory provision for contact students and finally the office provision for contact students. The class room provision is calculated by using the norm for ASM per FTE contact student in course levels 1-6 and 8 in Table A.2, namely 1.139 and multiplying this value by the total FTE students in course levels 1-6 and 8,

**TABLE 2.1 FTE ENROLLED STUDENTS AT RHODES UNIVERSITY IN 2009 ACCORDING TO CESM CATEGORY, COURSE LEVEL AND MODE OF INSTRUCTION**

Mode of instruction		Contact					Distance		
CESM category	Course level	1-4	5,6,8	1-6,8	7,9	1-9	1-6,8	7,9	1-9
01 Agriculture and Renewable Natural Resources		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02 Architecture and Environmental Design		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3A Music		79.9	2.0	81.9	3.4	85.3	0.0	0.0	0.0
3B History of Visual Arts		97.3	0.5	97.8	6.3	104.0	0.0	0.0	0.0
3C All other Arts, Visual and Performing		48.3	10.2	58.5	4.7	63.3	0.0	0.0	0.0
04 Business, Commerce and Management Sciences		635.7	59.5	695.2	13.1	708.3	0.0	0.0	0.0
05 Communication		258.6	12.8	271.3	14.4	285.7	0.0	0.0	0.0
06 Computer Science and Data Processing		259.9	45.3	305.3	16.1	321.3	0.0	0.0	0.0
07 Education		244.3	62.2	306.5	34.6	341.1	0.0	0.0	0.0
08 Engineering and Engineering Technology		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09A Nursing, Rehabilitation and Therapy, etc		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
09B All other Health Care and Health Sciences		227.7	3.9	231.6	14.5	246.1	0.0	0.0	0.0
10 Home Economics		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 Industrial Arts, Trades and Technology		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12 Languages, Linguistics and Literature		399.7	32.1	431.8	17.9	449.7	0.0	0.0	0.0
13 Law		463.6	0.5	464.1	5.6	469.7	0.0	0.0	0.0
14 Libraries and Museums		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15 Life Sciences and Physical Sciences		473.3	88.7	562.1	116.4	678.4	0.0	0.0	0.0
16 Mathematical Sciences		299.8	11.5	311.3	4.3	315.6	0.0	0.0	0.0
17 Military Sciences		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18 Philosophy, Religion and Theology		104.0	6.3	110.3	4.3	114.6	0.0	0.0	0.0
19 Physical Education, Health Education and Leisure		52.8	13.6	66.5	6.8	73.3	0.0	0.0	0.0
20 Psychology		299.4	34.3	333.8	22.1	355.9	0.0	0.0	0.0
21 Public Administration and Social Services		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22 Social Sciences and Social Studies		1114.7	103.8	1218.5	49.7	1268.2	0.0	0.0	0.0
<b>TOTAL</b>		<b>5059.0</b>	<b>487.3</b>	<b>5546.3</b>	<b>334.2</b>	<b>5880.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
FTE students using institutional housing						3 206.250			0.0
FTE students not using institutional housing						2674.3			0.0

namely 695.2 (See Table 2.1). The provision for CESM 04 for class room space for contact students is therefore 791.8 ASM. In the calculation of class/open laboratory space provision a distinction is made between course levels 1-4 and levels 5, 6 and 8. Separate calculations for these two categories, once again using Tables A.2 and Table 2.1, lead to a provision of respectively 190.7 ASM and 44.6 ASM for contact students for these two course level categories. Finally the office provision for the FTE contact students enrolled in CESM 04 is calculated by multiplying the norm provision of 0.750 in Table A.2 by the FTE contact students of 708.3, leading to a space provision of 531.3 ASM. Similar space calculations can be made for distance tuition students. However, since there are no such students enrolled in CESM 04 at Rhodes University, the total space provision for the Formal Instruction (1.1) subprogramme in CESM 04 is the sum of 791.8, 190.7, 44.6 and 531.3, namely 1558.4 ASM as indicated in Table 2.2.

By using the cost norm Table A.7 and Table 2.1 similar calculations as described above can be done to determine the total building cost units provided by the norms for each CESM

category. Using once again CESM 04 as an example, it is calculated that 1188.1 (classrooms), 190.7 (class/open laboratories for course levels 1-4), 44.6 (class/open laboratories for course level 5, 6 and 8) and 531.3 (offices), in total 1954.7 building cost units, are generated for CESM 04 as indicated in Table 2.2.

*Space and cost provision for programmes/subprogrammes 2.0 - 9.0*

Table 2.3 shows the calculated space and cost unit provision for all programmes/subprogrammes. The total calculated space and cost unit provision for the Formal Instruction (1.1) subprogramme were carried over from Table 2.2 and are also shown in Table 2.3. The space provision for each of the other programmes/subprogrammes is calculated by using the respective norms in Table A.4 and the groups of FTE enrolled students in Table 2.1. The provision of building cost units for the respective programmes/subprogrammes is calculated by using the norms in Table A.8 and the groups of FTE enrolled students in Table 2.1. We illustrate these calculations for the Student Health Services (5.4) subprogramme. According to Table A.4 the space norm for health care facilities is 0.016 ASM per FTE student.

**TABLE 2.2: TOTAL BUILDING SPACE AND BUILDING COST UNIT PROVISIONS FOR RHODES UNIVERSITY WITHIN THE FORMAL INSTRUCTION (1.1) SUBPROGRAMME IN 2009**

CESM	Norm provision	
	SPACE (ASM)	BUILD. COST (UNITS)
01 Agriculture and Renewable Natural Resources	0.00	0.00
02 Architecture and Environmental Design	0.00	0.00
3A Music	570.86	905.39
3B History of Visual Arts	221.21	253.86
3C All other Arts, Visual and Performing	410.77	459.58
04 Business, Commerce and Management Sciences	1558.43	1954.69
05 Communication	658.07	788.82
06 Computer Science and Data Processing	1315.17	1533.16
07 Education	837.68	1018.56
08 Engineering and Engineering Technology	0.00	0.00
09A Nursing, Rehabilitation and Therapy, etc	0.00	0.00
09B All other Health Care and Health Sciences	1400.63	2105.20
10 Home Economics	0.00	0.00
11 Industrial Arts, Trades and Technology	0.00	0.00
12 Languages, Linguistics and Literature	1088.82	1315.46
13 Law	1034.51	1311.57
14 Libraries and Museums	0.00	0.00
15 Life Sciences and Physical Sciences	3747.40	5754.04
16 Mathematical Sciences	785.07	1001.45
17 Military Sciences	0.00	0.00
18 Philosophy, Religion and Theology	233.95	287.54
19 Physical Education, Health Education and Leisure	382.00	439.46
20 Psychology	871.67	1072.66
21 Public Administration and Social Services	0.00	0.00
22 Social Sciences and Social Studies	3241.29	3884.65
<b>TOTAL</b>	<b>18357.52</b>	<b>24086.10</b>

Multiplying this value with the total FTE enrolled contact students of 5880.5 (as indicated in Table 2.1) the space provision of 94.1 ASM is derived. Since the subprogramme 5.4 only provides health care facilities' space and only to contact tuition students, this provision of 94.1 is the total space provided for subprogramme 5.4 as indicated in Table 2.3. A similar calculation (using Tables A.8 and Table 2.1) leads to the total cost unit provision of 94.1 for the same subprogramme 5.4 as also indicated in Table 2.3.

In the calculation of space and cost units for the Auxiliary Enterprises programme (9.0) it is important to note the footnotes at Tables A.4 and A.8 indicating the respective FTE student group to be used in the calculation of space and building cost units for the respective subprogrammes 9.1, 9.2, 9.4 and 9.6.

In the second last row of Table 2.3, the 13% additional cost units to provide for land improvements other than buildings are indicated. The total space (ASM) and building cost units provided to Rhodes University in 2009 by the space and cost norms, as described in Chapters 2 and 3 (Department of Education 2009b), are therefore respectively 102875.8 ASM and 128104.2 building cost units.

**TABLE 2.3: TOTAL SPACE AND COST PROVISION FOR RHODES UNIVERSITY IN 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME**

Programme/subprogramme	Norm provision	
	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction (Carried over from Table 5.2)	18357.5	24086.1
2.0 Research	4704.4	7997.5
4.0 Academic Support	14019.1	15128.8
4.1 Library Services	9114.8	9967.4
4.2 Museum Services	441.0	441.0
4.3 Educational Media Services	482.2	545.7
4.4 Academic Computing Support	394.0	587.5
4.5 Ancillary Support	2940.3	2940.3
4.6 Academic Administration	588.1	588.1
4.7 Course and Curriculum Development	29.4	29.4
4.8 Academic Personnel Development	29.4	29.4
5.0 Student Services	6062.8	6062.8
5.1 Student Services Administration	47.0	47.0
5.2 Social and Cultural Development	5804.1	5804.1
5.3 Counseling and Career Guidance	117.6	117.6
5.4 Student Health Services	94.1	94.1
6.0 Institutional Support	4863.2	4244.5
6.1 Executive Management	364.6	426.3
6.2 Financial Administration	294.0	294.0
6.3 Financial Aid Administration	117.6	117.6
6.4 General Administration and Logistical Services	3387.2	2628.6
6.5 Student Admissions, Records and Examination	176.4	176.4
6.6 Administrative Computing Support	258.7	337.0
6.7 Public Relations/Fund- Raising	176.4	176.4
6.8 Staff Social and Cultural Development	88.2	88.2
7.0 Operation and Maintenance of Plant	1764.2	1526.0
9.0 Auxiliary Enterprises	53104.7	54320.9
9.1 Student Housing Services <sup>1)</sup>	44579.7	46134.1
9.2 Student Food Services <sup>1)</sup>	5415.4	5144.6
9.3 Staff Housing Services	1176.1	1234.9
9.4 Other Food Services <sup>1)</sup>	1235.5	1173.7
9.5 Other Auxiliary Enterprises	258.7	245.8
9.6 Operation and Maintenance of Plant for Aux. Ent. <sup>1)</sup>	439.3	387.8
Unassigned		
<b>TOTAL FOR BUILDINGS</b>	<b>102875.8</b>	<b>113366.6</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>14737.7</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>102875.8</b>	<b>128104.2</b>

Table 2.1 of **Appendix B** (Department of Education (2009b)) shows the interrelationships between the programmes and space-use categories. Note that the total space and building cost provision for an institution refers only to cells in this table identified by an “A”. These cells present primary relationships where the state historically subsidised higher education institutions to establish buildings. According to this table building space used for Programmes 3.0, 8.0 and 11.0 is not provided by the state, while the provision of building space used for Programme 10.0 falls outside the scope of the space and cost norm document.

**Step 2: Determine the actual utilisation (ASM and building cost units) for Rhodes University in 2009**

Table 2.4 gives the actual ASMs available at Rhodes University in 2009 according to CESM category and space-use category for the Formal Instruction subprogramme (1.1). This table is the HEMIS VALPAC summary table calculated from the university’s HEMIS space data records. Table 2.5 shows the HEMIS VALPAC summary of the ASM available at Rhodes University in 2009 according to programme and space-use category.

**TABLE2.4: ASM AVAILABLE FOR FORMAL INSTRUCTION AT RHODES UNIVERSITY IN 2009 ACCORDING TO CESM CATEGORY AND SPACE-USE CATEGORY**

Space-use Category	Classroom Facilities (1100)	Laboratory Facilities (1210)	Open Laboratory Facilities (1220)	Research/ Non-Class Lab Facilities (1250)	Office Facilities (1300)	Study Facilities (1400)	All Other Space (1500 to 1900)	Total Assignable Square Metres
<b>CESM</b>								
010 Ag. / renewable natural resources	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
020 Architecture, environmental design	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
03A Music	253.350	0.000	15.040	0.000	258.690	0.000	0.000	527.080
03B Visual arts	178.450	1 032.600	50.600	0.000	343.550	0.000	0.000	1 605.200
03C All other arts, visual & performing	69.850	0.000	108.200	0.000	399.230	0.000	0.000	577.280
040 Business , commerce, mgmt.Science	2 106.462	0.000	20.800	0.000	838.540	0.000	0.000	2 965.802
050 Communication	726.043	54.000	0.000	0.000	765.700	0.000	0.000	1 545.743
060 Computer Science, data processing	236.666	0.000	91.763	0.000	816.040	0.000	0.000	1 144.469
070 Education	496.280	48.300	198.900	0.000	753.740	0.000	0.000	1 497.220
080 Engineering, engineering technology	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
09A Nursing, rehab, therapy, etc.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
09B All other health care & health Sc.	269.231	14.610	1 517.750	0.000	851.350	0.000	0.000	2 652.941
100 Home economics	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110 Industrial arts, trades & technology	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
120 Languages , linguistics, literature	810.495	70.300	253.230	0.000	1 077.400	0.000	0.000	2 211.425
130 Law	759.072	0.000	0.000	0.000	431.590	0.000	0.000	1 190.662
140 Libraries & museums	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
150 Life sciences, physical sciences	888.049	2 682.610	4 741.653	0.000	4 183.350	0.000	0.000	12 495.662
160 Mathematical sciences	455.989	0.000	102.553	0.000	537.010	0.000	0.000	1 095.552
170 Military sciences	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
180 Philosophy , religion, theology	136.704	0.000	0.000	0.000	245.370	0.000	0.000	382.074
190 Phys. ed., health ed., leisure	54.400	0.000	602.190	0.000	165.370	0.000	0.000	821.960
200 Pshchology	357.839	0.000	342.560	0.000	559.760	0.000	0.000	1 260.159
210 Public admin, social services	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
220 Social sciences, social studies	1 438.944	52.990	178.860	0.000	2 093.260	0.000	0.000	3 764.054
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>TOTAL</b>	<b>9 237.824</b>	<b>3 955.410</b>	<b>8 224.099</b>	<b>0.000</b>	<b>14 319.950</b>	<b>0.000</b>	<b>0.000</b>	<b>35 737.283</b>

All the ASM in the cells of Table 2.4 can be converted to building cost units by using the conversion Table A.5 in **Appendix B**. Table 2.6 shows the total available ASM, as well as the total available building cost units for the formal instruction programme after the conversions to building cost units were calculated

**TABLE 2.5: ASM AVAILABLE AT RHODES UNIVERSITY IN 2009 ACCORDING TO PROGRAMME AND SPACE-USE CATEGORY**

Space-use Category	Classroom Facilities (1100)	Laboratory Facilities (1210)	Open Laboratory Facilities (1220)	Non-Class Lab Facilities (1250)	Office Facilities (1300)	Study Facilities (1400)	Special Use Facilities (1500)	General Use Facilities (1600)	Support Facilities (1700)	Health Care Facilities (1800)	Residential Facilities (1900)	Un-classified Facilities (1000)	Total Assignable Square Metres
<b>Programme</b>													
1.0 Instruction	9 237.824	3 955.410	8 224.099	0.000	14 319.950	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<b>35 737.283</b>
2.0 Research	0.000	0.000	0.000	2 914.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<b>2 914.050</b>
3.0 Public Service	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<b>0.000</b>
4.0 Academic Support	0.000	0.000	0.000	0.000	2 597.503	6 527.009	5 147.730	3 982.510	4 027.260	0.000	0.000	0.000	<b>22 282.012</b>
5.0 Student Services	0.000	0.000	0.000	0.000	251.510	0.000	3 868.450	3 457.440	405.970	252.210	0.000	0.000	<b>8 235.580</b>
6.0 Institutional Support	0.000	0.000	0.000	0.000	10 071.750	0.000	60.020	1 259.700	4 370.480	0.000	0.000	0.000	<b>15 761.950</b>
7.0 Operation and Main. of Plant	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	309.600	0.000	0.000	0.000	<b>309.600</b>
9.0 Auxilliary Enterprises	0.000	0.000	0.000	0.000	1 382.130	0.000	376.090	11 277.040	696.480	0.000	51 001.060	0.000	<b>64 732.800</b>
10.0 Hospitals	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<b>0.000</b>
11.0 Independent Operations	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<b>0.000</b>
12.0 Unassigned	0.000	0.000	0.000	0.000	0.000	0.000	4.000	0.000	0.000	0.000	0.000	0.000	<b>4.000</b>
<b>13.0 TOTAL</b>	<b>9 237.824</b>	<b>3 955.410</b>	<b>8 224.099</b>	<b>2 914.050</b>	<b>28 622.843</b>	<b>6 527.009</b>	<b>9 456.290</b>	<b>19 976.690</b>	<b>9 809.790</b>	<b>252.210</b>	<b>51 001.060</b>	<b>0.000</b>	<b>149 977.275</b>

**TABLE 2.6: TOTAL BUILDING SPACE AND BUILDING COST UNITS AVAILABLE FOR RHODESUNIVERSITY WITHIN THE FORMAL INSTRUCTION (1.1) SUBPROGRAMME IN 2009**

CESM	Actual utilisation	
	SPACE (ASM)	BUILD. COST (UNITS)
01 Agriculture and Renewable Natural Resources	0.000	0.00
02 Architecture and Environmental Design	0.000	0.00
3A Music	527.080	665.04
3B History of Visual Arts	1 605.200	1802.75
3C All other Arts, Visual and Performing	577.280	623.03
04 Business, Commerce and Management Sciences	2 965.802	4019.03
05 Communication	1 545.743	1911.46
06 Computer Science and Data Processing	1 144.469	1271.98
07 Education	1 497.220	1770.08
08 Engineering and Engineering Technology	0.000	0.00
09A Nursing, Rehabilitation and Therapy, etc	0.000	0.00
09B All other Health Care and Health Sciences	2 652.941	3936.83
10 Home Economics	0.000	0.00
11 Industrial Arts, Trades and Technology	0.000	0.00
12 Languages, Linguistics and Literature	2 211.425	2632.85
13 Law	1 190.662	1570.20
14 Libraries and Museums	0.000	0.00
15 Life Sciences and Physical Sciences	12 495.662	18507.88
16 Mathematical Sciences	1 095.552	1323.55
17 Military Sciences	0.000	0.00
18 Philosophy, Religion and Theology	382.074	450.43
19 Physical Education, Health Education and Leisure	821.960	909.38
20 Psychology	1 260.159	1490.46
21 Public Administration and Social Services	0.000	0.00
22 Social Sciences and Social Studies	3 764.054	4483.53
<b>TOTAL</b>	<b>35 737.283</b>	<b>47368.46</b>

As was already discussed in Section 2.1.2 and seen from Table 2.5 only the total ASMs for the respective Programmes 2.0-11.0 are requested from HEIs within the HEMIS space data system. However, in order to convert the ASM to building cost units by means of Table A.6 of

Appendix B the individual ASM according to subprogramme and space-use category is needed. Estimates of the total building cost units for each programme have been calculated by using the average building cost units per ASM as indicated in Table A.6 in the case of special-use, general-use and supporting space-use categories.

Table 2.7 shows the total available ASM, as well as the estimated total available building cost units, according to PCS programme after the conversions to building cost units were made. It is very important to note that only the ASM and building cost units for Programmes 1.0, 2.0, 4.0, 5.0, 6.0, 7.0 and 9.0 are given, namely for these programmes where the state traditionally contributed some of the building costs of new buildings (See Section 2.3 for further discussion).

**TABLE 2.7: TOTAL AVAILABLE SPACE AND ESTIMATED BUILDING COST UNITS AVAILABLE FOR RHODES UNIVERSITY IN 2009 ACCORDING TO PROGRAMME/SUB-PROGRAMME**

Programme/subprogramme	Actual utilisation	
	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction (Carried over from Table 5.2)	35 737.28	47368.5
2.0 Research	2914.1	4953.9
4.0 Academic Support	22282.0	25 697.8
4.1 Library Services		
4.2 Museum Services		
4.3 Educational Media Services		
4.4 Academic Computing Support		
4.5 Ancillary Support		
4.6 Academic Administration		
4.7 Course and Curriculum Development		
4.8 Academic Personnel Development		
5.0 Student Services	8235.6	8235.6
5.1 Student Services Administration		
5.2 Social and Cultural Development		
5.3 Counselling and Career Guidance		
5.4 Student Health Services		
6.0 Institutional Support	15762.0	16 757.7
6.1 Executive Management		
6.2 Financial Administration		
6.3 Financial Aid Administration		
6.4 General Administration and Logistical Services		
6.5 Student Admissions, Records and Examination		
6.6 Administrative Computing Support		
6.7 Public Relations/Fund- Raising		
6.8 Staff Social and Cultural Development		
7.0 Operation and Maintenance of Plant	309.6	263.2
9.0 Auxiliary Enterprises	64732.8	66 418.4
9.1 Student Housing Services <sup>1)</sup>		
9.2 Student Food Services <sup>1)</sup>		
9.3 Staff Housing Services		
9.4 Other Food Services <sup>1)</sup>		
9.5 Other Auxiliary Enterprises		
9.6 Operation and Maintenance of Plant for Aux. Ent. <sup>1)</sup>		
Unassigned	4.0	4.1
<b>TOTAL FOR BUILDINGS</b>	<b>149977.3</b>	<b>169699.1</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>22060.9</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>149977.3</b>	<b>191760.0</b>

**Step 3: Determine ASM and building cost units for buildings under construction at Rhodes University in 2009**

As already indicated in Section 2.2 this information does unfortunately not form part of the HEMIS space data submission. Since ad hoc “Infrastructure and Efficiency” allocations of respectively R20m and R50m were made to Rhodes in 2008 and 2009 (see DHET 2010c) it could be assumed that some building construction was taking place at Rhodes in 2009.

**Step 4: Calculate the backlog/surplus in the provision of buildings at Rhodes University in 2009**

Table 2.7 shows that 149977 ASM and an estimated 191760 building cost units were available at Rhodes in 2009. When compared with the norm values in Table 2.3 Rhodes therefore had a surplus ASM of about 47101 and an estimated surplus in building cost units of about 63656 in 2009. These surplus values are even higher when the construction of buildings with funds from the “Infrastructure and Efficiency” allocations is also discounted. See Table 2.9 in this regard.

**2.1.4 Summary of calculations of backlogs/surpluses in 2009 for all HEIs which submitted HEMIS space data in respect of 2009**

The norm provisions, as well as the actual provisions were calculated for each of the 22 higher education institutions which submitted HEMIS space data for 2009. This information appears in Tables C.1 to C.22 of **Appendix C**. Note that no information on the actual provision of space at the University of the Witwatersrand is available. A summary of these tables, including a calculation of the backlogs/surpluses for the different higher education institutions in 2009 according to the summarised/grouped PCS programmes (see discussion on this in Appendix C) is also shown in Table 2.8. Backlogs/surpluses in ASM were calculated by (as was illustrated for Rhodes University) subtracting the available ASM for each institutional programme or group of programmes in 2009 from the institution’s programme or grouped programme norm ASM for 2009. In a similar way the (estimated) backlog/surplus in building cost units was also determined for each institutional programme for 2009. Positive values for this calculation therefore indicate backlogs and negative values indicate surpluses.

Table 2.9 shows the so-called “Infrastructure and Efficiency” allocations to all HEIs for the years 2008 and 2009. Since the actual amounts earmarked within these allocations for the construction of new buildings are unfortunately not officially available, for this analysis it is assumed that all the funds were used for the construction of new buildings. The second last column of Table 2.9 shows the total number of building cost units associated with these allocations in 2008 and 2009 in the case of each institution. This calculation has been done by utilising the BER building cost indices for 2008 and 2009. The method is described in Chapter 3 of DE (2009b). The ASMs associated with these allocations, shown in the last column of Table 2.9 for each HEI, are calculated by using the ASM to building cost unit ratio for 2009 (calculated from Table 2.8). The last two columns of Table 2.8 show the adjusted backlogs/surpluses when the allocations to HEIs in 2008 and 2009 are taken into account.

Relative backlogs/surpluses in ASM, calculated for each institution as the backlog/surplus ASM divided by the norm ASM (as a percentage), are shown according to the grouped PCS programmes in Table 2.10. Figure 2.1 shows ordered bar charts for the relative backlogs/surpluses percentages of the 22 HEIs for respectively the academic programmes (PCS 1.0 and 2.0), the support programmes (PCS 4.0-7.0), the auxiliary enterprises programme (PCS 9.0), as well as for the buildings in all programmes traditionally subsidised by the state.



**TABLE 2.8: BACKLOGS/SURPLUSES IN ASM AND BUILDING COST UNITS FOR HEIs IN 2009  
ACCORDING TO PROGRAMME GROUP AND INSTITUTION**

Institution	Programme group	Norm provision		Actual utilisation		Backlog/surplus <sup>3)</sup>		Adjusted backlog/surplus <sup>4)</sup>	
		SPACE (ASM)	BUILD. COST (UNITS) <sup>2)</sup>	SPACE (ASM)	BUILD. COST (UNITS) <sup>2)</sup>	SPACE (ASM)	BUILD. COST (UNITS) <sup>2)</sup>	SPACE (ASM)	BUILD. COST (UNITS)
Cape Peninsula Univ Techn <sup>1)</sup> (CPUT)	Academic (Prog. 1.0 & 2.0)	108451	140760	102378	132682	6073	8077		
	Support (Progr. 4.0 - 7.0)	102959	103932	66499	69887	36461	34045		
	Auxilliary Ent. (Progr. 9.0)	101727	103668	116725	119152	-14998	-15484		
	Total buildings	313137	348359	285602	321721	27535	26639		
	Land improvements		45287		41824	0	3463		
	TOTAL	313137	393646	285602	363544	27535	30102	22113	23285
University of Cape Town <sup>1)</sup> (UCT)	Academic (Prog. 1.0 & 2.0)	83951	112627	96441	128564	-12489	-15937		
	Support (Progr. 4.0 - 7.0)	85634	86444	112002	118111	-26368	-31667		
	Auxilliary Ent. (Progr. 9.0)	98000	99971	98321	101852	-321	-1881		
	Total buildings	267585	299042	306763	348527	-39178	-49485		
	Land improvements		38876		45309	0	-6433		
	TOTAL	267585	337918	306763	393835	-39178	-55918	-47436	-66346
Central University of Techn <sup>1)</sup> (CUT)	Academic (Prog. 1.0 & 2.0)	44522	57765	21361	27696	23161	30069		
	Support (Progr. 4.0 - 7.0)	43420	43820	32979	34398	10441	9422		
	Auxilliary Ent. (Progr. 9.0)	16926	17053	11878	11992	5049	5061		
	Total buildings	104869	118637	66218	74086	38651	44552		
	Land improvements		15423		9631	0	5792		
	TOTAL	104869	134060	66218	83717	38651	50344	34366	44866
Durban University of Techn <sup>1)</sup> (DUT)	Academic (Prog. 1.0 & 2.0)	80931	105193	85548	123400	-4617	-18207		
	Support (Progr. 4.0 - 7.0)	78738	79483	49286	49680	29452	29803		
	Auxilliary Ent. (Progr. 9.0)	70154	71434	36351	38168	33803	33266		
	Total buildings	229823	256111	171184	211248	58638	44862		
	Land improvements		33294		27462	0	5832		
	TOTAL	229823	289405	171184	238711	58638	50694	53367	44295
University of Fort Hare <sup>1)</sup> (UFH)	Academic (Prog. 1.0 & 2.0)	32750	45216	40337	61194	-7587	-15978		
	Support (Progr. 4.0 - 7.0)	40017	40396	33228	34629	6789	5767		
	Auxilliary Ent. (Progr. 9.0)	60321	61629	89388	92193	-29067	-30564		
	Total buildings	133088	147241	162954	188017	-29866	-40775		
	Land improvements		19141		24442	0	-5301		
	TOTAL	133088	166383	162954	212459	-29866	-46076	-34248	-51554
University of the Free State <sup>1)</sup> (UFS)	Academic (Prog. 1.0 & 2.0)	77429	106649	65341	97787	12089	8862		
	Support (Progr. 4.0 - 7.0)	86185	86890	109137	114054	-22953	-27164		
	Auxilliary Ent. (Progr. 9.0)	62457	63491	72459	74098	-10002	-10607		
	Total buildings	226071	257030	246937	285939	-20866	-28909		
	Land improvements		33414		37172	0	-3758		
	TOTAL	226071	290444	246937	323111	-20866	-32667	-23721	-36335
University of Johannesburg <sup>1)</sup> (UJ)	Academic (Prog. 1.0 & 2.0)	152970	203190	97120	140856	55850	62334		
	Support (Progr. 4.0 - 7.0)	172949	174586	171401	175667	1548	-1080		
	Auxilliary Ent. (Progr. 9.0)	103695	105162	73373	76987	30322	28175		
	Total buildings	429614	482938	341893	393509	87721	89429		
	Land improvements		62782		51156	0	11626		
	TOTAL	429614	545720	341893	444665	87721	101055	67551	75434
University of KwaZulu-Natal <sup>1)</sup> (UKZN)	Academic (Prog. 1.0 & 2.0)	109547	148524	121872	182180	-12325	-33656		
	Support (Progr. 4.0 - 7.0)	119290	120212	184657	197863	-65367	-77650		
	Auxilliary Ent. (Progr. 9.0)	131394	134025	133879	136062	-2485	-2037		
	Total buildings	360231	402762	440408	516105	-80177	-113343		
	Land improvements		52359		67094	0	-14735		
	TOTAL	360231	455121	440408	583199	-80177	-128078	-86691	-136307
University of Limpopo <sup>1)</sup> (UL)	Academic (Prog. 1.0 & 2.0)	59709	84206	46971	68998	12738	15208		
	Support (Progr. 4.0 - 7.0)	62331	62921	95593	97728	-33262	-34806		
	Auxilliary Ent. (Progr. 9.0)	137643	140848	141315	146914	-3672	-6066		
	Total buildings	259684	287975	283879	313639	-24196	-25664		
	Land improvements		37437		40773	0	-3336		
	TOTAL	259684	325412	283879	354412	-24196	-29000	-38748	-47235
Nelson Mandela Metr. Univ <sup>1)</sup> (NMMU)	Academic (Prog. 1.0 & 2.0)	71286	94682	59673	82284	11613	12398		
	Support (Progr. 4.0 - 7.0)	77465	78101	81376	83861	-3911	-5760		
	Auxilliary Ent. (Progr. 9.0)	56634	57573	51769	52811	4865	4762		
	Total buildings	205385	230356	192819	218956	12566	11400		
	Land improvements		29946		28464	0	1482		
	TOTAL	205385	260303	192819	247420	12566	12882	6106	4694
North West University <sup>1)</sup> (NWU)	Academic (Prog. 1.0 & 2.0)	91021	123512	78726	100919	12295	22593		
	Support (Progr. 4.0 - 7.0)	113582	114006	144802	148719	-31219	-34714		
	Auxilliary Ent. (Progr. 9.0)	132329	135075	111904	117500	20424	17575		
	Total buildings	336932	372593	335432	367138	1500	5455		
	Land improvements		48437		47728	0	709		
	TOTAL	336932	421030	335432	414866	1500	6164	1500	6164
University of Pretoria <sup>1)</sup> (UP)	Academic (Prog. 1.0 & 2.0)	151057	201674	211979	281709	-60922	-80035		
	Support (Progr. 4.0 - 7.0)	156326	157450	139420	153900	16906	3550		
	Auxilliary Ent. (Progr. 9.0)	141476	144113	145650	149231	-4175	-5118		
	Total buildings	448859	503237	497049	584840	-48190	-81603		
	Land improvements		65421		76028	0	-10607		
	TOTAL	448859	568657	497049	660867	-48190	-92210	-58430	-105182

TABLE 2.8 (CONT)

Institution	Programme group	Norm provision		Actual utilisation		Backlog/surplus <sup>3)</sup>		Adjusted backlog/surplus <sup>4)</sup>	
		SPACE (ASM)	BUILD. COST (UNITS) <sup>2)</sup>	SPACE (ASM)	BUILD. COST (UNITS) <sup>2)</sup>	SPACE (ASM)	BUILD. COST (UNITS) <sup>2)</sup>	SPACE (ASM)	BUILD. COST (UNITS)
Rhodes University (RU)	Academic (Prog. 1.0 & 2.0)	23062	32084	38651	52322	-15589	-20239		
	Support (Prog. 4.0 - 7.0)	26709	26962	46593	50958	-19884	-23996		
	Auxilliary Ent. (Prog. 9.0)	53105	54321	64733	66418	-11628	-12097		
	Total buildings	102876	113367	149977	169699	-47101	-56333		
	Land improvements		14738		22061	0	-7323		
	TOTAL	102876	128104	149977	191760	-47101	-63656	-52242	-70059
University of South Africa <sup>3)</sup> (UNISA)	Academic (Prog. 1.0 & 2.0)	47942	57030	26079	33903	21864	23127		
	Support (Prog. 4.0 - 7.0)	172349	166025	204552	216040	-32203	-50015		
	Auxilliary Ent. (Prog. 9.0)	13683	13589	11044	10929	2639	2661		
	Total buildings	233974	236644	241675	260871	-7701	-24227		
	Land improvements		30764		33913	0	-3150		
	TOTAL	233974	267408	241675	294785	-7701	-27377	-7701	-27377
University of Stellenbosch <sup>3)</sup> (SU)	Academic (Prog. 1.0 & 2.0)	92136	125090	98550	140990	-6413	-15900		
	Support (Prog. 4.0 - 7.0)	93876	94765	141427	147547	-47551	-52782		
	Auxilliary Ent. (Prog. 9.0)	127866	130573	96723	101559	31143	29013		
	Total buildings	313879	350427	336700	390096	-22821	-39669		
	Land improvements		45556		50712	0	-5157		
	TOTAL	313879	395983	336700	440809	-22821	-44826	-25502	-48207
Tshwane University of Tech <sup>3)</sup> (TUT)	Academic (Prog. 1.0 & 2.0)	172821	227605	117110	155986	55711	71619		
	Support (Prog. 4.0 - 7.0)	178924	180554	101678	104667	77246	75887		
	Auxilliary Ent. (Prog. 9.0)	162786	165792	57631	60473	105155	105320		
	Total buildings	514532	573950	276420	321125	238112	252825		
	Land improvements		74614		37400	0	37213		
	TOTAL	514532	648564	276420	358526	238112	290038	221645	269281
University of Venda <sup>3)</sup> (UNIVEN)	Academic (Prog. 1.0 & 2.0)	40371	56124	11032	14873	29339	41251		
	Support (Prog. 4.0 - 7.0)	44932	45358	20963	23102	23970	22256		
	Auxilliary Ent. (Prog. 9.0)	36470	37106	28531	29782	7939	7324		
	Total buildings	121774	138587	60526	67757	61248	70831		
	Land improvements		18016		8808	0	9208		
	TOTAL	121774	156603	60526	76565	61248	80039	48317	63409
Vaal University of Techn <sup>3)</sup> (VUT)	Academic (Prog. 1.0 & 2.0)	69069	91006	33259	44563	35811	46443		
	Support (Prog. 4.0 - 7.0)	66091	66717	32338	33897	33753	32820		
	Auxilliary Ent. (Prog. 9.0)	41251	41854	35211	36525	6039	5330		
	Total buildings	176411	199578	100808	114984	75603	84593		
	Land improvements		25945		14948	0	10997		
	TOTAL	176411	225523	100808	129932	75603	95590	73451	92839
Walter Sisulu Univ of Techn <sup>3)</sup> (WSU)	Academic (Prog. 1.0 & 2.0)	82884	110854	63886	89020	18998	21835		
	Support (Prog. 4.0 - 7.0)	96817	97729	72037	72915	24780	24815		
	Auxilliary Ent. (Prog. 9.0)	104818	106888	86340	90623	18479	16265		
	Total buildings	284519	315472	222262	252557	62257	62915		
	Land improvements		41011		32832	0	8179		
	TOTAL	284519	356483	222262	285389	62257	71094	38926	41862
University of Western Cape <sup>3)</sup> (UWC)	Academic (Prog. 1.0 & 2.0)	49378	67652	37542	57362	11836	10291		
	Support (Prog. 4.0 - 7.0)	54731	55249	49763	52954	4968	2295		
	Auxilliary Ent. (Prog. 9.0)	59487	60663	39398	40957	20088	19706		
	Total buildings	163595	183564	126704	151273	36892	32291		
	Land improvements		23863		19665	0	4198		
	TOTAL	163595	207427	126704	170938	36892	36489	25371	21882
University of Witwatersrand (WITS)	Academic (Prog. 1.0 & 2.0)								
	Support (Prog. 4.0 - 7.0)								
	Auxilliary Ent. (Prog. 9.0)								
	Total buildings								
	Land improvements								
	TOTAL								
University of Zululand <sup>3)</sup> (UNIZUL)	Academic (Prog. 1.0 & 2.0)	43336	58819	15867	22215	27469	36603		
	Support (Prog. 4.0 - 7.0)	54245	54759	36696	39002	17549	15757		
	Auxilliary Ent. (Prog. 9.0)	71596	73098	68519	70699	3077	2400		
	Total buildings	169177	186676	121082	131916	48095	54760		
	Land improvements		24268		17149	0	7119		
	TOTAL	169177	210944	121082	149065	48095	61879	40037	51832
Mangosuthu Univ of Techn <sup>3)</sup> (MUT)	Academic (Prog. 1.0 & 2.0)	36895	48189	16826	23296	20070	24893		
	Support (Prog. 4.0 - 7.0)	33245	33559	9184	9551	24060	24008		
	Auxilliary Ent. (Prog. 9.0)	60073	61426	14823	15229	45250	46197		
	Total buildings	130213	143175	40833	48076	89380	95098		
	Land improvements		18613		6250	0	12363		
	TOTAL	130213	161787	40833	54326	89380	107461	87172	104718
TOTAL <sup>5)</sup>	Academic (Prog. 1.0 & 2.0)	1721519	2298449	1486547	2062797	234972	235652		
	Support (Prog. 4.0 - 7.0)	1960816	1969919	1935612	2029130	25204	-59211		
	Auxilliary Ent. (Prog. 9.0)	1843892	1879353	1585966	1640153	257925	239201		
	Total buildings	5526227	6147721	5008125	5732080	518102	415642		
	Land improvements	0	799204	0	740823	0	58381		
	TOTAL	5526227	6946925	5008125	6472902	518102	474023	345203	255959
TOTAL BACKLOGS <sup>6)</sup>						838198	993830	719922	844561

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

2) 13% additional building cost units for land improvements other than buildings only included in each HEI's total building cost units

3) Negative values of ASM or building cost units indicate surpluses, while backlogs are indicated by positive values.

4) This is the adjusted backlogs/surpluses in ASM and building cost units when the ASM and building cost units associated with the allocations to HEIs in 2008 and 2009 for infrastructure and efficiency have been taken into account. (See Table 9)

5) Total only based on institutions with HEMIS data on available space

6) Total only based on institutions with backlogs

**TABLE 2.9: INFRASTRUCTURE AND EFFICIENCY ALLOCATIONS TO HEIs IN 2008 AND 2009  
ACCORDING TO INSTITUTION AND YEAR**

Institution	Infrastructure & Efficiency allocation (Rm)		Total number of building cost units <sup>1)</sup>	Estimated ASM associated with building cost units <sup>2)</sup>
	2008	2009		
Cape Peninsula Univ Techn <sup>1)</sup>	75		6816	5422
University of Cape Town	32	82	10428	8258
Central University of Techn <sup>1)</sup>	30	30	5478	4285
Durban University of Techn <sup>1)</sup>	25	45	6399	5271
University of Fort Hare	30	30	5478	4382
University of the Free State <sup>1)</sup>		40	3668	2855
University of Johannesburg <sup>1)</sup>	70	210	25621	20170
University of KwaZulu-Natal	30	60	8229	6513
University of Limpopo	130	70	18235	14552
Nelson Mandela Metr. Univ <sup>1)</sup>	80	10	8188	6460
North West University <sup>1)</sup>			0	0
University of Pretoria <sup>1)</sup>	61	81	12972	10240
Rhodes University	20	50	6403	5142
University of South Africa <sup>1)</sup>			0	0
University of Stellenbosch <sup>1)</sup>	14	23	3382	2681
Tshwane University of Tech <sup>1)</sup>	74	153	20757	16467
University of Venda	74	108	16630	12931
Vaal University of Techn <sup>1)</sup>		30	2751	2152
Walter Sisulu Univ of Techn <sup>1)</sup>	140	180	29232	23330
University of Western Cape	80	80	14608	11521
University of Witwatersrand	70	100	15533	12074
University of Zululand <sup>1)</sup>	50	60	10047	8058
Mangosuthu Univ of Techn <sup>1)</sup>	10	20	2743	2208
<b>TOTAL</b>	<b>1095</b>	<b>1462</b>	<b>233598</b>	<b>184972</b>

1) Calculated by using the following Rand values for a building cost units:

2008: R11003; 2009: R10904 (BER Building cost index. Third quarter 2010)

2) Calculated from building cost units by using the respective ASM:building cost units ratio of institutions

**TABLE 2.10: RELATIVE BACKLOGS/SURPLUSES (AS A PERCENTAGE) IN ASM IN 2009  
ACCORDING TO SUMMARISED PCS PROGRAMME AND HEI**

Institution	Summarised PCS programme			
	Academic	Support	Aux. Ent	Total
CPUT	5.60	35.41	-14.74	8.79
UCT	-14.88	-30.79	-0.33	-14.64
CUT	52.02	24.05	29.83	36.86
DUT	-5.70	37.40	48.18	25.51
UFH	-23.17	16.96	-48.19	-22.44
UFS	15.61	-26.63	-16.01	-9.23
UJ	36.51	0.90	29.24	20.42
UKZN	-11.25	-54.80	-1.89	-22.26
UL	21.33	-53.36	-2.67	-9.32
NMMU	16.29	-5.05	8.59	6.12
UNW	13.51	-27.49	15.43	0.45
UP	-40.33	10.81	-2.95	-10.74
RU	-67.60	-74.45	-21.90	-45.78
UNISA	45.60	-18.68	19.29	-3.29
SU	-6.96	-50.65	24.36	-7.27
TUT	32.24	43.17	64.60	46.28
UNIVEN	72.67	53.35	21.77	50.30
VUT	51.85	51.07	14.64	42.86
WSU	22.92	25.59	17.63	21.88
UWC	23.97	9.08	33.77	22.55
WITS				
UNIZUL	63.39	32.35	4.30	28.43
MUT	54.40	72.37	75.32	68.64

In evaluating the results of Table 2.8 the following points are important:

1. Apart from one institution, all other institutions' space data are either incomplete or not according to the HEMIS specifications. It is therefore very difficult to calculate backlogs/surpluses accurately in the building stock of HEIs, especially on the (PCS) programme level. Considering the fact that the first submission of HEMIS space data was already required by the DE three years ago and that various workshops were held by the DHET and the South African Association for Institutional Research (SAAIR) to iron out the problems encountered by HEIs in compiling the HEMIS space data, a better performance in the rendering of this crucial information to the DHET is expected from higher education institutions. The fact that no decisions on the allocations of state funding to HEIs currently depend on HEMIS space data, is undoubtedly an important reason for this poor performance of HEIs.
2. As was already indicated in Section 2.1.2 the HEMIS space data system has some deficiencies. These deficiencies were not only highlighted to the DHET in November 2009 in the HESA document (See **Appendix A**), but also on various occasions by specific institutions. Although the DHET acknowledged these deficiencies, no or little effort was made by them to rectify these efficiencies
3. It is already clear from Table 2.8 that the universities of technology all have huge backlogs in both ASM and building cost units. Many of these institutions' buildings were erected according to the SAPSE 101-norms for technikons (See Department of National Education (1985a)). The SAPSE 101 norms for ASM per FTE enrolled student, as well as building cost units per FTE enrolled student, for technikons were substantially lower for all programmes than the corresponding SAPSE 101 norms for universities. As already indicated, the current norms (used in the calculation of the norm values in Table 2.8) were compiled in 1996 with the specific purpose of creating similar norms for all higher education institutions. In this process the previous SAPSE 101 norms for technikons were mostly increased while the university norms were decreased. As a result of the big slump in the erection of new buildings at HEIs between 1997 to 2007 and no state funding for this purpose, the current norms have never or seldom been used since 1996 in the erection of new buildings. The big backlogs in the building stock at universities of technology are therefore not surprising.
4. It is evident that the so-called historically advantaged (White) institutions which were not significantly changed by the process of higher education mergers between 2003 and 2004, all had large surpluses in 2009 in both ASM and building cost units. Since many of these institutions' buildings were erected according to the relatively generous SAPSE 101 norms (compared to the 1996 norms) of 1982, and the buildings erected pre-1982 during an era where no building norms applied, the huge surpluses in buildings at these institutions are expected. During the investigation into backlogs/surpluses in buildings at universities and technikons in 1987 (see Section 2.1.1) it was argued by many of the historically advantaged institutions, especially those which were built in the first half of the

previous century, that part of their surplus ASM and building cost units should be written off due to earlier inefficient building practices. Some of the examples mentioned are the large office sizes of about 20-25 ASM which are difficult to subdivide, high ceilings and thick walls for the regulation of temperature before air conditioning was possible, etc. Based on official representations of these institutions a (relatively small) percentage of the surpluses was written off in an ad hoc way before the outcome of the investigations into the backlogs/surpluses was finalised as reported by Steyn and De Villiers (2006). Unfortunately these condoning percentages are not at present available. Most of the arguments put forward by the historically advantaged institutions regarding inefficient building practices of the past are, however, still valid today and should be taken into account before finalising the backlogs/surpluses in the provision of buildings at HEIs in 2009.

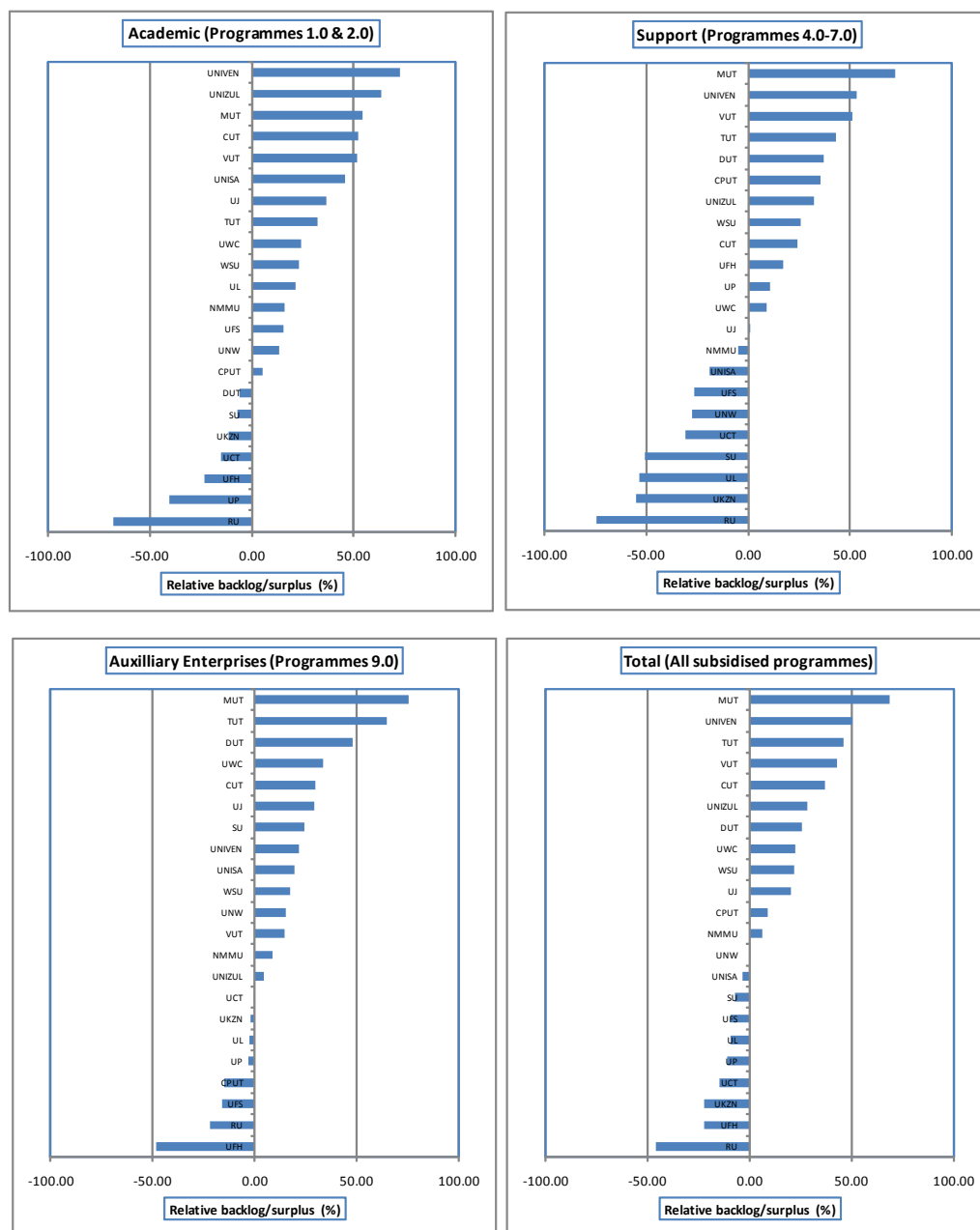
5. The present space and cost norms for buildings and other land improvements, which, apart from small adjustments in terminology to bring them in line with current higher education policy, are the same as those determined in 1996. Many significant changes have taken place since 1996 in building practices. Technological advances over the last two decades have influenced space-use for instruction and research purposes at HEIs. New staff positions and staff activities, especially relating to the academic support, student support and institutional support PCS programmes, have been established at all HEIs as a result of the higher education transformation initiatives of government since 1996. This was a direct result of Education White Paper 3: *A Programme for the Transformation of Higher Education* (Department of Education 1997), the *Higher Education Act (Act No 101 of 1997)* and its subsequent amendments, as well as the *National Plan for Higher Education* (Ministry of Education 2001). The Programme Classification Structure (PCS), especially on the second order (subprogramme) level, which is implicitly still important in the HEMIS staff reporting system, but also forms the basis for the breakdown of ASM in the HEMIS space system, is completely outdated and should be revised. A few years ago the Department of Education requested tenders for the revision of the PCS. It is not known whether the tender was awarded and whether a new system will be implemented. Furthermore, the relative importance of the various staff activities performed at HEIs, as reflected in the present space and cost norms, is also suspect. The argumentation in the reports SAPSE 110 and NATED 02-131 that building space in respect of only some of the PCS categories should be subsidised by the state, which is also reflected in the current space and cost norms, should also be revisited. The 22 CESM categories used in the current space and cost norms have also been replaced by a new system of only 20 categories with effect from 2010. Consequently the space and cost norms therefore need to be adjusted to accommodate all these factors. The results of Table 2.8 regarding backlogs/surpluses, although important, should therefore be regarded at best as indicative of the current situation in the provision of buildings at HEIs.
6. The total rand value (Rand of 2010) of the backlogs in buildings calculated in Table 2.8 (excluding the University of the Witwatersrand – data not available)

was about R10776m (unadjusted) and R9158m (adjusted). This building backlog cost represented about 14% of the total norm replacement cost in 2009.

### 2.1.5 A developmental approach to backlogs in buildings

The current space and cost norms for buildings (see discussion in Section 2.1.1) consist of 905 separate norms (560 in respect of building space and 345 in respect of building costs). The norms are multidimensional since they differentiate between study level, CESM category and space-use category (in the case of the instruction programme) and between PCS programme and space-use category in the case of all other PCS programmes “normally” subsidised by the state as far as buildings are concerned.

**FIGURE 2.1: ORDERED BAR CHARTS OF RELATIVE BACKLOGS/SURPLUSES IN ASM IN 2009 FOR THE HEIS ACCORDING TO GROUPED PCS PROGRAMMES**



If a developmental approach to norms and gaps (backlogs) in the provision of buildings is to be followed as outlined in the table in Section 1.4.1 of Part 1, it is important to note that the norm ASM for each HEI according to the grouped PCS programmes, as depicted in Table 2.8, automatically accommodates differences in the levels and mix of academic programmes, as well as the research foci, of HEIs.

In evaluating the backlogs/surpluses as indicated in Table 2.8 (see Section 2.1.4) it was indicated that the obvious larger backlogs in buildings at universities of technology than especially at historically advantaged (White) universities which were not changed significantly by the merger process of 2003 to 2004 are the result of smaller norm values for ASM/per FTE enrolled student at technikons than at universities during the pre-1996 years. As a result of the lack of state funds for new buildings during the period 1997 to 2007 the current “equity norms”, compiled already in 1996, have not had a major impact on the observed backlogs/surpluses in buildings facilities at HEIs in 2009 as shown in Figure 2.1.

Referring to the table in Section 1.4.1 of Part 1, it is therefore clear that, until substantiated reasons are put forward that the space and cost norms for different types of HEIs should differ with respect to a differentiation dimension not accommodated in the current space and cost norm structure, the structure of the current space and cost norms (560 in respect of building space and 345 in respect of building costs) should be kept intact.

If policy makers are of the opinion that the 560 space norms should be aggregated into fewer categories, examples of how this could be done are given in Figure 2.1. Priorities could then be set, e.g. by addressing backlogs in academic programmes as soon as possible. However, funding constraints are likely to require further differentiation because of the financial impossibility of addressing all backlogs simultaneously. For instance, government’s priorities may require that backlogs in undergraduate science and technology programmes should be addressed first; in which case the institutions with the greatest backlogs (according to the existing norms) in this subcategory of academic programmes could be identified from the available data and given the first allocations from the available funding. As has happened in recent years, the Department of Higher Education and Training could identify several categories within any year according to their own development priorities.

**TABLE 2.11: BACKLOGS AND RELATIVE BACKLOGS IN ASM AND BUILDING COST UNITS IN 2009 ACCORDING TO PROGRAMME GROUPS**

Programme group	BACKLOGS <sup>1)</sup>		RELATIVE BACKLOGS (%) <sup>2)</sup>	
	SPACE(ASM)	BUILD. COST UNITS	SPACE(ASM)	BUILD. COST UNITS
Academic (Prog. 1.0 & 2.0)	354915	435604	20.62	18.95
Support (Prog. 4.0 - 7.0)	307923	279344	15.70	14.18
Auxilliary Ent. (Prog. 9.0)	334273	323055	18.13	17.19
Total buildings	997112	1038003	18.04	16.88
Land improvements		118181		14.79
TOTAL <sup>3)</sup>	838198	993830	15.17	14.31

1) Based only on institutions with backlogs in respective programme group

2) Backlogs in columns 2 and 3 in respective programme group as percentage of norm provision for all institutions.

3) Based on institutions with backlogs in total ASM and total building cost units irrespective of backlog/surplus in PCS programme groups.

Table 2.11 provides a further important summary for all HEIs of the total backlogs in ASM, as well as building cost units, when the three groups of PCS programmes are considered. The relative backlogs are also indicated in this table. Note that in the calculation of the total backlogs for the different programme groups only HEIs with backlogs in the respective programme group were considered.

Table 2.10, Table 2.11 and Figure 2.1 show, however, that many gaps or backlogs exist in the provision of buildings within the three PCS programme groups. The patterns of these backlogs differ from institution to institution. The following are evident from these two tables and the figure:

- i. The total norm provision according to PCS programme group for the 22 HEIs in 2009 was according to Table 2.8: Academic – 1721519 ASM (31.2%); Support Services - 1960816 ASM (35.5%) and Auxiliary Enterprises - 1843892 ASM (33.3%). These three groupings of PCS programmes were therefore, from a norm provision viewpoint, in 2009 of about equal importance.
- ii. Figure 2.1 shows that in the case of academic programmes, as well as the auxiliary enterprises programme, 15 HEIs had backlogs in ASM building space in 2009 and only 7 HEIs had surpluses. The situation in the case of support services programmes was marginally better with 13 HEIs with backlogs in ASM building space in 2009 against 9 HEIs with surpluses. Considering only the total provision of buildings at the different HEIs irrespective of programme group, Figure 2.1 shows that overall there were backlogs at 13 HEIs and surpluses in the case of 9 HEIs.
- iii. Figure 2.1 also ranked the individual HEIs according to the sizes of the relative backlogs/surpluses in ASM building space in the case of the 3 PCS programme groupings, as well as for ASM buildings space when all PCS programmes are aggregated. This information should be crucial for the DHET decisions on the provision of future funding of HEIs for new buildings.
- iv. Table 2.11 shows that the biggest backlog in buildings in 2009 was in respect of academic programmes. This aggregated backlog size represents 20.62% of the norm provision in 2009 as far as ASM is concerned and 18.95% as far building cost units is concerned. The relative backlogs in the support service programmes was the smallest (15.70% in ASM and 14.18% in building cost units). Since there is no doubt that in the provision of resources at HEIs the academic programmes (Programmes 1.0 and 2.0) should always have priority, the developmental approach outlined in Section 1.4.1 of Part 1 would entail that the state should focus initially on decreasing the relative backlog in the HE system in academic ASM to a level where it represents the lowest backlog percentage of all three programme groups.

#### **2.1.6 Some useful indicators based on HEMIS space data**

One of the VALPAC tables generated from the submitted HEMIS space data is the number of stations associated with some of the space-use categories. A station is defined as the total facilities provided to accommodate one person during one time period. The total number of stations associated with classroom facilities (seats), office facilities (seats available with desk (and computer)), study facilities (seats for students in libraries and study centres), as well as



residential facilities (beds in residences, but also in staff housing) are considered in Table 2.12 for the year 2009.

It is informative to calculate the stations per FTE student and compare the ratios amongst the different HEIs. Note that in the case of determining the classroom stations and study stations per student, only the FTE contact students are used. For office space a weighted average of FTE contact students and FTE distance students is used, with respective weights of 1 and 0.5. For residential stations the FTE students using institutional housing are used. Unfortunately no distinction is made in the HEMIS space data system between residential stations for students and residential stations for staff. In cases of institutions with only residential stations for students or perhaps with only a few residential stations for staff the residential stations per FTE student should be about 1.0. The large discrepancies from this logical norm of 1.0 in Table 2.12 highlight a varied understanding or interpretation by institutions of definitions regarding institutional housing. Clearly, Table 2.12 shows some differences between various institutions in the various “stations per student” indicators. This is a result of space backlogs at some institutions and space surpluses at others, as well as a result of the different academic programmes offered at the various HEIs. At two institutions some of the data were obviously erroneous and had to be approximated by using external and historical information. This also indicates inaccurate HEMIS space data on the number of stations submitted by some institutions. Once all the problems in both the HEMIS space system structure and the submitted HEMIS space data of HEIs have been ironed out, these 4 indicators, especially on the system level, could provide important higher education planning information for the DHET. It could also be utilised in the much needed revision of the space and cost norms for buildings.

**TABLE 2.12: STATIONS PER FTE STUDENT IN 2009 ACCORDING TO STATION TYPE AND INSTITUTION**

Institution	FTE students (contact)	FTE students (distance)	FTE students (total)	FTE students (inst. housing)	Number of stations				Stations per FTE student <sup>1)</sup>			
					Class room	Office	Residential	Study	Class room	Office	Residential	Study
Cape Peninsula University of Technology	22660	30	22690	5615	21640	3336	8019	1467	0.95	0.15	1.43	0.06
University of Cape Town	18854		18854	5547								
Central University of Technology, Free State	9507		9507	668	6690	703	1574	1076	0.70	0.07	2.36	0.11
Durban Institute of Technology	17335		17335	3793	19266	2053	3752	2412	1.11	0.12	0.99	0.14
University of Fort Hare	8811		8811	3543	8349	1191	4215	745	0.95	0.14	1.19	0.08
University of the Free State	18456	1882	20338	3231	26576	4743	4657	2221	1.44	0.24	1.44	0.12
University of Johannesburg	38077		38077	5031	28169	4475	6002	921	0.74	0.12	1.19	0.02
University of KwaZulu-Natal	25291	3522	28813	7419	31588	6133	7439	6210	1.25	0.23	1.00	0.25
University of Limpopo	13723		13723	8381	13284	3534	11255	2285	0.97	0.26	1.34	0.17
Nelson Mandela Metropolitan University	16597	1659	18256	2934	13074	2134	2972	1332	0.79	0.12	1.01	0.08
North West University	21939	11111	33050	7598		3887	2632	2039		0.14	0.35	0.09
University of Pretoria	32740	6079	38819	7722	28691	6866	8291	2490	0.88	0.19	1.07	0.08
Rhodes University	5881		5881	3206	6844	1649	3630	1399	1.16	0.28	1.13	0.24
University of South Africa	508	135600	136108	207	6125	7453	67	7040	12.06	0.11	0.32	13.86
University of Stellenbosch	20668		20668	7419	28212	3942	7129	1860	1.37	0.19	0.96	0.09
Tshwane University of Technology	39089	1101	40190	8849	21204	2630	15781	1752	0.54	0.07	1.78	0.04
University of Venda	9893		9893	1931	3428	515	2613	238	0.35	0.05	1.35	0.02
Vaal University of Technology	14551		14551	2029	9873	1091	2874	1584	0.68	0.07	1.42	0.11
Walter Sisulu University for Technology	21299	61	21360	5880	10964	3155	7924	1103	0.51	0.15	1.35	0.05
University of Western Cape	12049	4	12053	3339	7451	1021			0.62	0.08		
University of Witwatersrand	21278		21278	3339								
University of Zululand	11943		11943	4137	4480	907	6559	489	0.38	0.08	1.59	0.04
Mangosuthu Technikon	7319		7319	3596	6433	431	1315	896	0.88	0.06	0.37	0.12
<b>Total</b>	<b>408468</b>	<b>161049</b>	<b>569517</b>	<b>105414</b>	<b>302341</b>	<b>61849</b>	<b>108700</b>	<b>39559</b>	<b>0.87</b>	<b>0.14</b>	<b>1.17</b>	<b>0.11</b>

1) Class room - Divide by FTE students (contact)

Office - Divide by FTE students (contact)+0.5\*FTE students (distance)

Residential - Divide by FTE students (Inst. Housing)

Study - Divide by FTE students (contact)

**Note:** Shaded numbers were estimated by using external and historical information

## **2.2 THE CONDITION OF BUILDINGS AT HIGHER EDUCATION INSTITUTIONS IN 2009**

### **2.2.1 Background**

One of the important features of the former SAPSE subsidy formulas for universities and technikons, used for the funding of higher education from 1983 to 2003, was that funds for the renewal and maintenance of buildings were included annually. This component of the funding formulas was based on the so-called “effective subsidy students” which was calculated for a specific institution as the average weighted FTE enrolled and weighted FTE degree credit students increased by the so-called number of set-up cost students. (See Department of National Education (1985b)). Funds for the renewal and maintenance of residences, based on FTE students using institutional housing, also formed part of the annual subsidy allocated by means of the SAPSE formulas. Although these subsidy allocations for renewal and maintenance of the buildings of universities and technikons were not earmarked, many institutions did use them fully or at least partly for the renewal and maintenance of buildings. It nevertheless provided a benchmark for HEIs as far as renewal and maintenance of buildings were concerned.

A measure of building condition, namely the “effective building date” of each building of a university or technikon formed part of the annual information submitted in Chapter 6 of the former SAPSE information system. This measure was calculated each year for each building by using all the renewal and maintenance expenses on the building since the construction of the building. It was assumed (as a result of international empirical studies) that if 1.33% of the replacement cost of a building in a given year was used each year for renewal and maintenance of that building, the building would stay as good as new and the effective building date the same year as the current year. If a building was erected, for example, in 1960, while the effective building date in 1990 was 1975 it is clear that only about 50% of the needed maintenance on the building was performed over the years 1960 to 1990.

Although nowhere specifically stated, the most probable assumption has to be that the current block grant formula does provide (indirectly) for the annual maintenance of buildings and land improvements other than buildings. Since this provision, like all other expenses of HEIs, is not explicitly indicated in the block grant and therefore cannot be calculated, there is no salient obligation on HEIs to budget in a responsible way for the annual maintenance of buildings. The result of this could have been that the maintenance plans of HEIs were neglected over the past few years, especially since the block grant formula came into effect in 2004. Furthermore, the notion of an effective building date was not re-introduced when the HEMIS space data system was established. A new measure was introduced, namely the condition of a building. This measure comprises a 7-point scale, namely:

1. Minimal Renovation needed (Good)
2. Limited Renovation needed (Satisfactory)
3. Moderate renovation needed (Fair)
4. Significant renovation needed (Poor)
5. Major renovation needed (Unsatisfactory)
6. Replace/Demolition of building

## 7. Vacating building

See Section 2 of the Department of Education (2009a) for more detailed definitions of these scale points.

### 2.2.2 Analysis of the conditions of buildings of universities in 2009

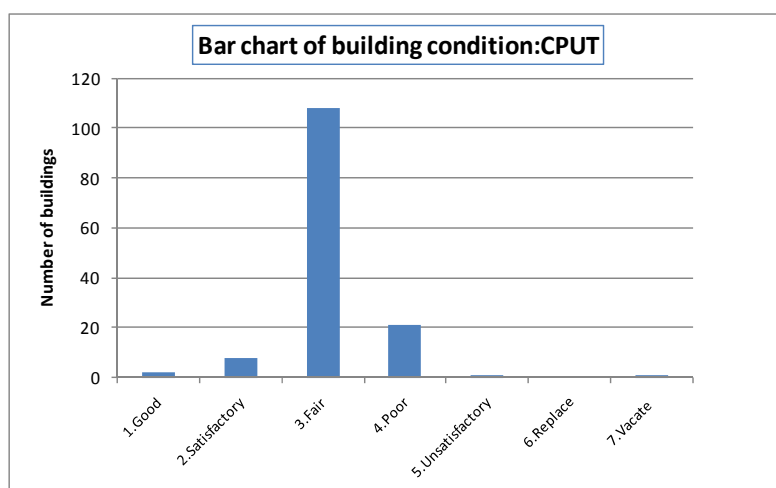
An analysis of the building conditions of all the buildings at a specific HEI could possibly be enhanced by two other information fields in the HEMIS space data system, namely “Year of construction of building”, as well as “Inventory value of building” (total cost of construction of the building in the year of completion).

A preliminary analysis of these three HEMIS information fields for the HEIs which have submitted HEMIS space data for 2009 is shown below. The weighted average building condition scores, as well as the weighted average building year were calculated by using the inventory value of the respective buildings as weights.

#### 2.2.2.1 Cape Peninsula University of Technology

##### *Summary statistics*

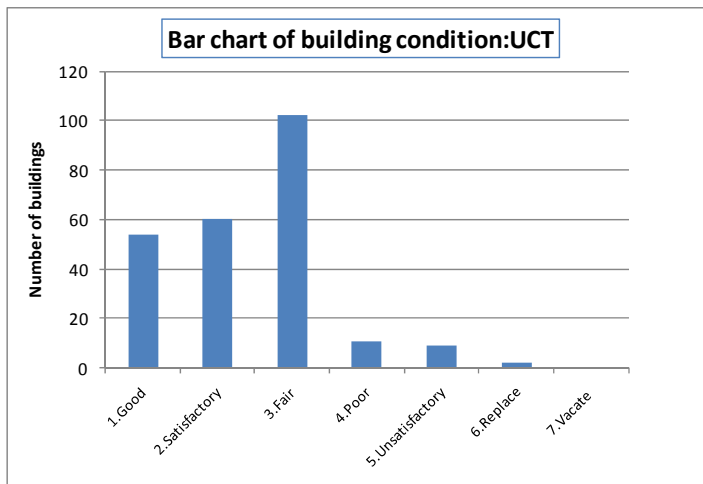
Number of buildings for which conditions are reported	224
Average building condition score	3.11
Weighted average building condition score	3.06
Average year of construction of buildings	1953
Weighted average year of construction of buildings	1963
% of buildings with condition scale values >3	10.3



No significant correlations were found between the three information fields.

*Note:* Apparently all unknown building construction years were coded as “1900”, hence the average year of construction of buildings, as well as the weighted average year of construction of the buildings, namely 1953 and 1963, are erroneous.

#### 2.2.2.2 University of Cape Town



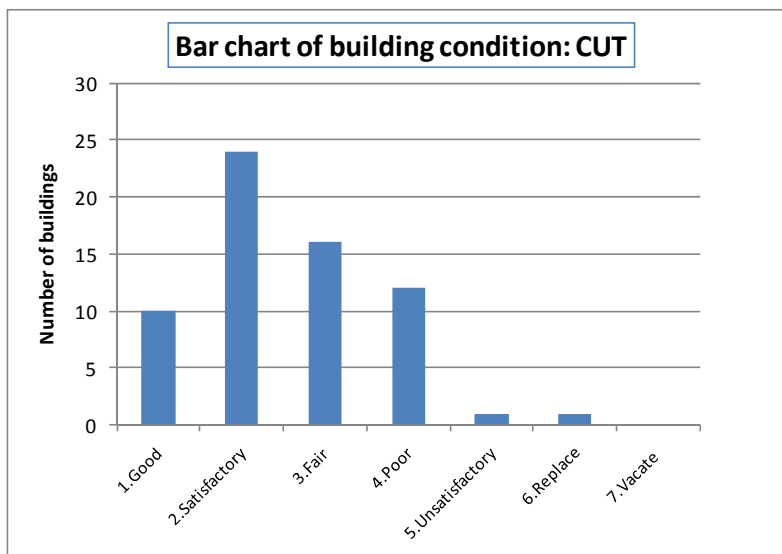
#### Summary statistics

Number of buildings for which conditions are reported	238
Average building condition score	2.44
Weighted average building condition score	1.92
Average year of construction of buildings	1959
Weighted average year of construction of buildings	1971
% of buildings with condition scale values >3	9.2

No significant correlations were found between the three information fields.

*Note:* In the case of 22 buildings no inventory values were given. These buildings were therefore excluded when both the weighted averages were calculated.

#### 2.2.2.3 Central University of Technology



#### Summary statistics

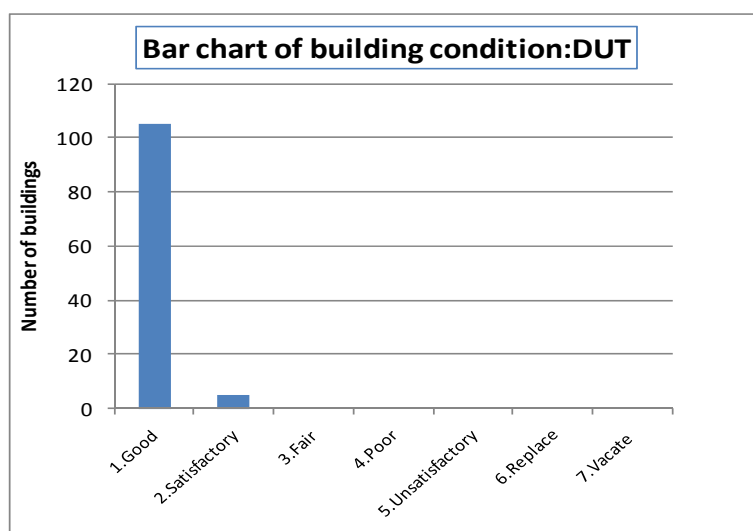
Number of buildings for which conditions are reported	64
Average building condition score	2.58

Weighted average building condition score	2.34
Average year of construction of buildings	1962
Weighted average year of construction of buildings	1983
% of buildings with condition scale values >3	21.9

No significant correlations were found between the three information fields.

*Note:* In the case of 3 buildings no inventory values were given. These buildings were therefore excluded when both the weighted averages were determined. Apparently all unknown building construction years were coded as “1900”, hence the average building construction years and weighted average building construction years of 1962 and 1983 are erroneous.

#### 2.2.2.4 Durban University of Technology



#### *Summary statistics*

Number of buildings for which conditions are reported	110
Average building condition score	1.05
Weighted average building condition score	Not available
Average year of construction of buildings	Not available
Weighted average year of construction of buildings	Not available
% of buildings with condition scale values >3	0

Correlations between the three information fields could not be calculated.

*Note:* Apparently all unknown building construction years were coded as “1980”, hence the average building construction years and weighted average building construction years of 1981 and 1980 are meaningless.

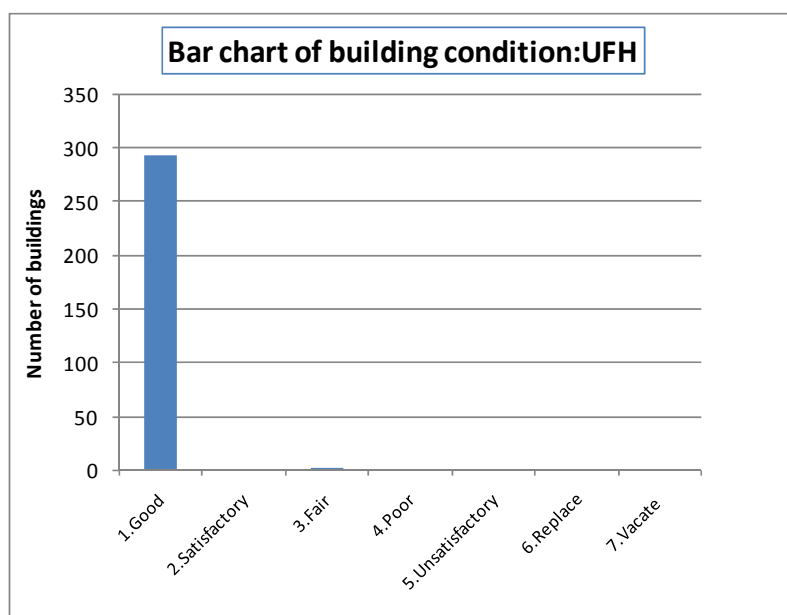
No information on year of construction of buildings and inventory values of buildings was submitted by the institution.

#### 2.2.2.5 University of Fort Hare

##### *Summary statistics*

Number of buildings for which conditions are reported	294
Average building condition score	1.01
Weighted average building condition score	1.0
Average year of construction of buildings	1929
Weighted average year of construction of buildings	1933
% of buildings with condition scale values >3	0

No significant correlations were found between the three information fields.



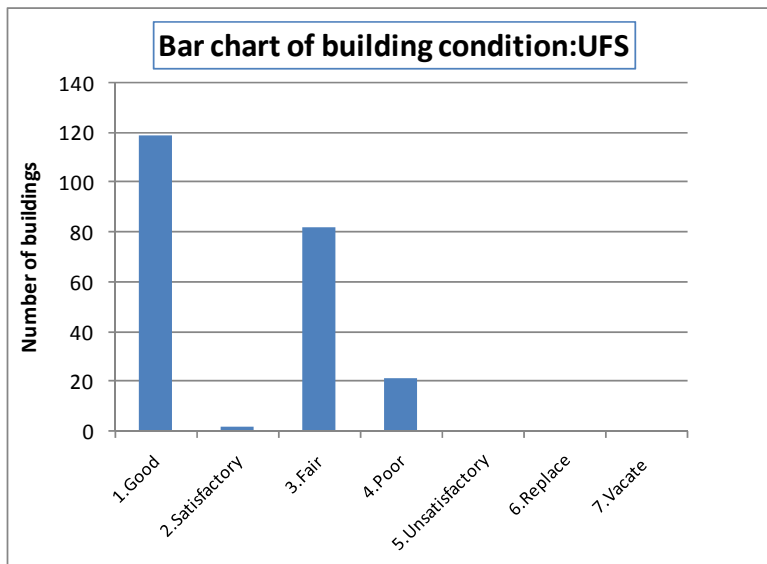
*Note:* Apparently all unknown building construction years were coded as “1900”, hence the average building construction years and weighted average building construction years of 1981 and 1980 are meaningless.

#### 2.2.2.6 University of the Free State

##### *Summary statistics*

Number of buildings for which conditions are reported	224
Average building condition score	2.02
Weighted average building condition score	1.80
Average year of construction of buildings	1967
Weighted average year of construction of buildings	1977
% of buildings with condition scale values >3	9.4

No significant correlations were found between the three information fields.

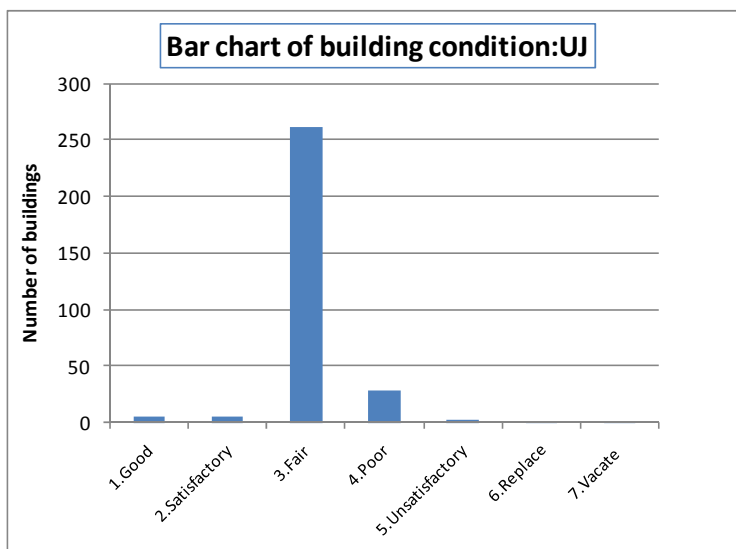


*Note:* In the case of 116 buildings no inventory values were reported. These buildings were therefore excluded when both the weighted averages were determined.

#### 2.2.2.7 University of Johannesburg

##### *Summary statistics*

Number of buildings for which conditions are reported	303
Average building condition score	3.08
Weighted average building condition score	2.84
Average year of construction of buildings	1968
Weighted average year of construction of buildings	1981
% of buildings with condition scale values >3	10.6



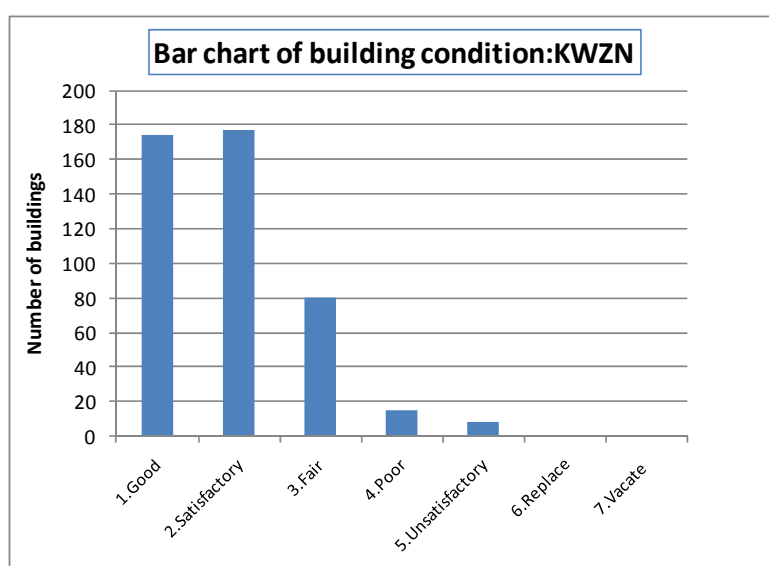
Significant negative correlation (1% level of significance) was found between building condition and building construction year. This means that older buildings are more associated with poor building conditions.

*Note:* In the case of 26 buildings no inventory values were given. These buildings were therefore excluded when both the weighted averages were determined.

#### 2.2.2.8 University of KwaZulu-Natal

##### *Summary statistics*

Number of buildings for which conditions are reported	454
Average building condition score	1.91
Weighted average building condition score	1.90
Average year of construction of buildings	1968
Weighted average year of construction of buildings	1969
% of buildings with condition scale values >3	5.1



No significant correlations were found between the three information fields.

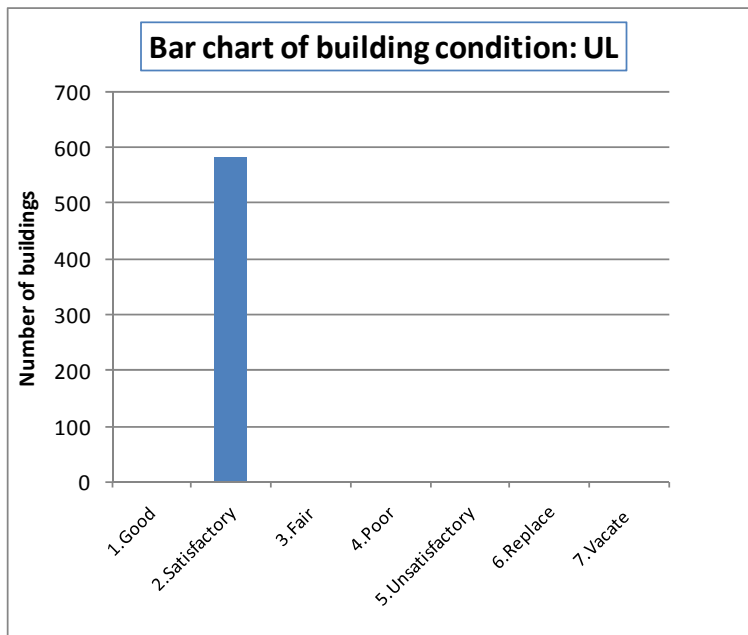
*Note:* All buildings' construction year and inventory value were available.

#### 2.2.2.9 University of Limpopo

##### *Summary statistics*

Number of buildings for which conditions are reported	584
Average building condition score	2.0
Weighted average building condition score	2.0
Average year of construction of buildings	1976
Weighted average year of construction of buildings	1967
% of buildings with condition scale values >3	0





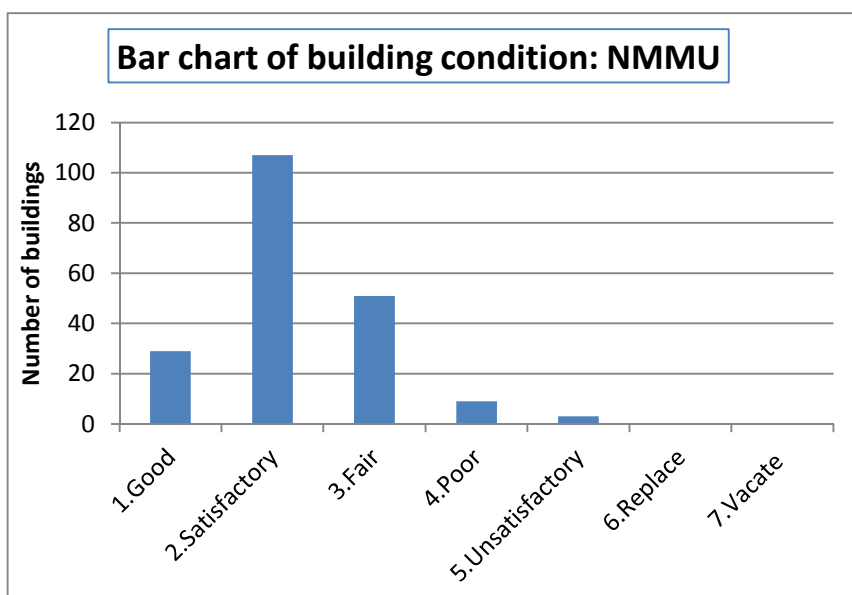
*Note:* In the case of 63 buildings no inventory values were given. These buildings were therefore excluded when both the weighted averages were determined.

#### 2.2.2.10 Nelson Mandela Metropolitan University

##### *Summary statistics*

Number of buildings for which conditions are reported	199
Average building condition score	2.25
Weighted average building condition score	2.10
Average year of construction of buildings	1979
Weighted average year of construction of buildings	1985
% of buildings with condition scale values >3	6.0

Significant positive correlation (5% level) was found between year of construction and inventory value. This is only an indication of building cost inflation.



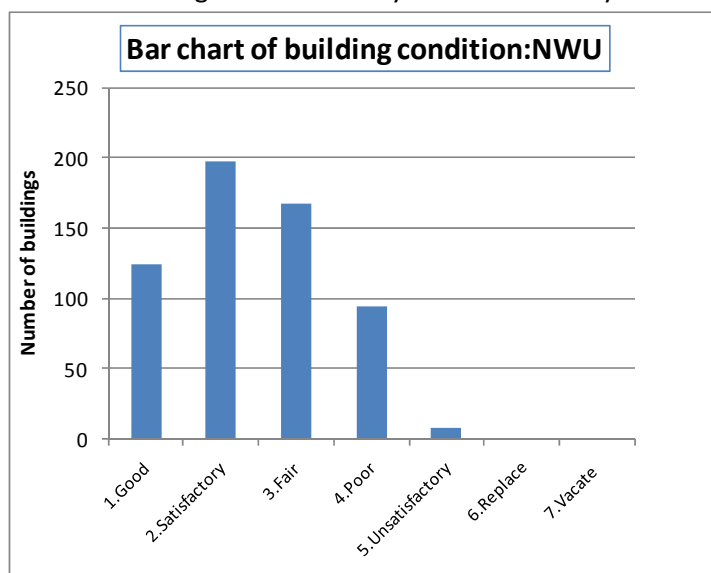
### 2.2.2.11 North West University

#### *Summary statistics*

Number of buildings for which conditions are reported	590
Average building condition score	2.43
Weighted average building condition score	2.22
Average year of construction of buildings	1989
Weighted average year of construction of buildings	1992
% of buildings with condition scale values >3	17.3

Significant negative correlation (1% level) was found between building condition and building construction year. This means that older buildings are more associated with poor building conditions.

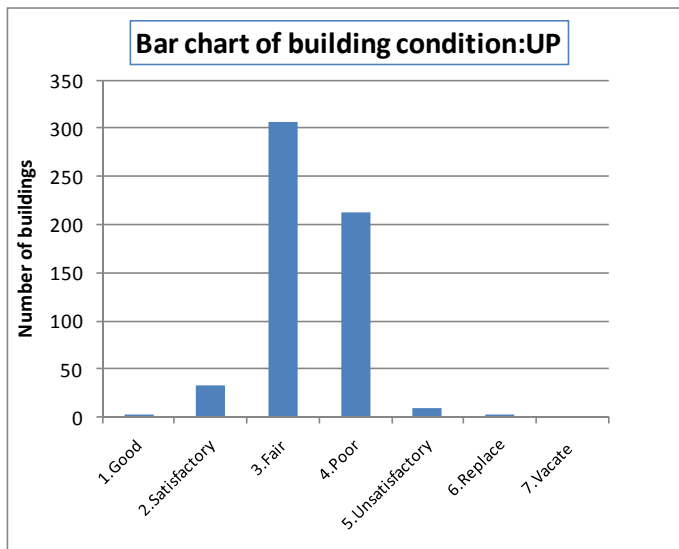
*Note:* All buildings' construction year and inventory value were available.



### 2.2.2.12 University of Pretoria

#### *Summary statistics*

Number of buildings for which conditions are reported	567
Average building condition score	3.36
Weighted average building condition score	2.63
Average year of construction of buildings	1973
Weighted average year of construction of buildings	1989
% of buildings with condition scale values >3	39.9



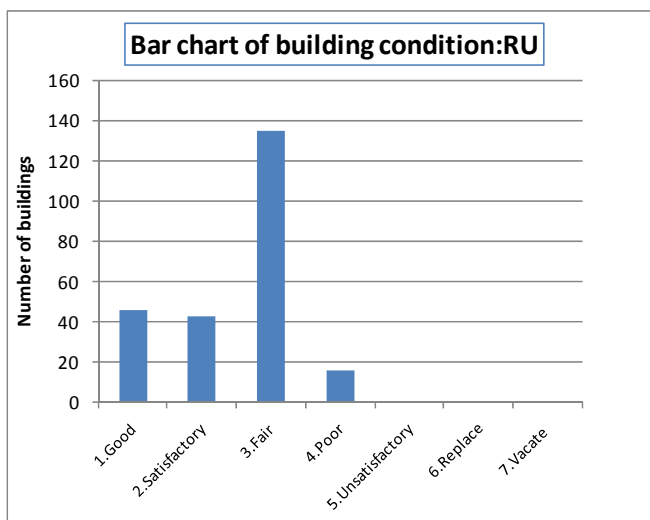
Significant negative correlation (1% level) was found between building condition and building construction year and between building condition and inventory value. This means that older buildings are more associated with poor building conditions. On the other hand the most expensive buildings are associated with better building conditions.

*Note:* In the case of 79 buildings no inventory values were reported. These buildings were therefore excluded when both the weighted averages were calculated.

#### 2.2.2.13 Rhodes University

##### *Summary statistics*

Number of buildings for which conditions are reported	240
Average building condition score	2.50
Weighted average building condition score	2.42
Average year of construction of buildings	1965
Weighted average year of construction of buildings	1968
% of buildings with condition scale values >3	6.7



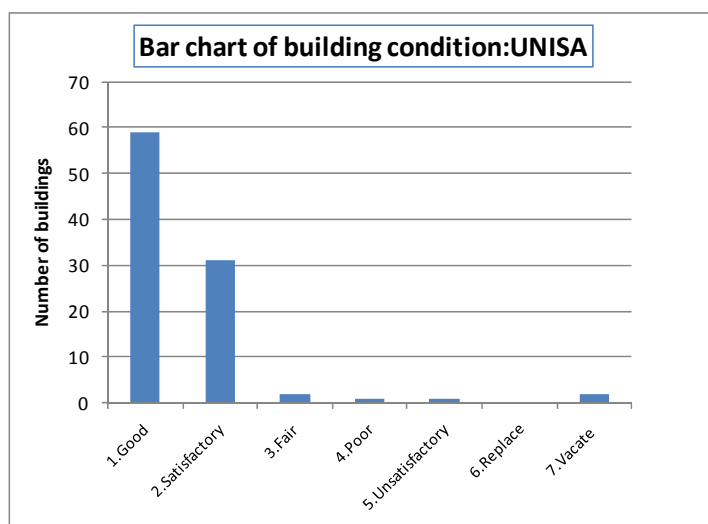
Significant negative correlation (5% level) was found between building condition and building construction year. This means that older buildings are more associated with poor building conditions.

*Note:* All buildings' construction year and inventory value were available.

#### 2.2.2.14 University of South Africa

##### *Summary statistics*

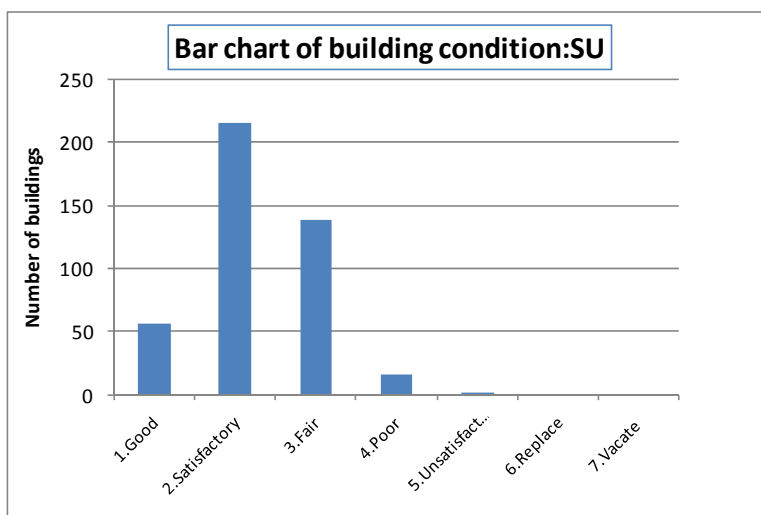
Number of buildings for which conditions are reported	96
Average building condition score	1.56
Weighted average building condition score	1.84
Average year of construction of buildings	1981
Weighted average year of construction of buildings	1980
% of buildings with condition scale values >3	4.2



No significant correlations were found between the three information fields.

*Note:* In the case of 2 buildings no inventory values were given. These buildings were therefore excluded when both the weighted averages were determined. Apparently all unknown building construction years were coded as "1980", hence the average building construction years and weighted average building construction years of 1981 and 1980 are meaningless.

#### 2.2.2.15 Stellenbosch University



#### Summary statistics

Number of buildings for which conditions are reported	426
Average building condition score	2.27
Weighted average building condition score	2.21
Average year of construction of buildings	Not available
Weighted average year of construction of buildings	Not available
% of buildings with condition scale values >3	4.0

No significant correlations were found between the three information fields.

*Note:* In the case of 414 buildings the construction year “1996” is used as default value since the correct values are apparently not available. Average values for the years of construction could therefore not be calculated.

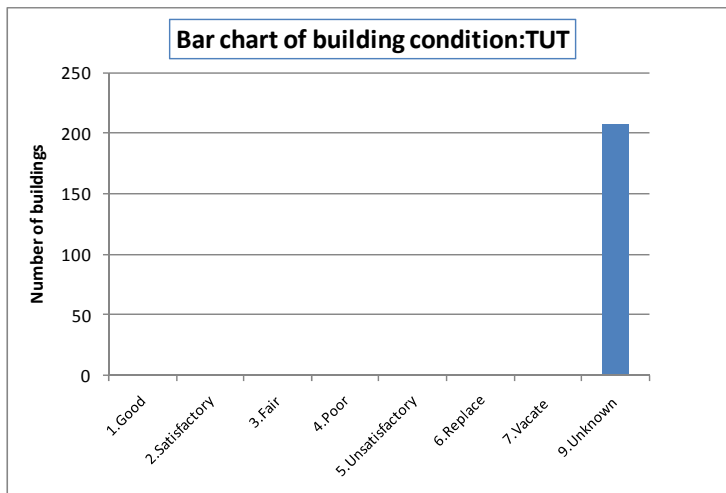
#### 2.2.2.16 Tshwane University of Technology

##### Summary statistics

Number of buildings for which conditions are reported	207
Average building condition score	Not available
Weighted average building condition score	Not available
Average year of construction of buildings	1979
Weighted average year of construction of buildings	1989
% of buildings with condition scale values >3	Not available

Obviously no significant correlations were found between the three information fields.

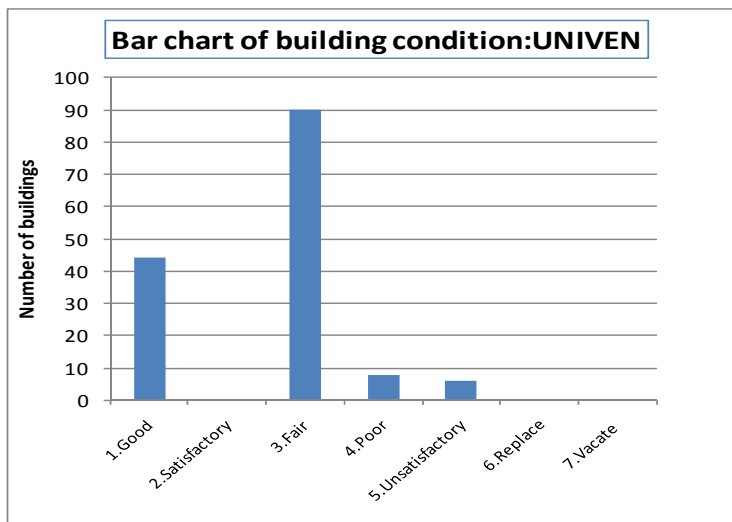
*Note:* In the case of 15 buildings no inventory values were given. These buildings were therefore excluded when the weighted average was determined.



#### 2.2.2.17 University of Venda

##### *Summary statistics*

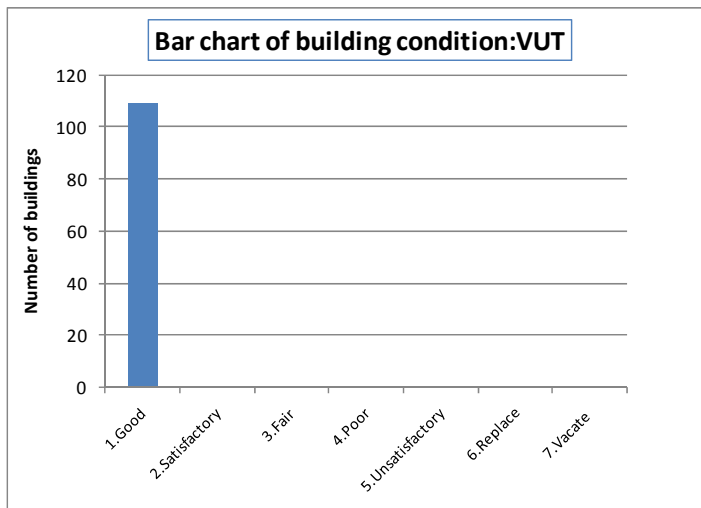
Number of buildings for which conditions are reported	148
Average building condition score	2.54
Weighted average building condition score	1.76
Average year of construction of buildings	1988
Weighted average year of construction of buildings	1986
% of buildings with condition scale values >3	9.46



Significant negative correlation (1%) was found between building condition and inventory value of buildings. This indicates that the bigger (more expensive) buildings are in a better condition.

*Note:* All buildings' construction year and inventory values were available.

#### 2.2.2.18 Vaal University of Technology



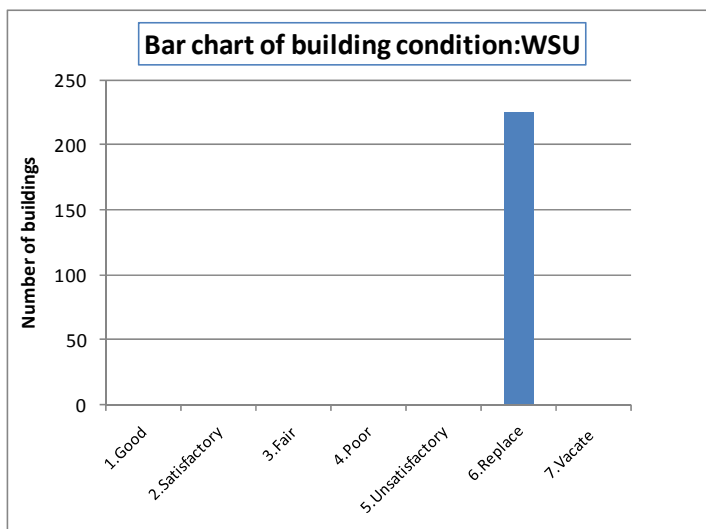
#### Summary statistics

Number of buildings for which conditions are reported	109
Average building condition score	1.0
Weighted average building condition score	1.0
Average year of construction of buildings	1984
Weighted average year of construction of buildings	1986
% of buildings with condition scale values >3	Not available

No significant correlations were found between the three information fields.

*Notes:* It is uncertain whether the conditions of all buildings are good. It could be that the conditions of the buildings are unknown and scale point 1 is only used as a default value. In the case of 15 buildings no inventory values were reported. These buildings were therefore excluded when the weighted average was determined.

#### 2.2.2.19 Walter Sisulu University



#### Summary statistics

Number of buildings for which conditions are reported	225
Average building condition score	6.0
Weighted average building condition score	6.0
Average year of construction of buildings	1937
Weighted average year of construction of buildings	1940
% of buildings with condition scale values >3	100.0

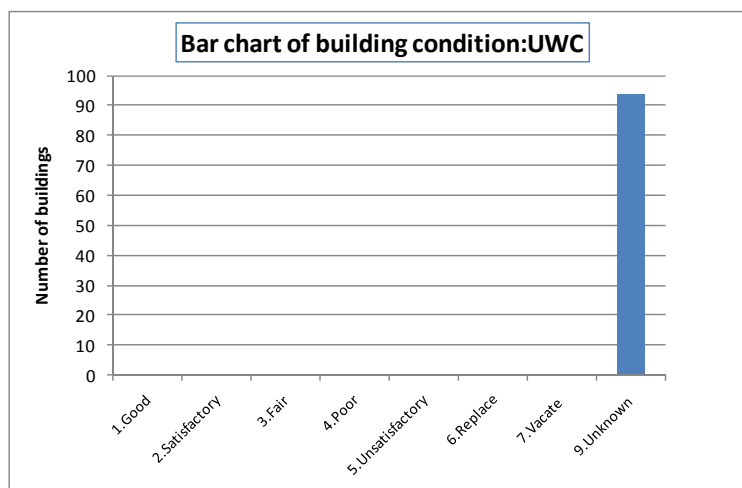
No significant correlations were found between the three information fields.

*Notes:* Apparently 161 of the building construction years are unknown and coded as “1990”, hence the average as well as the weighted average year of construction of buildings are not meaningful.

#### 2.2.2.20 University of Western Cape

##### *Summary statistics*

Number of buildings for which conditions are reported	94
Average building condition score	Not available
Weighted average building condition score	Not available
Average year of construction of buildings	1982
Weighted average year of construction of buildings	1983
% of buildings with condition scale values >3	Not available

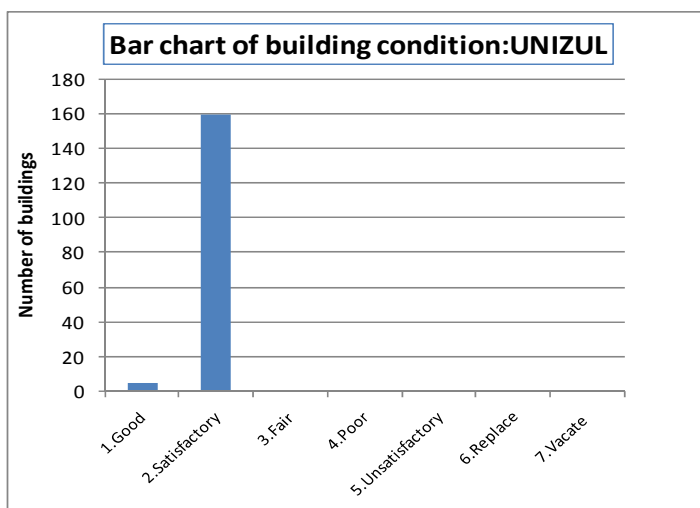


No significant correlations were found between the three information fields.

*Notes:* In the case of 13 buildings no inventory values were given. These buildings were therefore excluded when the weighted average year of construction was calculated.

#### 2.2.2.21 Zululand University





#### *Summary statistics*

Number of buildings for which conditions are reported	164
Average building condition score	1.97
Weighted average building condition score	1.98
Average year of construction of buildings	1968
Weighted average year of construction of buildings	1965
% of buildings with condition scale values >3	0

No significant correlations were found between the three information fields.

*Notes:* All buildings' construction year and inventory value were available.

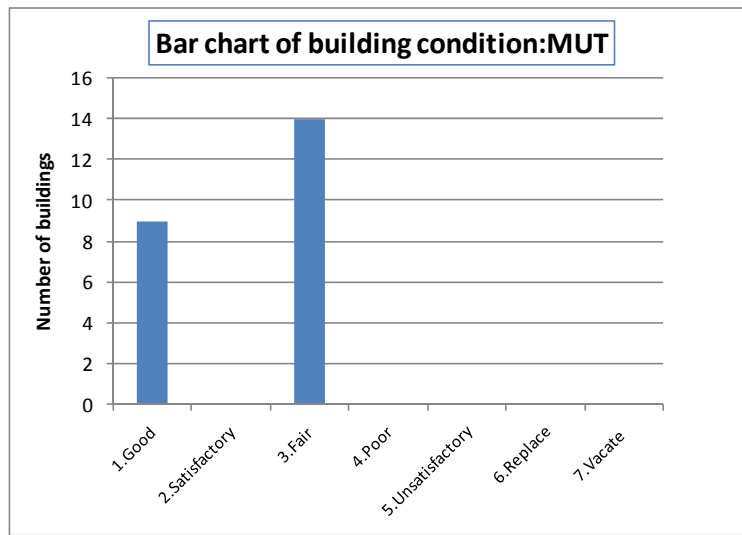
#### **2.2.2.22 Mangosuthu University of Technology**

#### *Summary statistics*

Number of buildings for which conditions are reported	23
Average building condition score	2.22
Weighted average building condition score	1.89
Average year of construction of buildings	1992
Weighted average year of construction of buildings	1998
% of buildings with condition scale values >3	0

No significant correlations were found between the three information fields.

*Note:* In the case of one building no inventory value was given. This building was therefore excluded when the weighted averages were calculated.



### 2.2.3 Discussion of results of the analysis of condition of buildings at HEIs in 2009

The HEIs can be divided into three groups as far as their results on condition of buildings are concerned.

Group 1: No submission of HEMIS space data on condition of buildings.

Witwatersrand University

Group 2: Submitted HEMIS space data on condition of buildings, but all buildings' condition are either "unknown" or only one building condition scale point is used. Such data is obviously incorrect and therefore meaningless.

University of Fort Hare

Tshwane University of Technology

Vaal University of Technology

Walter Sisulu University

University of Western Cape

Group 3: Information has the necessary quality for making conclusions.

The 17 institutions not included in Groups 1 and 2.

As far as the 17 institutions in Group 3 are concerned, Unisa's buildings seem to be on average in the best condition with an unweighted average condition scale point of 1.56 and a weighted average condition scale point of 1.84, although 4.2% of the buildings of Unisa are in a poor or even worse condition. On the other hand, the University of Pretoria's average building condition, as well as the University of Johannesburg's average building condition is both only "fair". The high percentages of buildings at the University of Pretoria and the University of North West classified as poor or even worse than poor, namely respectively 39.9% and 17.3% are a matter of concern.

The analyses in Section 2.2.2 of the building condition of HEIs' buildings, which are based on the HEIs' HEMIS space data submissions for 2009, show that in the case of many institutions more accurate and more reliable information will be needed by the state before any allocation of funds can be made for the upgrading of buildings which apparently need significant or major renovations. This issue will be addressed further in Section 2.3.3.

## **2.3 PROPOSALS FOR THE CRITERIA TO BE USED IN ALLOCATING EARMARKED GOVERNMENT FUNDING TO HEIs FOR THE ERECTION OF NEW BUILDINGS, LAND IMPROVEMENTS OTHER THAN BUILDINGS, AS WELL AS THE RENEWAL AND MAINTENANCE OF EXISTING BUILDINGS**

### **2.3.1 Introduction**

During the era when the SAPSE subsidy formulas were used, namely the 20 year period 1984 to 2003, a very sophisticated system for government subsidisation of buildings (both for the erection of new buildings, as well as the renewal and maintenance of existing buildings) at higher education institutions existed. This system, in its original form, for respectively universities and technikons, is outlined in the reports SAPSE 110 (Department of National Education (1985b)) and the report NATED 02-131(89/01) (Department of National Education (1989)) already referred to in Section 2.1.1. A summary of the procedures used in the state funding of buildings and land improvement other than buildings in the SAPSE era, but also in the earlier years 1951-1984 is available in Section 2.1.12 of Steyn and de Villiers (2006).

In short, the SAPSE formulas for the funding of buildings at universities and technikons consisted of:

- Capital allocation formulas (in terms of building cost units) for new buildings in academic and general programmes (PCS programmes 1.0, 2.0, 4.0, 5.0, 6.0, and 7.0) at universities and technikons based on the additional enrolled effective subsidy students in respectively the human sciences and the natural sciences.
- Capital allocation formulas (in terms of building cost units) for new buildings in the auxiliary enterprises programme (PCS programme 9.0) at universities and technikons based on the additional FTE students using institutional housing (residences) and additional FTE students not using institutional housing.
- Subsidy for universities and technikons for the renewal and maintenance of buildings in academic and general programmes based on effective subsidy students in respectively the human sciences and the natural sciences.
- Subsidy for universities and technikons for the renewal and maintenance of buildings in the auxiliary enterprises programme based on FTE students using institutional housing (residences) and FTE students not using institutional housing.
- A cost unit balance sheet based on the investigation into backlogs/surpluses of 1987 and updated annually with the cost units generated by means of the capital allocation formulas.

- A policy that 85% of the interest and redemption of loans associated with the building cost units awarded for new buildings in the educational and general programmes at universities and technikons is funded by the state, while only 50% of interest and redemption of loans associated with the building cost units for new buildings in the auxiliary enterprises programme at universities and technikons is funded by the state.
- A system of loan authority (state guaranteed loans) issued by the state for new building projects of universities and technikons to be erected according to the space and cost norms as set out in the report SAPSE 101 (See Department of National Education (1985a)). The loan authority system was revised and with effect from 1991 all new building projects based on building cost units awarded by the state were funded by once-off cash payments to institutions based on the 85% and 50% ratios referred to above for respectively the educational and general programmes and auxiliary enterprises programme. Note that the subsidisation of interest and redemption of long-term state guaranteed loans approved before 1991 was upheld until the loan was fully paid off. It is of some interest to note that in the higher education budget of 2011/12 provisions are still made for subsidy payments in respect of interest and redemption of long-term loans in the case of 18 institutions.
- A comprehensive reporting system (Chapter 6 of the SAPSE information system) on building and space statistics which served as a monitoring system of not only the construction of new buildings subsidised by the state, but also the institutional practices of renewal and maintenance of their building stock.

The system above slowly petered out towards 2003 and was apparently scrapped in 2004 as a result of:

- No new allocations of building cost units for new buildings since 1996.
- The revision of the space and cost norms in 1996 altered the capital provision scene drastically. The results of the backlog/surplus investigation of 1987 were no longer a true reflection of the building needs at universities and technikons. This investigation should have been repeated in terms of the new 1996 norms as was requested at the time of the finalisation of the 1996 norms. Furthermore, at the turn of the century whole teacher training college campuses were transferred to some HE institutions when the teacher training sector was incorporated into the university and technikon sectors. The effect of these additions and the possible aggravation of large inequities in an already skewed distribution of building stock in HE was therefore totally unknown to government.
- No official information on the available ASM and building cost units applicable to the buildings at the HEIs in the former TBVC states, which (apart from the University of Fort Hare) had not formed part of the SAPSE information and funding system pre 1994, was (and technically still is) not available. Allocating funds for new buildings in a responsible way to these HEIs is therefore currently impossible.
- Following the termination of capital allocations to HEIs during the period 1997 to 2007, most institutions have constructed new buildings from their own funds. The revised space and cost norms sent out by the Department of Education in 1996 were mostly ignored in the erection of these buildings.

- From the above it is therefore clear that although the cost unit balance sheet was updated annually by the Department of Education until about 2000, it certainly did not reflect the actual situation at the time. No wonder that the use of the balance sheet was abolished since it had become a useless instrument. With the merging of many HEIs in 2003 and 2004 the history of backlogs/surpluses of most of the pre 2003 institutions had also mostly become meaningless.
- The SAPSE building and space statistics reporting system for universities and technikons was terminated in 1998. No provision was made at the time to include space information in the new HEMIS information system. The HEMIS space data system, which is crudely based on the earlier SAPSE building and space statistics system, but with not nearly as much detail, was implemented only in 2007. The first submissions of space data in the new format were in 2008 in respect of the 2007 year. Unfortunately the information submitted in 2010 in respect of 2009 (therefore the third round of submission) is still below standard. One of the reasons for this is the fact that many officials at the HEIs with the necessary expertise in preparing the SAPSE building and space statistics until 1998 left their institutions as their expertise was no longer required. Some of them also retired. It will take some time to rebuild this expertise at HEIs. As was already indicated, some HEIs were never in the past exposed to the reporting of space statistics, hence the poor performance in rendering the HEMIS space information at these institutions.

As already indicated, in the new block grant formula, implemented with effect from 2004, no explicit provision is made for the funding of new buildings or the funding of the maintenance of existing buildings. It was unclear to the higher education community how these very important expenses of universities would be subsidised by the state from 2004 onwards.

During the 2008/09, 2009/10, 2010/11 and 2011/12 financial years amounts of respectively R1095m, R1562m, R1585m and R1615m were allocated by the Minister of Education and later the Minister of Higher Education and Training for improving infrastructure and efficiency at HEIs. The amounts to be allocated and the priorities and criteria for the next round of funding for 2012/13 and 2013/14 are not yet finalised. All the allocations for 2008/09, to 2011/12 have already been made. It is unknown how much of these funds was actually allocated to new capital projects or even to the renewal or refurbishment of existing buildings. It is, however, clear that possible existing backlogs/surpluses in ASM or building cost units did not feature officially in any of the decisions leading to these allocations. Furthermore, no condition was laid down that new buildings, subsidised by means of these allocations, should be constructed according to the space and cost norms published by the Department of Education in 2009.

According to the Ministerial Statement on University Funding: 2011/12 (December 2010) a Ministerial Committee to Review the Funding Framework with specific terms of reference will be appointed early in 2011. This has just happened. See Ministry of Higher Education and Training (2011a) for the terms of reference of this Committee. The opportunity will therefore be available to make representations for a more transparent and just system for the allocation of funds for new buildings and for the renewal and maintenance of buildings. The results of the analyses of Sections 2.1 and 2.2 could inform a new framework in this regard.

Before such a framework can be postulated consensus about the points of departure or agreement on the underlying principles for such a framework is needed.

### **2.3.2 Important issues underlying the future government funding framework for buildings at higher education institutions**

The current funding framework is set out in a publication by the Ministry of Education (2004). As already indicated no single reference on the funding of capital expenditure or the maintenance of fixed assets is made in this important document. State allocations to HEIs for the erection of new buildings or the renewal and maintenance of buildings, initiated officially from 2008/09, were therefore completely ad hoc. In order to develop a much needed state subsidy framework for buildings at HEIs the following issues should be debated.

#### **2.3.2.1 What is the status of the space and cost norms of 2009?**

What is the status, as well as the purpose, of these norms as set out in the Department of Education's (2009b) document? If the DHET considers these norms to be national policy and decides to use them as a blueprint for the construction of new buildings at HEIs, as well as an important tool for determining the backlogs/surpluses in the building stock at HEIs, it is of the utmost importance first to review these space and cost norms. It is indicated above that the higher education scene has changed drastically in many ways since 1996 when these norms were determined.

#### **2.3.2.2 Should the state contribute to the funding of all new buildings at HEIs or should buildings used for particular activities be excluded?**

The philosophy of government's subsidising only some of the activities of HEIs, both as far as current, as well as fixed assets (including the erection of new buildings and the renewal and maintenance of buildings) is concerned, under the SAPSE funding framework is set out in the SAPSE report 110 and the NATED 02-131 reports of the Department of National Education (1985, 1989). The methodology and percentage contribution to new buildings under the SAPSE funding framework is outlined above in Section 2.3.1. A new or revised funding framework will have to set specific guidelines since, for example, new building space is added annually by HEIs to their building stock for entrepreneurial activities. These activities enhance third stream income of HEIs by means of e. g. contract research and non-formal instruction. Even if the state allocations for new buildings at HEIs are made on a competitive basis and according to state priorities some transparent funding criteria will be needed in order to focus and direct institutional applications for the funding of new buildings.

#### **2.3.2.3 What is the status of the existing programme classification structure (PCS)?**

It is unclear whether the PCS system, which gives a breakdown of all HE activities according to 11 programmes and 43 subprogrammes (see Department of National Education (1982)) is still considered as current national policy. The PCS formed the backbone of Chapter 3

(Personpower statistics), Chapter 4 (Financial Statements), Chapter 5 (Fixed Asset Statements) and Chapter 6 Building and Space Statistics) of the former SAPSE information system. A summary of the first and second order (PCS) classification is attached in Table 1 of **Appendix D**. The PCS system is used (in terms of subprogrammes) in the space and cost norms document of 2009. However, only a summary, defined as *Staff Programmes*, with very short definitions, is currently used in the manual of the HEMIS staff system for a breakdown of staff according to activities (See Table 2 of **Appendix D**). In the HEMIS space system manual only the names of the 11 programmes are used for the classification of the activities in the respective rooms of a building. It was indicated in Section 1.2 above and **Appendix A** that this disparity between the way in which the PCS is used in the space and cost norms and in the HEMIS space data leads to erroneous results. Obviously, the 1982 PCS system is now, after almost 30 years, completely outdated. Many important support activities, e.g. quality management, academic programme management, institutional research, research innovation and commercialisation, to name only a few, have evolved, mostly as a result of government policies and initiatives since 1997. Furthermore, increasing emphasis is currently being placed on the PCS programme 3.0 *Public Service* (currently usually articulated as *Community Interaction*). All activities in this regard, which were not subsidised by the state in the SAPSE era, need to be unpacked into various subprogrammes. Some years ago the Department of Education requested tenders for the revision of Report SAPSE 002. Apparently the tender was awarded and the work done, but the new classification is still awaited by the HEIs.

#### 2.3.2.4 The need for an investigation into backlogs/surpluses in building ASM and building cost units at HEIs to ensure a level playing field before state funds are allocated for new buildings.

The first reason for the HESA building study was specifically to provide the newest data on backlogs/surpluses in buildings at HEIs to ensure that these data will be taken into account in future when funds for new buildings, whether in an ad hoc way or by means of some kind of structured approach, are allocated. The results of the HESA study described in Section 2.1 show big backlogs in buildings at some institutions and surpluses at other institutions. It is inconceivable that these backlogs could be eliminated in a short time. A developmental and structured approach is therefore needed in order to decrease these backlogs. See Section 1.4.1 (Part 1), Sections 2.1.1 and Section 2.3.3 (Point 7).

#### 2.3.2.5 Should higher education institutions be reimbursed for buildings erected from own funds or by means of earmarked third stream income?

In the determination of backlogs/surpluses in ASM at HEIs in 2009, as outlined in Section 2.1, all buildings utilised by HEIs were included. Certainly, following the termination of capital allocations to HEIs during the period 1997 to 2007, many HEIs had no choice but to erect much needed buildings from either their own funds (which could include some state block grant funding) or from earmarked funds coming from the private sector or alumni. Close co-operation between HEIs and private sector companies had also led to joint building endeavours between HEIs and these companies, mainly as far as buildings for post-graduate

teaching and academic staff research were concerned. The question therefore arises whether HEIs should be reimbursed by the state for the erection of these completed “emergency” building projects or, if not, the ASM included in these buildings should be taken into account when backlogs/surpluses for HEIs are calculated in future. However, the current HEMIS space data specifications do not provide for the identification of such ASM.

#### 2.3.2.6 The need for an investigation into the condition of the buildings at HEIs to ensure a level playing field before state funds are allocated for the renewal and maintenance of buildings

The second reason for the HESA study on university buildings was specifically to provide the newest data on the condition of the buildings. This information should be taken into account in future when funding for the renewal and replacement of buildings is considered by the DHET, whether in an ad hoc way or by means of some kind of structured approach. The preliminary results of the HESA study in Section 2.2 show that the percentage of buildings of inferior condition at HEIs with relatively reliable information is usually less than 10%. However, in the case of one of the biggest institutions it was almost 40% in 2009. The deferred maintenance backlogs at many HEIs should therefore be regarded in a very serious light. It could even be argued that the elimination of these backlogs in buildings should have the same priority as the elimination of the backlogs in buildings at HEIs. Annual earmarked funding for infrastructure and efficiency should therefore also be allocated for this purpose. The question should, however, also be raised whether the state is liable for allocating funding for the renewal of dilapidated buildings resulting from years of neglect and deferred maintenance as a result of bad management decisions.

When the HEMIS space data system is upgraded to ensure correct annual information in respect of building conditions, annual studies such as the HESA study outlined in Section 2.2 could be considered by the DHET in the future allocation of funding for the renewal and replacement of buildings. Obviously, since the 7 point scale used in the classification of each building’s condition, could be used in a subjective way, a team of expert architects and quantity surveyors should audit the HEMIS space data results before the renewal of any specific building is considered for state funding.

#### 2.3.2.7 The need for the improvement of the quality of the HEMIS space data

The quality of the HEMIS space data for 2009, three years after the first submission in 2008 in respect of 2007, is still unsatisfactory. Some of the reasons for this were indicated earlier. One gets the impression that the HEIs do not consider the submission of the HEMIS space data to be really important. Some institutions are just not submitting their information on time or at all, year after year, while other institutions’ submissions are incomplete or fraught with mistakes. Insufficient guidelines in the DHET’s HEMIS space data manual, structural problems in the design of the HEMIS space data system, as well as insufficient editing of the data have been brought to the attention of the former DE and to the DHET from year to year. (See e. g. **Appendix A**). The facts that the HEMIS space data are at present not used for the



execution of higher education policy, as well as not reported in any official HE statistics, are certainly contributing factors to this unsatisfactory situation.

#### **2.3.2.8 The role of multi-year enrolment planning in the funding framework for new buildings**

One of the important features of the existing funding framework is that it is linked to the overall multi-year student enrolment plan for the higher education system, as well as the disaggregated multi-year plans of individual HE institutions. Furthermore, government has also over the past few years encouraged institutions to increase student enrolments in specific academic programmes of national priority. The JIPSA initiative launched by government about 5 years ago and which is still running, is a case in point. Additional funding as part of the earmarked portion of the current funding framework under the heading “Infrastructure and Efficiency” has been allocated annually since 2008/09 to HE institutions which were prepared to increase enrolments significantly in Engineering programmes especially, but also in other programmes of national priority. Most of these funding allocations were for new infrastructure or the refurbishment of existing infrastructure. In November 2010 all institutions were requested by the DHET to resubmit institutional student enrolment plans for the period 2011-2013 by 15 January 2011. It was (once again) clearly spelled out in the Department’s request that these plans should take cognisance of national priorities in the form of the Ministerial PME targets for higher education, namely (i) Increasing the graduate output in Engineering Science to 15 000 per annum by 2014; (ii) Increasing the graduate output in Animal and Human Health to over 15 000 per annum by 2014; (iii) Increasing the graduate output in Natural and Physical Sciences to 8 000 by 2014; and (iv) Increasing the graduate output in Teacher Education to 12 000 by 2014. The indication from the DHET is certainly that the state is more prepared to fund increasing student enrolments in these priority areas than in other areas. The DHET also indicated that future infrastructure requirements (new or improved) should be identified by HEIs based on a needs assessment. Clearly this also indicates that the DHET foresees the continuation of substantial funding for infrastructure in 2012/13 and the years beyond that. A formal policy on the funding of infrastructure, including new buildings, is therefore clearly needed.

#### **2.3.3 A Proposed framework for national policy on the funding of buildings at higher education institutions**

In the light of the analyses of Sections 2.1 and 2.2, as well as the argumentation in Sections 2.3.1 and 2.3.2 above, the following steps in the development of a policy for the funding of new buildings and the renewal and maintenance of buildings are proposed:

1. Revise the PCS manual as set out in report SAPSE 002 as soon as possible. The classification should be according to programme and subprogramme with clear definitions for each subprogramme.

2. Decide which programmes/subprogrammes in the revised PCS should be subsidised by the state as far as buildings are concerned, that is, for both current expenditure and new capital projects. This decision could also inform the development of a new funding framework for higher education which is underway. The arguments underlying the SAPSE framework in which only Programmes 1.0, 2.0, 4.0, 5.0, 6.0, 7.0 and 9.0 were subsidised by the state still seem valid but should be revisited.
3. Develop policy regarding the state's position on the erection of subsidisable buildings (see point 2 above) from institutional own funds or earmarked third stream income.
4. Revise the existing space and cost norms for buildings and other land improvements at higher education institutions in accordance with steps 1 and 2 and also to accommodate the adjustment of the CESM categories with effect from 2010. Procedures should be laid down to ensure that only buildings planned and built (within approved limits) according to these norms could be considered for a state funding contribution. The Higher Education Facilities Management Associations of Southern Africa (HEFMA) should be involved in the revision of the norms.
5. Revise the HEMIS space data system to eliminate all the problem areas indicated in the previous sections of this document. This should be done jointly with the revision of the space and cost norms as indicated in Step 3. An application to the DHET for capital funding or funding for renewal of buildings by an institution should only be considered by the DHET if the institution's space data is submitted on time and an audit certificate is issued by the institution on certain crucial aspects of the data.
6. Once the space and cost norms, as well as the HEMIS space data, have been revised the norm ASM and building cost units generated by the FTE students in year  $n-1$  for each institution could, as a standard procedure, be compared with the available ASM and building cost units in year  $n-1$  at the respective institutions. The results of these comparisons should form very important background information when the allocation of funds for new buildings to each institution is determined in year  $n$  in respect of year  $n+1$ .
7. Many of the HEIs which are at present and will also over the next few years be important contributors towards increased student enrolments in the Ministerial PME target areas have at present (according to the 2009 norms) surplus building ASM and building cost units. See Tables 2.8 and 2.10 of Section 2.1 in this regard. It is certainly true that even with surpluses in building space it could be problematic or even impossible for an institution to increase student enrolments in certain programmes which are suddenly and sometimes somewhat unexpectedly of major importance to the state. This was certainly the case when all institutions with Engineering faculties were approached 5 years ago by the Minister of Education to increase their intake of new undergraduates substantially. For example, surplus space in one domain may be physically unsuitable for use in a second domain. Allocations to institutions for new buildings should therefore not exclude institutions with surplus capacity when measured against the space and cost norms. As far as buildings in the education and general programmes are concerned it is therefore suggested that firstly, the possible

funding of a new building at a HEI should be viewed against the importance of the building within the multi-year student enrolment plan of the state and of the individual institution, and also against the priority academic areas or regional development initiatives identified by the state. Secondly, the state contribution percentage towards the funding of approved buildings in the education and general programmes should be determined on a sliding scale with higher state contribution percentages towards buildings at HEIs with building ASM backlog space than towards buildings at HEIs with an overall surplus in ASM building space.

8. In the light of the discussion in Section 2.1.5 any elimination of backlogs in ASM building space should also take cognisance of the fact that the largest backlogs in 2009 were in respect of buildings used in the academic PCS programmes (Programmes 1.0 and 2.0). A first priority should therefore be to lower the relative backlogs in ASM space of individual HEIs in these two programmes to a more acceptable level.
  
9. The renewal of buildings for the educational and general programmes which are in a bad condition (scale points 4-7) is very important. These buildings constitute a risk to students and staff. It is proposed that the state funding of the renewal and maintenance of existing buildings at HEIs, as well as backlogs in the maintenance of roads, open-air parking areas, open-air recreational areas and utility distribution systems (jointly termed “land improvement other than buildings”) at HEIs, should be investigated by the Ministerial Committee appointed to revise the existing funding framework. If such funding does not form part of the block grant allocation to HEIs in the sense that input parameters associated with these funding needs are clearly identified and used in the calculation of the block grant, earmarked funding outside the block grant for renewal and maintenance purposes should be a feature of the revised funding framework. If this route is followed cost audits by a team of experts of the buildings in need of upgrading should annually precede any funding allocation process. For a start the state could allocate an earmarked amount to each HEI for the purpose of contracting such an expert audit team. A state contribution percentage determined on a sliding scale could also be used for the state funding of the renewal and maintenance of the buildings in the poorest condition. Institutions with big maintenance backlogs should receive a bigger state contribution than institutions with relatively small maintenance needs. In the revision of the HEMIS space data system (see step 4 above) attention should be given to the introduction of more detailed information on the funds spent on maintenance of buildings to improve the monitoring of the condition of buildings. Alternatively this type of information could form part of an additional HEMIS data focus dealing with expenditure on and investment in the various types of fixed assets (See also Part 3 of this report).
  
10. A Ministerial Committee was appointed in 2010 to review the provision of student housing. See Ministry of Higher Education and Training (2010) for the terms of reference of this Committee. Three of the terms of reference are the following: “Examine various models of securing physical accommodation”; “Explore the sources of finance available to universities”; and “Propose possible changes to the funding framework to obviate the financial problems created by the provision of more

accommodation and owning additional buildings”. It is proposed that the Ministerial Committee’s report is awaited and studied jointly with HESA’s infrastructure study before The Minister of Higher Education and Training determine policy regarding the funding of new residential buildings or the renewal of existing residential buildings. It is important that national policy regarding the state funding of residences, which forms part of Programme 9.0 *Auxiliary Enterprises*, should fit into a broader framework which also includes the funding of buildings in the educational and general programmes as outlined in Steps 7 and 9 above.

A process involving both the DHET and HESA should be put in place to build the capacity within HEIs to render complete, accurate and timeous HEMIS space data annually to the DHET.

12. A pre-requisite for the implementation of the proposed framework is the proper structuring and adequate staffing of the unit responsible for the estates and buildings at all HEIs.

## **PART 3: THE HIGHER EDUCATION EQUIPMENT STUDY**

### **3.1 A SURVEY INTO THE AVAILABILITY AND CONDITION OF EQUIPMENT USED IN TEACHING AND RESEARCH PROGRAMMES AT HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA IN 2009**

#### **3.1.1 Background**

It was indicated in Part 1 of this study that the SAPSE subsidy amounts provided to HEIs in South Africa during 1984 to 2003 (See Department of National Education (1985)) were non-earmarked (but well identified) block grant funds for inter alia the renewal and replacement of fixed assets (including equipment), as well as for new fixed assets (including equipment) associated with the annual increasing number of students at the respective institutions. These provisions also applied to fixed assets (including equipment) in the auxiliary enterprises programme (mostly residences). It was, however, further indicated in Part 1 that it is unclear whether such provision is made in the current HE funding framework used in South Africa which was introduced with effect from the 2004/05 financial year (See Ministry of Education 2004). The policy statements regarding the structure of the block grant part of the current HE funding framework, as well as a study of the input parameters which determine the block grant, give no indication of a specific provision for the maintenance of equipment or the provision for new equipment in the case of student growth from year to year. The Department of Education (DE) indicated to HEIs in 2009 that their requests for earmarked “Infrastructure and efficiency” allocations for 2010/11 and 2011/12, could include funds for new equipment. The actual allocations made by the DE for this purpose to individual institutions are, however, unknown. Apart from this once-off invitation, no other official earmarked allocations were made to HEIs for the acquisition of new equipment.

Chapter 5 of the SAPSE information system, namely the fixed asset statements, submitted annually by institutions since 1984 until 1998, provided very useful information according to PCS programme (See Appendix D) regarding the balances and changes in the investment in the different types of fixed assets (including equipment). The balances at the end of the year in the inventory values of the equipment for formal instruction according to CESM category were also reported annually by HEIs. The information contained in Chapter 5 of the SAPSE information system was not included in the HEMIS system which replaced the SAPSE information system in 1999.

#### **3.1.2 Sources of information regarding the existing stock of equipment for teaching and research at HEIs, as well as the annual level of spending on equipment**

As a result of the non-availability of formal HEMIS information on the existing stock of equipment at HEIs (see Section 3.1.1) other possible sources of information regarding different aspects of equipment used at HEIs were scrutinised with a view to establishing the

replacement cost, as well as the condition of the existing stock of equipment, as well as the annual level of spending on equipment at HEIs. These sources are:

- i. *Annual HEMIS Financial Statements*: These statements are prepared annually in accordance with regulations determined under the Higher Education Act (Act 101 of 1997) and reflect fixed assets in categories which should separate equipment from other forms of fixed assets, such as buildings, vehicles, library holdings, etc. The values disclosed are a summary of historic cost and accumulated depreciation by asset category. The regulations do not require the disclosure of the age or condition of the assets and it is therefore unlikely that a desk top study of HEI Annual Financial Statements will be of much value in establishing backlogs in equipment. Replacement values of assets are not required to be disclosed in HEI Annual Financial Statements.
- ii. *Institutional inventories of fixed assets*: Most institutions do have a computerised database of all fixed assets (a fixed assets register), including equipment for teaching and research. These registers may be used to determine the categories and ages of assets held by HEIs but do not always give an indication of the condition of the specific pieces of equipment, as well as the teaching and research programmes and study fields where utilised. The databases of many institutions are, however, sometimes incomplete and inaccurate.
- iii. *Reports of previous studies by the Department of Science and Technology (DST), the National Research Foundation (NRF) and the National Advisory Council for Innovation (NACI)*: These reports were found to be mainly focusing on the availability of equipment for research purposes and for senior post-graduate studies. The very influential annual Research and Development (R&D) survey reports of the DST only give overarching aggregated information on research and development expenditure of South Africa.

In the light of the above the HESA Steering Committee decided to establish the existing stock of equipment, as well as the annual level of spending on equipment for teaching and research at HEIs, by means of a comprehensive survey at all HEIs.

### **3.1.3 The equipment survey at higher education institutions in 2009/10**

The Task Team compiled an instrument for the survey of the equipment used in 2009 at all HEIs in August 2009. This instrument was piloted at two institutions in September 2009. After some adjustments the survey instrument was finalised by the HESA Task Team after a workshop, attended by representatives of all, but one, HEIs, which was held in October 2009. A letter requesting all institutions to complete the survey forms was sent by the Chairman of HESA to the Vice-Chancellors of all HEIs on 11 November 2009. A copy of this letter, as well as the survey documentation which accompanied the letter, is attached as **Appendix E**.

The deadline for the completion of the survey was set for 31 March 2010. After various requests for an extension of the due date were received the date was extended to 31 May 2010. In the light of the very complicated nature of the survey a HESA helpline was established to support institutions which encountered problems (especially with the

interpretation of definitions and the format of the data collection sheets) during the data collection process. Many such requests for help were handled by Task Team members.

Thirteen institutions had submitted their survey results by 31 May 2010. By 8 February 2011 all institutions except one had submitted some data. In the case of most of the institutions a second or third revised submission was needed before the survey results were ready for analysis. The situation at the time when the analyses of the survey data were concluded (31 August 2011) was that 21 HEIs have submitted final survey data. Although UCT submitted some information in 2010, the institution indicated in July 2011 that, as a result of insufficient capacity, it is impossible for them to submit the survey data in the required format. CPUT had, since November 2009, not responded to any request for survey information. The information submitted by two institutions, namely DUT and UNIZUL, is incomplete in some respects with the result that some analyses could not be performed for them.

### **3.1.4 Methodology used in the analysis of the survey data of each HEI**

In the collection of the data on the availability of and expenditure on equipment for teaching and research purposes the definition of the equipment to be included in the survey stood central. This comprehensive definition of the equipment to be included appears under *Section 1: General Notes* in **Appendix E**.

Rhodes University's submission will now be used to describe the different steps followed in the analysis of each institution's survey data. In describing the analysis references to the different sections and tables appearing in Appendix E will be frequently made.

#### **Step 1: Analysis of Section A of survey: Actual institutional expenditure on teaching and research equipment**

In Section A the actual expenditure on teaching and research equipment for the years 2006 to 2008, as well as the budgeted amounts for 2009, were requested. This information was collected according to academic organisational unit (OU) and according to support service. In the case of support services only equipment which directly supports the teaching and research programmes is included. Table 3.1 shows a summary of these expenditures for the academic units, as well as the support services, both in nominal and real (2009) rand. The total expenditure on equipment for each year is also divided between expenditure from council controlled funds and expenditure from other (mostly third stream income) funds.

Three expenditure indicators, namely real expenditure per FTE student, real expenditure per teaching input unit (TIU), as well as real expenditure as a percentage of the total expenditure on educational and general programmes (PCS programmes 1.0-8.0), are also indicated at the bottom of Table 3.1 for each year. These indicators are also represented graphically in Figure 3.1.

Figure 3.1 shows that the real per capita expenditure for Rhodes University on equipment for teaching and research in 2008 and 2009 (budgeted) was less than 40% of the corresponding

expenditure in 2006. Furthermore, according to the last row in Table 3.1, the real per capita expenditure for Rhodes University on equipment for teaching and research composed 7.12% of total expenditure on educational and general programmes in 2006. This percentage decreased to 2.76% in 2008 and a budgeted 2.95% in 2009.

**TABLE 3.1: EXPENDITURE OF RHODES UNIVERSITY ON EQUIPMENT FOR THE YEARS 2006-2009 ACCORDING TO TYPE OF FUNDING, PROGRAMME AND YEAR**

SUMMARY TABLE OF ACTUAL EXPENDITURE ON TEACHING AND RESEARCH EQUIPMENT ACCORDING TO YEAR, PROGRAMME AND TYPE OF FUNDING

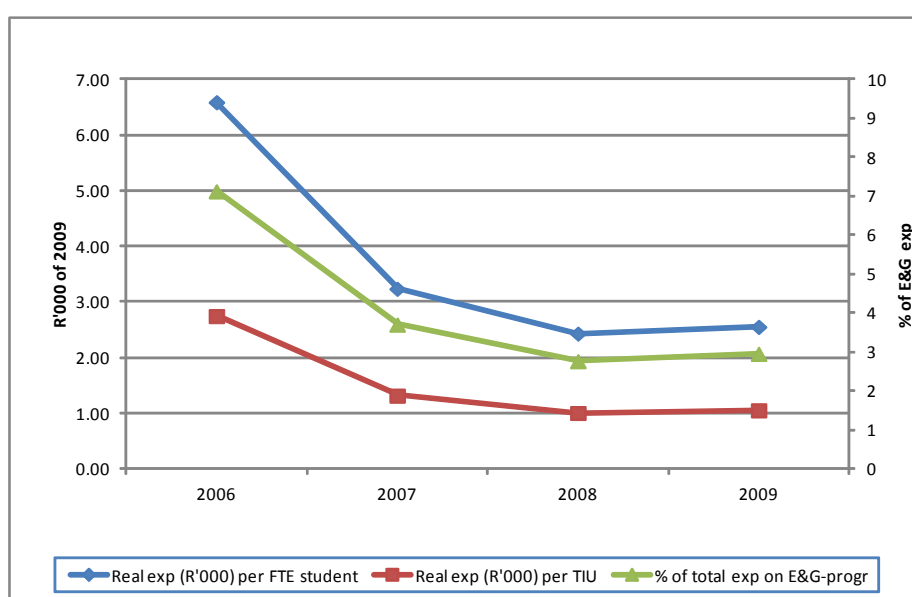
Programme	2006			2007			2008			2009		
	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total
Academic Organisational Units Type (%)	15645 73.7	5580 26.3	21225 100.0	7272 71.6	2891 28.4	10163 100.0	4376 53.2	3846 46.8	8222 100.0	3223 35.6	5821 64.4	9044 100.0
(Academic) Support Service Units Type (%)	3990 92.5	324 7.5	4314 100.0	3686 92.5	297 7.5	3984 100.0	3520 91.2	341 8.8	3861 100.0	5646 94.4	332 5.6	5978 100.0
TOTAL	19635 76.9	5904 23.1	25539 100.0	10959 77.5	3188 22.5	14147 100.0	7896 65.3	4187 34.7	12083 100.0	8869 59.0	6154 41.0	15022 100.0
Inflation factors	1.30			1.19			1.07			1.00		
FTE students	5042			5205			5325			5882		
TIUs	12100			12800			12900			14249		

SUMMARY TABLE OF REAL EXPENDITURE (IN 2009 PRICES) ON TEACHING AND RESEARCH EQUIPMENT ACCORDING TO YEAR, PROGRAMME AND TYPE OF FUNDING

Programme	2006			2007			2008			2009			Ave annual real expenditure (R'000 of 2009)
	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	
Academic Organisational Units Type (%)	20339 73.7	7254 26.3	27592 100.0	8654 71.6	3440 28.4	12094 100.0	4683 53.2	4115 46.8	8797 100.0	3223 35.6	5821 64.4	9044 100.0	14382
(Academic) Support Service Units Type (%)	5186 92.5	421 7.5	5608 100.0	4387 92.5	354 7.5	4741 100.0	3766 91.2	365 8.8	4131 100.0	5646 94.4	332 5.6	5978 100.0	5114
TOTAL Type (%)	25525 76.9	7675 23.1	33200 100.0	13041 77.5	3794 22.5	16835 100.0	8448 65.3	4480 34.7	12929 100.0	8869 59.0	6154 41.0	15022 100.0	19497
Real exp (R'000) per FTE student	5.062	1.522	6.585	2.505	0.729	3.234	1.587	0.841	2.428	1.508	1.048	2.554	
Real exp (R'000) per TIU	2.110	0.634	2.744	1.019	0.296	1.315	0.655	0.347	1.002	0.622	0.432	1.054	
Expenditure on equipment as % of total expenditure (E&G) <sup>1)</sup>			7.12			3.7			2.76			2.95	

1) Education and general programmes (E&G) refer to all PCS programmes 1.0- 8.0

**FIGURE 3.1: RHODES UNIVERSITY: TOTAL REAL EXPENDITURE ON EQUIPMENT PER FTE STUDENT, PER TIU AND EXPENDITURE ON EQUIPMENT AS % OF E&G EXPENDITURE ACCORDING TO YEAR**





**Step 2: Analysis of Section B of survey: Equipment inventory in 2009 according to academic organisational unit**

The inventory was completed for each separate academic organisational unit. At most universities academic departments were used as reporting entities, but in some institutions the inventories were done for schools. In the case of schools, FTE students associated with a school are usually distributed into more than one CESM category. This complicates the analysis. Two tables appear in this inventory (See Section B of Appendix E). The first, namely Table B1, includes equipment items (or a cluster of similar equipment items) with a replacement value of more than R15 000 but less than R100 000 per item, while the second table, namely Table B2, includes all equipment items with replacement values more than R100 000 per item. Apart from the replacement cost of each equipment item reported in the two tables, the distribution of the time for which it is utilised at the different teaching/research level(s), as well as the condition (3 point scale - see Section 3.2.4) of the equipment item, was also reported.

Table 3.2 summarises the information of Section B according to CESM category, FTE student enrolments on respectively the undergraduate and post-graduate levels and FTE numbers of academic and other departmental (school) support staff (excluding service workers) by means of 4 different sub-tables of similar structure. The first sub-table reflects the information regarding all equipment with replacement cost less than R100 000 and the second sub-table the information regarding all equipment with replacement cost more than R100 000. The third sub-table reflects the replacement cost of staff computers and printers. The last and fourth sub-table is the aggregate of the first three sub-tables. The weighted (by replacement cost) average condition of all the equipment used in the respective CESM categories, as well as the total replacement cost (and percentage) of the “outdated equipment still in use” (condition 3 in survey Tables B1 and B2) in the respective CESM categories are also shown in all the tables. The following notations were used in columns 9-12 in Table 3.2: Lev(u)=1 (undergraduate or equivalent level); Lev(u)=2&3 (postgraduate level); Lev(u)=4 (academic staff research level) and Lev(u)=5 (support staff-users of computers).

Note that although Table 3.2 shows summary data according to CESM category, summary data for each academic department/school are the building blocks of the four sub-tables in Table 3.2. These more detailed and very useful results are, however, not shown here

Different equipment replacement cost measures (usually per FTE student or FTE staff member) are indicated in columns 15 to 19 in each of the 4 sub-tables of Table 3.2. These measures are of special importance. They are the replacement cost of equipment used at undergraduate level per FTE undergraduate student, the replacement cost of equipment used at post-graduate level per FTE post-graduate student, the replacement cost of equipment used for academic staff research per FTE academic staff member (only in first two sub-tables), as well as the computer and printer replacement cost per academic staff member and per other support staff member (in the third sub-table). An overall measure of provision of equipment is the replacement cost of all equipment used on the different levels per FTE student. These per capita indicators are all aggregated in the last sub-table of Table 3.2. These aggregated per CESM indicators are of the utmost importance, especially when

different HEIs are compared as far as the availability (replacement cost) of equipment at the different teaching/research levels and study fields are concerned. These per capita values for all institutions will form the basis for determining differentiated norms and standards in the provision of equipment at HEIs. See Section 3.2 in this regard.

In the case of Rhodes University's last sub-table (in Table 3.2) the value in the last (total) row and third last column shows an equipment replacement cost of R19102 per FTE student. Very large discrepancies between the different CESM categories are, however, evident. The equipment replacement costs in CESMs 09, 15 and 19 are the largest. Furthermore, the replacement cost of all outdated equipment still in use at Rhodes University represented 11.75% of the total replacement cost of equipment for teaching and research in 2009.

### **Step 3: Analysis of Section C of survey: Inventory of centrally managed equipment**

In accordance with Section B this inventory also contains two tables, Table C1 for equipment items (or a cluster of similar equipment items) with a replacement value of more than R15 000 but less than R100 000 per item, and Table C2 for all equipment items with replacement values more than R100 000. Information on the number of staff computers and printers was excluded in Section C. Since the provision of equipment managed centrally is blind as far as the study field of the students serviced is concerned, CESM category is not relevant in this information. Apart from the replacement cost of each equipment item reported in the two tables, the distribution of the teaching/research level(s) at which the specific equipment item was used in 2009, as well as the condition (3 point scale) of the item, was also reported.

Table 3.3 summarises the information of Tables C1 and C2 for Rhodes University. This table shows that the replacement cost of equipment managed centrally per FTE student was R1 594 in 2009. Furthermore the value of the centrally managed outdated equipment at Rhodes University composes 15.7% of all centrally managed equipment. Most of the centrally managed equipment in 2009, namely 70.2%, was used at the undergraduate level.

**TABLE 3.2: SUMMARY OF REPLACEMENT COST (R'000) OF EQUIPMENT USED FOR TEACHING AND RESEARCH AT RHODES UNIVERSITY IN 2009 ACCORDING TO CESM CATEGORY AND TEACHING/RESEARCH LEVEL**

EQUIPMENT WITH REPLACEMENT COST < R100 000

CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equip.	Per capita replacement cost (R'000)					Repl cost: Cond 3 (R'000)	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources																			
2	Architecture & Environmental Design																			
3	Arts, Visual and Performing	190.6	45.7	236.3	22.74	13.1	48	748.683	477.965	440.270	0.000	1666.917	1.62	3.928	10.459	19.361		7.054	294.140	17.65
4	Business, Commerce & Mangement Sciences	523.7	104.1	627.8	23.26	5.5	36	15.954	23.721	4.786	0.000	44.462	1.72	0.030	0.228	0.206		0.071	15.954	35.88
5	Communication	182.3	84.7	267	20	6.75	48	2560.037	853.346	0.000	0.000	3413.383	1.00	14.043	10.075	0.000		12.784	0.000	
6	Computer Science and Data Processing	198.2	51.6	249.8	19.95	8	52	189.652	653.918	407.918	0.000	1251.489	1.42	0.957	12.673	20.447		5.010	301.242	24.07
7	Education	295.9	95.9	391.8	31.59	8.25	59	174.437	90.701	44.021	0.000	309.159	1.11	0.590	0.946	1.394		0.789	0.000	
8	Engineering & Engineering Technology																			
9	Health Care & Health Sciences	163.1	88.7	251.8	16.25	8.67	44	1567.937	2786.049	40.330	0.000	4394.316	1.31	9.613	31.410	2.482		17.452	573.402	13.05
10	Home Economics																			
11	Industrial Arts, Trades & Technology																			
12	Languages, Linguistics & Literature	360	39.95	399.95	35	3.73	60	28.940	29.414	10.826	0.000	69.180	1.00	0.080	0.736	0.309		0.173	0.000	
13	Law	412.3	49.8	462.1	14.53	3	29	142.439	0.000	15.899	0.000	158.338	1.00	0.345	0.000	1.094		0.343	0.000	
14	Libraries and Museums																			
15	Life Sciences and Physical Sciences	328.8	185.5	514.3	64.66	48.27	235	3105.820	11945.613	3716.722	0.000	18768.155	1.36	9.446	64.397	57.481		36.493	3104.366	16.54
16	Mathematical Sciences	218	13.1	231.1	13	2	34	0.000	40.824	16.604	0.000	57.428	1.00	0.000	3.116	1.277		0.248	0.000	
17	Military Sciences																			
18	Philosophy, Religion and Theology	100.6	9.6	110.2	6	0.37	8	0.000	0.795	15.104	0.000	15.899	1.00	0.000	0.083	2.517		0.144	0.000	
19	Physical Education, Health Education & Leisure	51.2	9.2	60.4	5	2.53	14	228.757	383.295	154.538	0.000	766.590	1.29	4.468	41.663	30.908		12.692	72.503	9.46
20	Psychology	309.6	55.1	364.7	12.18	5.21	19	12.500	95.950	20.146	0.000	128.596	1.00	0.040	1.741	1.654		0.353	0.000	
21	Public Administration and Social Services																			
22	Social Sciences & Social Studies	1002.4	149.8	1152.2	48.3	8.4	82	43.034	297.810	407.169	0.000	748.013	1.58	0.043	1.988	8.430		0.649	147.230	19.68
TOTAL		4336.7	982.75	5319.45	332.46	123.78	768	8818.191	17679.401	5294.332	0.000	31791.924	1.33	2.033	17.990	15.925		5.977	4508.837	14.18

EQUIPMENT WITH REPLACEMENT COST > R100 000

CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources																			
2	Architecture & Environmental Design																			
3	Arts, Visual and Performing	190.6	45.7	236.3	22.74	13.1	48	1035.962	863.867	49.981	0.000	1949.810	1.77	5.435	18.903	2.198		8.251	0.000	
4	Business, Commerce & Mangement Sciences	523.7	104.1	627.8	23.26	5.5	36	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
5	Communication	182.3	84.7	267	20	6.75	48	1184.433	394.811	0.000	0.000	1579.244	1.00	6.497	4.661	0.000		5.915	0.000	
6	Computer Science and Data Processing	198.2	51.6	249.8	19.95	8	52	16.182	59.334	32.364	0.000	107.880	1.00	0.082	1.150	1.622		0.432	0.000	
7	Education	295.9	95.9	391.8	31.59	8.25	59	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
8	Engineering & Engineering Technology																			
9	Health Care & Health Sciences	163.1	88.7	251.8	16.25	8.67	44	925.000	7152.762	0.000	0.000	8077.762	1.26	5.671	80.640	0.000		32.080	790.000	9.78
10	Home Economics																			
11	Industrial Arts, Trades & Technology																			
12	Languages, Linguistics & Literature	360	39.95	399.95	35	3.73	60	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
13	Law	412.3	49.8	462.1	14.53	3	29	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
14	Libraries and Museums																			
15	Life Sciences and Physical Sciences	328.8	185.5	514.3	64.66	48.27	235	3553.589	36252.507	6557.886	0.000	46363.981	1.29	10.808	195.431	101.421		90.150	6035.593	13.02
16	Mathematical Sciences	218	13.1	231.1	13	2	34	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
17	Military Sciences																			
18	Philosophy, Religion and Theology	100.6	9.6	110.2	6	0.37	8	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
19	Physical Education, Health Education & Leisure	51.2	9.2	60.4	5	2.53	14	413.295	826.589	413.295	0.000	1653.178	1.50	8.072	89.847	82.659		27.370	606.576	36.69
20	Psychology	309.6	55.1	364.7	12.18	5.21	19	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000		0.000	0.000	
21	Public Administration and Social Services																			
22	Social Sciences & Social Studies	1002.4	149.8	1152.2	48.3	8.4	82	842.777	1554.502	1546.883	0.000	3944.161	1.19	0.841	10.377	32.027		3.423	0.000	
TOTAL		4336.7	982.75	5319.45	332.46	123.78	768	7971.237	47104.371	8600.408	0.000	63676.016	1.29	1.838	47.931	25.869		11.970	7432.170	11.67

## STAFF COMPUTERS AND PRINTERS

CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)				
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud
1	Agriculture & Renewable Natural resources																	
2	Architecture & Environmental Design																	
3	Arts, Visual and Performing	190.6	45.7	236.3	22.74	13.1	48	0.000	0.000	225.563	158.437	384.000	1.00	0.000	0.000	9.919	12.094	1.625
4	Business, Commerce & Mangement Sciences	523.7	104.1	627.8	23.26	5.5	36	0.000	0.000	238.691	49.309	288.000	1.00	0.000	0.000	10.262	8.965	0.459
5	Communication	182.3	84.7	267	20	6.75	48	0.000	0.000	287.103	96.897	384.000	1.00	0.000	0.000	14.355	14.355	1.438
6	Computer Science and Data Processing	198.2	51.6	249.8	19.95	8	52	0.000	0.000	294.734	121.266	416.000	1.00	0.000	0.000	14.774	15.158	1.665
7	Education	295.9	95.9	391.8	31.59	8.25	59	0.000	0.000	370.340	101.660	472.000	1.00	0.000	0.000	11.723	12.322	1.205
8	Engineering & Engineering Technology																	
9	Health Care & Health Sciences	163.1	88.7	251.8	16.25	8.67	44	0.000	0.000	229.535	122.465	352.000	1.00	0.000	0.000	14.125	14.125	1.398
10	Home Economics																	
11	Industrial Arts, Trades & Technology																	
12	Languages, Linguistics & Literature	360	39.95	399.95	35	3.73	60	0.000	0.000	437.393	42.607	480.000	1.00	0.000	0.000	12.497	11.423	1.200
13	Law	412.3	49.8	462.1	14.53	3	29	0.000	0.000	192.297	39.703	232.000	1.00	0.000	0.000	13.234	13.234	0.502
14	Libraries and Museums																	
15	Life Sciences and Physical Sciences	328.8	185.5	514.3	64.66	48.27	235	0.000	0.000	1080.820	799.180	1880.000	1.00	0.000	0.000	16.715	16.556	3.655
16	Mathematical Sciences	218	13.1	231.1	13	2	34	0.000	0.000	235.077	36.923	272.000	1.00	0.000	0.000	18.083	18.462	1.177
17	Military Sciences																	
18	Philosophy, Religion and Theology	100.6	9.6	110.2	6	0.37	8	0.000	0.000	60.283	3.717	64.000	1.00	0.000	0.000	10.047	10.047	0.581
19	Physical Education, Health Education & Leisure	51.2	9.2	60.4	5	2.53	14	0.000	0.000	74.369	37.631	112.000	1.00	0.000	0.000	14.874	14.874	1.854
20	Psychology	309.6	55.1	364.7	12.18	5.21	19	0.000	0.000	106.461	45.539	152.000	1.00	0.000	0.000	8.741	8.741	0.417
21	Public Administration and Social Services																	
22	Social Sciences & Social Studies	1002.4	149.8	1152.2	48.3	8.4	82	0.000	0.000	539.511	116.489	656.000	1.00	0.000	0.000	11.170	13.868	0.569
TOTAL		4336.7	982.75	5319.45	332.46	123.78	768	0.000	0.000	4372.174	1771.826	6144.000	1.00	0.000	0.000	13.151	14.314	1.155

## ALL EQUIPMENT

CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources																			
2	Architecture & Environmental Design																			
3	Arts, Visual and Performing	190.6	45.7	236.3	22.74	13.1	48	1784.645	1341.831	715.814	158.437	4000.727	1.64	9.363	29.362	31.478	12.094	16.931	294.140	7.35
4	Business, Commerce & Mangement Sciences	523.7	104.1	627.8	23.26	5.5	36	15.954	23.721	243.477	49.309	332.462	1.10	0.030	0.228	10.468	8.965	0.530	15.954	4.80
5	Communication	182.3	84.7	267	20	6.75	48	3744.470	1248.157	287.103	96.897	5376.627	1.00	20.540	14.736	14.355	14.355	20.137	0.000	
6	Computer Science and Data Processing	198.2	51.6	249.8	19.95	8	52	205.834	713.252	735.016	121.266	1775.369	1.30	1.039	13.823	36.843	15.158	7.107	301.242	16.97
7	Education	295.9	95.9	391.8	31.59	8.25	59	174.437	90.701	414.360	101.660	781.159	1.04	0.590	0.946	13.117	12.322	1.994	0.000	
8	Engineering & Engineering Technology																			
9	Health Care & Health Sciences	163.1	88.7	251.8	16.25	8.67	44	2492.937	9938.811	269.865	122.465	12824.078	1.27	15.285	112.050	16.607	14.125	50.930	1363.402	10.63
10	Home Economics																			
11	Industrial Arts, Trades & Technology																			
12	Languages, Linguistics & Literature	360	39.95	399.95	35	3.73	60	28.940	29.414	448.218	42.607	549.180	1.00	0.080	0.736	12.806	11.423	1.373	0.000	
13	Law	412.3	49.8	462.1	14.53	3	29	142.439	0.000	208.195	39.703	390.338	1.00	0.345	0.000	14.329	13.234	0.845	0.000	
14	Libraries and Museums																			
15	Life Sciences and Physical Sciences	328.8	185.5	514.3	64.66	48.27	235	6659.409	48198.119	11355.428	799.180	67012.136	1.30	20.254	259.828	175.617	16.556	130.298	9139.960	13.64
16	Mathematical Sciences	218	13.1	231.1	13	2	34	0.000	40.824	251.681	36.923	329.428	1.00	0.000	3.116	19.360	18.462	1.425	0.000	
17	Military Sciences																			
18	Philosophy, Religion and Theology	100.6	9.6	110.2	6	0.37	8	0.000	0.000	75.386	3.717	79.899	1.00	0.000	0.000	12.564	10.047	0.725	0.000	
19	Physical Education, Health Education & Leisure	51.2	9.2	60.4	5	2.53	14	642.052	1209.884	642.202	37.631	2531.769	1.41	12.540	131.509	128.440	14.874	41.917	679.079	26.82
20	Psychology	309.6	55.1	364.7	12.18	5.21	19	12.500	95.950	126.608	45.539	280.596	1.00	0.040	1.741	10.395	8.741	0.769	0.000	
21	Public Administration and Social Services																			
22	Social Sciences & Social Studies	1002.4	149.8	1152.2	48.3	8.4	82	885.811	1852.312	2493.562	116.489	5348.174	1.22	0.884	12.365	51.627	13.868	4.642	147.230	2.75
TOTAL		4336.7	982.75	5319.45	332.46	123.78	768	16789.428	64782.977	18266.914	1771.826	101611.940	1.28	3.871	65.920	54.945	14.314	19.102	11941.007	11.75

**TABLE 3.3: SUMMARY OF REPLACEMENT COST OF CENTRALLY MANAGED EQUIPMENT AT RHODES UNIVERSITY IN 2009 ACCORDING TO TEACHING/RESEARCH LEVEL**

EQUIPMENT WITH REPLACEMENT COST < R100 000

FTE students 2009			FTE C1 staff	Replacement cost (R'000)				Av. cond. of equipment	Per capita replacement costs (R'000)				Repl cost of equipm. with Cond 3 (R'000)	Repl. Cost as % of total repl cost
Level 1	Levels 2-4	Total		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Total		UG FTE stud	PG FTE stud	FTE C1	Tot FTE stud <sup>1)</sup>		
4336.7	982.75	5319.45	332	5568	2307	194	8070	1.46	1.284	2.348	0.585	1.517	1332.292	16.51

EQUIPMENT WITH REPLACEMENT COST > R100 000

FTE students 2009			FTE C1 staff	Replacement cost (R'000)				Av. cond. of equipment	Per capita replacement cost (R'000)				Repl cost of equipm. with Cond 3 (R'000)	Repl. Cost as % of total repl cost
Level 1	Levels 2-4	Total		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Total		UG FTE stud	PG FTE stud	FTE C1	Tot FTE stud <sup>1)</sup>		
4336.7	982.75	5319.45	322	392	25	0	417	1.00	0.090	0.025	0.000	0.078		0.00

ALL EQUIPMENT

FTE students 2009			FTE C1 staff	Replacement cost (R'000)				Av. cond. of equipment	Per capita replacement cost (R'000)				Repl cost of equipm. with Cond 3 (R'000)	Repl. Cost as % of total repl cost
Level 1	Levels 2-4	Total		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Total		UG FTE stud	PG FTE stud	FTE C1	Tot FTE stud <sup>1)</sup>		
4336.7	982.75	5319.45	322	5960	2332	194	8487	1.44	1.374	2.373	0.604	1.595	1332.292	15.70

1) Total replacement cost used

### 3.1.5 Summary of survey results of all HEIs

Tables 3.4, 3.5, 3.6 and 3.7, as well as Figure 3.2, show the summary analyses of the 21 HEIs for which the analyses were made. Note that, in accordance with the block grant subsidy calculations, FTE distance tuition students on study levels 1 and 2 (undergraduate up to honours) were multiplied by a factor 0.5 before institutional analyses were performed.

The last 5 rows of Table 3.4, namely an aggregation of the real annual expenditure on equipment for teaching and research of 20 HEIs for 2006-2009 are of special interest. Three conclusions from these rows are:

- The real annual expenditure per FTE student, as well as the real annual expenditure per teaching input unit (TIU) for the HE system has increased from 2006 to 2008, but significantly declined in 2009. See also Figure 3.2 in this regard.
- Over the period 2006-2009 a percentage of 63.6 of total expenditure on teaching and research equipment originated from council controlled funds.
- About 70.7% of all teaching and research equipment was on equipment used by academic organisational units.

Table 3.4 also clearly shows that the expenditure per FTE student on equipment for teaching and research varies substantially amongst the 20 institutions.

Another, but related way, to establish the pattern of expenditure on teaching and research equipment over the period 2006-2009 is to express all the annual expenditures as a percentage of the total expenditure on educational and general programmes. This information is shown in Table 3.5 for all 20 HEIs. The aggregate percentages for the 20 HEIs jointly are also represented in Figure 3.2. The expenditure for the years 2006-2009 for this measure is similar to the patterns of the other two per capita measures. Table 3.5 is of special importance. It shows the budget priority of equipment for teaching and research of each university for the years 2006 to 2009. It is clear that the relative average annual expenditure on equipment varies significantly between institutions.

Table 3.6 contains the aggregate Section B inventory data for 21 HEIs. The information for the University of Zululand is incomplete since many academic departments' survey information was not included in this university's submission. Various attempts from the side of the Task Team to ensure more complete information failed. The 21 sub-tables in Table 3.6 provide a wealth of information and will be used extensively in Section 3.2 to determine norms and standards for the provision of equipment according to teaching/ research levels and study fields.

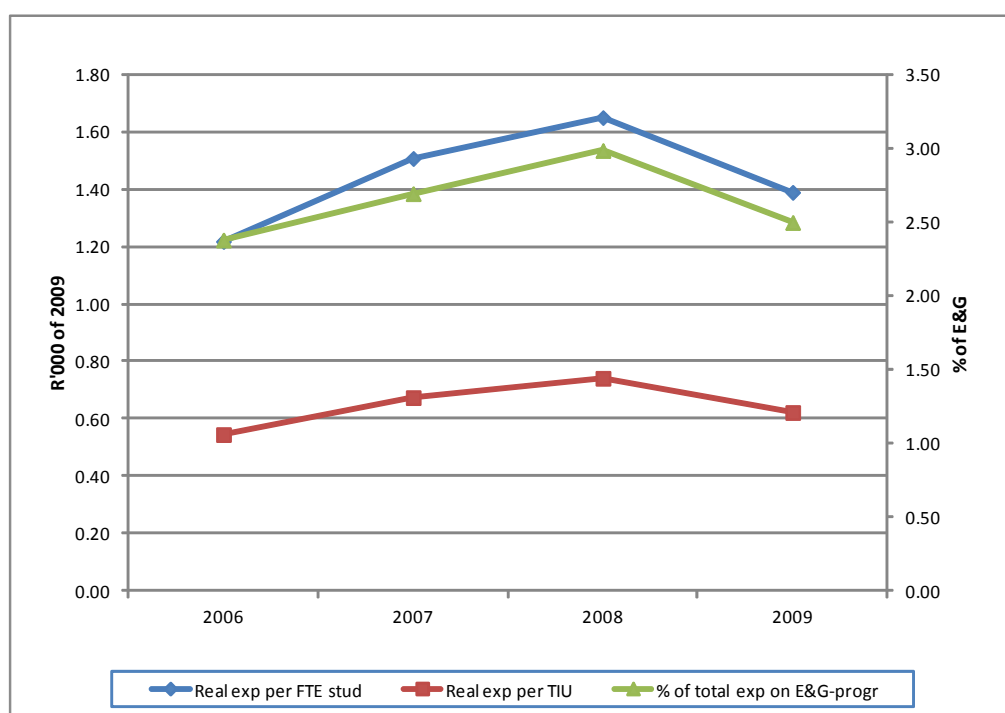
**TABLE 3.4: REAL EXPENDITURE (R'000 OF 2009) ON EQUIPMENT FOR TEACHING AND RESEARCH IN 2006-2009 ACCORDING TO HE INSTITUTION, SOURCE OF FUNDING, PROGRAMME AND YEAR**

Institution	Programme	2006			2007			2008			2009			Ave annual total expenditure (R'000 of 2009)	Concil funds as % of total expenditure) 2006-2009
		Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total		
Cape Peninsula Univ Techn	Academic Support Total Exp per FTE stud Exp per TIU														
University of Cape Town	Academic Support Total Exp per FTE stud Exp per TIU														
Central University of Techn	Academic Support Total Exp per FTE stud Exp per TIU	7156.50 186.86 7343.36 0.93 0.46	1576.90 0.00 1576.90 0.20 0.10	8733.40 186.86 8920.26 1.13 0.56	5806.09 879.67 6685.77 0.83 0.40	26.18 0.00 26.18 0.00 0.00	5832.27 879.67 6711.95 0.84 0.40	7629.51 1795.26 9424.77 1.12 0.54	1656.36 0.00 1656.36 0.20 0.09	9285.87 1795.26 11081.13 1.31 0.63	4794.57 1096.80 5891.37 0.61 0.29	613.00 0.00 613.00 0.06 0.03	5407.57 1096.80 6504.37 0.68 0.33	7314.78 989.65 8304.43	86.77 100.00 88.34
Durban University of Techn	Academic Support Total Exp per FTE stud Exp per TIU														
University of Fort Hare	Academic Support Total Exp per FTE stud Exp per TIU	2050.10 3237.00 5287.10 0.91 0.47	0.00 0.00 0.00 0.00 0.00	2050.10 3237.00 5287.10 0.91 0.47	1025.78 9046.38 10072.16 1.34 0.69	0.00 0.00 0.00 0.00 0.00	1025.78 9046.38 10072.16 1.34 0.69	817.48 6645.77 7463.25 0.99 0.49	0.00 0.00 0.00 0.00 0.00	817.48 6645.77 7463.25 0.99 0.49	9520.00 1919.00 11439.00 1.30 0.66	0.00 0.00 0.00 0.00 0.00	9520.00 1919.00 11439.00 1.30 0.66	3353.34 5212.04 8565.38	100.00 100.00 100.00
University of the Free State	Academic Support Total Exp per FTE stud Exp per TIU	8293.24 9883.65 18176.89 1.08 0.42	9696.41 129.34 9825.76 0.59 0.23	17989.65 10012.99 28002.65 1.67 0.65	12511.51 8774.73 21286.24 1.21 0.49	11954.85 317.36 12272.21 0.70 0.28	24466.36 9092.09 33558.45 1.91 0.77	28228.72 27372.30 55601.02 2.97 1.21	15883.03 447.66 16330.69 0.87 0.35	44111.76 27819.95 71931.71 3.84 1.56	49949.44 13039.46 62988.89 3.25 1.31	15731.60 837.42 16569.02 0.85 0.34	65681.04 13876.87 79557.91 4.10 1.65	38062.20 15200.48 53262.68	65.01 97.15 74.19
University of Johannesburg	Academic Support Total Exp per FTE stud Exp per TIU	13704.11 19232.21 32936.32 1.02 0.49	3680.24 0.00 3680.24 0.11 0.06	17384.35 19232.21 36616.56 1.14 0.55	20241.56 16754.66 36996.22 1.19 0.57	7180.91 0.00 7180.91 0.23 0.11	27422.47 16754.66 44177.14 1.42 0.68	15632.51 26375.23 42007.75 1.24 0.59	17617.17 0.00 17617.17 0.52 0.25	33249.68 26375.23 59624.92 1.76 0.83	10324.38 20862.95 31187.33 0.82 0.39	13975.12 0.00 13975.12 0.37 0.17	24299.49 20862.95 45162.45 1.19 0.56	25589.00 20806.26 46395.26	58.52 100.00 77.12
University of KwaZulu-Natal	Academic Support Total Exp per FTE stud Exp per TIU	7403.44 11735.82 19139.25 0.69 0.26	20123.04 384.22 20507.27 0.74 0.28	27526.48 12120.04 39646.52 1.43 0.55	32044.85 6794.44 38839.29 1.47 0.55	13843.35 526.65 14370.00 0.54 0.20	45888.19 7321.10 53209.29 2.01 0.76	16098.29 15148.16 31246.45 1.22 0.45	29612.94 1424.22 31037.16 1.21 0.45	45711.23 16572.38 62283.61 2.44 0.90	12992.36 8280.95 21273.31 0.79 0.30	19669.05 1135.44 20804.48 0.77 0.29	32661.40 9416.39 42077.79 1.56 0.59	37946.83 11357.00 49304.30	45.15 92.36 56.03
University of Limpopo	Academic Support Total Exp per FTE stud Exp per TIU	2741.70 10223.20 12964.90 0.98 0.38	0.00 0.00 0.00 0.00 0.00	2741.70 10223.20 12964.90 0.98 0.38	5109.86 134.47 5244.0 0.39 0.15	0.00 0.00 0 0.00 0.00	5109.86 134.47 5244.0 0.39 0.15	3039.87 1325.73 4366.0 0.33 0.12	0.00 0.00 0 0.00 0.00	3039.87 1325.73 4366.0 0.33 0.12	7952.00 2200.00 10152.00 0.74 0.26	0.00 0.00 0.00 0.00 0.00	7952.00 2200.00 10152.00 0.74 0.26	4710.86 3470.85 8181.71	100.00 100.00 100.00
Nelson Mandela Metr. Univ	Academic Support Total Exp per FTE stud Exp per TIU	5167.50 6004.70 11172.20 0.70 0.33	3745.30 621.40 4366.70 0.27 0.13	8912.80 6626.10 15538.90 0.97 0.46	7587.44 7074.55 14661.99 0.92 0.43	8538.25 165.41 8703.66 0.54 0.25	16125.69 7239.96 23365.65 1.46 0.68	7091.96 9240.52 16332.48 1.04 0.48	12188.37 12188.37 24376.74 1.55 0.71	19280.33 21428.89 40709.22 2.59 1.18	3222.79 5645.88 8868.67 0.51 0.24	5821.39 332.27 6153.66 0.35 0.16	9044.18 5978.15 15022.33 0.86 0.40	13340.75 10318.28 23659.03	43.23 67.76 53.93
North West University	Academic Support Total Exp per FTE stud Exp per TIU	40874.60 6475.30 47349.90 1.86 0.87	0.00 0.00 0.00 0.00 0.00	40874.60 6475.30 47349.90 1.86 0.87	46022.06 9093.98 55116.04 2.03 1.00	0.00 0.00 0.00 0.00 0.00	46022.06 9093.98 55116.04 2.03 1.00	28275.82 12110.26 40386.08 1.52 0.76	0.00 0.00 0.00 0.00 0.00	28275.82 12110.26 40386.08 1.52 0.76	31372.00 18366.00 49738.00 1.81 0.89	0.00 0.00 0.00 0.00 0.00	31372.00 18366.00 49738.00 1.81 0.89	36636.12 11511.39 48147.51	100.00 100.00 100.00
University of Pretoria	Academic Support Total Exp per FTE stud Exp per TIU	33418.25 15643.82 49062.07 1.52 0.57	26453.15 437.45 26890.61 0.83 0.31	59871.40 16081.27 75952.67 2.35 0.88	48153.88 30832.95 78986.83 2.43 0.90	26960.89 3318.82 30279.71 0.93 0.35	75114.77 34151.77 109266.54 3.36 1.25	41162.94 28009.17 69172.11 2.07 0.78	22294.23 221.76 22515.99 0.67 0.25	63457.17 28230.93 91688.10 2.74 1.04	38899.07 23239.83 61228.90 1.71 0.65	19681.46 615.01 20296.48 0.57 0.21	58580.53 22944.85 81525.38 2.28 0.86	64255.97 25352.20 89608.17	62.89 95.47 72.11
Rhodes University	Academic Support Total Exp per FTE stud Exp per TIU	20338.56 5186.40 25525 5.09 2.10	7253.87 421.43 7675 1.53 0.63	27592.43 5607.83 33200 6.62 2.73	8654.11 4386.84 13041 2.51 1.02	3440.24 353.70 3794 0.73 0.30	12094.35 4740.55 16835 3.24 1.31	4682.56 3765.91 8448 1.59 0.65	4114.90 365.33 4480 0.84 0.35	8797.46 4131.24 12929 2.43 1.00	3222.79 5645.88 8869 1.51 0.62	5821.39 332.27 6154 1.05 0.43	9044.18 5978.15 15022 2.55 1.04	14382.11 5114.44 19496.55	64.14 92.80 71.66
University of South Africa	Academic Support Total Exp per FTE stud Exp per TIU	7041.67 17733.30 24774.97 0.45 0.27	0.00 0.00 0.00 0.00 0.00	7041.67 17733.30 24774.97 0.45 0.27	10750.90 16965.83 27716.73 0.47 0.29	0.00 0.00 0.00 0.00 0.00	10750.90 16965.83 27716.73 0.47 0.29	12066.87 4352.76 16419.63 0.25 0.15	0.00 0.00 0.00 0.00 0.00	12066.87 4352.76 16419.63 0.25 0.15	44182.80 3044.00 47226.80 0.69 0.43	0.00 0.00 0.00 0.00 0.00	44182.80 3044.00 47226.80 0.69 0.43	18510.56 10523.97 29034.53	100.00 100.00 100.00
University of Stellenbosch	Academic Support Total Exp per FTE stud Exp per TIU	21966.10 1385.80 23351.90 1.31 0.45	35690.20 9514.70 45204.90 2.53 0.88	57656.30 10900.50 68556.80 3.84 1.33	20984.46 1538.67 22523.13 1.23 0.41	56448.84 22794.45 79243.29 4.32 1.46	77433.30 24333.12 101766.42 5.54 1.87	11972.23 2066.17 14038.40 0.72 0.24	56412.54 15245.36 71657.90 3.67 1.24	68384.77 17311.53 85696.30 4.39 1.48	9611.00 1153.00 10764.00 0.52 0.17	45498.00 13999.00 59097.00 2.86 0.96	55109.00 14752.00 69861.00 3.38 1.13	64645.84 16824.29 81470.13	24.96 9.13 21.69
Tshwane University of Tech	Academic Support Total Exp per FTE stud Exp per TIU	9176.84 1184.67 10361.51 0.30 0.15	8797.97 3.89 8801.86 0.25 0.12	17974.80 1188.56 19163.37 0.55 0.27	13687.40 2315.55 16002.96 0.38 0.18	1908.99 16.26 1925.25 0.05 0.02	15596.39 2331.81 17928.21 0.42 0.21	5026.66 1350.65 6377.31 0.16 0.08	5303.40 0.00 5303.40 0.14 0.07	10330.06 1350.65 11680.71 0.30 0.15	3165.00 0.26 3165.26 0.08 0.04	3165.02 0.00 3165.02 0.08 0.04	6330.02 0.26 6330.28 0.16 0.08	12557.82 1217.82 13775.64	61.83 99.59 65.16
University of Venda	Academic Support Total Exp per FTE stud Exp per TIU	1299.36 1602.89 2902.26 0.33 0.16	530.17 1258.65 1788.82 0.20 0.10	1829.54 2861.54 4691.08 0.53 0.26	5965.72 175.29 6141.01 0.61 0.30	1055.83 6534.79 7590.62 0.75 0.37	7021.55 6710.08 13731.63 1.36 0.67	1673.38 732.05 2405.43 0.12 0.25	8297.67 8116.90 16414.57 1.68 0.81	9971.05 8848.95 18820.00 1.92 0.93	653.14 1952.61 2605.75 0.26 0.13	18493.34 2768.88 21262.22 1.02 1.15	19146.49 4721.49 23867.98 2.41 1.15	9492.16 5785.52 15277.67	25.26 19.28 23.00
Vaal University of Techn	Academic Support Total Exp per FTE stud Exp per TIU	5703.32 0.00 5703.32 0.45 0.22	0.00 0.00 0.00 0.00 0.00	5703.32 0.00 5703.32 0.45 0.22	6906.72 0.00 6906.72 0.58 0.28	4511.87 0.00 4511.87 0.38 0.18	11418.59 0.00 11418.59 0.96 0.46	4395.03 0.00 4395.03 0.36 0.17	5436.97 0.00 5436.97 0.44 0.21	9832.00 0.00 9832.00 0.80 0.38	7831.68 0.00 7831.68 0.54 0.25	6487.75 0.00 6487.75 0.45 0.21	14319.43 0.00 14319.43 0.98 0.46	10318.33 0.00 10318.33	60.18 0.00 60.18

TABLE 3.4 (CONT)

Institution	Programme	2006			2007			2008			2009			Ave annual total expenditure (R'000 of 2009)	Concil funds as % of total expenditure) 2006-2009
		Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total	Council controlled funds (R'000)	Other funds (R'000)	Total		
Walter Sisulu Univ of Techn	Academic	1656.24	0.00	1656.24	4653.01	0.00	4653.01	5534.37	0.00	5534.37	9520.00	0.00	9520.00	5340.91	100.00
	Support	540.51	0.00	540.51	2469.08	0.00	2469.08	3723.06	0.00	3723.06	1919.00	0.00	1919.00	2162.91	100.00
	Total	2196.75	0.00	2196.75	7122.10	0.00	7122.10	9257.43	0.00	9257.43	11439.00	0.00	11439.00	7503.82	100.00
	Exp per FTE stud	0.11	0.00	0.11	0.34	0.00	0.34	0.42	0.00	0.42	0.54	0.00	0.54		
	Exp per TIU	0.06	0.00	0.06	0.18	0.00	0.18	0.23	0.00	0.23	0.29	0.00	0.29		
University of Western Cape	Academic	9716.34	7328.79	17045.13	4422.68	8112.57	12535.25	16589.57	12477.52	29067.09	16201.26	16716.11	32917.38	22891.21	51.25
	Support	17326.18	1462.38	18788.56	9982.35	1791.76	11774.11	10740.37	1573.56	12313.93	13084.51	1825.41	14909.92	14446.63	88.49
	Total	27042.52	8791.17	35833.68	14405.03	9904.33	24309.36	27329.93	14051.08	41381.01	29285.77	18541.53	47827.30	37337.84	65.66
	Exp per FTE stud	2.36	0.77	3.12	1.22	0.84	2.06	2.34	1.20	3.54	2.43	1.54	3.97		
	Exp per TIU	0.96	0.31	1.28	0.48	0.33	0.80	0.91	0.47	1.38	0.95	0.60	1.56		
University of Witwatersrand	Academic	21146.60	24954.63	46101.23	35356.80	38824.81	74181.62	33774.08	62843.96	96618.03	40890.17	37779.29	78669.46	73892.59	44.38
	Support	7985.74	9817.02	17802.75	4386.03	2926.92	7312.95	7778.85	7785.41	15564.26	13585.28	4051.54	17636.82	14579.20	57.85
	Total	29132.34	34771.65	63903.99	39742.84	41751.73	81494.57	41552.92	70629.37	112182.29	54475.45	41830.83	96306.28	88471.78	46.60
	Exp per FTE stud	1.61	1.92	3.53	2.16	2.27	4.43	2.21	3.76	5.97	2.56	1.97	4.53		
	Exp per TIU	0.52	0.63	1.15	0.71	0.75	1.46	0.71	1.20	1.91	0.86	0.66	1.53		
University of Zululand	Academic	306.75	0.00	306.75	423.43	0.00	423.43	982.70	285.12	1267.82	622.48	0.00	622.48	655.12	89.12
	Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Total	306.75	0.00	306.75	423.43	0.00	423.43	982.70	285.12	1267.82	622.48	0.00	622.48	655.12	89.12
	Exp per FTE stud	0.03	0.00	0.03	0.05	0.00	0.05	0.10	0.03	0.13	0.05	0.00	0.05		
	Exp per TIU	0.02	0.00	0.02	0.03	0.00	0.03	0.06	0.02	0.08	0.03	0.00	0.03		
Mangosuthu Univ of Techn	Academic	0.00	156.00	156.00	4427.99	142.80	4570.79	5865.74	0.00	5865.74	4406.00	0.00	4406.00	3749.63	98.01
	Support	109.20	0.00	109.20	2523.99	0.00	2523.99	2344.37	0.00	2344.37	1851.00	0.00	1851.00	1707.14	100.00
	Total	109.20	0.00	265.20	6951.98	142.80	7094.78	8210.11	0.00	8210.11	6257.00	0.00	6257.00	5456.77	98.63
	Exp per FTE stud	0.01	0.00	0.04	1.02	0.02	1.05	1.20	0.00	1.20	0.85	0.00	0.85		
	Exp per TIU	0.01	0.00	0.02	0.51	0.01	0.52	0.60	0.00	0.60	0.43	0.00	0.43		
TOTAL <sup>1)</sup>	Academic	219161.23	149986.68	369147.91	294736.26	182950.38	477686.64	250540.28	254424.19	504964.47	309332.93	209452.53	518785.46	467646.12	57.40
	Support	135677.23	24050.48	159727.71	134129.49	38746.12	172875.61	164876.59	47368.56	212245.15	135976.42	25497.23	161473.65	176580.53	80.79
	Total	354838.46	173881.16	528719.62	428865.75	221696.51	650562.25	415416.87	301792.75	717209.62	445309.35	234949.76	680259.11	644226.65	63.81
	Exp per FTE stud	0.82	0.40	1.22	0.96	0.50	1.45	0.90	0.65	1.56	0.91	0.48	1.39		
	Exp per TIU	0.37	0.18	0.55	0.43	0.22	0.65	0.41	0.29	0.70	0.41	0.21	0.62		

FIGURE 3.2: ALL INSTITUTIONS (EXCLUDING CPUT, UCT AND DUT) - TOTAL REAL EXP. ON EQUIPMENT PER FTE STUDENT AND PER TIU, AS WELL AS EQUIPMENT EXP. AS % OF E&amp;G EXP ACCORDING TO YEAR





**TABLE 3.5: EXPENDITURE ON EQUIPMENT FOR TEACHING AND RESEARCH AS PERCENTAGE OF TOTAL EXPENDITURE ON EDUCATIONAL AND GENERAL PROGRAMMES ACCORDING TO INSTITUTION AND YEAR**

Institution	2006	2007	2008	2009	Average annual percentage
Cape Peninsula University of Technology					
University of Cape Town					
Central University of Technology, Free State	2.52	1.95	3.08	1.83	2.34
Durban Institute of Technology					
University of Fort Hare	1.02	1.91	1.36	2.89	1.79
University of the Free State	2.90	3.25	6.26	6.59	4.75
University of Johannesburg	2.10	2.63	3.50	2.42	2.66
University of KwaZulu-Natal	1.62	2.31	2.55	1.66	2.04
University of Limpopo	1.34	0.52	0.52	1.21	0.90
Nelson Mandela Metropolitan University	1.61	1.96	4.15	1.60	2.33
North West University	3.30	3.73	2.55	2.99	3.14
University of Pretoria	2.98	4.16	3.40	2.66	3.30
Rhodes University	7.12	3.70	2.76	2.95	4.13
University of South Africa	0.89	0.90	0.55	1.47	0.95
University of Stellenbosch	3.69	5.38	4.32	3.13	4.13
Tshwane University of Technology	1.05	1.07	0.73	0.36	0.81
University of Venda	1.33	3.86	4.11	6.02	3.83
Vaal University of Technology	1.35	2.92	2.42	2.99	2.42
Walter Sisulu University for Technology	0.27	0.91	1.00	1.13	0.83
University of Western Cape	5.24	3.33	5.52	5.95	5.01
University of Witwatersrand	2.33	2.91	3.87	2.99	3.02
University of Zululand	0.07	0.10	0.27	0.13	0.14
Mangosuthu Technikon	0.16	2.39	3.49	2.14	2.05
<b>Total<sup>1)</sup></b>	<b>2.38</b>	<b>2.69</b>	<b>2.98</b>	<b>2.50</b>	<b>2.64</b>

1) Excluding CPUT, UCT and DUT

Table 3.7 shows similar information to that in Table 3.6 but refers to the replacement costs of centrally managed equipment. Most of the equipment included by the HEIs in Section C relates to the provision of audiovisual equipment in centralised class rooms, to computer equipment for students' use in computer laboratories and to sophisticated laboratory equipment for research purposes used by more than one academic department, school or faculty. The table clearly shows that HEIs differ in their approaches towards the centralisation of the management of these types of equipment items. The last column shows that although 18.35% of all equipment reported by the 20 HEIs included in both Sections B and C was centrally managed in 2009, the individual HEIs' percentages range from a very small 0.79% in the case of UP to an understandably very high percentage of 82.67% in the case of UNISA. Furthermore, the average condition of the centrally managed equipment was 1.58 on the 3-point condition scale, while 16.32% of all centrally managed equipment was of condition 3, namely outdated but still in use.

**TABLE 3.6: SUMMARY OF SECTION B INVENTORY DATA ON ALL EQUIPMENT USED FOR TEACHING AND RESEARCH IN 2009 ACCORDING TO CESM CATEGORY, LEVEL OF INSTRUCTION/RESEARCH AND INSTITUTION**

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University of Fort Hare																				
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources	281.61	30.60	312.22	7.13	47.86	25.00	4301	1983	958	172	7413	1.77	15.272	64.787	134.267	3.604	23.745	85	1.15
2	Architecture & Environmental Design																			
3	Arts, Visual and Performing	39.01	7.27	46.28	7.00	1.67	8.00	1760	2943	1796	12	6511	2.28	45.127	404.703	256.533	7.057	140.690	330	5.07
4	Business, Commerce & Mangement Sciences	1852.85	193.43	2046.27	53.24	159.18	55.00	707	362	118	322	1509	1.43	0.382	1.870	2.208	2.026	0.737	66	4.39
5	Communication	206.17	38.76	244.93	1.50	17.13	4.00	144	36	3	29	212	1.00	0.698	0.929	1.718	1.718	0.866		
6	Computer Science and Data Processing	182.72	22.61	205.34	4.09	4.48	12.00	654	773	434	29	1890	1.35	3.579	34.185	106.170	6.537	9.204	20	1.06
7	Education	789.35	96.89	886.24	12.03	15.00	63.00	882	184	217	287	1570	1.62	1.117	1.901	18.017	19.156	1.772	69	4.38
8	Engineering & Engineering Technology																			
9	Health Care & Health Sciences	153.13	39.75	192.88	11.34	11.90	39.00	1382	284	155	160	1981	2.20	9.026	7.152	13.643	13.423	10.271	74	3.73
10	Home Economics																			
11	Industrial Arts, Trades & Technology																			
12	Languages, Linguistics & Literature	270.37	19.26	289.63	17.02	7.63	23.00	2000	0	127	57	2184	2.83	7.397	0.000	7.438	7.521	7.541	200	9.16
13	Law	822.95	17.65	840.60	17.82	33.58	39.00	0	50	108	204	362	1.27	0.000	2.805	6.071	6.071	0.430	5	1.37
14	Libraries and Museums	113.15	13.08	126.23	2.01	28.22	48.00	606	471	27	377	1482	1.07	5.352	36.041	13.664	13.365	11.737		
15	Life Sciences and Physical Sciences	555.56	97.97	653.53	44.75	81.66	75.00	4814	6061	2786	364	14025	1.60	8.665	61.866	62.267	4.458	21.461	1954	13.93
16	Mathematical Sciences	289.08	8.37	297.45	11.85	17.44	24.00	38	220	74	118	450	1.37	0.133	26.240	6.223	6.783	1.513	8	1.87
17	Military Sciences																			
18	Philosophy, Religion and Theology	64.90	22.49	87.39	5.00	4.12	9.00	0	0	44	28	72	1.00	0.000	0.000	8.731	6.871	0.824		
19	Physical Education, Health Education & Leisure	9.50	0.00	9.50	3.00	1.58	6.00	315	82	37	17	450	1.22	33.115		12.478	10.478	47.395	3	0.72
20	Psychology	357.17	26.17	383.33	8.98	31.47	28.00	0	14	32	100	146	1.25	0.000	0.550	3.565	3.164	0.381	2	1.23
21	Public Administration and Social Services	170.87	44.01	214.87	4.00	9.47	4.00	0	0	10	22	32	1.00	0.000	0.000	2.376	2.376	0.149		
22	Social Sciences & Social Studies	1323.20	94.20	1417.40	32.53	114.79	127.00	438	46	85	951	1520	1.26	0.331	0.490	2.617	8.282	1.072		
TOTAL		7481.57	772.51	8254.07	243.28	587.17	589	18041	13509	7009	3251	41809	1.77	2.411	17.487	28.810	5.536	5.065	2817	6.74

University of Free State																				
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources	502.54	265.12	767.66	56	22.9	141	4746	8704	7088	320	20858	1.68	9.444	32.830	126.569	13.967	27.171	4698	22.52
2	Architecture & Environmental Design	385.156	145.492	530.648	21.1	11.26	51	16	8	313	142	479	1.00	0.041	0.055	14.812	12.636	0.902		
3	Arts, Visual and Performing	229.473	42.668	272.141	20.76	9.01	54	4310	3353	3922	131	11716	1.13	18.783	78.572	188.928	14.592	43.052	516	4.40
4	Business, Commerce & Mangement Sciences	2285.336	556.744	2842.08	66	12	73.5	443	721	500	97	1762	1.04	0.194	1.296	7.574	8.110	0.620	2	0.13
5	Communication	599.517	39.628	639.145	7.03	0.03	22	0	0	175	1	176	1.00	0.000	0.000	24.929	24.929	0.275		
6	Computer Science and Data Processing	425.482	30.583	456.065	10	1	28	1315	145	391	20	1872	1.00	3.091	4.751	39.114	20.364	4.105		
7	Education	1583.015	1302.48	2885.495	59	55.46	172.5	750	11	711	669	2141	1.28	0.474	0.008	12.057	12.057	0.742	440	20.55
8	Engineering & Engineering Technology																			
9	Health Care & Health Sciences	1230.175	224.698	1454.873	168.51	47	325.5	3298	7267	3607	519	14692	1.09	2.681	32.343	21.405	11.042	10.098	224	1.52
10	Home Economics	84.825	6.268	91.093	4	2.63	8	639	11	39	25	714	1.00	7.536	1.755	9.653	9.653	7.841		
11	Industrial Arts, Trades & Technology																			
12	Languages, Linguistics & Literature	1268.175	136.115	1404.29	47.37	16.69	96.5	67	37	583	205	892	1.00	0.053	0.272	12.313	12.291	0.635		
13	Law	1060.042	507.28	1567.322	34.03	15.63	73	87	119	444	184	833	1.00	0.082	0.234	13.037	11.760	0.531		
14	Libraries and Museums																			
15	Life Sciences and Physical Sciences	1281.869	336.985	1618.854	95	46.64	383	5773	199879	32695	1011	239357	1.32	4.503	593.140	344.158	21.668	147.856	45530	19.02
16	Mathematical Sciences	955.581	56.444	1012.025	24	2	40.5	0	0	299	25	324	1.00	0.000	0.000	12.462	12.462	0.320		
17	Military Sciences																			
18	Philosophy, Religion and Theology	118.187	83.192	201.379	11	0.75	3.75	0	0	23	7	30	1.00	0.000	0.000	2.132	8.727	0.149		
19	Physical Education, Health Education & Leisure	252.765	48.764	301.529	8	2	22	932	1464	655	35	3086	1.04	3.688	30.028	81.828	17.600	10.236		
20	Psychology	1809.891	157.385	1967.276	31.03	9.63	63.5	336	21	420	107	883	1.00	0.185	0.136	13.531	11.075	0.449		
21	Public Administration and Social Services	575.022	173.141	748.163	37.18	16	38	636	24	216	89	964	1.09	1.106	0.136	5.797	5.544	1.288	1	0.07
22	Social Sciences & Social Studies	2097.43	196.219	2293.649	66.66	14.07	106	553	363	1095	159	2169	1.00	0.263	1.848	16.434	11.272	0.946		
TOTAL		16744.48	4309.21	21053.69	766.67	284.70	1702	23901	222127	53176	3745	302949	1.32	1.427	51.547	69.359	13.155	14.389	51411	16.97

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University of Kwazulu-Natal																					
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost	
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud			
1	Agriculture & Renewable Natural resources	202.50	63.10	265.60	34.16	68.81	92.00	1232	5246	2844	431	9753	1.00	6.084	83.144	83.255	6.264	36.721			
2	Architecture & Environmental Design	463.16	112.67	575.83	37.01	22.09	96.00	1637	1794	1493	281	5205	1.00	3.535	15.924	40.346	12.721	9.040			
3	Arts, Visual and Performing	934.37	46.31	980.67	59.47	16.59	9.00	536	722	498	16	1772	1.01	0.573	15.600	8.369	0.947	1.807			
4	Business, Commerce & Mangement Sciences	3578.57	792.57	4371.14	92.29	95.18	162.00	2395	3218	2090	916	8619	1.01	0.669	4.060	22.646	9.624	1.972	11	0.13	
5	Communication																				
6	Computer Science and Data Processing	763.46	22.83	786.29	39.91	20.99	288.00	3505	2228	2776	845	9354	1.00	4.591	97.559	69.569	40.251	11.897			
7	Education	3651.13	439.84	4090.97	147.50	68.21	217.00	1547	1430	4219	578	7775	1.04	0.424	3.250	28.605	8.480	1.900	131	1.69	
8	Engineering & Engineering Technology	657.53	310.28	967.81	74.09	89.61	299.00	9422	6548	8641	1586	26196	1.04	14.330	21.102	116.623	17.695	27.068	270	1.03	
9	Health Care & Health Sciences	1546.79	1069.99	2616.78	290.59	315.90	201.00	18350	32820	24228	1137	76535	1.01	11.863	30.673	83.375	3.599	29.248	67	0.09	
10	Home Economics																				
11	Industrial Arts, Trades & Technology																				
12	Languages, Linguistics & Literature	835.55	44.42	879.97	81.57	21.32	49.00	4185	7914	4972	77	17148	1.00	5.009	178.178	60.947	3.622	19.487			
13	Law	1333.41	359.67	1693.08	70.78	35.94	8.00	384	924	434	17	1759	1.00	0.288	2.569	6.132	0.464	1.039			
14	Libraries and Museums																				
15	Life Sciences and Physical Sciences	1934.73	141.58	2076.31	171.01	165.22	291.00	16111	53450	13788	1030	84379	1.01	8.327	377.522	80.628	6.234	40.639	179	0.21	
16	Mathematical Sciences	1552.84	24.65	1577.49	68.27	9.58	56.00	548	1051	1074	55	2728	1.01	0.353	42.650	15.736	5.724	1.729	18	0.65	
17	Military Sciences																				
18	Philosophy, Religion and Theology	410.50	59.59	470.09	46.27	16.86	17.00	197	386	452	9	1043	1.03	0.479	6.483	9.759	0.518	2.219	14	1.35	
19	Physical Education, Health Education & Leisure	516.92	19.82	536.75	23.67	7.22	55.00	597	869	923	103	2493	1.00	1.156	43.842	39.002	14.243	4.644			
20	Psychology	969.23	71.84	1041.08	44.11	25.85	63.00	280	549	946	186	1962	1.00	0.289	7.647	21.444	7.204	1.884			
21	Public Administration and Social Services	491.83	101.24	593.07	26.54	8.71	23.00	393	673	453	47	1566	1.02	0.799	6.647	17.053	5.429	2.640			
22	Social Sciences & Social Studies	2849.28	252.82	3102.10	163.59	101.77	268.00	1581	3449	4236	790	10056	1.01	0.555	13.642	25.894	7.763	3.242	10	0.10	
TOTAL		22691.80	3933.21	26625.01	1470.83	1089.84	2194	62901	123271	74067	8104	268343	1.01	2.772	31.341	50.357	7.436	10.079	700	0.26	

University of Limpopo																					
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost	
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud			
1	Agriculture & Renewable Natural resources	336.16	198.96	535.12	20	19	23	235	470	332	87	1124	2.43	0.699	2.362	16.585	4.592	2.100	795	70.72	
2	Architecture & Environmental Design																				
3	Arts, Visual and Performing																				
4	Business, Commerce & Mangement Sciences	1484.61	388.36	1872.97	44.13	13.63	48	0	0	289	95	384	1.00	0.000	0.000	6.540	6.999	0.205			
5	Communication	461.95	27.23	489.18	9.93	4.11	15	0	0	85	35	120	1.00	0.000	0.000	8.547	8.547	0.245			
6	Computer Science and Data Processing	338.08	31.08	369.16	6.13	6	10	184	37	40	40	301	2.23	0.546	1.176	6.595	6.595	0.815	164	54.49	
7	Education	935.12	191.86	1126.98	37.06	12.32	44	12	12	265	87	377	1.07	0.013	0.064	7.164	7.022	0.334			
8	Engineering & Engineering Technology																				
9	Health Care & Health Sciences	2410.25	403.45	2813.70	587.13	239.75	393	20092	13820	11897	806	46615	2.04	8.336	34.255	20.263	3.362	16.567			
10	Home Economics																				
11	Industrial Arts, Trades & Technology																				
12	Languages, Linguistics & Literature	512.61	104.52	617.13	19.93	7.22	28	0	0	163	61	224	1.00	0.000	0.000	8.190	8.417	0.363			
13	Law	1309.86	41.65	1351.51	29	6.24	19	0	0	125	27	152	1.00	0.000	0.000	4.326	4.253	0.112			
14	Libraries and Museums																				
15	Life Sciences and Physical Sciences	1639.24	109.3	1748.54	126.7	73	163	11341	12562	6820	353	31076	2.25	6.919	114.934	53.827	4.829	17.773	17444	56.13	
16	Mathematical Sciences	876.58	44.36	920.94	21.43	4	37	99	176	262	46	583	1.61	0.113	3.977	12.213	11.518	0.633	90	15.44	
17	Military Sciences																				
18	Philosophy, Religion and Theology																				
19	Physical Education, Health Education & Leisure																				
20	Psychology	268.05	34.52	302.57	8.93	5.22	8	0	0	40	24	64	1.00	0.000	0.000	4.523	4.523	0.212			
21	Public Administration and Social Services	605.29	259.56	864.85	10.53	7.53	11	0	0	52	36	88	1.00	0.000	0.000	4.974	4.731	0.102			
22	Social Sciences & Social Studies	1070.09	107.76	1177.85	28.13	10.47	26	20	30	151	57	257	1.19	0.018	0.275	5.357	5.474	0.219	27	10.48	
TOTAL		12247.89	1942.61	14190.50	949.03	408.49	825	31984	27107	20522	1752	81365	2.10	2.611	13.954	21.624	4.290	5.734	18520	22.76	

Nelson Mandela Metropolitan University																					
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost	
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud			
	1 Agriculture & Renewable Natural resources	504.33	72.7	577.03	28.77	15.84	70.73	1003	782	416	150	2351	1.00	1.989	10.752	14.470	9.441	4.074			
	2 Architecture & Environmental Design	864.08	181.16	1045.24	30.63979379	9.10068841	59.58	688	526	367	110	1690	1.16	0.796	2.903	11.974	12.062	1.617	19	1.14	
	3 Arts, Visual and Performing	540.36	75.94	616.3	32.91	8.19	53.8	985	1427	811	86	3309	1.00	1.824	18.796	24.637	10.471	5.370	0.3	0.01	
	4 Business, Commerce & Mangement Sciences	4092.18	562.95	4655.13	96.34	80.74	256.74	1609	2626	2381	833	7448	1.00	0.393	4.664	24.710	10.314	1.600			
	5 Communication	175.7	16.4	192.1	10.92	1.82	17	17	87	134	19	257	1.00	0.098	5.287	12.259	10.675	1.339			
	6 Computer Science and Data Processing	1119.65	73.55	1193.2	62.96	39.54	146.46	1754	1569	774	446	4543	1.00	1.567	21.337	12.287	11.279	3.808			
	7 Education	2540.7	425.1	2965.8	57	42	137	88	0	631	465	1184	1.00	0.034	0.000	11.071	11.071	0.399			
	8 Engineering & Engineering Technology	855.34	159.58	1014.92	38.34	38.86	113.14	5420	7745	6503	450	20118	1.00	6.337	48.534	169.619	11.575	19.822			
	9 Health Care & Health Sciences	561.48	177.2	738.68	34.09	16.83	69.55	1545	1802	606	182	4136	1.00	2.751	10.169	17.791	10.838	5.599			
	10 Home Economics	52.84	9.28	62.12	3.3	0.83	5.5	100	145	83	9	337	1.00	1.893	15.666	25.130	10.654	5.428			
	11 Industrial Arts, Trades & Technology	75.11	13.02	88.13	4.4	1.1	7.2	132	191	109	12	444	1.00	1.753	14.704	24.768	10.473	5.034			
	12 Languages, Linguistics & Literature	490.22	87.7	577.92	27.51	5.59	45.24	240	200	339	62	841	1.00	0.489	2.275	12.335	11.164	1.455			
	13 Law	910.18	212.86	1123.04	29	24.55	82.33	219	58	360	299	936	1.00	0.241	0.273	12.409	12.170	0.833			
	14 Libraries and Museums																				
	15 Life Sciences and Physical Sciences	352.93	119.88	472.81	41.85	54.95	111.97	2750	4049	436	502	7737	1.00	7.793	33.774	10.418	9.131	16.364			
	16 Mathematical Sciences	400.1	22.31	422.41	30.82	23.08	69.62	1702	3057	1449	238	6446	1.00	4.254	137.017	47.029	10.316	15.261			
	17 Military Sciences																				
	18 Philosophy, Religion and Theology																				
	19 Physical Education, Health Education & Leisure	115.5	29.3	144.8	5.12	4.26	12.51	91	488	101	45	726	1.04	0.786	16.669	19.703	10.670	5.011			
	20 Psychology	252.38	80.72	333.1	10.71	4.35	20.94	125	189	166	48	528	1.00	0.496	2.338	15.485	11.114	1.586			
	21 Public Administration and Social Services	544.11	127.61	671.72	19.51	9.25	37.08	14	34	221	95	365	1.00	0.026	0.267	11.342	10.320	0.543			
	22 Social Sciences & Social Studies	1085.37	315.09	1400.46	35.76	19.38	81.97	94	70	443	224	831	1.00	0.087	0.222	12.395	11.548	0.594			
	TOTAL	15532.56	2762.35	18294.91	599.95	400.26	1398	18577	25045	16330	4275	64227	1.01	1.196	9.067	27.220	10.680	3.511	20	0.03	



Rhodes University																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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University of South Africa																					
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost	
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud			
	1 Agriculture & Renewable Natural resources	255.42	47.33	302.75	22.22	2.00	32.00	306	136	182	20	644	1.24	1.199	2.865	8.185	10.045	2.126			
	2 Architecture & Environmental Design																				
	3 Arts, Visual and Performing	97.70	12.95	110.66	21.15	4.70	25.00	768	689	242	36	1735	1.44	7.865	53.153	11.444	7.736	15.683			
	4 Business, Commerce & Mangement Sciences	19705.79	2895.93	22601.72	315.16	96.38	405.00	67	2408	3264	711	6450	1.41	0.003	0.832	10.356	7.375	0.285	380	5.89	
	5 Communication	1358.91	41.15	1400.06	35.40	4.77	45.00	0	0	0	43	43	0.00	0.000	0.000	0.000	8.961	0.031			
	6 Computer Science and Data Processing	2727.52	116.80	2844.32	47.36	6.65	65.00	170	85	484	64	803	1.47	0.062	0.727	10.226	9.628	0.282			
	7 Education	9616.76	1771.31	11388.07	118.86	27.82	162.00	314	195	1134	213	1856	1.13	0.033	0.110	9.537	7.664	0.163			
	8 Engineering & Engineering Technology	552.14	195.31	747.45	27.89	5.83	45.00	703	1027	1014	20	2764	1.19	1.274	5.259	36.359	3.390	3.698			
	9 Health Care & Health Sciences	889.49	115.83	1005.32	25.85	8.00	27.00	0	0	0	51	51	0.00	0.000	0.000	0.000	6.382	0.051			
	10 Home Economics																				
	11 Industrial Arts, Trades & Technology																				
	12 Languages, Linguistics & Literature	2996.49	122.42	3118.91	140.63	33.06	160.00	16	8	3	254	281	3.00	0.005	0.067	0.019	7.679	0.090	27	9.71	
	13 Law	7139.37	834.63	7974.00	178.01	34.52	244.00	0	0	0	299	299	0.00	0.000	0.000	0.000	8.657	0.037			
	14 Libraries and Museums	280.98	73.92	354.90	17.77	2.90	22.00	0	0	199	25	224	1.00	0.000	0.000	11.200	8.514	0.630			
	15 Life Sciences and Physical Sciences	608.34	26.08	634.43	42.15	10.15	63.00	1703	7061	37631	95	46491	1.75	2.800	270.709	892.877	9.350	73.280	2947	6.34	
	16 Mathematical Sciences	1927.58	41.96	1969.55	63.16	12.06	82.00	293	30	590	92	1005	1.59	0.152	0.712	9.339	7.663	0.510	134	13.34	
	17 Military Sciences																				
	18 Philosophy, Religion and Theology	463.93	132.69	596.62	79.88	15.23	102.00	0	0	0	128	128	0.00	0.000	0.000	0.000	8.433	0.215			
	19 Physical Education, Health Education & Leisure																				
	20 Psychology	2681.43	707.77	3389.19	74.50	26.32	91.00	34	34	0	197	264	2.00	0.013	0.048	0.000	7.475	0.078	0	0.00	
	21 Public Administration and Social Services	3415.12	732.26	4147.38	98.61	12.26	153.00	2	26	1069	174	1271	1.07	0.001	0.035	10.837	14.198	0.306	47	3.68	
	22 Social Sciences & Social Studies	5441.27	406.97	5848.24	155.02	24.20	186.00	71	67	1165	200	1504	1.16	0.013	0.166	7.515	8.283	0.257	66	4.40	
	TOTAL	60158.25	8275.31	68433.56	1463.63	326.85	1909	4449	11766	46976	2622	65813	1.46	0.074	1.422	32.096	8.024	0.962	3601	5.47	

Stellenbosch University																				
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
	1 Agriculture & Renewable Natural resources	195.06	280.56	475.62	76.68	81.03	311	3242	32871	22049	1026	59188	1.46	16.619	117.162	287.546	12.668	124.444	4313	7.28707609
	2 Architecture & Environmental Design																			
	3 Arts, Visual and Performing	398.3	158.61	556.91	42.08	12.21	106	3443	3906	2602	162	10114	2.15	8.645	24.627	61.836	13.301	18.161	4884	48.29
	4 Business, Commerce & Mangement Sciences	3456.31	809.49	4265.8	122	101.41	292	113	722	1613	870	3318	1.23	0.033	0.892	13.217	8.580	0.778	328	9.89
	5 Communication	39.77	29.59	69.36	4.35	2.03	21	4	26	120	55	204	1.15	0.089	0.867	27.595	27.221	2.948	46	22.38
	6 Computer Science and Data Processing	282.26	23.39	305.65	10.84	3.21	22.4	53	148	149	41	392	1.29	0.189	6.343	13.741	12.713	1.281		
	7 Education	708.14	533.97	1242.11	35.09	34.72	99	356	957	481	317	2110	1.45	0.502	1.792	13.698	9.116	1.698	259	12.27
	8 Engineering & Engineering Technology	851.78	535.36	1387.14	92.75	125.34	367	18241	60994	22691	1650	103576	2.04	21.415	113.931	244.642	13.168	74.669	37651	36.35
	9 Health Care & Health Sciences	1426.59	1066.84	2493.43	202.55	490.83	634	7466	44501	34109	3090	89165	1.72	5.233	41.712	168.396	6.295	35.760	15968	17.91
	10 Home Economics																			
	11 Industrial Arts, Trades & Technology	279.63	79.73	359.36	17.57	3.71	19	271	317	219	27	834	1.45	0.969	3.976	12.450	7.304	2.320	97	11.60
	12 Languages, Linguistics & Literature	907.4	264.37	1171.77	64.9	16.95	147	235	573	1009	285	2103	1.23	0.259	2.168	15.552	16.820	1.795	57	2.70
	13 Law	813.29	296.27	1109.56	37.06	36.44	53	169	259	248	188	864	1.04	0.208	0.875	6.685	5.159	0.779		
	14 Libraries and Museums																			
	15 Life Sciences and Physical Sciences	1724.94	312.21	2037.15	137.29	127.26	460	40543	89338	21522	1692	153095	1.89	23.504	286.146	156.763	13.299	75.151	35665	23.30
	16 Mathematical Sciences	1137.49	92.99	1230.48	53.97	16.59	93.6	351	1717	1104	157	3329	1.42	0.308	18.466	20.450	9.485	2.705	207	6.22
	17 Military Sciences																			
	18 Philosophy, Religion and Theology	349.08	248.93	598.01	35.66	21.73	63	203	203	314	190	911	1.18	0.582	0.817	8.807	8.742	1.523	67	7.36
	19 Physical Education, Health Education & Leisure	226.86	56.08	282.94	10.5	2	15	601	7237	101	19	7958	1.94	2.651	129.041	9.600	9.600	28.126	2772	34.84
	20 Psychology	534.3	70.35	604.65	24.23	22.34	26	116	109	151	100	475	1.68	0.216	1.549	6.241	4.466	0.786	70	14.63
	21 Public Administration and Social Services	155.11	239	394.11	18.23	9.49	26	43	343	383	60	829	1.75	0.276	1.437	20.992	6.282	2.102	288	34.75
	22 Social Sciences & Social Studies	1441.78	263.64	1705.42	71.64	42.24	176	558	473	978	519	2528	1.19	0.387	1.795	13.648	12.291	1.483	106	4.18
	TOTAL	14928.09	5361.38	20289.47	1057.39	1149.53	2931	76007	244695	109841	10449	440992	1.82	5.092	45.640	103.879	9.090	21.735	102777	23.31

Tshwane University of Technology																				
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
	1 Agriculture & Renewable Natural resources	1013.73	107.88	1121.61	44.97	35.44	81	2344	1159	932	291	4726	1.21	2.312	10.743	20.723	8.219	4.213	77	1.63
	2 Architecture & Environmental Design	814.08	282.02	1096.1	49.07	18.67	67	993	1492	826	149	3460	1.64	1.220	5.289	16.824	7.998	3.156	861	
	3 Arts, Visual and Performing	813.83	121.61	935.44	93.33	67.63	68	3666	2073	343	211	6294	1.73	4.505	17.049	3.677	3.124	6.728	1858	29.52
	4 Business, Commerce & Mangement Sciences	10036.85	856.29	10893.14	201.43	94.63	337	7830	1889	2915	818	13452	1.55	0.780	2.206	14.470	8.643	1.235	2646	19.67
	5 Communication	493.98	84.98	578.96	17.68	4.74	35	1432	227	1370	55	3084	1.38	2.898	2.669	77.496	11.607	5.326	120	3.89
	6 Computer Science and Data Processing	4019.6	422.86	4442.46	118.58	42.84	156	25996	5961	1564	331	33852	1.59	6.467	14.097	13.186	7.731	7.620	6656	19.66
	7 Education	1549.31	553.28	2102.59	40.9	20.81	54	1431	375	286	146	2238	1.20	0.924	0.678	7.000	7.000	1.064		
	8 Engineering & Engineering Technology	2837.58	806.69	3644.27	112.8	113.78	200	17607	5914	4275	816	28613	1.39	6.205	7.331	37.900	7.175	7.851	1933	6.76
	9 Health Care & Health Sciences	935.43	417.65	1353.08	109.84	50.42	128	17254	11774	3165	281	32473	1.45	18.445	28.190	28.813	5.574	24.000	5657	17.42
	10 Home Economics	157	29.1	186.1	10.09	4.02	26	129	309	189	59	686	2.15	0.824	10.613	18.686	14.741	3.686	382	55.69
	11 Industrial Arts, Trades & Technology																			
	12 Languages, Linguistics & Literature	1873.97	21.1	1895.07	27.52	2.64	66	2087	287	625	46	3046	1.51	1.114	13.597	22.719	17.507	1.607	666	21.87
	13 Law	2096.55	0	2096.55	17.77	2.5	31	131	188	279	31	629	1.00	0.062		15.713	12.235	0.300		
	14 Libraries and Museums																			
	15 Life Sciences and Physical Sciences	1152.92	110.34	1263.26	52.89	17.74	115	4206	8403	5778	227	18614	1.29	3.648	76.155	109.255	12.777	14.735	3210	17.25
	16 Mathematical Sciences	1686.9	90.72	1777.62	29.12	9.56	75	1773	142	527	151	2593	1.18	1.051	1.562	18.111	15.817	1.459	450	17.35
	17 Military Sciences																			
	18 Philosophy, Religion and Theology																			
	19 Physical Education, Health Education & Leisure																			
	20 Psychology																			
	21 Public Administration and Social Services	4508.93	291.62	4800.55	57.34	13.03	66	435	873	593	103	2004	1.15	0.096	2.994	10.343	7.871	0.417		
	22 Social Sciences & Social Studies	1781.7	70.03	1851.73	32.23	10.52	47	1757	0	468	81	2306	1.76	0.986	0.000	14.524	7.689	1.245		
	TOTAL	35772.36	4266.17	40038.53	1015.56	508.97	1552	89071	41066	24135	3796	158069	1.46	2.490	9.626	23.765	7.459	3.948	24515	15.51





Walter Sisulu University																					
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost	
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud			
	1 Agriculture & Renewable Natural resources																				
	2 Architecture & Environmental Design	295.85	0.00	295.85	9.57	0.45	10.00	0	0	76	4	80	1.00	0.00		7.98	7.98	0.27			
	3 Arts, Visual and Performing	230.51	0.92	231.43	9.51	0.45	9.00	0	0	69	3	72	1.00	0.000	0.000	7.228	7.228	0.311			
	4 Business, Commerce & Mangement Sciences	5159.91	1.00	5160.91	102.41	4.86	107.00	3017	192	0	0	3210	1.74	0.585	192.190	0.000	0.000	0.622	1	0.04	
	5 Communication	626.63	4.95	631.58	21.53	1.02	22.00	0	0	168	8	176	1.00	0.000	0.000	7.804	7.804	0.279			
	6 Computer Science and Data Processing	1727.31	5.63	1732.93	40.50	1.92	42.00	0	0	321	15	336	1.00	0.000	0.000	7.921	7.921	0.194			
	7 Education	3016.36	1328.59	4344.95	52.98	2.51	55.00	652	1305	416	0	2374	2.00	0.216	0.982	7.862	0.000	0.546	3	0.14	
	8 Engineering & Engineering Technology	851.27	0.00	851.27	45.99	2.18	48.00	8113	5256	160	0	13528	1.53	9.530		3.476	0.000	15.892	14	0.11	
	9 Health Care & Health Sciences	1008.07	77.16	1085.23	69.10	3.28	72.00	1416	1596	1268	0	4279	1.74	1.404	20.679	18.348	0.000	3.943	7	0.16	
	10 Home Economics	261.32	0.00	261.32	20.25	0.96	21.00	0	0	160	8	168	1.00	0.000		7.919	7.919	0.643			
	11 Industrial Arts, Trades & Technology	3.75	0.00	3.75	0.70	0.03	0.00	0	0	0	0	0	1.00	0.000		0.000	0.000	0.000			
	12 Languages, Linguistics & Literature	592.13	8.23	600.36	23.08	1.09	24.00	0	0	183	9	192	1.00	0.000	0.000	7.942	7.942	0.320			
	13 Law	1570.49	0.00	1570.49	25.97	1.23	27.00	0	0	206	10	216	1.00	0.000		7.942	7.942	0.138			
	14 Libraries and Museums	1.55	8.09	9.64	2.40	0.11	2.00	0	0	15	1	16	1.00	0.000	0.000	6.365	6.365	1.660			
	15 Life Sciences and Physical Sciences	539.86	32.51	572.37	41.54	1.97	43.00	0	0	328	16	344	1.00	0.000	0.000	7.906	7.906	0.601			
	16 Mathematical Sciences	470.56	4.64	475.20	25.00	1.19	26.00	0	0	199	9	208	1.00	0.000	0.000	7.944	7.944	0.438			
	17 Military Sciences											0									
	18 Philosophy, Religion and Theology	23.95	1.20	25.15	2.60	0.12	2.00	0	0	15	1	16	1.00	0.000	0.000	5.875	5.875	0.636			
	19 Physical Education, Health Education & Leisure	19.00	0.00	19.00	0.75	0.04	0.00	0	0	0	0	0		0.000		0.000	0.000	0.000			
	20 Psychology	410.06	9.44	419.50	11.13	0.53	11.00	0	0	84	4	88	1.00	0.000	0.000	7.545	7.545	0.210			
	21 Public Administration and Social Services	1588.47	55.68	1644.15	11.32	0.54	11.00	0	0	84	4	88	1.00	0.000	0.000	7.424	7.424	0.054			
	22 Social Sciences & Social Studies	1329.85	34.01	1363.86	40.75	1.93	42.00	0	0	321	15	336	1.00	0.000	0.000	7.872	7.872	0.246			
	TOTAL	19726.89	1572.03	21298.92	557.08	26.43	574	13198	8348	4074	106	25727	1.60	0.669	5.311	7.314	4.003	1.208	26	0.10	

University of Western Cape																				
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
	1 Agriculture & Renewable Natural resources																			
	2 Architecture & Environmental Design																			
	3 Arts, Visual and Performing																			
	4 Business, Commerce & Mangement Sciences	1159.54	148.70	1308.24	47.05	27.85	42.00	0	0	213	123	336	1.00	0.000	0.000	4.518	4.432	0.257		
	5 Communication																			
	6 Computer Science and Data Processing	529.88	72.05	601.93	13.75	19.00	15.00	38	24	58	62	182	1.00	0.072	0.339	4.236	3.250	0.303		
	7 Education	631.98	120.20	752.18	30.10	27.70	38.00	143	148	195	146	632	1.30	0.227	1.234	6.466	5.260	0.840		
	8 Engineering & Engineering Technology																			
	9 Health Care & Health Sciences	1151.75	671.64	1823.39	159.81	153.70	170.00	6450	3891	861	721	11923	1.12	5.600	5.793	5.390	4.690	6.539		
	10 Home Economics	57.55	33.56	91.11	10.50	13.50	14.00	0	0	49	63	112	1.00	0.000	0.000	4.667	4.667	1.229		
	11 Industrial Arts, Trades & Technology																			
	12 Languages, Linguistics & Literature	934.54	61.94	996.48	51.05	19.40	50.00	261	69	307	93	730	1.02	0.279	1.113	6.019	4.781	0.732		
	13 Law	1156.55	65.16	1221.71	49.01	23.40	51.00	109	63	276	132	581	1.00	0.095	0.974	5.635	5.635	0.476		
	14 Libraries and Museums	114.91	13.20	128.11	10.14	2.00	12.00	0	0	80	16	96	1.00	0.000	0.000	7.908	7.908	0.749		
	15 Life Sciences and Physical Sciences	1200.69	239.08	1439.77	109.05	137.20	108.00	11725	26821	4978	475	43999	1.22	9.765	112.184	45.651	3.464	30.560		
	16 Mathematical Sciences	365.06	49.82	414.88	22.00	15.00	22.00	48	12	104	72	236	1.13	0.131	0.240	4.748	4.770	0.568		
	17 Military Sciences																			
	18 Philosophy, Religion and Theology	208.79	18.02	226.81	9.64	6.40	16.00	0	0	101	27	128	1.00	0.000	0.000	10.456	4.251	0.564		
	19 Physical Education, Health Education & Leisure	113.70	23.21	136.91	7.00	4.00	5.00	229	153	25	15	421	1.00	2.012	6.571	3.636	3.636	3.077		
	20 Psychology	755.36	99.58	854.94	21.50	11.60	21.00	0	0	106	62	168	1.00	0.000	0.000	4.924	5.357	0.197		
	21 Public Administration and Social Services	234.85	123.48	358.33	27.00	38.20	33.00	55	18	110	154	337	1.11	0.233	0.144	4.070	4.034	0.939		
	22 Social Sciences & Social Studies	1288.20	266.92	1555.12	58.74	37.25	71.00	0	0	356	212	568	1.00	0.000	0.000	6.062	5.689	0.365		
	TOTAL	9903.35	2006.56	11909.91	626.34	536.20	668	19058	31199	7820	2372	60449	1.19	1.924	15.549	12.486	4.423	5.076		

University of the Witwatersrand																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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University of Zululand																				
CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources	140.00	37.00	177.00	7.00	0.00	10.50	235	0	675	92	1002	1.38	1.676	0.000	96.457		5.659	40	4.00
2	Architecture & Environmental Design																			
3	Arts, Visual and Performing																			
4	Business, Commerce & Mangement Sciences																			
5	Communication																			
6	Computer Science and Data Processing																			
7	Education																			
8	Engineering & Engineering Technology																			
9	Health Care & Health Sciences																			
10	Home Economics	62.00	0.00	62.00	6.00	0.00	7.00	2664	0	56	1	2721	1.08	42.974		9.333		43.889	1342	49.32
11	Industrial Arts, Trades & Technology																			
12	Languages, Linguistics & Literature																			
13	Law																			
14	Libraries and Museums																			
15	Life Sciences and Physical Sciences	245	14	259.00	13	0	23	1667	0	2406	1150	5223	1.52	6.806	0.000	185.076		20.167	419	8.03
16	Mathematical Sciences																			
17	Military Sciences																			
18	Philosophy, Religion and Theology																			
19	Physical Education, Health Education & Leisure																			
20	Psychology	58	11	69.00	7	0	14	1092	0	528	114	1734	1.74	18.833	0.000	75.439		25.134	308	17.76
21	Public Administration and Social Services																			
22	Social Sciences & Social Studies																			
TOTAL		505.00	62.00	567.00	33.00	0.00	54	5659	0	3665	1356	10680	1.43	11.206	0.000	111.069		18.836	2110	19.75

Mangosotho University of Technology																					
CESM	Description	FTE students			FTE staff		No of  comp.	Replacement cost (R'000)					Av. cond. of  equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost	
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud			
	1 Agriculture & Renewable Natural resources	463.00	0.00	463.00	13.83	3.00	22	364	-	536	19	919	1.36	0.786		38.728	6.463	1.985	100.00	10.88	
	2 Architecture & Environmental Design	384.00	0.00	384.00	2.99	0.00	3	-	-	24	-	24	1.00	-		8.021		0.063			
	3 Arts, Visual and Performing																				
	4 Business, Commerce & Mangement Sciences	2875.00	0.00	2875.00	20.11	0.15	21	-	-	167	1	168	1.00	-		8.293	8.293	0.058			
	5 Communication																				
	6 Computer Science and Data Processing	414.00	0.00	414.00	15.32	1.75	17	-	-	122	14	136	1.00	-		7.969	7.969	0.329			
	7 Education																				
	8 Engineering & Engineering Technology	2296.00	0.00	2296.00	47.92	9.36	38	19,224		325	47	19,595	1.39	8.373		6.779	4.997	8.534	606.00	3.09	
	9 Health Care & Health Sciences	174.00	0.00	174.00	12.92	3.34	12	2,903	-	76	20	2,999	1.43	16.684		5.905	5.901	17.236	433.00	14.44	
	10 Home Economics																				
	11 Industrial Arts, Trades & Technology																				
	12 Languages, Linguistics & Literature																				
	13 Law																				
	14 Libraries and Museums																				
	15 Life Sciences and Physical Sciences	91.00	0.00	91.00	13.98	4.09	8	2,110	-	253	14	2,377	1.94	23.187		18.062	3.543	26.121	748.00	31.47	
	16 Mathematical Sciences																				
	17 Military Sciences																				
	18 Philosophy, Religion and Theology																				
	19 Physical Education, Health Education & Leisure																				
	20 Psychology																				
	21 Public Administration and Social Services	620.00	0.00	620.00	7.37	0.00	8	-	-	64	-	64	1.00	-		8.679		0.103			
	22 Social Sciences & Social Studies																				
	TOTAL	7317.00	0.00	7317.00	134.44	21.69	129	24601	0	1566	116	26282	1.44	3.362		11.649	5.327	3.592	1887	7.18	

**TABLE 3.7: REPLACEMENT COST (R'000) OF EQUIPMENT MANAGED CENTRALLY IN 2009  
ACCORDING TO COST LEVEL OF EQUIPMENT, LEVEL OF INSTRUCTION/RESEARCH AND  
HE INSTITUTION**

Institution	Equipment replacement cost level	FTE students 2009 *			FTE C1 staff *	Replacement cost (R'000) <sup>1</sup>				Av. cond. of equipment	Per capita replacement costs (R'000)				Repl cost of equipm. with Cond 3 as % of total repl cost (R'000)	Repl. cost with cond 3 as % of total repl cost	centr. man. equipment as % of total repl. cost of equipment
		Level 1	Levels 2-4	Total		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Total		UG FTE stud	PG FTE stud	FTE C1	Tot FTE stud <sup>2</sup>			
Cape Peninsula Univ Techn	Repl cost<R100 th Repl cost>R100 th Total																
University of Cape Town	Repl cost<R100 th Repl cost>R100 th Total																
Central University of Techn	Repl cost<R100 th Repl cost>R100 th Total	8443.2 8443.2 8443.2	1159.0 1159.0 1159.0	9602.3 9602.3 9602.3	333.0 333.0 333.0	1014.77 763.21 1777.98	434.90 327.09 761.99	53.40 0.00 53.40	1503.07 1090.31 2593.37	1.00 1.00 1.00	0.12 0.09 0.21	0.38 0.28 0.66	0.16 0.00 0.16	0.16 0.11 0.27		0.00 0.00 0.00	9.64
Durban University of Techn	Repl cost<R100 th Repl cost>R100 th Total		Nil Return			Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return		
University of Fort Hare	Repl cost<R100 th Repl cost>R100 th Total	7720.4 7720.4 7720.4	1090.1 1090.1 1090.1	8810.5 8810.5 8810.5	321.0 321.0 321.0	155.10 5948.50 6103.60	15.90 941.50 957.40	0.00 419.00 419.00	171.00 7309.00 7480.00	1.00 1.61 1.60	0.02 0.77 0.79	0.01 0.86 0.88	0.00 1.31 1.31	0.02 0.83 0.85	0.00 2230.00 2230.00	0.00 30.51 29.81	
University of the Free State	Repl cost<R100 th Repl cost>R100 th Total		Nil Return			Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return		15.18
University of Johannesburg	Repl cost<R100 th Repl cost>R100 th Total	32615.1 32615.1 32615.1	5462.6 5462.6 5462.6	38077.7 38077.7 38077.7	2020.0 2020.0 2020.0	22917.51 105.00 23022.51	9102.85 37.50 9140.35	2012.86 7.50 2020.36	34033.22 150.00 34183.22	1.33 1.00 1.33	0.70 0.00 0.71	1.67 0.01 1.67	1.00 0.00 1.00	0.89 0.00 0.90	1800.57 0.00 1800.57	5.29 0.00 5.27	14.63
University of KwaZulu-Natal	Repl cost<R100 th Repl cost>R100 th Total	22080.1 22080.1 22080.1	4974.9 4974.9 4974.9	27054.9 27054.9 27054.9	1501.0 1501.0 1501.0	13462 3001 16463	13088 5643 18731	9947 5240 15187	36497 13884 50381	1.00 1.00 1.00	0.61 0.14 0.75	2.63 1.13 3.77	6.63 3.49 10.12	1.35 0.51 1.86		0.00 0.00 0.00	15.81
University of Limpopo	Repl cost<R100 th Repl cost>R100 th Total	10870.4 10870.4 10870.4	2853.0 2853.0 2853.0	13723.3 13723.3 13723.3	907.0 907.0 907.0	143.05 3532.27 3675.32	220.89 1162.06 1382.96	196.05 1607.50 1803.55	559.99 6301.84 6861.83	2.08 2.06 2.06	0.01 0.32 0.34	0.08 1.77 0.48	0.22 0.46 1.99	0.04 0.46 5.50	263.00 4273.70 4536.70	46.97 67.82 66.12	7.78
Nelson Mandela Metr. Univ	Repl cost<R100 th Repl cost>R100 th Total	14929.9 14929.9 14929.9	2496.8 2496.8 2496.8	17426.7 17426.7 17426.7	671.0 671.0 671.0	3155.65 2591.94 3155.65	5525.59 674.67 5525.59	2762.80 380.41 2762.80	11444.04 3647.02 11444.04	1.00 1.00 1.00	0.21 0.11 0.21	2.21 0.30 2.21	4.12 0.30 4.12	0.66 0.13 0.66		0.00 0.00 0.00	15.12
North West University	Repl cost<R100 th Repl cost>R100 th Total	22580.1 22580.1 22580.1	4924.7 4924.7 4924.7	27504.8 27504.8 27504.8	1251.0 1251.0 1251.0	16197.13 18789.07 18789.07	2590.69 3265.36 3265.36	127.37 507.77 507.77	18915.19 22562.21 22562.21	1.00 1.00 1.00	0.72 0.83 0.83	0.53 0.66 0.66	0.10 0.41 0.41	0.69 0.82 0.82	151.43 151.43 151.43	0.80 0.67 0.67	7.29
University of Pretoria	Repl cost<R100 th Repl cost>R100 th Total	26977.5 26977.5 26977.5	8801.5 8801.5 8801.5	35779.0 35779.0 35779.0	1602.0 1602.0 1602.0	5762.50 0.00 5762.50	0.00 0.00 0.00	0.00 0.00 0.00	5762.50 0.00 5762.50	1.00 1.00 1.00	0.21 0.00 0.21	0.00 0.00 0.00	0.00 0.00 0.00	0.16 0.00 0.16		0.00 0.00 0.00	0.79
Rhodes University	Repl cost<R100 th Repl cost>R100 th Total	4811.0 4811.0 4811.0	1069.5 1069.5 1069.5	5880.5 5880.5 5880.5	365.0 365.0 365.0	5568.31 391.97 5960.27	2307.13 25.02 2332.15	194.34 0.00 194.34	8069.78 416.98 8486.76	1.46 1.00 1.44	1.16 0.08 1.24	2.16 0.02 2.18	0.53 0.00 0.53	1.37 0.07 1.44	1332.29 0.00 1332.29	16.51 0.00 15.70	7.71
University of South Africa	Repl cost<R100 th Repl cost>R100 th Total	60578.3 60578.3 60578.3	8363.3 8363.3 8363.3	68941.6 68941.6 68941.6	1598.0 1598.0 1598.0	36100.99 113125.62 149226.61	16236.53 97309.62 113546.15	4506.99 37700.50 42207.49	56844.51 248135.73 304980.24	1.85 1.85 1.85	0.60 1.87 2.46	1.94 11.64 13.58	2.82 23.59 26.41	0.82 3.60 4.42	35486.61 17226.50 52713.10	62.43 6.94 17.28	82.67
University of Stellenbosch	Repl cost<R100 th Repl cost>R100 th Total	15295.9 15295.9 15295.9	5372.5 5372.5 5372.5	20668.4 20668.4 20668.4	1111.0 1111.0 1111.0	6418.57 7709.73 14128.31	13168.51 39460.08 52628.59	6324.44 31115.91 37440.36	25911.53 78285.73 104197.26	1.43 1.51 1.49	0.42 0.50 0.92	2.45 7.34 9.80	5.69 28.01 33.70	1.25 3.79 5.04	798.52 17625.03 18423.55	3.08 22.51 17.68	19.11
Tshwane University of Tech	Repl cost<R100 th Repl cost>R100 th Total	35431.0 35431.0 35431.0	4222.1 4222.1 4222.1	39653.0 39653.0 39653.0	1164.0 1164.0 1164.0	9729.21 2227.30 11956.51	3321.92 520.70 3842.62	1340.74 115.00 1455.74	14391.86 2863.00 17254.86	2.12 1.55 2.03	0.27 0.06 0.34	0.79 0.12 0.91	1.15 0.10 1.25	0.36 0.07 0.44	3092.00 555.00 3647.00	21.48 19.39 21.14	9.84
University of Venda	Repl cost<R100 th Repl cost>R100 th Total	8710.4 8710.4 8710.4	1182.3 1182.3 1182.3	9892.7 9892.7 9892.7	294.0 294.0 294.0	852.74 9321.79 10174.53	85.27 932.18 1017.45	9.47 103.58 113.05	947.49 10357.55 11305.04	3.00 1.76 1.86	0.10 1.07 1.17	0.07 0.79 0.86	0.03 0.35 0.38	0.10 1.05 1.14	947.49 947.49 1894.98	100.00 9.15 16.76	22.43
Vaal University of Techn	Repl cost<R100 th Repl cost>R100 th Total	13244.8 13244.8 13244.8	1306.3 1306.3 1306.3	14551.1 14551.1 14551.1	396.0 396.0 396.0	759.43 20.81 780.24	6075.45 166.44 6241.89	759.43 20.81 780.24	7594.32 208.05 7802.37	1.76 2.00 1.77	0.06 0.00 0.06	4.65 0.13 4.78	1.92 0.05 1.97	0.52 0.01 0.54	4425.08 0.00 4425.08	58.27 0.00 56.71	8.30
Walter Sisulu Univ of Techn	Repl cost<R100 th Repl cost>R100 th Total	17800.9 17800.9 17800.9	3528.6 3528.6 3528.6	21329.5 21329.5 21329.5	717.0 717.0 717.0	6458.12 0.00 6458.12	8690.79 0.00 8690.79	2166.93 0.00 2166.93	17315.85 0.00 17315.85	1.67 0.00 1.67	0.36 0.00 0.36	2.46 0.00 2.46	3.02 0.00 3.02	0.81 0.00 0.81	136.37 0.00 136.37	0.79 0.00 0.79	40.23
University of Western Cape	Repl cost<R100 th Repl cost>R100 th Total	9628.4 9628.4 9628.4	2422.5 2422.5 2422.5	12050.9 12050.9 12050.9	641.0 641.0 641.0	590.64 7676.49 8267.13	1214.91 3859.43 5074.34	268.63 537.26 805.89	2074.17 12073.18 14147.35	1.12 1.08 1.09	0.06 0.80 0.86	0.50 1.59 2.09	0.42 0.84 1.26	0.17 1.00 1.17		0.00	18.96
University of Witwatersrand	Repl cost<R100 th Repl cost>R100 th Total	16369.8 16369.8 16369.8	4908.2 4908.2 4908.2	21278.1 21278.1 21278.1	1873.0 1873.0 1873.0	1386.73 7055.83 8442.56	4667.50 12106.80 95327.88	1001.87 109823.01 13108.67	7056.10 109823.01 116879.10	1.14 1.39 1.37	0.08 0.43 0.52	0.95 18.47 19.42	0.53 6.46 7.00	0.33 5.16 5.49	426.90 26900.45 27327.34	6.05 24.49 23.38	
University of Zululand	Repl cost<R100 th Repl cost>R100 th Total	10395.5 10395.5 10395.5	1547.5 1547.5 1547.5	11943.1 11943.1 11943.1	335.0 335.0 335.0	3715.88 0.00 3715.88	561.80 0.00 561.80	0.00 0.00 0.00	4277.68 0.00 4277.68	1.67 1.00 1.67	0.36 0.00 0.36	0.36 0.00 0.36	0.00 0.00 0.00	0.36 0.00 0.36		0.00 0.00 0.00	28.60
Mangosuthu Univ of Techn	Repl cost<R100 th Repl cost>R100 th Total	7247.8 7247.8 7247.8	71.6 71.6 71.6	7319.4 7319.4 7319.4	170.0 170.0 170.0	171.95 7031.60 7203.55	0.00 0.00 0.00	9.05 131.40 140.45	181.00 7163.00 7344.00	1.00 2.29 2.06	0.02 0.97 0.99	0.02 0.77 0.83	0.05 0.98 0.83	0.02 0.98 0.58	0.00 4616.00 4616.00	0.00 64.44 62.85	3.81
TOTAL <sup>2</sup>	Repl cost<R100 th Repl cost>R100 th Total	345730.3 345730.3 345730.3	65757.1 65757.1 65757.1	411487.4 411487.4 411487.4	17270.0 17270.0 17270.0	120955.0 184107.9 305062.9	85393.1 243635.5 329028.6	13193.4 89232.8 121167.1	238282.5 516976.2 755258.7	1.48 1.63 1.58	0.35 0.53 0.88	1.30 3.71 5.00	1.85 5.17 7.02	1.58 1.26 1.84	48708.8 74525.6 123234.4	20.44 14.42 16.32	18.35

## 3.2 DETERMINING NORMS AND STANDARDS FOR THE PROVISION OF EQUIPMENT AT HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA

### 3.2.1 A Roadmap for the derivation of norms and standards

The information summarised in Tables 3.4-3.7 will now be used to calculate norms and standards for the provision of teaching and research equipment to HEIs. The following process will be used:

- Select a few HEIs which could be considered as leading or benchmark institutions as far as their quality of teaching and research is concerned. These institutions' provision (funding), management and maintenance of equipment could therefore be considered as "ideal".

- b. Derive norms and standards of good practice for the replacement cost of equipment from Section B of the equipment survey data of these identified benchmark institutions.
- c. By applying these norms and standards to the data of each of the 21 HEIs determine backlogs/surpluses in each HEI as far as the availability of equipment for teaching and research is concerned.
- d. Use the benchmark institutions' actual expenditure for the period 2006-2009 jointly with the derived norms and standards to provide a viable higher education equipment funding formula which could be used annually by the state as well as each HEI.

### **3.2.2 Selection of benchmark HEIs for the determination of norms for the availability of equipment for teaching and research at HEIs, as well as for the annual expenditure on equipment for teaching and research at HEIs**

In the absence of norms and standards for the availability of equipment for teaching and research the equipment survey data will be used to determine such norms. According to Section 1.4.1 of this report, norms and standards will be needed for at least undergraduate teaching, post-graduate teaching and for academic staff research.

#### **3.2.2.1 Benchmark institutions for calculating norms and standards for the provision of equipment for undergraduate teaching**

A well established measure for undergraduate teaching efficiency is the undergraduate success rate. This rate has been officially published annually since 2001 by the Department of Education/Department of Higher Education and Training. This rate is calculated as the FTE undergraduate degree credit students as a percentage of the undergraduate FTE enrolled students.

Table 3.8 shows the most recent success rates for 22 HEIs for the period 2006-2009. Note that only contact tuition success rates are shown, hence the success rates for UNISA, with only a small number of contact tuition students, are not included. Using the average success rates over the 4 years as basis, the 5 institutions with the highest success rates are UKZN, UNW, UP, RU and SU if UCT is excluded. Although UCT had the highest average success rate it cannot be used in determining norms for the provision of equipment since no equipment survey data has been submitted by that institution.

#### **3.2.2.2 Benchmark institutions for calculating norms and standards for the provision of equipment for post-graduate teaching, as well as for staff research**

Since the provision of equipment for post-graduate teaching is closely linked to the provision of equipment for staff research (especially for masters' and doctoral study), it was decided to determine the best 5 (benchmark) post-graduate/research institutions by using only one efficiency measure. The measure used in the selection of the 5 benchmark institutions for post-graduate teaching and staff research was the average total research output per FTE academic (C1) staff member for the years 2006-2009. The total research output for a given year is defined as the weighted sum of the DHET approved publications (weight 1), the research masters degrees conferred (weight 1) and the doctoral degrees conferred (weight 3). Table 3.9 shows the calculation of these average values.

**TABLE 3.8: UNDERGRADUATE SUCCESS RATE (%) OF CONTACT STUDENTS IN HIGHER EDUCATION FOR 2006-2009 ACCORDING TO HE INSTITUTION AND YEAR**

Institution	2006	2007	2008	2009	Average
Cape Peninsula University of Technology	76.00	77.00	78.00	79.00	77.50
University of Cape Town	86.00	86.00	85.00	84.00	85.25
Central University of Technology, Free State	74.00	75.00	75.00	73.00	74.25
Durban Institute of Technology	75.00	76.00	77.00	76.00	76.00
University of Fort Hare	74.00	75.00	78.00	79.00	76.50
University of the Free State	73.00	71.00	72.00	72.00	72.00
University of Johannesburg	75.00	77.00	78.00	75.00	76.25
University of KwaZulu-Natal	80.00	81.00	82.00	80.00	80.75
University of Limpopo	78.00	83.00	77.00	80.00	79.50
Nelson Mandela Metropolitan University	72.00	72.00	74.00	74.00	73.00
North West University	79.00	79.00	80.00	84.00	80.50
University of Pretoria	81.00	81.00	82.00	80.00	81.00
Rhodes University	87.00	85.00	85.00	83.00	85.00
University of South Africa <sup>1)</sup>					
University of Stellenbosch	82.00	82.00	84.00	84.00	83.00
Tshwane University of Technology	70.00	71.00	72.00	71.00	71.00
University of Venda	75.00	76.00	78.00	79.00	77.00
Vaal University of Technology	70.00	73.00	73.00	73.00	72.25
Walter Sisulu University for Technology	68.00	69.00	69.00	72.00	69.50
University of Western Cape	77.00	77.00	78.00	79.00	77.75
University of Witwatersrand	80.00	79.00	81.00	77.00	79.25
University of Zululand	72.00	78.00	78.00	77.00	76.25
Mangosuthu Technikon	81.00	82.00	78.00	78.00	79.75
<b>Total</b>	<b>76.00</b>	<b>77.00</b>	<b>77.00</b>	<b>77.00</b>	<b>76.75</b>

<sup>1)</sup> Since Unisa had an FTE undergraduate enrolment of less than 500 contact students during 2006-2009 this institution's success rate was not included

Source : Department of Education 2006-2008, Department of Basic Education 2009.

**TABLE 3.9: TOTAL RESEARCH OUTPUT<sup>1)</sup> PER ACADEMIC STAFF MEMBER FOR 2006-2009 ACCORDING TO HE INSTITUTION AND YEAR**

Institution	Research Output				FTE academic staff				Research Outp. per FTE acad. Staff member				Average
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009	
Cape Peninsula University of Technology	132	129	174	250	852	895	1017	882	0.155	0.144	0.171	0.283	0.188
University of Cape Town	1692	1834	1884	2062	1303	1122	1160	1184	1.299	1.635	1.624	1.742	1.575
Central University of Technology, Free State	77	78	66	78	294	288	305	333	0.262	0.271	0.216	0.234	0.246
Durban Institute of Technology	81	77	67	102	608	613	603	586	0.133	0.126	0.111	0.174	0.136
University of Fort Hare	123	140	166	292	324	317	306	321	0.380	0.442	0.542	0.910	0.568
University of the Free State	837	895	804	996	1071	1069	1051	1129	0.782	0.837	0.765	0.882	0.816
University of Johannesburg	857	760	884	898	2205	2173	1920	2020	0.389	0.350	0.460	0.445	0.411
University of KwaZulu-Natal	1756	1525	1750	2029	1709	1646	1589	1533	1.028	0.926	1.101	1.324	1.095
University of Limpopo	273	268	210	253	887	760	902	907	0.308	0.353	0.233	0.279	0.293
Nelson Mandela Metropolitan University	452	437	505	504	618	619	629	671	0.731	0.706	0.803	0.751	0.748
North West University	1074	1061	1083	1186	1049	909	1047	1251	1.024	1.167	1.034	0.948	1.043
University of Pretoria	2146	2141	2219	2287	1967	1818	1893	1937	1.091	1.178	1.172	1.181	1.155
Rhodes University	544	549	539	564	312	320	350	365	1.744	1.716	1.540	1.545	1.636
University of South Africa <sup>1)</sup>	943	925	952	939	1486	1465	1522	1598	0.635	0.631	0.625	0.588	0.620
University of Stellenbosch	1723	1641	1850	2009	1131	1034	1043	1111	1.523	1.587	1.774	1.808	1.673
Tshwane University of Technology	271	232	269	330	1295	1193	1180	1164	0.209	0.194	0.228	0.284	0.229
University of Venda	65	62	89	89	267	264	274	294	0.243	0.235	0.325	0.303	0.276
Vaal University of Technology	41	33	39	58	426	391	369	396	0.096	0.084	0.106	0.146	0.108
Walter Sisulu University for Technology	25	19	23	30	723	682	683	717	0.035	0.028	0.034	0.042	0.034
University of Western Cape	443	448	482	584	610	634	671	641	0.726	0.707	0.718	0.911	0.766
University of Witwatersrand	1475	1615	1495	1718	1736	1847	1760	1873	0.850	0.874	0.849	0.917	0.873
University of Zululand	207	143	127	169	287	261	306	335	0.721	0.548	0.415	0.504	0.547
Mangosuthu Technikon	7	1	2	4	173	162	148	170	0.040	0.006	0.014	0.024	0.021
<b>Total</b>	<b>15244</b>	<b>15013</b>	<b>15679</b>	<b>17431</b>	<b>21333</b>	<b>20482</b>	<b>20728</b>	<b>21418</b>	<b>0.715</b>	<b>0.733</b>	<b>0.756</b>	<b>0.814</b>	<b>0.754</b>

<sup>1)</sup> Calculated as weighted sum of approved publications (weight 1), research masters graduates (weight 1) and doctoral graduates (weight 3).

Sources: Information on the State Budget for Universities 2010, 2011;  
HEMIS information 2006-2009

It follows from Table 3.9 that, once again excluding UCT, the best 5 universities to be used as benchmark universities for the provision of equipment for post-graduate teaching and staff research

are UKZN, UNW, UP, RU and SU. These 5 are precisely the same as the selected benchmark institutions for the provision of equipment for undergraduate teaching.

The selected 5 institutions will be used extensively to determine norms and standards for

- a. The availability of equipment for teaching and research purposes measured in terms of the equipment replacement cost per FTE student on the undergraduate or post-graduate teaching levels, as well as the equipment replacement cost per FTE academic staff member and per academic support staff member; and
- b. the actual annual expenditure on equipment for teaching and research.

### **3.2.3 Norms and standards for the unit replacement costs of equipment for teaching and research**

Table 3.10 shows an aggregation of the summary tables (See Table 3.6) of the 5 benchmark universities. In Table 3.11 the rows (CESM categories) of Table 3.10 are also summarised according to two broad fields of study, which are used in HEMIS reporting, namely human sciences and natural sciences (also referred to as SET). These two fields of study are defined as follows:

Human Sciences: CESMs 03, 04, 05, 07, 12, 13, 14, 18, 19, 20, 21 and 22

Natural Sciences: CESMs 01, 02, 06, 08, 09, 10, 11, 15, 16, 17

Furthermore, since Table 3.10 only contains equipment managed by academic departments, schools and faculties (Section B survey), the second sub-table in Table 3.11 provides similar information to that in Table 3.10 in the case of equipment which is centrally managed (Section C survey). Note that the information on centrally managed equipment was not surveyed according to CESM category since this equipment is usually utilised by students and staff across a wide spectrum of academic and research programmes.

Note that the academic levels used in Sections B and C of the equipment survey are the same as the levels used in the calculation of teaching input units in the block grant funding formula for higher education. This means that the category *undergraduate (and equivalent) FTE enrolled students* refers to students in their first 3 years of B degrees, as well as to students in undergraduate diplomas/certificate programmes of duration 1, 2 or 3 years, as well as those in one-year post-graduate diplomas/certificate programmes (indicated as level 1 students in Tables 3.6, 3.10 and 3.11). The category *FTE students in academic levels 2-4* in these 3 tables refers to students enrolled for all other programmes. These students are associated with post-graduate study in this analysis although this category also includes students in the fourth or later years of professional first degrees.

The 11 unit replacement costs, based on the replacement costs of the 5 benchmark institutions are highlighted in Table 3.11. In the light of the developmental approach to norms and standards in Section 1.4.1 of this report, these costs can be considered as benchmark norms and should be associated with the “Top standard norms”.



**TABLE 3.10: AGGREGATE OF SECTION B INVENTORY DATA ON ALL EQUIPMENT USED FOR TEACHING AND RESEARCH IN 2009 FOR 5 BENCHMARK UNIVERSITIES ACCORDING TO CESM CATEGORY AND LEVEL OF INSTRUCTION/RESEARCH**

CESM	Description	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
		Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
1	Agriculture & Renewable Natural resources	960	570	1530	231	241	618	8260	55673	41059	2227	107220	1.40	8.603	97.648	177.390	9.247	70.062	14260	13.30
2	Architecture & Environmental Design	1018	355	1374	77	32	143	3254	3446	1816	364	8880	1.48	3.195	9.698	23.727	11.241	6.464	2998	33.77
3	Arts, Visual and Performing	2276	467	2743	197	59	226	9597	10615	7619	437	28268	1.66	4.217	22.725	38.740	7.396	10.306	5342	18.90
4	Business, Commerce & Mangement Sciences	16079	3282	19360	674	316	961	4959	5053	7675	2583	20271	1.12	0.308	1.540	11.395	8.179	1.047	355	1.75
5	Communication	595	183	778	59	15	106	5033	1714	660	195	7602	1.10	8.455	9.363	11.118	13.226	9.767	203	2.68
6	Computer Science and Data Processing	3396	363	3758	170	47	470	9404	4753	4843	1109	20108	1.04	2.769	13.110	28.508	23.790	5.350	1627	8.09
7	Education	14480	4683	19163	490	260	802	11749	3990	8391	1998	26128	1.30	0.811	0.852	17.127	7.681	1.363	2033	7.78
8	Engineering & Engineering Technology	3702	2481	6183	363	352	947	95776	137638	156657	4121	394192	1.62	25.872	55.479	431.215	11.699	63.756	80371	20.39
9	Health Care & Health Sciences	6635	4249	10884	1159	1239	1858	64648	173811	106570	7121	352149	1.37	9.744	40.902	91.925	5.746	32.354	35392	10.05
10	Home Economics	288	75	363	21	15	40	4482	119	193	133	4927	1.11	15.537	1.583	9.168	8.617	13.559	252	5.11
11	Industrial Arts, Trades & Technology	280	80	359	18	4	19	271	317	219	27	834	1.45	0.969	3.976	12.450	7.304	2.320	97	11.60
12	Languages, Linguistics & Literature	4619	538	5156	327	88	402	4867	9602	7627	639	22736	1.02	1.054	17.863	23.306	7.249	4.409	76	0.34
13	Law	6235	1653	7888	260	114	268	695	1183	1902	464	4245	1.01	0.112	0.716	7.318	4.079	0.538	0	0.00
14	Libraries and Museums	349	59	408	23	2	0	0	0	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0	0.00
15	Life Sciences and Physical Sciences	6816	1124	7940	588	506	1293	108216	467539	177389	4578	757721	1.55	15.877	416.078	301.547	9.044	95.435	184265	24.32
16	Mathematical Sciences	6195	369	6564	260	82	309	2081	6459	5770	449	14759	1.17	0.336	17.520	22.194	5.476	2.248	780	5.28
17	Military Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Philosophy, Religion and Theology	1764	734	2498	147	46	183	466	633	1499	327	2925	1.07	0.264	0.863	10.221	7.098	1.171	81	2.77
19	Physical Education, Health Education & Leisure	1767	138	1905	74	28	136	2011	12214	2326	293	16845	1.51	1.138	88.425	31.453	10.384	8.841	3451	20.49
20	Psychology	3422	519	3942	126	62	162	430	1004	1685	392	3511	1.17	0.126	1.933	13.410	6.381	0.891	133	3.78
21	Public Administration and Social Services	1876	675	2550	93	30	125	592	1208	1406	221	3426	1.23	0.316	1.791	15.116	7.364	1.343	288	8.40
22	Social Sciences & Social Studies	8728	1349	10077	451	188	690	5249	7179	10352	1617	24397	1.16	0.601	5.323	22.973	8.622	2.421	505	2.07
TOTAL		91480	23945	115425	5807	3725	9758	342040	904152	545659	29295	1821145	1.49	3.739	37.760	93.964	7.864	15.778	332510	18.26

**TABLE 3.11: AGGREGATES OF SECTION B AND SECTION C INVENTORY DATA ON ALL EQUIPMENT USED FOR TEACHING AND RESEARCH IN 2009 FOR 5 BENCHMARK UNIVERSITIES ACCORDING TO TYPE OF EQUIPMENT MANAGEMENT, BROAD FIELD OF STUDY AND LEVEL OF INSTRUCTION/RESEARCH**

Broad field of study	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
	Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
Human Sciences	62190	14279	76469	2920	1207	4061	45649	54397	51142	9166	160354	1.27	0.734	3.810	17.516	7.597	2.097	12468	7.78
Natural Sciences	29291	9665	38956	2887	2519	5697	296391	849755	494516	20129	1660791	1.51	10.119	87.918	171.267	7.992	42.633	320042	19.27
Total	91480	23945	115425	5807	3725	9758	342040	904152	545659	29295	1821145	1.49	3.739	37.760	93.964	7.864	15.778	332510	18.26

Centrally managed by institution (Section C data)

	FTE students			FTE staff		No of comp.	Replacement cost (R'000)					Av. cond. of equipment	Per capita replacement cost (R'000)					Repl cost of equipm. with Cond 3	% of total repl cost
	Level 1	Levels 2-4	Total	C1	C2		Lev(u)=1	Lev(u)=2&3	Lev(u)=4	Lev(u)=5	Total		UG FTE stud	PG FTE stud	FTE C1	FTE C2	Tot FTE stud		
Total	90535	22841	113522	5729			61103	76957	53330		191390	1.29	0.675	3.369	9.309		1.686	19907	10.40

### Norms for the replacement cost of equipment for undergraduate teaching

Table 3.8 indicates that the undergraduate success rates for all HEIs over the most recent reported four year period, namely from 2006-2009 was 76.75%. The lowest institutional average success rate over this period was 69.5%, while the highest was 85.25%. All institutions are striving towards an annual undergraduate success rate of at least 80%. An undergraduate success rate of 80% is also seen by the DHET as the minimum target for all HEIs. Referring to Section 1.4.1 where a developmental approach to norms and gaps in the provision of (buildings and) equipment is discussed, it would therefore be counterproductive to have more than one norm for the provision of equipment for undergraduate teaching. The norms for the provision of equipment for undergraduate teaching, based on the aggregation of the replacement costs of the 5 benchmark universities, should therefore be considered as *uniform norms for all HEIs*. According to Table 3.11 these norms (in the rand of 2009) are the following:

#### **Equipment replacement cost norms (R of 2009) for UG teaching per UGFTE student**

Different norms (levels of provision)	Managed by academic dep/schools/faculties		Centrally managed <sup>1)</sup>
	Human Sciences	Natural Sciences	
<i>Minimum/basic standards, norms</i>	R734	R10 119	R675
<i>Middle standards, norms</i>	R734	R10 119	R675
<i>Top standards, norms</i>	R734	R10 119	R675
<i>Frontier/advanced norms</i>	R734	R10 119	R675

- 2) This norm should be used with circumspection since the management model of equipment used by HEIs is also determined by institutional size and other factors

### Different norms for the replacement cost of equipment used for post-graduate teaching

Table 3.6 clearly shows that many institutions have relatively few FTE student enrolments for post-graduate study (academic levels 2-4), especially on the masters' and doctoral levels. The particular mission and programme mix of some institutions restricts them to certain post-graduate programmes, usually only on the honours or equivalent level. The highest equipment replacement costs for post-graduate teaching are associated with masters' and doctoral studies, especially in the natural sciences. In the light of the developmental approach discussed in Section 1.4.1 it is therefore important to define different norms, all based on the benchmark norms for post-graduate teaching in Table 3.11, for HEIs in different phases of the development of post-graduate programmes or with different missions as far as post-graduate teaching is concerned. Suggested norms (in the rand of 2009) are the following:

### Equipment replacement cost norms (R of 2009) for PG teaching per PG FTE student

Different norms (levels of provision)	Managed by academic dep/schools/faculties		Centrally managed <sup>1)</sup>
	Human Sciences	Natural Sciences	
<i>Minimum/basic standards, norms</i>	R1 270	R29 306	R1 123
<i>Middle standards, norms</i>	R2 540	R58 612	R2 246
<i>Top standards, norms</i>	R3 810	R87 918	R3 369
<i>Frontier/advanced norms</i>	More than R3 810	More than R87 918	More than R3 369

- 2) This norm should be used with circumspection since the management model for equipment used by HEIs is also determined by institutional size and other factors

Note that the minimum/basic standard norms were assumed to be one third of the respective top standards (benchmark) norms, while the middle standards norms were assumed to be two thirds of the respective top standards (benchmark) norms.

### Different norms for the replacement cost of equipment used for academic staff research

The institutional mission in respect of the priority attached to academic staff research, as well as the post-graduate programme mix of institutions usually determines the intensity of research activities at the various HEIs. It is therefore, like in the case of the provision of equipment for post-graduate teaching, important to define different norms for HEIs, all based on the benchmark norms for academic staff research in Table 3.11. The suggested norms (in the rand of 2009) are the following:

### Equipment replacement cost norms (R of 2009) for research per FTE academic staff member

Different norms (levels of provision) & gaps	Managed by academic dep/schools/faculties		Centrally managed <sup>1)</sup>
	Human Sciences	Natural Sciences	
<i>Minimum/basic standards, norms</i>	R5 839	R57 089	R3 103
<i>Middle standards, norms</i>	R11 677	R114 178	R6 207
<i>Top standards, norms</i>	R17 516	R171 267	R9 309
<i>Frontier/advanced norms</i>	More than R17516	More than R171 267	More than R9 309

- 2) This norm should be used with circumspection since the management model of equipment used by HEIs is also determined by institutional size and other factors

Note again that the minimum/basic standard norms were assumed to be one third of the respective top standards (benchmark) norms, while the middle standards norms were assumed to be two thirds of the respective top standards (benchmark) norms.

### Uniform norm for the replacement cost of equipment for support staff in academic units

This uniform norm for equipment is essentially to ensure that each staff member rendering administrative or technical support in academic units will at least be issued with a standard desktop computer. Although a small difference is shown in Table 3.11 between the replacement cost of equipment for support staff in the human and natural sciences, it is proposed that the average cost of R8000 is used as uniform norm.

**Equipment replacement cost norms (R of 2009) for academic administrative and technical support per FTE academic support staff member (excluding service workers)**

Different norms (levels of provision) & gaps	Managed by academic dep/schools/faculties	
	Human Sciences	Natural Sciences
<i>Minimum/basic standards, norms</i>	R8000	R8000
<i>Middle standards, norms</i>	R8000	R8000
<i>Top standards, norms</i>	R8000	R8000
<i>Frontier/advanced norms</i>	R8000	R8000

### 3.2.4 Determination of backlogs/surpluses in the replacement cost of equipment for teaching and research

Three sets of backlogs/surpluses in the replacement costs for teaching and research equipment can be calculated for each HEI by subtracting the actual provisions (as included in Table 3.6) from the respective minimum/basic standard norm provision, the middle standard norm provision and the top standard norm provision. Relative backlogs/surpluses, defined as the backlogs/surpluses expressed as a percentage of the norm provisions, are shown in Table 3.12 for all HEIs which submitted survey information according to the type of norm provision, the type of student/staff and the broad field of study. Positive relative backlogs/surpluses percentages in Table 3.12 indicate backlogs, while negative percentages indicate surpluses. Obviously the most appropriate set of relative backlogs/surpluses for a specific HEI should be determined by inter alia taking cognisance of the teaching and research mission of each institution. For the 5 benchmark institutions, for example, the top standards norms should be used in determining their respective total relative backlogs/surpluses.

Table 3.12 could be regarded as a very important source of information for HESA, but also for the DHET, when annual allocations for equipment are made to HEIs in order to eliminate current backlogs in equipment for teaching and research.

**TABLE 3.12: RELATIVE BACKLOGS/SURPLUSES (%) IN THE PROVISION OF EQUIPMENT FOR TEACHING AND RESEARCH AT DIFFERENT HEIs IN 2009 ACCORDING TO TYPE OF NORMPROVISION, TYPE OF STUDENT/STAFF AND BROAD FIELD OF STUDY**

Institution		Relative backlog/surplus (%) - Min standards					Relative backlog/surplus (%) - Middle standards					Relative backlog/surplus (%) - Top standards				
		UG	PG	C1 res.	C2 comp	Total	UG	PG	C1 res.	C2 comp	Total	UG	PG	C1 res.	C2 comp	Total
Cape Peninsula Univ Techn	Human Sciences															
	Natural Sciences															
	Total: Academic															
	Centrally managed															
	Grand total															
University of Cape Town	Human Sciences															
	Natural Sciences															
	Total: Academic															
	Centrally managed															
	Grand total															
Central University of Techn	Human Sciences	39.37	-72.35	-49.67	21.61	6.69	39.37	13.82	25.16	21.61	29.27	39.37	42.55	50.11	21.61	43.06
	Natural Sciences	70.42	63.88	77.28	6.01	69.55	70.42	81.94	88.64	6.01	78.10	70.42	87.96	92.43	6.01	82.90
	Total: Academic	68.31	58.18	68.03	12.29	65.47	68.31	79.09	84.01	12.29	75.08	68.31	86.06	89.34	12.29	80.51
	Centrally managed	66.67	37.99	94.34	0.00	65.43	66.67	69.00	97.17	0.00	73.18	66.67	79.33	98.11	0.00	78.09
	Grand total	68.13	56.80	70.18	12.29	65.46	68.13	78.40	85.09	12.29	74.91	68.13	85.60	90.06	12.29	80.30
Durban University of Techn	Human Sciences	-155.22	-110.52	-100.27	54.25	-135.86	-155.22	-5.26	-0.14	54.25	-96.52	-155.22	29.83	33.24	54.25	-68.43
	Natural Sciences	-24.42	51.91	-57.33	25.26	-2.53	-24.42	75.96	21.34	25.26	27.67	-24.42	83.97	47.56	25.26	44.12
	Total: Academic	-37.74	47.70	-60.91	34.19	-13.11	-37.74	73.85	19.54	34.19	19.22	-37.74	82.57	46.36	34.19	37.18
	Centrally managed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grand total	-37.74	47.70	-60.91	34.19	-13.11	-37.74	73.85	19.54	34.19	19.22	-37.74	82.57	46.36	34.19	37.18

TABLE 3.12 (CONT)

Institution	Programme	Relative backlog/surplus (%) -Min standards					Relative backlog/surplus (%) -Middle standards					Relative backlog/surplus (%) -Top standards				
		UG	PG	C1 res.	C2 comp	Total	UG	PG	C1 res.	C2 comp	Total	UG	PG	C1 res.	C2 comp	Total
University of Fort Hare	Human Sciences	-55.07	-475.39	-171.61	29.01	-69.03	-55.07	-187.69	-35.81	29.01	-43.54	-55.07	-91.80	9.46	29.01	-24.73
	Natural Sciences	24.37	-59.58	2.49	35.42	2.65	24.37	20.21	51.25	35.42	30.04	24.37	46.81	67.50	35.42	45.40
	Total: Academic	6.10	-105.65	-27.97	30.80	-16.28	6.10	-2.83	36.02	30.80	12.90	6.10	31.45	57.34	30.80	30.37
	Centrally managed	-20.89	-10.30	44.49	0.00	-12.11	-20.89	44.85	72.25	0.00	9.82	-20.89	63.23	81.50	0.00	24.57
	Grand total	0.49	-94.53	-19.19	30.80	-15.63	0.49	2.74	40.41	30.80	12.45	0.49	35.16	60.27	30.80	29.55
University of the Free State	Human Sciences	6.95	-48.40	-285.94	-39.06	-51.11	6.95	25.80	-92.97	-39.06	-8.61	6.95	50.53	-28.65	-39.06	15.23
	Natural Sciences	67.93	-591.73	-105.56	-93.21	-169.81	67.93	-245.87	-2.78	-93.21	-78.41	67.93	-130.58	31.48	-93.21	-33.26
	Total: Academic	58.76	-528.42	-122.68	-64.44	-153.60	58.76	-214.21	-11.34	-64.44	-69.54	58.76	-109.47	25.77	-64.44	-27.34
	Centrally managed															
	Grand total	58.76	-528.42	-122.68	-64.44	-153.60	58.76	-214.21	-11.34	-64.44	-69.54	58.76	-109.47	25.77	-64.44	-27.34
University of Johannesburg	Human Sciences	70.35	53.86	-36.50	0.20	40.54	70.35	76.93	31.75	0.20	53.66	70.35	84.62	54.50	0.20	62.04
	Natural Sciences	22.00	-189.24	86.02	0.18	3.66	22.00	-44.62	93.01	0.18	31.32	22.00	3.59	95.34	0.18	46.64
	Total: Academic	28.72	-165.94	73.41	0.19	8.69	28.72	-32.97	86.71	0.19	34.14	28.72	11.35	91.14	0.19	48.50
	Centrally managed	1.29	-131.34	61.98	0.00	-4.89	1.29	-15.67	80.99	0.00	18.32	1.29	22.89	87.33	0.00	33.12
	Grand total	24.44	-162.25	72.34	0.19	6.93	24.44	-31.12	86.17	0.19	32.22	24.44	12.58	90.78	0.19	46.70
University of KwaZulu-Natal	Human Sciences	-5.83	-624.65	-335.58	13.90	-148.56	-5.83	-262.32	-117.79	13.90	-86.91	-5.83	-141.55	-45.19	13.90	-49.76
	Natural Sciences	29.49	-101.67	-34.36	3.13	-26.30	29.49	-0.83	32.82	3.13	18.11	29.49	32.78	55.21	3.13	39.42
	Total: Academic	24.66	-128.62	-63.74	7.06	-40.23	24.66	-14.31	18.13	7.06	7.63	24.66	23.79	45.42	7.06	31.14
	Centrally managed	-7.50	-324.03	-232.76	0.00	-107.36	-7.50	-112.01	-66.38	0.00	-51.40	-7.50	-41.34	-10.92	0.00	-19.22
	Grand total	19.67	-143.41	-79.23	7.06	-47.79	19.67	-21.71	10.38	7.06	1.56	19.67	18.86	40.26	7.06	26.21
University of Limpopo	Human Sciences	99.34	97.14	-6.89	21.17	79.11	99.34	98.57	46.55	21.17	84.19	99.34	99.05	64.37	21.17	87.28
	Natural Sciences	43.62	-17.33	55.48	51.30	36.72	43.62	41.34	77.74	51.30	58.59	43.62	60.89	85.16	51.30	69.23
	Total: Academic	48.03	-10.48	53.95	46.38	39.24	48.03	44.76	76.97	46.38	59.92	48.03	63.17	84.65	46.38	70.10
	Centrally managed	55.54	36.61	38.74	0.00	48.76	55.54	68.31	69.37	0.00	62.95	55.54	78.87	79.58	0.00	70.98
	Grand total	48.92	-6.64	53.01	46.38	40.11	48.92	46.68	76.50	46.38	60.17	48.92	64.45	84.34	46.38	70.17
Nelson Mandela Metr. Univ	Human Sciences	55.85	-110.90	-194.61	-35.98	-18.67	55.85	-5.45	-47.31	-35.98	9.72	55.85	29.70	1.80	-35.98	27.14
	Natural Sciences	68.83	18.19	31.61	-31.02	46.90	68.83	59.10	65.80	-31.02	63.23	68.83	72.73	77.20	-31.02	71.88
	Total: Academic	67.01	6.34	7.24	-33.50	38.16	67.01	53.17	53.62	-33.50	56.67	67.01	68.78	69.08	-33.50	66.65
	Centrally managed	69.89	-78.12	-48.42	0.00	25.91	69.89	10.94	25.79	0.00	43.93	69.89	40.63	50.53	0.00	54.90
	Grand total	67.47	-2.44	1.92	-33.50	36.58	67.47	48.78	50.96	-33.50	55.12	67.47	65.85	67.31	-33.50	65.28
North West University	Human Sciences	43.48	7.89	-28.79	35.58	21.91	43.48	53.94	35.61	35.58	43.66	43.48	69.30	57.07	35.58	55.94
	Natural Sciences	49.70	-397.45	-175.86	32.18	-122.69	49.70	-148.73	-37.93	32.18	-47.32	49.70	-65.82	8.05	32.18	-10.07
	Total: Academic	48.54	-341.66	-156.22	33.72	-97.81	48.54	-120.83	-28.11	33.72	-32.75	48.54	-47.22	14.59	33.72	0.10
	Centrally managed	-23.45	40.20	87.55	0.00	8.88	-23.45	70.10	93.78	0.00	34.22	-23.45	80.07	95.85	0.00	48.54
	Grand total	35.31	-290.47	-130.97	33.72	-82.16	35.31	-95.24	-15.48	33.72	-23.53	35.31	-30.16	23.01	33.72	6.55
University of Pretoria	Human Sciences	-5.34	-53.81	-210.90	-32.82	-53.36	-5.34	23.09	-55.45	-32.82	-7.85	-5.34	48.73	-3.63	-32.82	16.84
	Natural Sciences	-37.78	-151.90	-353.14	6.30	-146.84	-37.78	-25.95	-126.57	6.30	-51.82	-37.78	16.03	-51.05	6.30	-9.62
	Total: Academic	-34.19	-147.35	-343.36	-1.08	-139.65	-34.19	-23.68	-121.68	-1.08	-48.83	-34.19	17.55	-47.79	-1.08	-7.93
	Centrally managed	68.34	100.00	100.00	0.00	82.57	68.34	100.00	100.00	0.00	87.98	68.34	100.00	100.00	0.00	90.82
	Grand total	-19.96	-129.56	-307.83	-1.08	-117.76	-19.96	-14.78	-103.91	-1.08	-36.58	-19.96	23.48	-35.94	-1.08	0.51
Rhodes University	Human Sciences	-195.28	-620.65	-343.05	-52.18	-288.33	-195.28	-260.33	-121.53	-52.18	-174.75	-195.28	-140.22	-47.68	-52.18	-112.58
	Natural Sciences	-1.84	-492.96	-94.03	-101.64	-213.27	-1.84	-196.48	2.99	-101.64	-92.40	-1.84	-97.65	35.32	-101.64	-38.84
	Total: Academic	-43.43	-502.67	-134.90	-78.93	-225.45	-43.43	-201.33	-17.45	-78.93	-104.25	-43.43	-100.89	21.70	-78.93	-48.83
	Centrally managed	-103.64	-111.30	81.16	0.00	-67.65	-103.64	-5.65	90.58	0.00	-17.91	-103.64	29.57	93.72	0.00	9.07
	Grand total	-55.47	-466.23	-109.59	-78.93	-203.43	-55.47	-183.11	-4.80	-78.93	-93.34	-55.47	-88.74	30.14	-78.93	-41.87
University of South Africa	Human Sciences	96.74	65.10	1.89	-1.02	75.91	96.74	82.55	50.94	-1.02	81.35	96.74	88.37	67.30	-1.02	84.79
	Natural Sciences	95.49	47.63	-205.72	4.26	48.12	95.49	73.81	-52.86	4.26	59.80	95.49	82.54	-1.91	4.26	67.18
	Total: Academic	95.94	54.29	-131.84	-0.29	58.37	95.94	77.15	-15.92	-0.29	67.75	95.94	84.76	22.72	-0.29	73.69
	Centrally managed	-267.54	-1121.72	-829.35	0.00	-460.24	-267.54	-510.86	-364.67	0.00	-346.71	-267.54	-307.24	-209.78	0.00	-271.44
	Grand total	-2.39	-257.68	-259.55	-0.29	-74.46	-2.39	-78.84	-79.77	-0.29	-36.13	-2.39	-19.23	-19.85	-0.29	-11.61
University of Stellenbosch	Human Sciences	11.89	-292.63	-194.15	-14.62	-102.25	11.89	-96.31	-47.07	-14.62	-42.64	11.89	-30.88	1.95	-14.62	-10.17
	Natural Sciences	-17.57	-228.07	-201.51	-13.28	-140.49	-17.57	-64.03	-50.76	-13.28	-49.39	-17.57	-9.36	-50.76	-13.28	-8.35
	Total: Academic	-14.63	-231.37	-200.97	-13.63	-137.29	-14.63	-65.68	-50.48	-13.63	-48.89	-14.63	-10.46	-0.32	-13.63	-8.48
	Centrally managed	-40.23	-774.04	-1041.10	0.00	-437.72	-40.23	-337.02	-470.55	0.00	-263.31	-40.23	-191.35	-280.37	0.00	-174.33
	Grand total	-18.00	-272.28	-270.26	-13.63	-165.66	-18.00	-86.14	-85.13	-13.63	-67.82	-18.00	-24.09	-23.42	-13.63	-22.65
Tshwane University of Tech	Human Sciences	-10.43	-132.95	-141.36	13.96	-37.05	-10.43	-16.47	-20.68	13.96	-12.02	-10.43	22.35	19.55	13.96	5.28
	Natural Sciences	44.94	47.09	42.69	1.43	44.82	44.94	73.55	71.34	1.43	61.31	44.94	82.36	80.90	1.43	70.21
	Total: Academic	38.43	40.47	26.77	6.76	36.94	38.43	70.23	63.38	6.76	55.17	38.43	80.16	75.59	6.76	65.23
	Centrally managed	50.47	19.79	53.80	0.00	46.22	50.47	59.90	76.90	0.00	56.89	50.47	73.26	84.60	0.00	64.03
	Grand total	40.15	39.13	29.13	6.76	38.00	40.15	69.56	64.56	6.76	55.35	40.15	79.71	76.38	6.76	65.11
University of Venda	Human Sciences	-1.44	-216.53	-280.65	-27.79	-65.12	-1.44	-58.27	-90.32	-27.79	-32.26	-1.44	-5.51	-26.88	-27.79	-10.30
	Natural Sciences	62.33	-93.96	-3.93	-49.01	27.45	62.33	3.02	48.04	-49.01	44.70	62.33	35.35	65.36	-49.01	55.33
	Total: Academic	53.82	-104.50	-36.42	-42.45	15.81	53.82	-2.25	31.79	-42.45	35.45	53.82	31.83	54.53	-42.45	47.65
	Centrally managed	-76.58	-38.09	86.34	0.00	-54.31	-76.58	30.95	93.17	0.00	-27.16	-76.58	53.97	95.45	0.00	-8.14
	Grand total	33.87	-97.86	-24.21	-42.45	6.26	33.87	1.07	37.89	-42.45						

### 3.2.5. Norms for the condition of equipment for teaching and research

A 3-point scale was used for the classification of the condition of each piece of equipment included in the equipment survey. The scale points were defined in the following way:

- 1 = Fit for purpose and fully functional
- 2 = Fit for purpose but only partially functional and still in use
- 3 = Outdated but still in use

The average condition (on this 3-point scale), the replacement costs for equipment in condition 3, as well as the replacement costs of equipment in condition 3 as a percentage of the total replacement costs of equipment, are all shown in Tables 3.6 according to CESM category and in Table 3.7 in the case of centrally managed equipment. A summary according to broad field of study for each HEI is also shown in Table 3.13. The summarised values and percentages are also shown for the 5 benchmark universities in Table 3.13. These aggregate (weighted average) conditions of the 5 benchmark institutions are of special interest. The average condition of equipment at these 5 HEIs at academic units is 1.49. The average condition of the equipment in the human sciences academic units, namely 1.27, is significantly lower (indicating better condition) than the corresponding average in the natural sciences, namely 1.51. Apart from computers (including dedicated printers) of staff, many academic departments/schools/faculties in the broad field of human sciences do not utilise much equipment for teaching and research purposes. Note further that all computers' condition was taken by default as scale point 1. This factor therefore deflates the average scale point of the condition of equipment index (indicating better condition) to a larger extent in the case of human sciences than in the case of natural sciences. The average of the centrally managed equipment for the 5 benchmark institutions is only 1.29, which is significantly lower (indicating better condition) than the average condition of equipment used by academic units.

The percentages of equipment used by the 5 benchmark HEIs in the various categories which is outdated but still in use (scale point 3) appearing in Table 3.11 also make interesting reading. A percentage of 18.26% of equipment used in academic OUs is outdated, while only 10.40% of centrally managed equipment is outdated. This is a matter of concern because this means that even at the best teaching and research universities a large percentage of equipment should already have been replaced.

Although the individual HEIs' summary data in respect of the condition of their stock of equipment are shown in Table 3.13, it should be noted that many of the organisational units in institutions unfortunately frequently used scale point 1 as default value in their survey data. The reason for that could be that the officials at HEIs who had completed Sections B and C for each academic unit and support unit did not have the capacity or time to make an accurate judgment of the condition (or age as proxy) of every piece of equipment included in the survey. Although the information concerning the 5 benchmark institutions is believed to be reasonably accurate as far as the quality of equipment is concerned, the same cannot be said in respect of all other institutions.

**TABLE 3.13: SUMMARY INFORMATION ON THE CONDITION OF EQUIPMENT AT HEIS IN 2009  
ACCORDING TO HEI**

Institution		Average condition of equipment on 3 point scale	Percentage of equipment with condition 3
Cape Peninsula Univ Techn	Human Sciences		
	Natural Sciences		
	Total: Academic		
	Centrally managed		
	Grand total		
University of Cape Town	Human Sciences		
	Natural Sciences		
	Total: Academic		
	Centrally managed		
	Grand total		
Central University of Techn	Human Sciences	1.00	0.00
	Natural Sciences	1.00	0.00
	Total: Academic	1.00	0.00
	Centrally managed	1.00	0.00
	Grand total	1.00	0.00
Durban University of Techn	Human Sciences	1.69	22.36
	Natural Sciences	1.73	24.35
	Total: Academic	1.72	24.02
	Centrally managed		
	Grand total	1.72	24.02
University of Fort Hare	Human Sciences	1.92	4.21
	Natural Sciences	1.67	8.31
	Total: Academic	1.77	6.74
	Centrally managed	1.60	29.81
	Grand total	1.74	10.24
University of the Free State	Human Sciences	1.10	3.89
	Natural Sciences	1.34	18.13
	Total: Academic	1.32	16.97
	Centrally managed		
	Grand total	1.32	16.97
University of Johannesburg	Human Sciences	1.32	3.73
	Natural Sciences	1.41	15.64
	Total: Academic	1.40	14.58
	Centrally managed	1.33	5.27
	Grand total	1.39	13.22
University of KwaZulu-Natal	Human Sciences	1.01	0.31
	Natural Sciences	1.01	0.25
	Total: Academic	1.01	0.26
	Centrally managed	1.00	0.00
	Grand total	1.01	0.22
University of Limpopo	Human Sciences	1.04	1.62
	Natural Sciences	2.13	23.20
	Total: Academic	2.10	22.76
	Centrally managed	2.06	66.12
	Grand total	2.10	26.13
Nelson Mandela Metr. Univ	Human Sciences	1.00	0.00
	Natural Sciences	1.01	0.04
	Total: Academic	1.01	0.03
	Centrally managed	1.00	0.00
	Grand total	1.00	0.03
North West University	Human Sciences	1.31	2.00
	Natural Sciences	1.15	15.80
	Total: Academic	1.16	14.82
	Centrally managed	1.00	0.67
	Grand total	1.15	13.78
University of Pretoria	Human Sciences	1.26	5.26
	Natural Sciences	1.64	25.05
	Total: Academic	1.62	24.07
	Centrally managed	1.00	0.00
	Grand total	1.62	23.88
Rhodes University	Human Sciences	1.25	5.78
	Natural Sciences	1.29	13.19
	Total: Academic	1.28	11.75
	Centrally managed	1.44	15.70
	Grand total	1.30	12.06
Institution		Average condition of equipment on 3 point scale	Percentage of equipment with condition 3
University of South Africa	Human Sciences	1.31	3.70
	Natural Sciences	1.70	5.95
	Total: Academic	1.62	5.47
	Centrally managed	1.85	17.28
	Grand total	1.81	15.19
University of Stellenbosch	Human Sciences	1.73	28.25
	Natural Sciences	1.82	22.93
	Total: Academic	1.82	23.31
	Centrally managed	1.49	17.68
	Grand total	1.75	22.23
Tshwane University of Techn	Human Sciences	1.52	16.00
	Natural Sciences	1.45	15.38
	Total: Academic	1.46	15.51
	Centrally managed	2.03	21.13
	Grand total	1.52	16.06
University of Venda	Human Sciences	1.13	0.35
	Natural Sciences	1.14	4.93
	Total: Academic	1.14	3.80
	Centrally managed	1.86	16.76
	Grand total	1.30	6.71
Vaal University of Techn	Human Sciences	1.23	10.12
	Natural Sciences	1.29	9.61
	Total: Academic	1.29	9.68
	Centrally managed	1.77	56.71
	Grand total	1.33	13.58
Walter Sisulu Univ of Techn	Human Sciences	1.70	0.07
	Natural Sciences	1.54	0.11
	Total: Academic	1.59	0.10
	Centrally managed	1.67	0.79
	Grand total	1.62	0.38
University of Western Cape	Human Sciences	1.06	0.00
	Natural Sciences	1.19	0.00
	Total: Academic	1.19	0.00
	Centrally managed	1.09	0.00
	Grand total	1.17	0.00
University of Witwatersrand	Human Sciences	1.73	32.95
	Natural Sciences	1.59	28.98
	Total: Academic	1.61	29.47
	Centrally managed	1.37	23.38
	Grand total	1.54	27.78
University of Zululand	Human Sciences	1.74	17.76
	Natural Sciences	1.37	20.14
	Total: Academic	1.43	19.75
	Centrally managed	1.67	0.00
	Grand total	1.50	14.10
Mangosuthu Univ of Techn	Human Sciences	1.00	0.00
	Natural Sciences	1.44	7.24
	Total: Academic	1.44	7.18
	Centrally managed	2.06	6.03
	Grand total	1.57	6.93
Benchmark universities	Human Sciences	1.27	7.72
	Natural Sciences	1.51	19.26
	Total: Academic	1.49	18.24
	Centrally managed	1.29	10.40
	Grand total	1.47	17.49

### 3.2.6 A viable higher education equipment funding formula for the provision of equipment for teaching and research which could be used annually by the state as well as HEIs

It has already been indicated that no norms or formula have existed for the state's provision of equipment to HEIs since 2004 when the block grant subsidy formula came into effect. Prior to 2004, since 1993, the SAPSE subsidy formula provided, in the case of universities, equipment to HEIs on the following basis (See Department of National Education 1985b):

- i. For the replacement and renewal of equipment for instruction (teaching) and research  
*Human Sciences:*  
 0.0343 equipment cost units (equals R288 in the rand of 2009) per effective subsidy student  
*Natural Sciences:*  
 0.1794 equipment cost units (equals R1 508 in the rand of 2009) per effective subsidystudent
- ii. For new equipment for instruction (teaching) and research as a result of the increase in effective subsidy students  
*Human Sciences*  
 0.0680equipment cost units (equals R572 in the rand of 2009) per additional effective subsidy student  
*Natural Sciences*  
 0.3594equipment cost units (equals R3 022 in the rand of 2009) per additional effective subsidy student

Note that the above provisions did not take account of the fact that the funding level of the SAPSE subsidy formula was well below 100% during the years 1993-2003. In 2003 the funding level for all HEIs was, for example, only 60.29%. As a result of large backlogs in the availability of equipment at technikons twenty years ago the SAPSE subsidy provision for equipment over the period 1992-2003 for teaching and research was significantly better for technikons than for universities. The measure of effective subsidy students used in the SAPSE formula incorporated the usual weighting of FTE students according to study level (as is used in the calculation of teaching input units), an averaging of FTE enrolled and FTE successful (degree credit) students, as well as the addition of 1 000 set-up cost FTE students.

The second component of the above SAPSE formula provision was especially important for fast growing institutions. Double the annual provision per ESS for replacement and renewal of equipment was allocated per additional ESS for the acquiring of new equipment.

Can this SAPSE formula be updated or revised to be applied under the current or future funding regime? This will be difficult. Firstly, the second component, relating to growth in FTE students, complicated the SAPSE formula since strict rules had to be applied for the determination of additional students at HEIs in which growth had fluctuated extremely from year to year. Since 2005 each HEI's growth rate has been regulated within a national student enrolment plan for 2007-2010 determined by the former Minister of Education. A national FTE student annual average growth target of 2.8% is currently indicated for the period 2011/12 to 2013/14 in the Ministerial Statement on Student Enrolment Planning (Ministry of Higher Education and Training, 2011b). According to this latest ministerial plan of differential FTE student targets for HEIs, only 3 institutions' annual average growth targetsshould exceed 4%. In the light of the above it seems unnecessary to include a "second" component in any equipment funding formula. Secondly, the SAPSE funding formula for equipment was based on weighted FTE students with weights 1, 2, 3 and 4 according to the 4 study levels, which still forms part of the calculation of the current block grant formula. The SAPSE funding formula also distinguished between the two broad fields of study, namely human sciences and natural sciences. The equipment survey data, which is used for the derivation of the different proposed norms (See Section 3.2.3), distinguishes between undergraduate FTE students, post-graduate FTE students, FTE academic staff and FTE support staff working in academic units. The proposed norms and standards for the equipment replacement cost, proposed in Section 3.2.3,



provide obvious and nuanced weights (also according to the two broad fields of study) which could be used to great effect in the derivation of an equipment funding formula.

Table 3.14, which is an extract from Table 3.4, shows the expenditure of the 5 benchmark universities on equipment for teaching and research according to type of funds used and year. If UNW is omitted (See note under Table 3.14), it is important to note that a high percentage of between 45-51% of all expenditure of the remaining 4 institutions annually came from “other funds”, i. e. funds not controlled by the councils of these institutions. These “other funds” are mostly earmarked third stream income project funding from the NRF, MRC, as well as from private sector companies for which these institutions performed contract research. It could therefore safely be assumed that a high percentage of the expenditure on equipment of these 4 benchmark institutions from these sources was in respect of sophisticated equipment used for higher post-graduate teaching and staff research. Third stream income is therefore used to provide the equipment for post-graduate teaching and staff research to ensure “top standards” (see norm tables in Section 3.2.3) in post-graduate and staff research.

**TABLE 3.14: SUMMARY OF BENCHMARK UNIVERSITIES’ REAL EXPENDITURE (R OF 2009) ON EQUIPMENT FOR TEACHING AND RESEARCH FOR 2006-2009 ACCORDING TO HEI, TYPE OF FUNDING AND YEAR**

Institution	2006			2007			2008			2009		
	Council controlled (R'000)	Other (R'000)	Total (R'000)	Council controlled (R'000)	Other (R'000)	Total (R'000)	Council controlled (R'000)	Other (R'000)	Total (R'000)	Council controlled (R'000)	Other (R'000)	Total (R'000)
UKZN	19139	20507	39647	38839	14370	53209	31246	31037	62284	21273	20804	42078
UNW	47350	0	47350	55116	0	55116	40386	0	40386	49738	0	49738
UP	49062	26891	75953	78987	30280	109267	69172	22516	91688	61229	20296	81525
RU	25525	7675	33200	13041	3794	16835	8448	4480	12929	8869	6154	15022
SU	23352	45205	68557	22523	79243	101766	14038	71658	85696	10764	59097	69861
<b>Total (Excluding UNW)<sup>1)</sup></b>	<b>117078</b>	<b>100278</b>	<b>217356</b>	<b>153390</b>	<b>127687</b>	<b>281077</b>	<b>122905</b>	<b>129691</b>	<b>252597</b>	<b>102135</b>	<b>106352</b>	<b>208487</b>
<b>%</b>	<b>53.86</b>	<b>46.14</b>	<b>100.00</b>	<b>54.57</b>	<b>45.43</b>	<b>100.00</b>	<b>48.66</b>	<b>51.34</b>	<b>100.00</b>	<b>48.99</b>	<b>51.01</b>	<b>100.00</b>

1) UNW includes all equipment expenditure under Council controlled. This is obviously incorrect.

What is the Minister of Higher Education and Training’s funding role and responsibility in the funding of equipment for teaching and research at HEIs? The Minister should provide an adequate share of funding for equipment to ensure that the “minimum/basic standards” level (See norm tables in Section 3.2.3) of teaching and research equipment is guaranteed. In the light of the discussion in the previous paragraph, the total expenditures on equipment from council controlled funds for the 4 benchmark institutions for 2006-2009 in Table 3.14 therefore represent an approximation of the annual amounts needed for each of the 4 years to provide the equipment to ensure the minimum/basic standards in teaching and research. It is, however, important to remember that often the first budgets to be cut at HEIs when financial pressure is experienced, is the budget for equipment. The council controlled funding for equipment as indicated in Table 3.14 for the years 2006-2009 could therefore be regarded as usually insufficient to fulfill the actual equipment needs for teaching and research.

Table 3.15 shows the block grant allocation, as well as the total income for the education and general programmes controlled by council, for the 4 benchmark (excluding UNW) institutions for 2006-2009. The total block grant as percentage of total council controlled income per year is shown in the last row for each of the 4 years. These percentages aggregated over the 4 years are also shown for each institution in the last column. The main conclusion is that for the 4 benchmark institutions over the 4 years, the block grants contributed 52.79% of all council controlled funding as far as education and general programmes are concerned. This percentage could therefore provide the benchmark for the

DHET contribution towards the council controlled funding of equipment for teaching and research to ensure minimum/basic standards.

**TABLE 3.15: INCOME DATA FOR 4 BENCHMARK INSTITUTIONS FOR 2006-2009 ACCORDING TO HE INSTITUTION AND YEAR**

Institution	2006		2007		2008		2009		Total		% Block grant
	Block grant (R'000)	E&G Income (Council) (R'000)	Block grant (R'000)	E&G Income (Council) (R'000)	Block grant (R'000)	E&G Income (Council) (R'000)	Block grant (R'000)	E&G Income (Council) (R'000)	Block grant (R'000)	E&G Income (Council) (R'000)	
UKZN	735839	1358875	783578	1459785	869517	1576092	958015	1775883	3346949	6170635	54.24
UP	869371	1584123	938146	1746132	997423	1958386	1134396	2147384	3939336	7436025	52.98
RU	137798	242430	152923	260383	172760	298285	199371	345860	662852	1146958	57.79
SU	529058	1096358	569640	1266977	621795	1216210	693093	1296483	2413586	4876028	49.50
Total	2272066	4281786	2444287	4733277	2661495	5048973	2984875	5565610	10362723	19629646	52.79
% Block grant	53.06		51.64		52.71		53.63		52.79		

Let us define an equipment provision cost unit (EPCU) as the annual norm provision of equipment for one undergraduate FTE student in the natural sciences. Then, by using the minimum/basic standards norms per FTE student, FTE academic staff and FTE support staff, as set out in Section 3.2.3, as weights the relative cost of the provision of equipment for the different types of students and staff can be determined. This is set out in the table below.

Type of student/staff	Number of EPCUs
1 FTE UG student in the natural sciences	1.00
1 FTE UG student in the human sciences	0.07
1 FTE PG student in the natural sciences	2.90
1 FTE PG student in the human sciences	0.13
1 FTE academic staff member in the natural sciences	5.64
1 FTE academic staff member in the human sciences	0.58
1 FTE support staff member in an academic department	0.79
1 FTE UG student (centrally managed equipment)	0.07
1 FTE PG student (centrally managed equipment)	0.11
1 FTE academic staff member (centrally man. equipment)	0.31

The total numbers of the different parameters (types of student/staff) in the above table can be determined for the 4 expenditure benchmark HEIs from Table 3.6. These numbers, as well as the numbers of EPCUs generated by these parameters are set out in Table 3.16.

**TABLE 3.16: CALCULATION OF THE TOTAL EPCUs FOR THE 4 BENCHMARK INSTITUTIONS**

Type of student/staff	Total number	EPCU weights	Total EPCUs
FTE UG student in natural sciences	23852	1.00	23852
FTE UG student in human sciences	45078	0.07	3270
FTE PG student in natural sciences	8627	2.90	24986
FTE PG student in human sciences	10456	0.13	1312
FTE C1 staff member in natural sciences	2351	5.64	13266
FTE C1 staff member in human sciences	2112	0.58	1218
C2 staff member in academic department	2991	0.79	2365
FTE UG student (centrally managed equipment)	68930	0.07	4597
FTE PG student (centrally managed equipment)	19083	0.11	2118
FTE C1 staff member (centrally man.equipment)	4463	0.31	1369
Total			78353

The average annual real expenditure (R of 2009) on equipment for teaching and research from council controlled funds for the period 2006-2009 for the 4 benchmark institutions as calculated from Table 3.14 was R123 877 000. By dividing this amount by the 78353 EPCUs in Table 3.16, the value of EPCU in 2009, namely R1 581, is determined.

The proposal for the annual state's provision for the equipment for teaching and research at a specific institution to ensure minimum/basic standards is therefore:

$$\text{State provision} = 0.5279 \times \text{Total EPCU} \times \text{Rand value of EPCU}$$

where 0.5279 is the state contribution ratio determined in Table 3.15. For the annual application of the formula for financial year  $n$  the most recent number of EPCUs, usually for year  $(n-2)$ , should be used. The rand value of the EPCU can be determined annually by using some of the components of the Production Price Index (PPI) which is published monthly by Statistics SA. This method was also used in the equipment survey to determine the replacement costs of equipment in 2009. (See last page of **Appendix E**)

Table 3.17 shows the state provision for equipment in 2009 for each HEI as calculated by means of the above formula.

**TABLE 3.17: PROPOSED STATE PROVISION FOR TEACHING AND RESEARCH EQUIPMENT IN 2009 ACCORDING TO HE INSTITUTION**

Institution	Proposed state provision in 2009 (R'000)
Cape Peninsula University of Technology	
University of Cape Town	
Central University of Technology, Free State	6428
Durban Institute of Technology	5442
University of Fort Hare	3516
University of the Free State	9853
University of Johannesburg	20713
University of KwaZulu-Natal	17788
University of Limpopo	12150
Nelson Mandela Metropolitan University	9841
North West University	13924
University of Pretoria	27689
Rhodes University	2993
University of South Africa	17530
University of Stellenbosch	16927
Tshwane University of Technology	23323
University of Venda	4436
Vaal University of Technology	9574
Walter Sisulu University for Technology	8369
University of Western Cape	8718
University of Witwatersrand	17955
University of Zululand	1427
Mangosuthu Technikon	4374
<b>Total</b>	<b>242971</b>

### **3.3 CONCLUSIONS AND PROPOSALS**

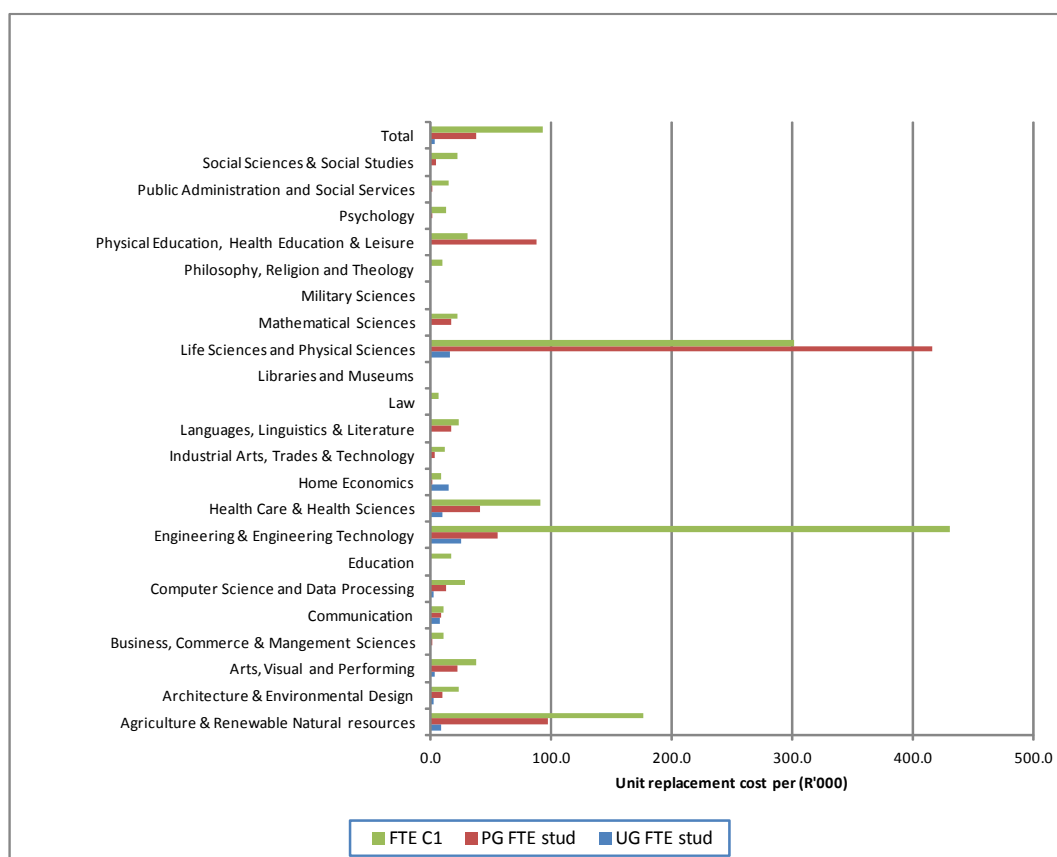
#### **3.3.1 Some conclusions made from the survey analyses in Sections 3.1 and the derivation of norms and standards for the provision of equipment in Section 3.2**

Although institutions were requested in November 2009 to include in the survey the equipment available for teaching and research purposes in respect of 2009, many institutions' surveys were only completed in late 2010 or even in 2011. The last institutional survey was completed in August 2011. Most of the institutional surveys had to be referred back to institutions at least two or three times for revision since they were incomplete or not according to the specifications set out in Appendix E. Two HEIs did not respond, while the final submissions of two institutions were incomplete. Although the student and staff numbers used in the analyses set out in Sections 3.1 and 3.2 refer to 2009, the long survey process could have led to the inclusion of some pieces of equipment acquired after 2009. Even with these deficiencies the equipment survey provides a wealth of information regarding the stock of equipment which was available at HEIs in 2009. The analyses of the equipment survey data as described in Sections 3.1 and 3.2 indicated some important trends in the current availability of and expenditure on equipment for teaching and research. More detailed analyses regarding differences in the provision of equipment between HEIs according to CESM category and according to specific academic departments, e. g. Physics, Chemistry, are also important but not covered in this report.

The following important overarching conclusions can be made from the analyses of the institutional surveys:

1. The long and arduous processes involved in the completion of most of the institutional surveys suggest that no or very little information regarding equipment are available at HEIs. Where inventories of equipment or general asset registers existed at institutions it was sometimes very difficult for institutions to allocate individual pieces of equipment to specific academic organisational units. This is a matter of concern since millions of rand are invested in equipment and other fixed assets. Furthermore, for regular institutional fixed asset maintenance, equipment inventory information like purchase date and purchasing cost of all pieces of equipment are of the utmost importance.
2. Table 3.10 shows that R1.821 billion was invested in equipment for teaching and research purposes in 2009 at the 5 benchmark universities. This represented an equipment replacement cost of R15 778 per FTE student. Figure 3.3 shows that Life Sciences and Physical Sciences, Engineering, as well as Agriculture and Renewable Natural Resources are the most expensive study fields for the provision of equipment, especially for post-graduate teaching and staff research. With effect from 2010 the 22 CESM categories were reduced to only 20 categories. Category 14 (Libraries and Museums) and Category 19 (Physical Education, Health Education and Leisure) of the CESM categories used until 2009 were discontinued and incorporated in the other 20 categories. The new, but very obvious, classification of CESM categories between human sciences and natural sciences should therefore be used with effect from 2010, also as far as the application of the funding formula for equipment is concerned.

**FIGURE 3.3: UNIT REPLACEMENT COST OF EQUIPMENT OF 5 BENCHMARK UNIVERSITIES IN 2009**



- Table 3.12 shows (See “Grand total row for each HEI) that 15 of the 20 HEIs have backlogs in the provision of undergraduate equipment for teaching when the uniform norms for human and natural sciences derived from the 5 benchmark universities are applied. When the minimum/basic standards norms are applied 5 HEIs have backlogs as far as post-graduate teaching is concerned and 9 institutions have backlogs as far as academic staff research is concerned.
- Table 3.5 shows that for the 4 years 2006-2009 on average 2.64% of total expenditure by 20 HEIs on education and general programmes was annually spent on equipment for teaching and research. It is a matter of concern that the system average for 2009 was lower than for both 2007 and 2008. In the case of 5 of the 20 institutions the annual average expenditure over the four years was less than 1%. The relative expenditure on teaching and research equipment is decreasing at many HEIs, in all probability to fund “more important” types of expenditure like remuneration of staff and services like electricity.

Table 3.7 shows that just more than 18% of total expenditure by reporting HEIs on teaching and research equipment was on equipment which was centrally managed. The percentages for individual institutions vary markedly with the UP percentage the lowest, namely 0.79% and the UNISA percentage of 82.67% the highest.

6. The funding of especially state of the art equipment by the NRF at HEIs makes it essential that more co-operation between the DHET and the DST is needed for the funding of large research equipment

### **3.3.2 Proposals for a national policy for the funding of equipment at higher education institutions**

In the light of the foregoing analyses and conclusions three proposals are made:

#### **3.3.2.1 Development norms for the provision of equipment for teaching and research**

It is proposed that the norms set out in Section 3.2.3 are used as guiding principles by both HEI managements, but also the Ministry of Higher Education and Training, in the annual provision of equipment for teaching and research.

#### **3.3.2.2 A national reporting system for higher education equipment**

Although no institution doubted the necessity of the ad hoc equipment survey, the institutions found it difficult to complete the survey. It was even more difficult for the HESA infrastructure task team to coach, guide and motivate the responsible officials at HEIs on their way to the conclusion of the survey. Even with this huge effort from many people some of the collected survey information is suspect. However, the value of the 2009 survey information, the first that has become available since the last (incomplete) SAPSE submission (including Chapter 5: Fixed asset reporting) in 1998, should not be underestimated. It will be to the detriment of the HE sector if the next round of equipment information is only collected in a similar ad hoc way as this one in 10-15 years time.

It is abundantly clear that if information on the annual availability and expenditure on equipment for teaching and research at all HEIs is considered as an important part of the medium to long term financial planning in higher education, a national equipment reporting system (as an additional component of HEMIS) is needed. With this as point of departure, the following is proposed:

- a. The new reporting system should include equipment reporting in all PCS programmes. The 2009 survey concentrated on the most important PCS programmes regarding the provision of equipment, namely 01 (Instruction), 02 (Research) and partly also 04 (Academic support).
- b. In compiling the new reporting system, Chapter 5 of the SAPSE system (Fixed assets reporting), as well as the 2009 survey formats in Sections A, B and C (See Appendix E) could serve as points of departure. The 2009 formats were workshopped in October 2009 by 22 HEIs and worked reasonably well in the completion of the survey. These can perhaps be refined further and even be extended to also include all PCS programmes.
- c. Chapter 5 of the SAPSE system did not only include reporting on equipment, but also reporting on the other types of fixed assets, namely land, buildings, land improvements other than buildings and library collections. The inclusion of other types of fixed assets in the proposed new reporting system should therefore also be considered.

- d. Since the availability (replacement cost) of equipment at HEIs is a slowly changing phenomenon, biennial national HEMIS reporting on equipment (and other fixed assets) could be considered by the DHET.
- e. The implementation of the HEMIS space data system in 2007 had many problems. This was outlined in Part 2 of this study. The 2009 HEMIS space data submitted by many HEIs was still of inferior quality. Any new equipment (or fixed asset) reporting system will have to be thoroughly designed and workshopped with all HEIs. It will be important to ensure that the necessary capacity and expertise to collect and submit the equipment information will exist at all HEIs. The same holds for the DHET where the HEMIS reports will have to be scrutinised, summarised and eventually be used in financial planning processes.

### 3.3.2.3 The funding of equipment

The following is true of the HE sector as far as the provision of equipment for teaching and research is concerned:

- Most HEIs have backlogs in the per unit provision when the uniform undergraduate provision norm is considered;
- The available equipment is totally inadequate at most institutions when they endeavour to either significantly enhance their intake in post-graduate students or their staff research activities;
- The stock of equipment per student or per staff member in the HE system is not likely to increase since the real annual expenditure on equipment as percentage of all expenditure in the education and general programmes in the system is apparently decreasing.
- No indication has been given by the government since the SAPSE subsidy system was replaced by the current funding regime in 2004 of how equipment is funded by government.
- Although earmarked funds for equipment were apparently allocated to some HEIs from the *Infrastructure and Efficiency fund* for the 2010/11 and 2011/12 financial years, the names of the receiving institutions, as well as the extent of the funding, are unknown.

In order to amend and improve the situation set out above the following two tier funding process for teaching and research equipment is proposed: *A. Eliminating backlogs by means of ad hoc funding*

With the information contained in this report, as well as all the other detailed information in the individual institutional surveys, it will be possible for HESA and the DHET to determine the HEIs with the most pressing needs as far as the provision of equipment is concerned. The emphasis should be on ensuring the attainment of the uniform norm provision of equipment on the undergraduate level at all HEIs. The study fields named in the PME targets should perhaps have priority. These backlogs should be funded as soon as possible from the annual earmarked *Infrastructure and Efficiency fund*. This should happen in a completely transparent way.

#### *B. A formula as part of the block grant allocation*

A formula for the state's annual contribution towards the funding of equipment for teaching and research at each HEI should form part of the block grant formula. Even if this formula amount is not earmarked, it will be a disciplinary measure. It will be possible from the proposed HEMIS equipment reporting system (See Section 3.3.2.2) to compare the state

allocated amount with the actual institutional expenditure on equipment, especially when a funding formula for equipment, like the one proposed in Section 3.2.6, where the expenditure for equipment is shared by government and institutions, is used.



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## **APPENDIX A: SOME COMMENTS AFTER AN ANALYSIS OF THE HEMIS SPACE DATA FOR 2008 AS PART OF THE HESA INFRASTRUCTURE STUDY**

### **1. Background**

The HESA infrastructure study has two components, namely:

- An investigation into the current building facilities available at HEIs, the condition of the facilities, as well as the development of proposals for national policy on the provision of funds for the erection of new building facilities and land improvements other than buildings.
- An investigation into the availability and condition of equipment used currently in the teaching and research programmes at HEIs, as well as the development of proposals for the enhancement of funding for equipment at HEIs if significant needs (backlogs) in equipment are proven.

A Task team was appointed early in 2009 by HESA to conduct this study. The second component of the study, namely the equipment survey (outlined in Section 5 of the attached document) is currently underway and all HEIs will submit their collected data by the end of March 2010.

As indicated in Section 4 of the attached document the Task Team planned to utilize the HEMIS space data submissions for 2008 of the respective HEIs as the basis for determining the backlogs/surpluses in buildings and other land improvements, as well as the condition of the buildings at each institution. The backlogs/surpluses in buildings for each HEI in 2008 can be determined by comparing the actual building stock available (both in terms of ASM and building cost units) at the HEI, as reflected in the HEMIS submissions, with the norm ASM and norm building cost units of the HEI, as determined by means of the space and cost norms for buildings and other land improvements at higher education institutions (DoE, April 2009). The norm ASM for 2008 for each HEI depends only on the respective FTE student numbers according to CESM category, total FTE students and FTE residential students of the HEIs.

All the available submitted HEMIS space data for 2008 needed for the building part of the HESA study were provided by Ms Jean Skene of DHET to the HESA Task Team. After an analysis of the data the Task Team came to the conclusion that since many HEIs' 2008 data are still not available and some major inaccuracies are present in the data of many of the institutions which have submitted space information, the 2008 HEMIS space data is not suited to be utilized in the building part of the study. The Task team is also of the opinion that the HEMIS space data file specifications should be adjusted in order to ensure that the 2009 space data submissions of HEIs will be more accurate and more suited for the study as anticipated by the HESA Task Team.

This document outlines some of the problems encountered by the Task team in their analyses and makes some suggestions for improvement of the HEMIS space data file specifications. This must not be seen as petty criticism but as well-meant and constructive comments with a view to improving the HEMIS space information system which is of major importance to the higher education sector. The DHET has already succeeded in implementing a very sophisticated HEMIS space data system and all that is needed is some further fine-tuning and perhaps some more capacity building of the staff dealing with the submission of the space data at some HEIs.

Proposals/suggestions in this document for the possible improvement of the HEMIS space data specifications are underlined in the text.

### **2. Outstanding space data**

By 1 November 2009, 5 months after the deadline for the submission of the HEMIS space data for 2008, 7 HEIs have either not submitted any data or the HEMIS records submitted by them could not be processed by the DHET to provide the space data summary reports. In the case of a few other HEIs, some important space data fields are missing in their submissions with the result that their reports (especially as far as the CESM report on formal instruction space is concerned) are also incomplete. From the correspondence between the Task Team and Ms Skene's office it is clear that the department is doing its utmost to ensure that the outstanding data are submitted as soon as

possible. The fact that the space data summaries for each HEI presently do not form part of published data on higher education activities or that the space data do not influence state allocations to institutions at this stage definitely also contributes towards the lack of institutional co-operation in submitting accurate and timeous space information.

### **3. Interrelationship between space-use categories and programmes**

One of the important summary tables generated by the DHET from the space data is the *ASM available in 2008 by programme and space-use category*. The submitted data shows many improbable classifications of ASM space according to PCS programme and space-use category, e.g. study space used in institutional support or residential space used in academic support. It is proposed that Table 2.1 on p 7 of the policy document (DoE, April 2009) be presented as a guideline to institutions for determining the PCS code (element number 219) of each room in the room file. It must, however, be noted that this table reflects the scope of the DHET space and cost norms for buildings at HEIs and does not mean that HEIs are bound to use ASM space exclusively in this way. If for instance study space is available in students' residences besides students' rooms (classified as residential space) it is not inconceivable to classify this space under PCS Programme 9.0 Auxiliary Enterprises. Furthermore, the debate regarding the correct classification of research/non-class laboratories in either PCS Programme 2.0 Research or in PCS Programme 1.0 Instruction could lead to different classifications at HEIs of this space-use category as far as PCS Programme 1.0 and 2.0 are concerned.

Table 2.1 shows that no norms are given for PCS programmes 3.0, 8.0, 10.0 (only for the University of Pretoria) and 11.0, the reason being that government traditionally did not subsidise buildings used for these programmes. HEIs will therefore have to consider carefully the classification of ASMs used in these 4 programmes according to space-use category.

### **4. First order classification of PCS**

Element 219, namely PCS code, specifies that only the first order PCS classification is used for each room. This has the serious consequence that the standard building cost units relating to a room used in PCS Programmes 4.0, 5.0, 6.0 and 9.0 cannot be calculated directly since the conversion factors of ASM to building cost units in these 4 programmes (see Table A.6 in (DoE, April 2009)) are in terms of the second order PCS programmes. Element 213, namely the standard cost units in the building file, providing the aggregated building cost units for all the rooms of a building, can therefore only be calculated if each room in the building is classified according to the second order PCS programme. It is therefore proposed that element 219 in the room file should be specified as the second order PCS code. The field width will therefore also have to be extended.

### **5. Building cost units available in 20XX by programme and space-use category**

A table indicating the *Building cost units available in 20XX by second order PCS programme and space-use category* will be a very useful addition to the existing summary tables of the HEMIS space data of each HEI. This table can be calculated from the extended (see par 4) summary table *ASM available in 20XX by second order PCS programme and space-use category* by using the conversion Tables A.5 and A.6 in (DHET, April 2009). In order to include all PCS programmes in this table, cost norms (building cost units per ASM) according to space-use category will also have to be determined for programmes 3.0, 8.0, 10.0 and 11.0.

It is therefore proposed that a table *Building cost units available in 20XX by second order PCS programme and space-use category* be added to the summary tables of HEMIS space data and that the necessary additional cost norms be determined for this purpose.

### **6. Unassigned ASM and buildings under construction**

For many HEIs, the summary table *ASM available in 2008 by programme and space-use category* shows unreasonably high unassigned ASM according to programme. One institution's percentage of unassigned ASM according to programme is 73% of total ASM. Clearly not only inactive areas, alteration and conversion areas, as well as unfinished areas, as specified in element 219, are included under unassigned areas but many usable rooms' purposes are apparently unknown and the element 219 field is left open. Better editing of element field 219 is therefore clearly needed.

The allocation of millions of rand for new buildings as part of the JIPSA initiative the last three years, as well as the allocation of infrastructure and efficiency funding for the next two years, resulted in many new buildings currently being erected or buildings planned to be erected during the next few years. Consideration should be given to including a field in the building file to indicate whether the building is under construction. Element 208 could even be adapted to include this information. The information in this field can also be used to ascertain whether large unassigned ASMs can be the result of some buildings under construction.

## 7. Building condition

Since the condition of existing buildings (Element 209) is a crucial variable for the analysis of the Task Team, the data provided in this field was requested separately from Ms Skene's office. Table 1 shows a summary of the data provided, as well as some additional information calculated from this summary (see the last three columns). Apart from the institutions which provided no data, only about 8 institutions' data seems reasonable and credible. There is a need for some additional edits on this field to ensure useful information.

Table 5.1: SUMMARY OF BUILDING CONDITIONS OF BUILDINGS AT HEIs IN 2008

Institution	Building condition										Number of buildings	Average <sup>1)</sup> condition	% in bad shape (Codes 5, 6 & 7)
	No data	0	1	2	3	4	5	6	7	9			
H01			2		137						139	2.97	0.00
H02													
H03							64				64	5.00	100.00
H04			105	5							110	1.05	0.00
H05													
H06			104		76	22					202	2.08	0.00
H07													
H08			174	177	80	15	8				454	1.91	1.76
H09													
H10			178								178	1.00	0.00
H11	2		124	195	155	93	8				577	2.42	1.39
H12		1	2	33	305	213	10	3			567	3.36	2.30
H13			35	17	134	17					203	2.66	0.00
H14			54	31	2	1	1		2		91	1.59	3.30
H15			56	214	138	16	1				425	2.28	0.24
H16										206	206		
H17													
H18			100								100	1.00	0.00
H19								225			225	6.00	100.00
H20		94									94		
H21			3	5	20	39	16	1			84	3.75	20.24
H22			5	153							158	1.97	0.00
H25													
Grand Total	2	95	942	830	1047	416	108	229	2	206	3877	2.61	9.49
1) Average building condition ignoring codes other than 1-7.													
List of building codes													
1 Minimal renovation (good)													
2 Limited renovation (satisfactory)													
3 Moderate renovation (fair)													
4 Significant renovation (poor)													
5 Major renovation (unsatisfactory)													
6 Replace/demolition													
7 Vacating building													
0 unknown code													
9 unknown code													

## 8. Conclusion

The above comments by the Task team are submitted to the DHET with the request for the Department to investigate and evaluate them and, should the Department agree, to consider making some adjustments to the HEMIS space data specifications before the submission of the HEMIS space data for 2009.

## 9. Reference

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## APPENDIX B: SPACE AND COST NORM TABLES (SEE DEPARTMENT OF EDUCATION 2009b)

**TABLE A.2: BUILDING SPACE NORMS PER FTE STUDENT FOR CONTACT AND DISTANCE TUITION IN THE FORMAL INSTRUCTION SUBPROGRAMME (1.1)**  
**AT HIGHER EDUCATION INSTITUTIONS ACCORDING TO CESM CATEGORY, COURSE LEVEL AND SPACE USE CATEGORY**

Space use Category	Classroom Facilities <sup>1)</sup>		Class/Open Laboratory Facilities <sup>1) 3)</sup>			Office Facilities <sup>2)</sup>	
(ASM PER FTE STUDENT OF A PARTICULAR	(1100)		( 1210, 1215, 1220, 1225)			(1300)	
CESM CATEGORY)	Contact	Distance	Contact	Distance		Contact	Distance
CESM category Course level <sup>4)</sup>	1-6,8		1-4	5,6,8	1-6,8	1-9	
01 Agriculture and Renewable Natural Resources	1.028	0.055	3.000	4.833	0.104	1.500	0.370
02 Architecture and Environmental Design	1.222	0.055	4.117	7.042	0.148	1.500	0.370
3A Music	0.667	0.095	5.000	5.000	0.133	1.250	0.750
3B History of Visual Arts	0.667	0.083			0.000	1.500	0.370
3C All other Arts, Visual and Performing	0.667	0.110	5.000	5.000	1.200	1.250	0.370
04 Business, Commerce and Management Sciences	1.139	0.123	0.300	0.750	0.014	0.750	0.188
05 Communication	0.888	0.055	0.550	4.750	0.070	0.750	0.188
06 Computer Science and Data Processing	0.972	0.040	2.333	2.000	0.033	1.000	0.214
07 Education	1.000	0.055	0.875	0.992	0.025	0.750	0.214
08 Engineering and Engineering Technology	1.554	0.055	4.550	5.600	0.135	1.500	0.370
09A Nursing, Rehabilitation and Therapy, etc.	1.194	0.055	2.000	2.000	0.050	1.500	0.214
09B All other Health Care and Health Sciences	1.194	0.040	3.250	3.833	0.094	1.500	0.214
10 Home Economics	0.917	0.040	3.683	6.717	0.138	1.500	0.375
11 Industrial Arts, Trades and Technology	0.722	0.040	7.000	7.000	0.186	1.500	0.370
12 Languages, Linguistics and Literature	0.972	0.083	0.750	1.000	0.023	0.750	0.300
13 Law	1.194	0.055	0.275	1.375	0.022	0.750	0.188
14 Libraries and Museums	0.917	0.040	0.700	1.150	0.025	0.750	0.370
15 Life Sciences and Physical Sciences	1.194	0.040	3.583	6.000	0.125	1.250	0.370
16 Mathematical Sciences	1.389	0.040	0.375	0.300	0.009	0.750	0.250
17 Military Sciences	0.946	0.040	0.642	1.458	0.028	1.000	0.250
18 Philosophy, Religion and Theology	0.972	0.068	0.300	1.525	0.024	0.750	0.300
19 Physical Education, Health Education and Leisure	1.000	0.040	3.500	4.200	0.102	1.000	0.250
20 Psychology	0.944	0.055	0.700	2.333	0.029	0.750	0.188
21 Public Administration and Social Services	0.778	0.095	0.375	0.250	0.025	0.750	0.188
22 Social Sciences and Social Studies	1.056	0.055	0.700	2.150	0.038	0.750	0.188

1) Calculated according to the formula  $A \times C/U$ .

2) Calculated according to the formula  $B/R$ .

3) Non-class laboratory space (250) and research excluded.

4) Course level key: 1 Low er Undergraduate/low er pre-diplomate; 2 Intermediate Undergraduate/Intermediate pre-diplomate; 3 Higher Undergraduate; 4 Preparatory Post-graduate/preparatory post-diplomate;

5 Low er post-graduate/Low er post-diplomate; 6 Intermediate Post-graduate (Non-research)/ ontermediate post-diplomate (Non-research); 7 Intermediate post-graduate (Research)/Intermediate post-diplomate (Research);

8 Higher post-graduate (Non-research)/Higher post-diplomate (Non-research); 9 Higher post-graduate (Research)/Higher post-diplomate (Research)

**TABLE A.4: BUILDING SPACE NORMS PER FTE STUDENT FOR CONTACT AND DISTANCE TUITION AT HIGHER EDUCATION INSTITUTIONS  
ACCORDING TO SPACE USE CATEGORY AND PROGRAMMES/SUBPROGRAMME (EXCLUDING PROGRAMME 1.1: FORMAL INSTRUCTION)**

Space use Category	Research/Non-class Laboratories Facilities (1250, 1255)		Office Facilities (1300)		Study Facilities (1400)		Special-Use, General-Use & Supporting Facilities (1500, 1600, 1700)		Health-Care Facilities (1800)	Residential Facilities (1900)		TOTAL	
(ASM PER FTE STUDENT ENROLLED AT AN INSTITUTION)													
Programme/subprogramme <sup>1)</sup>	Contact	Distance	Contact	Distance	Contact	Distance	Contact	Distance	Contact	Contact	Distance	Contact	Distance
2.0 Research	0.800	0.030										0.800	0.030
4.0 Academic Support													
4.1 Library Services			0.100	0.050	1.450	0.400						1.550	1.550
4.2 Museum Services							0.075	0.030				0.075	0.075
4.3 Educational Media Services			0.010	0.010			0.072	0.015				0.082	0.082
4.4 Academic Computing Support			0.020	0.008			0.047	0.001				0.067	0.067
4.5 Ancillary Support			0.075	0.038			0.425	0.035				0.500	0.500
4.6 Academic Administration			0.100	0.050								0.100	0.100
4.7 Course and Curriculum Development			0.005									0.005	
4.8 Academic Personnel Development			0.005									0.005	
5.0 Student Services													
5.1 Student Services Administration			0.008									0.008	
5.2 Social and Cultural Development			0.060				0.927	0.020				0.987	0.987
5.3 Counselling and Career Guidance			0.020									0.020	
5.4 Student Health Services									0.016			0.016	
6.0 Institutional Support													
6.1 Executive Management			0.020	0.010			0.042	0.006				0.062	0.062
6.2 Financial Administration			0.050	0.025				0.006				0.050	0.050
6.3 Financial Aid Administration			0.020									0.020	
6.4 General Administration and Logistical Services			0.060	0.030			0.516	0.371				0.576	0.576
6.5 Student Admissions, Records and Examination			0.030	0.020								0.030	0.030
6.6 Administrative Computing Support			0.025	0.019			0.019	0.015				0.044	0.044
6.7 Public Relations/Fund- Raising			0.030	0.030								0.030	0.030
6.8 Staff Social and Cultural Development			0.015									0.015	
7.0 Operation and Maintenance of Plant			0.030	0.005			0.270	0.060				0.300	0.300
9.0 Auxiliary Enterprises													
9.1 Student Housing Services <sup>1)</sup>							2.104			11.800		13.904	
9.2 Student Food Services <sup>1)</sup>							1.689					1.689	
9.3 Staff Housing Services										0.200	0.020	0.200	0.200
9.4 Other Food Services <sup>1)</sup>							0.462	0.040				0.462	0.462
9.5 Other Auxiliary Enterprises				0.010			0.044	0.005				0.044	0.044
9.6 Operation and Maintenance of Plant for Aux. Ent. <sup>1)</sup>			0.030				0.107					0.137	

1) Subprogramme 9.1, 9.2 and 9.6 apply to FTE students using institutional housing, and subprogramme 9.4 to FTE students not using institutional housing. All students of course levels 2-10 apply to all other programmes/subprogrammes

**TABLE A.5: BUILDING COST UNITS PER ASM FOR CONTACT AND DISTANCE TUITION AT HIGHER EDUCATION INSTITUTIONS FOR THE FORMAL INSTRUCTION (1.1) SUBPROGRAMME ACCORDING TO CESM CATEGORY AND SPACE USE CATEGORY**

Space use Category (BUILDING COST UNITS PER ASM)	Classroom Facilities	Class/Open Laboratory Facilities (1210, 1215, 1220, 1225)	Office Facilities (1300)
CESM category	(1100)		
01 Agriculture and Renewable Natural Resources	1.5	1.75	1.00
02 Architecture and Environmental Design	1.5	1.00	1.00
03 Arts, Visual and Performing			
3A Music	1.5	1.75	1.00
3B History of Visual Arts	1.5		1.00
3C All other Arts, Visual and Performing	1.5	1.10	1.00
04 Business, Commerce and Management Sciences	1.5	1.00	1.00
05 Communication	1.5	1.05	1.00
06 Computer Science and Data Processing	1.5	1.10	1.00
06 Education	1.5	1.10	1.00
07 Engineering and Engineering Technology	1.5	1.10	1.00
09 Health Care and Health Sciences			
09A Nursing, Rehabilitation and Therapy, etc	1.5	1.10	1.00
09B All other Health Care and Health Sciences	1.5	1.75	1.00
10 Home Economics	1.5	1.25	1.00
11 Industrial Arts, Trades and Technology	1.5	0.90	1.00
12 Languages, Linguistics and Literature	1.5	1.05	1.00
13 Law	1.5	1.00	1.00
14 Libraries and Museums	1.5	1.00	1.00
15 Life Sciences and Physical Sciences	1.5	1.75	1.00
16 Mathematical Sciences	1.5	1.00	1.00
17 Military Sciences	1.5	1.00	1.00
18 Philosophy, Religion and Theology	1.5	1.00	1.00
19 Physical Education, Health Education and Leisure	1.5	1.10	1.00
20 Psychology	1.5	1.15	1.00
21 Public Administration and Social Services	1.5	1.00	1.00
22 Social Sciences and Social Studies	1.5	1.00	1.00

DE-Norm Tables.xls



**TABLE A.7: BUILDING COST NORMS<sup>1)</sup> PER FTE STUDENT FOR CONTACT AND DISTANCE TUITION AT HIGHER EDUCATION INSTITUTIONS  
FOR THE FORMAL INSTRUCTION SUBPROGRAMME (1.1) ACCORDING TO CESM CATEGORY, COURSE LEVEL AND SPACE USE CATEGORY**

Space use Category	Classroom Facilities		Class Laboratory Facilities <sup>2)</sup>			Office Facilities	
(BUILDING COST UNITS PER FTE STUDENT OF A PARTICULAR CESM CATEGORY)	(100)		(210, 220, 230)			(300)	
CESM Category Course Level <sup>3)</sup>	Contact	Distance	Contact		Distance	Contact	Distance
	1-6,8		1-4	5,6,8	1-6,8	1-9	
01 Agriculture and Renewable Natural Resources	1.542	0.083	5.250	8.458	0.182	1.500	0.370
02 Architecture and Environmental Design	1.833	0.083	4.117	7.042	0.148	1.500	0.370
3A Music	1.001	0.143	8.750	8.750	0.233	1.250	0.750
3B History of Visual Arts	1.001	0.125				1.500	0.370
3C All other Arts, Visual and Performing	1.001	0.165	5.500	5.500	1.320	1.250	0.370
04 Business, Commerce and Management Sciences	1.709	0.185	0.300	0.750	0.014	0.750	0.188
05 Communication	1.332	0.083	0.578	4.988	0.074	0.750	0.188
06 Computer Science and Data Processing	1.458	0.060	2.566	2.200	0.036	1.000	0.214
06 Education	1.500	0.083	0.963	1.091	0.027	0.750	0.214
07 Engineering and Engineering Technology	2.331	0.083	5.005	6.160	0.148	1.500	0.370
09A Nursing, Rehabilitation and Therapy, etc <sup>1)</sup>	1.791	0.083	2.200	2.200	0.055	1.500	0.214
09B All other Health Care and Health Sciences	1.791	0.060	5.688	6.708	0.165	1.500	0.214
10 Home Economics	1.376	0.060	4.604	8.396	0.173	1.500	0.375
11 Industrial Arts, Trades and Technology	1.083	0.060	6.300	6.300	0.168	1.500	0.370
12 Languages, Linguistics and Literature	1.458	0.125	0.788	1.050	0.024	0.750	0.300
13 Law	1.791	0.083	0.275	1.375	0.022	0.750	0.188
14 Libraries and Museums	1.376	0.060	0.700	1.150	0.025	0.750	0.370
15 Life Sciences and Physical Sciences	1.791	0.060	6.270	10.500	0.219	1.250	0.370
16 Mathematical Sciences	2.084	0.060	0.375	0.300	0.009	0.750	0.250
17 Military Sciences	1.419	0.060	0.642	1.458	0.028	1.000	0.250
18 Philosophy, Religion and Theology	1.458	0.102	0.300	1.525	0.024	0.750	0.300
19 Physical Education, Health Education and Leisure	1.500	0.060	3.850	4.620	0.113	1.000	0.250
20 Psychology	1.416	0.083	0.805	2.683	0.033	0.750	0.188
21 Public Administration and Social Services	1.167	0.143	0.375	0.250	0.025	0.750	0.188
22 Social Sciences and Social Studies	1.584	0.083	0.700	2.150	0.038	0.750	0.188

1) Calculations were made by multiplying the values of the cost units in Table 4.5 with the space norms in Table 4.2.

2) Non-class laboratory space (250) and research excluded

3) Course level key: 1 Low er Undergraduate/low er pre-diplomate; 2 Intermediate Undergraduate/Intermediate pre-diplomate; 3 Higher Undergraduate; 4 Preparatory Post-graduate/preparatory post-diplomate;

5 Low er post-graduate/Low er post-diplomate; 6 Intermediate Post-graduate (Non-research)/ ontermediate post-diplomate (Non-research); 7 Intermediate post-graduate (Research)/Intermediate post-diplomate (Research);

8 Higher post-graduate (Non-research)/Higher post-diplomate (Non-research); 9 Higher post-graduate (Research)/Higher post-diplomate (Research)

**TABLE A.8: BUILDING COST NORMS<sup>1)</sup> PER FTE STUDENT FOR CONTACT AND DISTANCE TUITION AT HIGHER EDUCATION INSTITUTIONS FOR NON-INSTRUCTIONAL PROGRAMMES/SUBPROGRAMME ACCORDING TO SPACE USE CATEGORY AND PROGRAMME/SUBPROGRAMME**

Space use Category	Non-class Laboratory Facilities (1250, 1255)		Office Facilities (1300)		Study Facilities (1400)		Special-Use, General-Use & Supporting Facilities (1500, 1600, 1700)		Health-Care Facilities (1800)	Residential Facilities (1900)		TOTAL	
(COST UNITS PER FTE STUDENT ENROLLED AT AN INSTITUTION)													
Programme/subprogramme <sup>1)</sup>	Contact	Distance	Contact	Distance	Contact	Distance	Contact	Distance	Contact	Contact	Distance	Contact	Distance
2.0 Research	1.360	0.051										1.360	0.051
4.0 Academic Support													
4.1 Library Services			0.100	0.050	1.595	0.440						1.695	0.490
4.2 Museum Services							0.075	0.030				0.075	0.030
4.3 Educational Media Services			0.010	0.010			0.083	0.017				0.093	0.027
4.4 Academic Computing Support			0.020	0.008			0.080	0.002				0.100	0.010
4.5 Ancillary Support			0.075	0.038			0.425	0.035				0.500	0.073
4.6 Academic Administration			0.100	0.050								0.100	0.050
4.7 Course and Curriculum Development			0.005									0.005	
4.8 Academic Personnel Development			0.005									0.005	
5.0 Student Services													
5.1 Student Services Administration			0.008									0.008	
5.2 Social and Cultural Development			0.060				0.927	0.020				0.987	0.020
5.3 Counseling and Career Guidance			0.020									0.020	
5.4 Student Health Services									0.016			0.016	
6.0 Institutional Support													
6.1 Executive Management			0.020	0.010			0.053	0.008				0.073	0.018
6.2 Financial Administration			0.050	0.025				0.006				0.050	0.031
6.3 Financial Aid Administration			0.020									0.020	
6.4 General Administration and Logistical Services			0.060	0.030			0.387	0.278				0.447	0.308
6.5 Student Admissions, Records and Examination			0.030	0.020								0.030	0.020
6.6 Administrative Computing Support			0.025	0.019			0.032	0.026				0.057	0.045
6.7 Public Relations/Fund- Raising			0.030	0.030								0.030	0.030
6.8 Staff Social and Cultural Development			0.015									0.015	0.000
7.0 Operation and Maintenance of Plant			0.030	0.005			0.230	0.051				0.260	0.056
9.0 Auxiliary Enterprises <sup>2)</sup>													
9.1 Student Housing Services							1.999			12.390		14.389	
9.2 Student Food Services							1.605					1.605	
9.3 Staff Housing Services										0.210	0.021	0.210	0.021
9.4 Other Food Services							0.439	0.038				0.439	0.038
9.5 Other Auxiliary Enterprises				0.010			0.042	0.005				0.042	0.015
9.6 Operation and Maintenance of Plant for Aux. Ent. <sup>1)</sup>			0.030				0.091					0.121	

1) Calculations were made by multiplying the values of the cost units in Table 4.6 with the space norms in Table 4.4.

2) Subprogrammes 9.1, 9.2 and 9.6 apply to FTE students using institutional housing, and subprogramme 9.4 to FTE students not using institutional housing. All students of course levels 1-9 apply to all other programmes/subprogrammes

TABLE 2.1: Interrelationship between space use categories and programmes, and the scope of this manual

Space-use category Programmes	Classroom Facilities	Class/Open Laboratory Facilities	Res/Non-class Laboratory Facilities	Office Facilities	Study Facilities	Special-use Gen-use & Sup.fac.	Health-care Facilities	Residential Facilities
1.0 Instruction	A	A	B	A	B	B	B	B
2.0 Research	B	B	A	B	B	B	B	B
3.0 Public Service	B	B	B	B	B	B	B	B
4.0 Academic Support	B	B	B	A	A	A	B	B
5.0 Student Services	B	B	B	A	B	A	A	B
6.0 Institutional Support	B	B	B	A	B	A	B	B
7.0 Op. & Maint.of Plant	B	B	B	A	B	A	B	B
8.0 Bursaries	B	B	B	B	B	B	B	B
9.0 Auxilliary Enterprises	B	B	B	A	B	A	B	A
10.0 Hospitals	C	C	C	C	C	C	C	C
11.0 Ind. Operations	B	B	B	B	B	B	B	B

Key: A = This is a primary relationship for which space and cost norms are provided  
B = No provision is made for space within this programme and space facility  
C = This manual does not cover this programme

## **APPENDIX C: ANALYSIS OF BACKLOGS/SURPLUSES IN ASM IN 2009 ACCORDING TO (PCS) PROGRAMME AND INSTITUTION**

### **C.1 Backlogs/surpluses for all (PCS) programmes**

Tables C.1 to C.22 show the norm provisions, as well as the actual utilisations, in respect of all (PCS) programmes for both ASM and building cost units for the 22 HEIs which have submitted HEMIS space data for 2009. Note that even after the adjustments made to 21 HEIs' ASM space data, referred to in Section 2.1.2 of Part 2 of this report, in the case of 3 institutions (DUT, UNW and TUT) substantial "unassigned" ASM (and related building cost units) are still included in the before-mentioned tables. Since ASMs relating to formal instruction, research and auxiliary enterprises (especially for the residential space) are usually well classified, it could (perhaps) be assumed that all the "unassigned" spaces relate mostly to support space, namely space used in PCS Programmes 4.0, 5.0, 6.0 or 7.0).

### **C.2 Relative backlogs/surpluses for all (PCS) programmes**

The relative backlogs/surpluses in ASM for the different PCS programmes can be calculated for a specific HEI by dividing the institutional ASM backlog/surplus in a specific PCS programme by the respective ASMs determined by the norm in that programme and multiplying the result by 100%. Relative backlogs/surpluses can also be determined for total ASM, for total support services ASM (sum of Programmes 4.0-7.0) and for total academic ASM (sum of Programmes 1.1 and 2.0). A statistical analysis of these relative backlogs/surpluses for all the PCS programmes, as well as for the two grouped PCS programmes indicated above suggested that the further analysis of relative backlogs/surpluses in ASM building space should be based on the following classification of PCS programmes:

- Academic programmes (ASM in Programmes 1.0 and 2.0)
- Support services programmes (ASM in Programmes 4.0-7.0, plus "unassigned" spaces)
- Auxiliary enterprises (ASM in Programme 9.0)
- All programmes (Total ASM)

In the light of the argumentation in Section C.1 above all unassigned ASM are classified as ASM used in support services programmes. The above classification is used in Tables 2.8, 2.10 and Figure 2.1 in Section 2.1.4 of Part 2 of this report.

Figure 2.1 in Section 2.1.4 shows the ranked bar charts of the relative backlogs/surpluses in ASM for the above classification of (PCS) programmes. The first three graphical representations in Figure 2.1 are important because they represent an unbundling of the total backlogs/surpluses in ASM into 3 mutually exclusive sets of relative backlogs/surpluses, namely for academic programmes, for support services programmes and for the auxiliary enterprises programme.

**TABLE C.1: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: CPUT**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	90322	109940	102220	132419
2.0 Research	18129	30819	157	263
4.0 Academic Support	54041	58318	37751	40929
4.1 Library Services	35136	38423		
4.2 Museum Services	1700	1700		
4.3 Educational Media Services	1859	2104		
4.4 Academic Computing Support	1518	2264		
4.5 Ancillary Support	11332	11332		
4.6 Academic Administration	2268	2268		
4.7 Course and Curriculum Development	113	113		
4.8 Academic Personnel Development	113	113		
5.0 Student Services	23363	23363	15061	15090
5.1 Student Services Administration	181	181		
5.2 Social and Cultural Development	22366	22366		
5.3 Counseling and Career Guidance	453	453		
5.4 Student Health Services	363	363		
6.0 Institutional Support	18756	16370	11204	11563
6.1 Executive Management	1405	1643		
6.2 Financial Administration	1134	1134		
6.3 Financial Aid Administration	453	453		
6.4 General Administration and Logistical Services	13064	10138		
6.5 Student Admissions, Records and Examination	680	680		
6.6 Administrative Computing Support	998	1300		
6.7 Public Relations/Fund- Raising	681	681		
6.8 Staff Social and Cultural Development	340	340		
7.0 Operation and Maintenance of Plant	6800	5882	2483	2304
9.0 Auxiliary Enterprises	101727	103668	116725	119152
9.1 Student Housing Services1)	78068	80790		
9.2 Student Food Services1)	9483	9009		
9.3 Staff Housing Services	4533	4759		
9.4 Other Food Services1)	7876	7482		
9.5 Other Auxiliary Enterprises	997	948		
9.6 Operation and Maintenance of Plant for Aux. En	769	679		
Unassigned				
TOTAL FOR BUILDINGS	313137	348359	285602	321721
LAND IMPROVEMENTS OTHER THAN BUILDINGS		45287		41824
ALL LAND IMPROVEMENTS	313137	393646	285602	363544

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.2: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UCT**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	68868	86986	80978	102281
2.0 Research	15083	25641	15463	26283
4.0 Academic Support	44947	48505	53673	56949
4.1 Library Services	29223	31957		
4.2 Museum Services	1414	1414		
4.3 Educational Media Services	1546	1750		
4.4 Academic Computing Support	1263	1883		
4.5 Ancillary Support	9427	9427		
4.6 Academic Administration	1885	1885		
4.7 Course and Curriculum Development	94	94		
4.8 Academic Personnel Development	94	94		
5.0 Student Services	19438	19438	20668	20712
5.1 Student Services Administration	151	151		
5.2 Social and Cultural Development	18609	18609		
5.3 Counseling and Career Guidance	377	377		
5.4 Student Health Services	302	302		
6.0 Institutional Support	15592	13609	32237	35052
6.1 Executive Management	1169	1367		
6.2 Financial Administration	943	943		
6.3 Financial Aid Administration	377	377		
6.4 General Administration and Logistical Services	10860	8428		
6.5 Student Admissions, Records and Examination	566	566		
6.6 Administrative Computing Support	830	1080		
6.7 Public Relations/Fund- Raising	566	566		
6.8 Staff Social and Cultural Development	283	283		
7.0 Operation and Maintenance of Plant	5656	4893	2708	2683
9.0 Auxiliary Enterprises	98000	99971	98321	101852
9.1 Student Housing Services1)	77123	79812		
9.2 Student Food Services1)	9369	8900		
9.3 Staff Housing Services	3771	3959		
9.4 Other Food Services1)	6148	5840		
9.5 Other Auxiliary Enterprises	830	788		
9.6 Operation and Maintenance of Plant for Aux. En	760	671		
Unassigned			2715	2715
TOTAL FOR BUILDINGS	267585	299042	306763	348527
LAND IMPROVEMENTS OTHER THAN BUILDINGS		38876		45309
ALL LAND IMPROVEMENTS	267585	337918	306763	393835

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.3: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: CUT**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	36911	44825	20983	27275
2.0 Research	7611	12939	377	421
4.0 Academic Support	22786	24588	15095	16280
4.1 Library Services	14822	16208		
4.2 Museum Services	719	719		
4.3 Educational Media Services	784	887		
4.4 Academic Computing Support	639	952		
4.5 Ancillary Support	4767	4767		
4.6 Academic Administration	960	960		
4.7 Course and Curriculum Development	48	48		
4.8 Academic Personnel Development	48	48		
5.0 Student Services	9806	9806	7540	7556
5.1 Student Services Administration	76	76		
5.2 Social and Cultural Development	9387	9387		
5.3 Counseling and Career Guidance	190	190		
5.4 Student Health Services	152	152		
6.0 Institutional Support	7964	6948	7346	7777
6.1 Executive Management	592	693		
6.2 Financial Administration	481	481		
6.3 Financial Aid Administration	190	190		
6.4 General Administration and Logistical Services	5552	4308		
6.5 Student Admissions, Records and Examination	289	289		
6.6 Administrative Computing Support	425	553		
6.7 Public Relations/Fund- Raising	291	291		
6.8 Staff Social and Cultural Development	143	143		
7.0 Operation and Maintenance of Plant	2864	2478	2967	2752
9.0 Auxiliary Enterprises	16926	17053	11878	11992
9.1 Student Housing Services1)	9289	9613		
9.2 Student Food Services1)	1128	1072		
9.3 Staff Housing Services	1905	2000		
9.4 Other Food Services1)	4091	3887		
9.5 Other Auxiliary Enterprises	421	400		
9.6 Operation and Maintenance of Plant for Aux. En	92	81		
Unassigned			31	32
<b>TOTAL FOR BUILDINGS</b>	<b>104869</b>	<b>118637</b>	<b>66218</b>	<b>74086</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>15423</b>		<b>9631</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>104869</b>	<b>134060</b>	<b>66218</b>	<b>83717</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.4: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: DUT**

Programme/subprogramme	Norm provision		Actual utilisation <sup>2)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	67063	81617	85548	123400
2.0 Research	13868	23576	0	0
4.0 Academic Support	41328	44599	4409	4850
4.1 Library Services	26870	29384		
4.2 Museum Services	1300	1300		
4.3 Educational Media Services	1422	1609		
4.4 Academic Computing Support	1161	1732		
4.5 Ancillary Support	8668	8668		
4.6 Academic Administration	1734	1734		
4.7 Course and Curriculum Development	87	87		
4.8 Academic Personnel Development	87	87		
5.0 Student Services	17873	17873	105	105
5.1 Student Services Administration	139	139		
5.2 Social and Cultural Development	17110	17110		
5.3 Counseling and Career Guidance	347	347		
5.4 Student Health Services	277	277		
6.0 Institutional Support	14336	12513		
6.1 Executive Management	1075	1257		
6.2 Financial Administration	867	867		
6.3 Financial Aid Administration	347	347		
6.4 General Administration and Logistical Services	9985	7749		
6.5 Student Admissions, Records and Examination	520	520		
6.6 Administrative Computing Support	763	993		
6.7 Public Relations/Fund- Raising	520	520		
6.8 Staff Social and Cultural Development	260	260		
7.0 Operation and Maintenance of Plant	5201	4499		
9.0 Auxiliary Enterprises	70154	71434	36351	38168
9.1 Student Housing Services1)	52741	54580		
9.2 Student Food Services1)	6407	6086		
9.3 Staff Housing Services	3467	3640		
9.4 Other Food Services1)	6256	5944		
9.5 Other Auxiliary Enterprises	763	725		
9.6 Operation and Maintenance of Plant for Aux. En	520	459		
Unassigned			44772	44725
<b>TOTAL FOR BUILDINGS</b>	<b>229823</b>	<b>256111</b>	<b>171184</b>	<b>211248</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>33294.38175</b>		<b>27462.29334</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>229823</b>	<b>289405</b>	<b>171184</b>	<b>238711</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.5: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UFH**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	25702.0	33234.0	39 750.55	60196.7
2.0 Research	7048.4	11982.2	586.8	997.5
4.0 Academic Support	21004.1	22666.7	19184.9	21 406.2
4.1 Library Services	13656.2	14933.7		
4.2 Museum Services	660.8	660.8		
4.3 Educational Media Services	722.5	817.6		
4.4 Academic Computing Support	590.3	880.2		
4.5 Ancillary Support	4405.2	4405.2		
4.6 Academic Administration	881.0	881.0		
4.7 Course and Curriculum Development	44.1	44.1		
4.8 Academic Personnel Development	44.1	44.1		
5.0 Student Services	9083.6	9083.6	5668.0	5668.0
5.1 Student Services Administration	70.5	70.5		
5.2 Social and Cultural Development	8695.9	8695.9		
5.3 Counseling and Career Guidance	176.2	176.2		
5.4 Student Health Services	141.0	141.0		
6.0 Institutional Support	7286.2	6359.4	2458.1	2 486.7
6.1 Executive Management	546.2	638.8		
6.2 Financial Administration	440.5	440.5		
6.3 Financial Aid Administration	176.2	176.2		
6.4 General Administration and Logistical Services	5074.8	3938.3		
6.5 Student Admissions, Records and Examination	264.3	264.3		
6.6 Administrative Computing Support	387.7	504.8		
6.7 Public Relations/Fund- Raising	264.3	264.3		
6.8 Staff Social and Cultural Development	132.2	132.2		
7.0 Operation and Maintenance of Plant	2643.1	2286.3	5917.2	5068.2
9.0 Auxiliary Enterprises	60320.5	61629.3	89388.0	92 193.4
9.1 Student Housing Services1)	49267.2	50985.0		
9.2 Student Food Services1)	5984.8	5685.5		
9.3 Staff Housing Services	1762.1	1850.2		
9.4 Other Food Services1)	2433.4	2311.7		
9.5 Other Auxiliary Enterprises	387.7	368.3		
9.6 Operation and Maintenance of Plant for Aux. En	485.4	428.6		
Unassigned				
<b>TOTAL FOR BUILDINGS</b>	<b>133088.0</b>	<b>147241.5</b>	<b>162953.6</b>	<b>188016.7</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>19141.4</b>		<b>24442.2</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>133088.0</b>	<b>166382.9</b>	<b>162953.6</b>	<b>212458.9</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.6: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UFS**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	62609	81453	56398	82606
2.0 Research	14821	25195	8943	15181
4.0 Academic Support	45197	48760	62797	67297
4.1 Library Services	29453	32204		
4.2 Museum Services	1441	1441		
4.3 Educational Media Services	1560	1764		
4.4 Academic Computing Support	1253	1862		
4.5 Ancillary Support	9365	9365		
4.6 Academic Administration	1940	1940		
4.7 Course and Curriculum Development	92	92		
4.8 Academic Personnel Development	92	92		
5.0 Student Services	19065	19065	15851	15856
5.1 Student Services Administration	148	148		
5.2 Social and Cultural Development	18253	18253		
5.3 Counseling and Career Guidance	369	369		
5.4 Student Health Services	295	295		
6.0 Institutional Support	16264	14170	19837	20801
6.1 Executive Management	1174	1371		
6.2 Financial Administration	981	981		
6.3 Financial Aid Administration	369	369		
6.4 General Administration and Logistical Services	11385	8830		
6.5 Student Admissions, Records and Examination	591	591		
6.6 Administrative Computing Support	876	1141		
6.7 Public Relations/Fund- Raising	610	610		
6.8 Staff Social and Cultural Development	277	277		
7.0 Operation and Maintenance of Plant	5659	4895	6111	5445
9.0 Auxiliary Enterprises	62457	63491	72459	74098
9.1 Student Housing Services1)	44918	46484		
9.2 Student Food Services1)	5456	5184		
9.3 Staff Housing Services	3729	3915		
9.4 Other Food Services1)	7071	6718		
9.5 Other Auxiliary Enterprises	840	799		
9.6 Operation and Maintenance of Plant for Aux. En	443	391		
Unassigned			4541	4655
<b>TOTAL FOR BUILDINGS</b>	<b>226071</b>	<b>257030</b>	<b>246937</b>	<b>285939</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>33414</b>		<b>37172</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>226071</b>	<b>290444</b>	<b>246937</b>	<b>323111</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

TABLE C.7: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UJ

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	122508	151404	92614	133301
2.0 Research	30462	51786	4506	7554
4.0 Academic Support	90777	97963	21515	23794
4.1 Library Services	59020	64542		
4.2 Museum Services	2856	2856		
4.3 Educational Media Services	3122	3534		
4.4 Academic Computing Support	2551	3804		
4.5 Ancillary Support	19039	19039		
4.6 Academic Administration	3808	3808		
4.7 Course and Curriculum Development	190	190		
4.8 Academic Personnel Development	190	190		
5.0 Student Services	39258	39258	32521	32521
5.1 Student Services Administration	305	305		
5.2 Social and Cultural Development	37583	37583		
5.3 Counseling and Career Guidance	762	762		
5.4 Student Health Services	609	609		
6.0 Institutional Support	31490	27484	98304	103149
6.1 Executive Management	2361	2761		
6.2 Financial Administration	1904	1904		
6.3 Financial Aid Administration	762	762		
6.4 General Administration and Logistical Services	21933	17021		
6.5 Student Admissions, Records and Examination	1142	1142		
6.6 Administrative Computing Support	1675	2182		
6.7 Public Relations/Fund- Raising	1142	1142		
6.8 Staff Social and Cultural Development	571	571		
7.0 Operation and Maintenance of Plant	11423	9881	19061	16202
9.0 Auxiliary Enterprises	103695	105162	73373	76987
9.1 Student Housing Services1)	69950	72389		
9.2 Student Food Services1)	8497	8072		
9.3 Staff Housing Services	7616	7996		
9.4 Other Food Services1)	15268	14504		
9.5 Other Auxiliary Enterprises	1675	1592		
9.6 Operation and Maintenance of Plant for Aux. En	689	608		
Unassigned				
TOTAL FOR BUILDINGS	429614	482938	341893	393509
LAND IMPROVEMENTS OTHER THAN BUILDINGS		62782		51156
ALL LAND IMPROVEMENTS	429614	545720	341893	444665

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

TABLE C.8: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UKZN

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	89208	113948	103179	150926
2.0 Research	20339	34576	18693	31255
4.0 Academic Support	62538	67462	148949	161575
4.1 Library Services	40786	44595		
4.2 Museum Services	2003	2003		
4.3 Educational Media Services	2162	2443		
4.4 Academic Computing Support	1726	2561		
4.5 Ancillary Support	12903	12903		
4.6 Academic Administration	2705	2705		
4.7 Course and Curriculum Development	126	126		
4.8 Academic Personnel Development	126	126		
5.0 Student Services	26146	26146	21375	21382
5.1 Student Services Administration	202	202		
5.2 Social and Cultural Development	25033	25033		
5.3 Counseling and Career Guidance	506	506		
5.4 Student Health Services	405	405		
6.0 Institutional Support	22790	19845	11237	12025
6.1 Executive Management	1624	1895		
6.2 Financial Administration	1374	1374		
6.3 Financial Aid Administration	506	506		
6.4 General Administration and Logistical Services	15980	12391		
6.5 Student Admissions, Records and Examination	829	829		
6.6 Administrative Computing Support	1233	1606		
6.7 Public Relations/Fund- Raising	864	864		
6.8 Staff Social and Cultural Development	379	379		
7.0 Operation and Maintenance of Plant	7816	6760	3097	2881
9.0 Auxiliary Enterprises	131394	134025	133879	136062
9.1 Student Housing Services1)	103155	106752		
9.2 Student Food Services1)	12531	11904		
9.3 Staff Housing Services	5129	5385		
9.4 Other Food Services1)	8398	7978		
9.5 Other Auxiliary Enterprises	1166	1109		
9.6 Operation and Maintenance of Plant for Aux. En	1016	897		
Unassigned				
TOTAL FOR BUILDINGS	360231	402762	440408	516105
LAND IMPROVEMENTS OTHER THAN BUILDINGS		52359		67094
ALL LAND IMPROVEMENTS	360231	455121	440408	583199

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted



**TABLE C.9: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UL**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	48730	65542	40496	58084
2.0 Research	10979	18664	6475	10914
4.0 Academic Support	32716	35306	51277	54431
4.1 Library Services	21271	23261		
4.2 Museum Services	1029	1029		
4.3 Educational Media Services	1125	1274		
4.4 Academic Computing Support	919	1371		
4.5 Ancillary Support	6862	6862		
4.6 Academic Administration	1372	1372		
4.7 Course and Curriculum Development	69	69		
4.8 Academic Personnel Development	69	69		
5.0 Student Services	14149	14149	11958	12036
5.1 Student Services Administration	110	110		
5.2 Social and Cultural Development	13545	13545		
5.3 Counseling and Career Guidance	274	274		
5.4 Student Health Services	220	220		
6.0 Institutional Support	11349	9905	12891	14176
6.1 Executive Management	851	995		
6.2 Financial Administration	686	686		
6.3 Financial Aid Administration	274	274		
6.4 General Administration and Logistical Services	7905	6134		
6.5 Student Admissions, Records and Examination	412	412		
6.6 Administrative Computing Support	604	786		
6.7 Public Relations/Fund- Raising	412	412		
6.8 Staff Social and Cultural Development	206	206		
7.0 Operation and Maintenance of Plant	4117	3561	19416	17034
9.0 Auxiliary Enterprises	137643	140848	141315	146914
9.1 Student Housing Services1)	116524	120586		
9.2 Student Food Services1)	14155	13447		
9.3 Staff Housing Services	2745	2882		
9.4 Other Food Services1)	2468	2345		
9.5 Other Auxiliary Enterprises	604	574		
9.6 Operation and Maintenance of Plant for Aux. En	1148	1014		
Unassigned			51	51
<b>TOTAL FOR BUILDINGS</b>	<b>259684</b>	<b>287975</b>	<b>283879</b>	<b>313639</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>37437</b>		<b>40773</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>259684</b>	<b>325412</b>	<b>283879</b>	<b>354412</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.10: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: NMMU**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	57959	72025	58174	79745
2.0 Research	13328	22657	1499	2539
4.0 Academic Support	40625	43828	37070	38701
4.1 Library Services	26472	28945		
4.2 Museum Services	1295	1295		
4.3 Educational Media Services	1402	1585		
4.4 Academic Computing Support	1127	1674		
4.5 Ancillary Support	8420	8420		
4.6 Academic Administration	1743	1743		
4.7 Course and Curriculum Development	83	83		
4.8 Academic Personnel Development	83	83		
5.0 Student Services	17145	17145	23571	23676
5.1 Student Services Administration	133	133		
5.2 Social and Cultural Development	16415	16415		
5.3 Counseling and Career Guidance	332	332		
5.4 Student Health Services	266	266		
6.0 Institutional Support	14608	12728	15769	17144
6.1 Executive Management	1056	1232		
6.2 Financial Administration	881	881		
6.3 Financial Aid Administration	332	332		
6.4 General Administration and Logistical Services	10225	7930		
6.5 Student Admissions, Records and Examination	531	531		
6.6 Administrative Computing Support	787	1025		
6.7 Public Relations/Fund- Raising	548	548		
6.8 Staff Social and Cultural Development	249	249		
7.0 Operation and Maintenance of Plant	5087	4400	4966	4340
9.0 Auxiliary Enterprises	56634	57573	51769	52811
9.1 Student Housing Services1)	40790	42213		
9.2 Student Food Services1)	4955	4707		
9.3 Staff Housing Services	3353	3520		
9.4 Other Food Services1)	6379	6060		
9.5 Other Auxiliary Enterprises	755	718		
9.6 Operation and Maintenance of Plant for Aux. En	402	355		
Unassigned				
<b>TOTAL FOR BUILDINGS</b>	<b>205385</b>	<b>230356</b>	<b>192819</b>	<b>218956</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>29946</b>		<b>28464</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>205385</b>	<b>260303</b>	<b>192819</b>	<b>247420</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLEC.11: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME: UNW**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	73136	93108	76929	97937
2.0 Research	17885	30404	1797	2982
4.0 Academic Support	59381	63999	18783	20626
4.1 Library Services	39006	42632		
4.2 Museum Services	1979	1979		
4.3 Educational Media Services	2077	2339		
4.4 Academic Computing Support	1570	2300		
4.5 Ancillary Support	11781	11781		
4.6 Academic Administration	2749	2749		
4.7 Course and Curriculum Development	110	110		
4.8 Academic Personnel Development	110	110		
5.0 Student Services	22842	22842	13229	13245
5.1 Student Services Administration	176	176		
5.2 Social and Cultural Development	21876	21876		
5.3 Counseling and Career Guidance	439	439		
5.4 Student Health Services	351	351		
6.0 Institutional Support	24055	20850	295	324
6.1 Executive Management	1538	1785		
6.2 Financial Administration	1441	1441		
6.3 Financial Aid Administration	439	439		
6.4 General Administration and Logistical Services	17093	13232		
6.5 Student Admissions, Records and Examination	880	880		
6.6 Administrative Computing Support	1343	1752		
6.7 Public Relations/Fund- Raising	992	992		
6.8 Staff Social and Cultural Development	329	329		
7.0 Operation and Maintenance of Plant	7304	6316	1006	927
9.0 Auxiliary Enterprises	132329	135075	111904	117500
9.1 Student Housing Services1)	105643	109326		
9.2 Student Food Services1)	12833	12191		
9.3 Staff Housing Services	4610	4841		
9.4 Other Food Services1)	7070	6717		
9.5 Other Auxiliary Enterprises	1132	1081		
9.6 Operation and Maintenance of Plant for Aux. En	1041	919		
Unassigned			111488	113598
TOTAL FOR BUILDINGS	336932	372593	335432	367138
LAND IMPROVEMENTS OTHER THAN BUILDINGS		48437		47728
ALL LAND IMPROVEMENTS	336932	421030	335432	414866

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.12: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:UP**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	124683	156837	197247	256666
2.0 Research	26374	44836	14731	25043
4.0 Academic Support	81924	88363	50814	56067
4.1 Library Services	53482	58472		
4.2 Museum Services	2638	2638		
4.3 Educational Media Services	2837	3204		
4.4 Academic Computing Support	2248	3330		
4.5 Ancillary Support	16814	16814		
4.6 Academic Administration	3578	3578		
4.7 Course and Curriculum Development	164	164		
4.8 Academic Personnel Development	164	164		
5.0 Student Services	33876	33876	15960	15963
5.1 Student Services Administration	262	262		
5.2 Social and Cultural Development	32436	32436		
5.3 Counseling and Career Guidance	655	655		
5.4 Student Health Services	524	524		
6.0 Institutional Support	30310	26374	68439	78107
6.1 Executive Management	2127	2480		
6.2 Financial Administration	1825	1825		
6.3 Financial Aid Administration	655	655		
6.4 General Administration and Logistical Services	21296	16508		
6.5 Student Admissions, Records and Examination	1104	1104		
6.6 Administrative Computing Support	1647	2146		
6.7 Public Relations/Fund- Raising	1165	1165		
6.8 Staff Social and Cultural Development	491	491		
7.0 Operation and Maintenance of Plant	10217	8836	4196	3752
9.0 Auxiliary Enterprises	141476	144113	145650	149231
9.1 Student Housing Services1)	107372	111116		
9.2 Student Food Services1)	13043	12391		
9.3 Staff Housing Services	6670	7003		
9.4 Other Food Services1)	11801	11211		
9.5 Other Auxiliary Enterprises	1532	1458		
9.6 Operation and Maintenance of Plant for Aux. En	1058	934		
Unassigned			11	11
TOTAL FOR BUILDINGS	448859	503237	497038	584829
LAND IMPROVEMENTS OTHER THAN BUILDINGS		65421		76028
ALL LAND IMPROVEMENTS	448859	568657	497038	660857

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.13: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:RU**

Programme/subprogramme	Norm provision		Actual utilisation	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	18358	24086	35737	47368
2.0 Research	4704	7997	2914	4954
4.0 Academic Support	14019	15129	22282	25698
4.1 Library Services	9115	9967		
4.2 Museum Services	441	441		
4.3 Educational Media Services	482	546		
4.4 Academic Computing Support	394	587		
4.5 Ancillary Support	2940	2940		
4.6 Academic Administration	588	588		
4.7 Course and Curriculum Development	29	29		
4.8 Academic Personnel Development	29	29		
5.0 Student Services	6063	6063	8236	8236
5.1 Student Services Administration	47	47		
5.2 Social and Cultural Development	5804	5804		
5.3 Counseling and Career Guidance	118	118		
5.4 Student Health Services	94	94		
6.0 Institutional Support	4863	4245	15762	16758
6.1 Executive Management	365	426		
6.2 Financial Administration	294	294		
6.3 Financial Aid Administration	118	118		
6.4 General Administration and Logistical Services	3387	2629		
6.5 Student Admissions, Records and Examination	176	176		
6.6 Administrative Computing Support	259	337		
6.7 Public Relations/Fund- Raising	176	176		
6.8 Staff Social and Cultural Development	88	88		
7.0 Operation and Maintenance of Plant	1764	1526	310	263
9.0 Auxiliary Enterprises	53105	54321	64733	66418
9.1 Student Housing Services1)	44580	46134		
9.2 Student Food Services1)	5415	5145		
9.3 Staff Housing Services	1176	1235		
9.4 Other Food Services1)	1236	1174		
9.5 Other Auxiliary Enterprises	259	246		
9.6 Operation and Maintenance of Plant for Aux. En	439	388		
Unassigned			4	4
<b>TOTAL FOR BUILDINGS</b>	<b>102876</b>	<b>113367</b>	<b>149977</b>	<b>169699</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>14738</b>		<b>22061</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>102876</b>	<b>128104</b>	<b>149977</b>	<b>191760</b>

**TABLE C.14: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:UNISA**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	43468	49423	25089	32397
2.0 Research	4474	7606	990	1506
4.0 Academic Support	87588	93508	100567	107195
4.1 Library Services	61807	67305		
4.2 Museum Services	4106	4106		
4.3 Educational Media Services	3432	3742		
4.4 Academic Computing Support	1254	1366		
4.5 Ancillary Support	10153	10153		
4.6 Academic Administration	6831	6831		
4.7 Course and Curriculum Development	3	3		
4.8 Academic Personnel Development	3	3		
5.0 Student Services	3236	3236	5472	5493
5.1 Student Services Administration	4	4		
5.2 Social and Cultural Development	3213	3213		
5.3 Counseling and Career Guidance	10	10		
5.4 Student Health Services	8	8		
6.0 Institutional Support	72559	61556	89382	94993
6.1 Executive Management	2201	2410		
6.2 Financial Administration	4229	4229		
6.3 Financial Aid Administration	10	10		
6.4 General Administration and Logistical Services	54668	42026		
6.5 Student Admissions, Records and Examination	2727	2727		
6.6 Administrative Computing Support	4633	6063		
6.7 Public Relations/Fund- Raising	4083	4083		
6.8 Staff Social and Cultural Development	8	8		
7.0 Operation and Maintenance of Plant	8966	7725	6147	5376
9.0 Auxiliary Enterprises	13683	13589	11044	10929
9.1 Student Housing Services1)	2872	2972		
9.2 Student Food Services1)	349	331		
9.3 Staff Housing Services	2814	2954		
9.4 Other Food Services1)	5563	5285		
9.5 Other Auxiliary Enterprises	2056	2021		
9.6 Operation and Maintenance of Plant for Aux. En	28	25		
Unassigned			2984	2984
<b>TOTAL FOR BUILDINGS</b>	<b>233974</b>	<b>236644</b>	<b>241675</b>	<b>260871</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>30764</b>		<b>33913</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>233974</b>	<b>267408</b>	<b>241675</b>	<b>294785</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.15: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCOF PROGRAMME/SUBPROGRAMME:SU**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	75602	96981	89301	125391
2.0 Research	16535	28109	9249	15599
4.0 Academic Support	49273	53174	109324	118974
4.1 Library Services	32036	35033		
4.2 Museum Services	1550	1550		
4.3 Educational Media Services	1695	1918		
4.4 Academic Computing Support	1385	2065		
4.5 Ancillary Support	10334	10334		
4.6 Academic Administration	2067	2067		
4.7 Course and Curriculum Development	103	103		
4.8 Academic Personnel Development	103	103		
5.0 Student Services	21309	21309	7783	7797
5.1 Student Services Administration	165	165		
5.2 Social and Cultural Development	20400	20400		
5.3 Counselling and Career Guidance	413	413		
5.4 Student Health Services	331	331		
6.0 Institutional Support	17093	14918		
6.1 Executive Management	1281	1498		
6.2 Financial Administration	1033	1033		
6.3 Financial Aid Administration	413	413		
6.4 General Administration and Logistical Services	11905	9239		
6.5 Student Admissions, Records and Examination	620	620		
6.6 Administrative Computing Support	909	1184		
6.7 Public Relations/Fund- Raising	620	620		
6.8 Staff Social and Cultural Development	310	310		
7.0 Operation and Maintenance of Plant	6201	5363	24199	20569
9.0 Auxiliary Enterprises <sup>2)</sup>	127866	130573	96723	101559
9.1 Student Housing Services1)	103155	106752		
9.2 Student Food Services1)	12531	11904		
9.3 Staff Housing Services	4134	4340		
9.4 Other Food Services1)	6121	5815		
9.5 Other Auxiliary Enterprises	909	864		
9.6 Operation and Maintenance of Plant for Aux. En	1016	897		
Unassigned			121	206
<b>TOTAL FOR BUILDINGS</b>	<b>313879</b>	<b>350427</b>	<b>336700</b>	<b>390096</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>45556</b>		<b>50712</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>313879</b>	<b>395983</b>	<b>336700</b>	<b>440809</b>

1) Distribution of available ASM according to programme and space-use category adjusted.

2) Residential space estimated by utilising the (residential space: FTE residential student) ratio for 1997 and the FTE residential students for 2009

**TABLE C.16: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCOF PROGRAMME/SUBPROGRAMME:TUT**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	141516	174387	116626	155175
2.0 Research	31304	53218	484	811
4.0 Academic Support	93890	101314	31991	33432
4.1 Library Services	61084	66796		
4.2 Museum Services	2965	2965		
4.3 Educational Media Services	3233	3657		
4.4 Academic Computing Support	2629	3916		
4.5 Ancillary Support	19625	19625		
4.6 Academic Administration	3964	3964		
4.7 Course and Curriculum Development	195	195		
4.8 Academic Personnel Development	195	195		
5.0 Student Services	40323	40323	1025	1025
5.1 Student Services Administration	313	313		
5.2 Social and Cultural Development	38603	38603		
5.3 Counselling and Career Guidance	782	782		
5.4 Student Health Services	625	625		
6.0 Institutional Support	32913	28711	15454	15458
6.1 Executive Management	2441	2853		
6.2 Financial Administration	1989	1989		
6.3 Financial Aid Administration	782	782		
6.4 General Administration and Logistical Services	22957	17812		
6.5 Student Admissions, Records and Examination	1195	1195		
6.6 Administrative Computing Support	1757	2289		
6.7 Public Relations/Fund- Raising	1206	1206		
6.8 Staff Social and Cultural Development	586	586		
7.0 Operation and Maintenance of Plant	11798	10205	1521	1519
9.0 Auxiliary Enterprises	162786	165792	57631	60473
9.1 Student Housing Services1)	123037	127327		
9.2 Student Food Services1)	14946	14199		
9.3 Staff Housing Services	7840	8232		
9.4 Other Food Services1)	14015	13314		
9.5 Other Auxiliary Enterprises	1736	1650		
9.6 Operation and Maintenance of Plant for Aux. En	1212	1070		
Unassigned			51689	53234
<b>TOTAL FOR BUILDINGS</b>	<b>514532</b>	<b>573950</b>	<b>276420</b>	<b>287694</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>74614</b>		<b>37400</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>514532</b>	<b>648564</b>	<b>276420</b>	<b>325094</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.17: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:UNIVEN**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	32457	42669	10348	14144
2.0 Research	7914	13454	684	729
4.0 Academic Support	23584	25451	11953	13497
4.1 Library Services	15334	16768		
4.2 Museum Services	742	742		
4.3 Educational Media Services	811	918		
4.4 Academic Computing Support	663	988		
4.5 Ancillary Support	4946	4946		
4.6 Academic Administration	989	989		
4.7 Course and Curriculum Development	49	49		
4.8 Academic Personnel Development	49	49		
5.0 Student Services	10199	10199	1253	1253
5.1 Student Services Administration	79	79		
5.2 Social and Cultural Development	9764	9764		
5.3 Counseling and Career Guidance	198	198		
5.4 Student Health Services	158	158		
6.0 Institutional Support	8181	7141	6166	6837
6.1 Executive Management	613	717		
6.2 Financial Administration	495	495		
6.3 Financial Aid Administration	198	198		
6.4 General Administration and Logistical Services	5698	4422		
6.5 Student Admissions, Records and Examination	297	297		
6.6 Administrative Computing Support	435	567		
6.7 Public Relations/Fund- Raising	297	297		
6.8 Staff Social and Cultural Development	148	148		
7.0 Operation and Maintenance of Plant	2968	2567	1591	1515
9.0 Auxiliary Enterprises	36470	37106	28531	29782
9.1 Student Housing Services1)	26852	27788		
9.2 Student Food Services1)	3262	3099		
9.3 Staff Housing Services	1979	2077		
9.4 Other Food Services1)	3678	3494		
9.5 Other Auxiliary Enterprises	435	414		
9.6 Operation and Maintenance of Plant for Aux. En	265	234		
Unassigned				
TOTAL FOR BUILDINGS	121774	138587	60526	67757
LAND IMPROVEMENTS OTHER THAN BUILDINGS		18016		8808
ALL LAND IMPROVEMENTS	121774	156603	60526	76565

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.18: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:VUT**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	57428	71217	32594	43447
2.0 Research	11641	19790	664	1116
4.0 Academic Support	34690	37436	17331	18389
4.1 Library Services	22554	24664		
4.2 Museum Services	1091	1091		
4.3 Educational Media Services	1193	1350		
4.4 Academic Computing Support	975	1454		
4.5 Ancillary Support	7276	7276		
4.6 Academic Administration	1455	1455		
4.7 Course and Curriculum Development	73	73		
4.8 Academic Personnel Development	73	73		
5.0 Student Services	15002	15002	4000	4000
5.1 Student Services Administration	116	116		
5.2 Social and Cultural Development	14362	14362		
5.3 Counseling and Career Guidance	291	291		
5.4 Student Health Services	233	233		
6.0 Institutional Support	12034	10503	9263	9918
6.1 Executive Management	902	1055		
6.2 Financial Administration	728	728		
6.3 Financial Aid Administration	291	291		
6.4 General Administration and Logistical Services	8381	6504		
6.5 Student Admissions, Records and Examination	437	437		
6.6 Administrative Computing Support	640	834		
6.7 Public Relations/Fund- Raising	437	437		
6.8 Staff Social and Cultural Development	218	218		
7.0 Operation and Maintenance of Plant	4365	3776	1422	1268
9.0 Auxiliary Enterprises	41251	41854	35211	36525
9.1 Student Housing Services1)	28210	29194		
9.2 Student Food Services1)	3427	3255		
9.3 Staff Housing Services	2910	3056		
9.4 Other Food Services1)	5785	5496		
9.5 Other Auxiliary Enterprises	640	608		
9.6 Operation and Maintenance of Plant for Aux. En	278	245		
Unassigned			322	322
TOTAL FOR BUILDINGS	176411	199578	100808	114984
LAND IMPROVEMENTS OTHER THAN BUILDINGS		25945		14948
ALL LAND IMPROVEMENTS	176411	225523	100808	129932

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.19: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:WSU**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	65843	81885	63679	88669
2.0 Research	17041	28970	206	351
4.0 Academic Support	50816	54837	10587	11464
4.1 Library Services	33041	36132		
4.2 Museum Services	1599	1599		
4.3 Educational Media Services	1748	1978		
4.4 Academic Computing Support	1428	2128		
4.5 Ancillary Support	10654	10654		
4.6 Academic Administration	2133	2133		
4.7 Course and Curriculum Development	106	106		
4.8 Academic Personnel Development	106	106		
5.0 Student Services	21960	21960	58579	58579
5.1 Student Services Administration	170	170		
5.2 Social and Cultural Development	21023	21023		
5.3 Counseling and Career Guidance	426	426		
5.4 Student Health Services	341	341		
6.0 Institutional Support	17647	15401	2570	2570
6.1 Executive Management	1322	1545		
6.2 Financial Administration	1067	1067		
6.3 Financial Aid Administration	426	426		
6.4 General Administration and Logistical Services	12293	9539		
6.5 Student Admissions, Records and Examination	640	640		
6.6 Administrative Computing Support	939	1223		
6.7 Public Relations/Fund- Raising	641	641		
6.8 Staff Social and Cultural Development	319	319		
7.0 Operation and Maintenance of Plant	6394	5531	302	302
9.0 Auxiliary Enterprises	104818	106888	86340	90623
9.1 Student Housing Services1)	81756	84607		
9.2 Student Food Services1)	9931	9435		
9.3 Staff Housing Services	4261	4474		
9.4 Other Food Services1)	7126	6770		
9.5 Other Auxiliary Enterprises	938	891		
9.6 Operation and Maintenance of Plant for Aux. En	806	711		
Unassigned				
<b>TOTAL FOR BUILDINGS</b>	<b>284519</b>	<b>315472</b>	<b>222262</b>	<b>252557</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>41011</b>		<b>32832</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>284519</b>	<b>356483</b>	<b>222262</b>	<b>285389</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.20: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:UWC**

Programme/subprogramme	Norm provision		Actual utilisation	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction (Carried over from Table 5.2)	39738.3	51265.7	34 533.16	52433.8
2.0 Research	9639.2	16386.7	3008.9	4928.1
4.0 Academic Support	28727.1	31000.9	9076.0	10 007.7
4.1 Library Services	18677.6	20424.8		
4.2 Museum Services	903.8	903.8		
4.3 Educational Media Services	988.1	1118.2		
4.4 Academic Computing Support	807.3	1203.7		
4.5 Ancillary Support	6024.7	6024.7		
4.6 Academic Administration	1205.1	1205.1		
4.7 Course and Curriculum Development	60.2	60.2		
4.8 Academic Personnel Development	60.2	60.2		
5.0 Student Services	12422.5	12422.5	1055.1	1078.9
5.1 Student Services Administration	96.4	96.4		
5.2 Social and Cultural Development	11892.3	11892.3		
5.3 Counseling and Career Guidance	241.0	241.0		
5.4 Student Health Services	192.8	192.8		
6.0 Institutional Support	9966.6	8698.7	37453.1	39 975.8
6.1 Executive Management	747.1	873.6		
6.2 Financial Administration	602.6	602.6		
6.3 Financial Aid Administration	241.0	241.0		
6.4 General Administration and Logistical Services	6941.8	5387.1		
6.5 Student Admissions, Records and Examination	361.5	361.5		
6.6 Administrative Computing Support	530.3	690.6		
6.7 Public Relations/Fund- Raising	361.6	361.6		
6.8 Staff Social and Cultural Development	180.7	180.7		
7.0 Operation and Maintenance of Plant	3614.9	3126.9	2179.1	1891.8
9.0 Auxiliary Enterprises	59486.7	60662.6	39398.4	40 956.7
9.1 Student Housing Services1)	46425.5	48044.2		
9.2 Student Food Services1)	5639.6	5357.6		
9.3 Staff Housing Services	2409.9	2530.4		
9.4 Other Food Services1)	4024.1	3822.9		
9.5 Other Auxiliary Enterprises	530.2	503.7		
9.6 Operation and Maintenance of Plant for Aux. En	457.4	403.9		
Unassigned				
<b>TOTAL FOR BUILDINGS</b>	<b>163595.4</b>	<b>183564.1</b>	<b>126703.8</b>	<b>151272.8</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>23863.3</b>		<b>19665.5</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>163595.4</b>	<b>207427.4</b>	<b>126703.8</b>	<b>170938.2</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.21: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:UNIZUL**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	33781	42576	15867	22215
2.0 Research	9554	16243		
4.0 Academic Support	28472	30726	21842	23357
4.1 Library Services	18512	20243		
4.2 Museum Services	896	896		
4.3 Educational Media Services	979	1108		
4.4 Academic Computing Support	800	1193		
4.5 Ancillary Support	5972	5972		
4.6 Academic Administration	1194	1194		
4.7 Course and Curriculum Development	60	60		
4.8 Academic Personnel Development	60	60		
5.0 Student Services	12313	12313	4236	4245
5.1 Student Services Administration	96	96		
5.2 Social and Cultural Development	11788	11788		
5.3 Counseling and Career Guidance	239	239		
5.4 Student Health Services	191	191		
6.0 Institutional Support	9877	8620	8863	9764
6.1 Executive Management	740	866		
6.2 Financial Administration	597	597		
6.3 Financial Aid Administration	239	239		
6.4 General Administration and Logistical Services	6879	5339		
6.5 Student Admissions, Records and Examination	358	358		
6.6 Administrative Computing Support	525	684		
6.7 Public Relations/Fund- Raising	358	358		
6.8 Staff Social and Cultural Development	179	179		
7.0 Operation and Maintenance of Plant	3583	3099	1754	1636
9.0 Auxiliary Enterprises	71596	73098	68519	70699
9.1 Student Housing Services1)	57521	59527		
9.2 Student Food Services1)	6987	6638		
9.3 Staff Housing Services	2389	2508		
9.4 Other Food Services1)	3606	3426		
9.5 Other Auxiliary Enterprises	525	499		
9.6 Operation and Maintenance of Plant for Aux. En	567	500		
Unassigned				
<b>TOTAL FOR BUILDINGS</b>	<b>169177</b>	<b>186676</b>	<b>121082</b>	<b>131916</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>24268</b>		<b>17149</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>169177</b>	<b>210944</b>	<b>121082</b>	<b>149065</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

**TABLE C.22: TOTAL BUILDING SPACE AND BUILDING COST NORM PROVISION, AS WELL AS ACTUAL UTILISATION FOR 2009 ACCORDING TO PROGRAMME/SUBPROGRAMME:MUT**

Programme/subprogramme	Norm provision		Actual utilisation (adjusted) <sup>1)</sup>	
	SPACE (ASM)	BUILD. COST (UNITS)	SPACE (ASM)	BUILD. COST (UNITS)
1.0 Instruction	31040	38234	16602	22915
2.0 Research	5856	9954	224	381
4.0 Academic Support	17449	18831	4385	4717
4.1 Library Services	11345	12406		
4.2 Museum Services	549	549		
4.3 Educational Media Services	600	679		
4.4 Academic Computing Support	490	731		
4.5 Ancillary Support	3660	3660		
4.6 Academic Administration	732	732		
4.7 Course and Curriculum Development	37	37		
4.8 Academic Personnel Development	37	37		
5.0 Student Services	7546	7546	1690	1690
5.1 Student Services Administration	59	59		
5.2 Social and Cultural Development	7224	7224		
5.3 Counseling and Career Guidance	146	146		
5.4 Student Health Services	117	117		
6.0 Institutional Support	6053	5283	2341	2469
6.1 Executive Management	454	531		
6.2 Financial Administration	366	366		
6.3 Financial Aid Administration	146	146		
6.4 General Administration and Logistical Services	4216	3272		
6.5 Student Admissions, Records and Examination	220	220		
6.6 Administrative Computing Support	322	419		
6.7 Public Relations/Fund- Raising	220	220		
6.8 Staff Social and Cultural Development	110	110		
7.0 Operation and Maintenance of Plant	2196	1899	769	675
9.0 Auxiliary Enterprises	60073	61426	14823	15229
9.1 Student Housing Services1)	50001	51744		
9.2 Student Food Services1)	6074	5770		
9.3 Staff Housing Services	1464	1537		
9.4 Other Food Services1)	1720	1634		
9.5 Other Auxiliary Enterprises	322	306		
9.6 Operation and Maintenance of Plant for Aux. En	493	435		
Unassigned				
<b>TOTAL FOR BUILDINGS</b>	<b>130213</b>	<b>143175</b>	<b>40833</b>	<b>48076</b>
<b>LAND IMPROVEMENTS OTHER THAN BUILDINGS</b>		<b>18613</b>		<b>6250</b>
<b>ALL LAND IMPROVEMENTS</b>	<b>130213</b>	<b>161787</b>	<b>40833</b>	<b>54326</b>

1) Distribution of available ASM according to programme and space-use category adjusted. Total ASM as submitted

## APPENDIX D: PROGRAMME CLASSIFICATION SYSTEM

TABLE 1: PROGRAMME CLASSIFICATION SYSTEM ACCORDING TO SAPSE 002 (1982)

PROGRAMME/SUBPROGRAMME
1.0 Instruction
1.1 Formal Instruction
1.2 Community Instruction
1.3 Preparatory/Remedial Instruction
2.0 Research
3.0 Public Service
4.0 Academic Support
4.1 Library Services
4.2 Museum Services
4.3 Educational Media Services
4.4 Academic Computing Support
4.5 Ancillary Support
4.6 Academic Administration
4.7 Course and Curriculum Development
4.8 Academic Personnel Development
5.0 Student Services
5.1 Student Services Administration
5.2 Social and Cultural Development
5.3 Counselling and Career Guidance
5.4 Student Health Services
6.0 Institutional Support
6.1 Executive Management
6.2 Financial Administration
6.3 Financial Aid Administration
6.4 General Administration and Logistical Services
6.5 Student Admissions, Records and Examinations
6.6 Administrative Computing Support
6.7 Public Relations/Fund Raising
6.8 Staff Social and Cultural Development
7.0 Operation and Maintenance of Plant
7.1 Administration of the Operation and Maintenance of Physical Plant
7.2 Building Maintenance
7.3 Custodial Services
7.4 Utilities
7.5 Landscape and Grounds Maintenance
7.6 Non-capitalisable Alterations and Renovations
9.0 Auxiliary Enterprises
9.1 Student Housing Services
9.2 Student Food Services
9.3 Staff Housing Services
9.4 Other Food Services
9.5 Other Auxiliary Enterprises
9.6 Operation and Maintenance of Plant for Auxiliary Enterprises
10.0 Hospitals
10.1 Medical Care of Patients
10.2 Medical Care Supportive Services
10.3 Administration of Hospitals
10.4 Operation and Maintenance of Plant for Hospitals
11.0 Independent Operations
11.1 Independent Operations - Institutional
11.2 Independent Operations - External Agencies
11.3 Operation and Maintenance of Plant for Independent Operations



**TABLE 2:STAFF PROGRAMME ACCORDING TO HEMIS MANUAL FOR STAFF DATA**

A staff programme is a type of programme for which a staff member is undertaking duties. The staff programmes are:

**Instruction:** Activities directly involved in the teaching of students, including preparation, marking, setting examinations, curriculum development, lectures, seminars, practicals, and supervision of research projects, theses and dissertations.

**Research:** Activities which are designed to further human knowledge, either by the creation of new knowledge or the application of existing knowledge.

**Public service:** Activities which make available to the public the resources and skills of staff in order to meet a specific community need.

**Academic support:** Activities which support in direct ways the activities of instruction, research and public service, including library and museum services, educational media services, academic computing support, technical support, and academic administration at the course, departmental and faculty level.

**Student services:** Activities, other than instructional ones, which relate to student development, social and sporting clubs, counselling, career guidance and health services.

**Institutional support:** Centralised activities which are carried out to support the day-to-day as well as long term viability of the operations of the institution, including executive management, financial management and administration, human resources management, facilities management, financial aid, student admissions, records and examinations, administrative computing support, public relations and fund raising.

**Operation and maintenance of plant:** Activities which are associated with building and plant maintenance, building and plant renovations and alterations, landscaping, gardens and grounds, custodial and security services, parking, cleaning services, and the provision of utilities.

**Auxiliary enterprises:** Activities which are related to the provision of primary support and convenience services on campus for students and staff, including student housing, staff housing, food services, bookshops and child care services.

**Hospital services:** Activities which are related to the operations of a teaching hospital or clinic, and teaching health sciences centres.

**Independent operations:** Activities which are independent of and unrelated to the above programmes.

## APPENDIX E: EQUIPMENT SURVEY: LETTER, INSTRUCTIONS AND TABLES



11 November 2009

The Vice-Chancellor  
Prof R Botman  
Stellenbosch University  
Private Bag X1  
MATIELAND  
7602

Electronically transferred: [abe@sun.ac.za](mailto:abe@sun.ac.za)

Dear Colleague

### COMMENCEMENT OF EQUIPMENT SURVEY

We refer to our letter sent to you on 4 September 2009 regarding the study by a HESA Task Team to investigate the current building facilities available at HEIs, the condition of the facilities, as well as the availability and condition of equipment used currently in the teaching and research programmes at HEIs. We also informed you of a workshop on 13 October 2009 dealing with the draft survey instrument to determine the current stock of equipment for teaching and research at HEIs.

A very constructive workshop took place on that date at the University of Pretoria. **Your institution was represented by Prof Gary Stevens and Ms Helette Pieterse.** All involved in the workshop agreed that the survey is very important but at the same time very complicated. It was decided at the workshop that the final survey forms and accompanying documentation, revised in accordance with the advice of the workshop, will be disseminated by the HESA office to HEIs in early November. The completed institutional survey forms should be returned to the HESA office not later than 31 March 2010.

A **summary document** with more background about the infrastructure study, which was also presented at the workshop, and which inter alia indicates the **importance of the equipment survey** in this study is attached. Your attention is especially drawn to the **developmental approach** outlined in Section 3 of this summary document.

The final survey documentation has recently been sent to your institutional representatives who attended the workshop. They have been requested to start immediately with the institutional data collection process. They have also been advised of a "helpline" should they have any questions about the documentation.

**We kindly request that the institutional resources needed to successfully complete the survey forms be made available to your institutional team.** The outcome of this important exercise depends on the full cooperation of all institutions.

Yours sincerely,

**Directors:** M.S. Badat; M.M. Balintulo; R. Botman; R.H. du Pree; T. Eloff (Chairperson); R.V. Gumbe; J.D. Jansen; M.W. Makgoba; L.V. Mazwi Tanga; P. Mbat; N.M. Mokgalong; I. Moutlana; T.Z. Mthembu; A.M. Ndlovu; G.L. Nongxa; B.P. O'Connell; C.W.J. Pistorius; N.S. Pityana; M. Price; L.L. Rensburg; D.J. Swartz; M. Tom; E.M. Tyobeka (Deputy Chairperson)

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Reg. No. 2005/013711/08



# INFRASTRUCTURE STUDY AT ALL HIGHER EDUCATION INSTITUTIONS: SURVEY OF TEACHING AND RESEARCH EQUIPMENT

## NOTES FOR COMPLETION OF THE SURVEY

### 1 GENERAL NOTES

#### **Background**

The Exco of HESA has commissioned a study to investigate:

- The current building facilities available at HEIs, the condition of the facilities, as well as the development of proposals for national policy on the provision of funds for the erection of new building facilities and land improvements other than buildings.
- The availability and condition of equipment used currently in the teaching and research programmes at HEIs, as well as the development of proposals for the enhancement of funding for equipment at HEIs if significant needs (backlogs) in equipment are proven.

This initiative arises from a mandate issued by the HESA Board of Directors to the HESA Exco on 12 June 2008 and accepted by all vice-chancellors who are part of this body.

There should be no doubt as to the benefits of participating in this survey, especially on the part of those who may be asked to carry out the hard and unenviable work of completing the survey questionnaires mentioned below.

HESA believes that the results of this survey will place it in a very strong position to undertake an advocacy role in negotiations with the Department of Higher Education and Training. The evidence provided should make it possible, during these negotiations, to address objectively and constructively the concerns some members have over the apparent ad-hoc funding of equipment and buildings during the recent past. To do so effectively will require *inter alia* detailed and accurate information on the availability and condition of equipment and the attached survey instrument has been designed with that aim in mind.

The expectation is that the results of this survey will bring about improvements in the method of governmental allocation of funds for the provision and maintenance of equipment at higher education institutions. It is evident that with the termination of the annual SAPSE submissions of fixed asset statements in 1999, no comprehensive, system-wide information on the availability of and expenditure on equipment at higher education institutions is now immediately to hand.

It was therefore approved by the Finance Strategy Group (FSG) of HESA that, with reference to the second bullet point above, a survey be conducted at all HEIs to determine the availability and condition of equipment, as well as the annual expenditure patterns on equipment. It was further decided that this survey should focus mainly on equipment used for teaching and research. It should

produce information on available equipment and the condition thereof which is comparable between HEIs.

The attached survey instrument has been developed (and adjusted after the consultative workshop held by HESA on 13 October 2009 at the University of Pretoria) by the Task Team appointed by the FSG. It would be greatly appreciated if you were to ensure that your response is as comprehensive and accurate as possible.

### **Definition of equipment for teaching and research purposes**

In this survey, equipment will be taken to mean:

- (1) All equipment in classrooms, class laboratories, open laboratories, research/non-class laboratories and study spaces (e.g. in libraries and student centres) used for teaching and research, including computers, audio-visual equipment, specialized fittings, fixtures and furniture such as cabinets, benches and lecterns to which equipment is attached and which is not fixed to a building; all scientific, optical and related equipment and all electric and electronic machinery used for teaching and research; musical instruments for music departments; animal cages (not fixed); fish tanks; stage equipment in drama studios; sport equipment directly associated with formal under- and postgraduate programmes and motor vehicles used specifically and exclusively for teaching and research.
- (2) All computers and printers in academic offices and conference rooms used by academic staff. All (other) standard office and conference room equipment, including furniture, is excluded.
- (3) Excluded are: Materials consumed in experiments, such as chemical reagents, liquefied gases, etc.; workshop materials such as metals, glass, timber, plastics, etc; minor components or pieces of equipment such as valves, transistors, switches, etc; biological specimens for use in experiments for teaching and research, as well as general network cabling which forms part of a building and/or infrastructure of a building.
- (4) Additional information regarding some aspects of the above definitions is given in the notes below for the completion of the respective sections of the survey.

### **Space-use categories referred to in the survey**

The space classification definitions and codes as set out in the national policy document “*Building and Space Inventory and Classification Manual, April 2009*” apply to all tables in this survey. These classifications and their respective 4 digit codes are as follows:

- (a) Classroom (1100) and Classroom Service (1115)
- (b) Class Laboratory (1210) and Class Laboratory Service (1215)
- (c) Research/Non-class Laboratory (1250) and Research/Non-class Laboratory Service (1255)
- (d) Open laboratory (1220) and Open Laboratory Service (1225)
- (e) Study space (1410) and Study Service (1455)
- (f) Office (1310) and Office Service (1315)
- (g) Conference Room (1350) and Conference Room Service (1355)

### **Structure of survey instrument (refer to excel spreadsheet : HESA – Equipment Survey)**

The survey instrument is a set of tables structured in the following way:

**Section A, Tables A1 and A2**, deals with actual expenditure on teaching and research equipment year by year over the period 2006-2009 from the institution’s own “council-controlled” funds and “other” funds (see definitions under section 2) . This is required by faculty and organizational unit, or, where applicable, by support service entity and organizational unit, for example, a supplementary instruction unit within a teaching and learning centre. **(Could be completed centrally)**

**Section B, Tables B1 and B2,** calls for a current equipment inventory, that is, the 2009 status quo, according to faculty and organizational unit. **(Should be completed by all faculties and individual organizational units within faculties e.g. schools or academic departments)**

**Section C, Tables C1 and C2,** elicits a current inventory of that teaching and research equipment which is centrally managed, such as, data-projectors in large lecture venues, computers in open laboratories or study spaces used by a number of faculties. **(Could be completed centrally)**

### **Help-line for problems encountered with completion of the survey**

Should you encounter any problems when completing the survey, you may send your questions to Jana van Wyk at [jana@hesa.org.za](mailto:jana@hesa.org.za). She will coordinate the queries and the HESA Task Team will endeavour to respond as quickly as possible.

We thank you most sincerely for participating in this survey and we trust that the proposal based on the findings emanating from the combined submissions, which will eventually be submitted to the Department of Higher Education and Training, will ultimately result in benefit to your institution.

Send completed survey document to: [jana@hesa.org.za](mailto:jana@hesa.org.za)

Deadline for submissions: **31 March 2010 or sooner if possible**

## **2**

### **NOTES ON THE TABLES IN SECTION A**

The amounts in the tables should be in thousands of Rand (R'000).

- a. The information requested in Section A (Tables A1 and A2) relates to the actual institutional expenditure for teaching and research equipment for 2006 to 2008 and the budgeted expenditure for 2009 for Academic Organisational Units (Table A1) and Academic Support Service Units (Table A2).
- b. The information is requested for academic organisational units e.g. faculties and a further breakdown to a school or departmental level (Column 1). If a centre, bureau, institute or research unit forms part of an academic department their equipment expenditure should not be included separately but as part of the department's expenditure. If such a centre, bureau, etc. is a separate entity the expenditure should be reported as such in a separate row.
- c. Columns 2, 3, 4 and 5 require that the expenditure per organisational unit be split between "Council Controlled Funds" and "Other funds".

The definition of "Council Controlled Funds" is taken from the regulations to the Act which governs the manner of completing an Institution's Annual Financial Statements (quote):

*Equipment purchased/acquired "directly from appropriations of revenues that fall under the absolute discretion/control of the University Council, e.g. state subsidies for general purposes, tuition and related fee income, sales of goods and services, non-prescriptive donations and grants, income from investments that are not held as cover for trust, specific purpose endowments or administered funds, etc."*

The Higher Education Act, 1997 (Act No 101 of 1997) also states that:

*"council controlled funds include the total of all funds, both encumbered and unrestricted, that are under control of the council, but does not include restricted funds".*

“Other Funds” in column 2 to 5, can be taken to mean funds related to activities usually not funded from state subsidies or student fees. Expenditure in this category is, therefore, largely financed from external funds and other funds earmarked by Council in accordance with certain regulations. Examples of “Other Funds” could be externally funded institutes, bureaus, research units, contract research funds, NRF, MRC, SABS contributions and income from short-courses. If an institution makes a contribution towards equipment financed by external donors, the expenditure should be pro-rated between “Council Controlled Funds” and “Other Funds”.

- d. Expenditure on customised furniture for computing equipment in laboratories and study space areas which are a fixture of the building (for instance, items other than buildings not on the asset register) should not be included.
- e. The amounts spent should be the total value of **all** the equipment expended and capitalised.
- f. The expenditure reported in Table A2 for (academic) support services should only include the expenditure on equipment which directly supports the teaching and research function.
- g. Expenses on academic staff computers (including laptops) and printers (owned or leased) should be included in Table A2, e.g. under the IT expenditure.
- h. Network cabling which is part of a building and/or infrastructure of the institution should not be included. Dedicated cabling and equipment which is used specifically to support the teaching and research function, e.g. video conferencing, which forms part of the formal subsidised academic programmes, should be included.

### 3

## NOTES ON THE TABLES IN SECTION B

- a. It is suggested that the tables in Section B could be prepared by the institutional survey conveners for every organizational unit (with each organizational unit's information in the heading already filled in with the assistance of the HEMIS office). These tables could then be disseminated by the conveners to the heads of organizational units to be completed by them.
- b. Tables B1 and B2 in Section B should be completed by all the Faculties for each academic organisational unit separately within the faculty.
- c. The equipment in Table B1 should be listed per item if the estimated replacement value of the item is > R15 000, up to a value of ≤ R100 000. A cluster of items of equipment which serve the same purpose and which has a joint value of > R15 000 should be listed as one cluster item. (e.g. 10 scales with a value R2000 each should be indicated as 1 item (10 scales) with replacement value of R20 000).
- d. Table B2 should list all individual equipment items with an estimated replacement value of > R100 000. A **detailed** description of those items should be provided.
- e. The space in which the equipment is used should be indicated in column 2 of tables B1 and B2 by using the 4 digit numerical space-code given at the top of the table.
- f. Detailed definitions of the space codes are given in the “*Building and space inventory and classification manual*” of the Department of Higher Education and Training which was distributed to all institutions in October 2009. An extract from the manual, relevant to the survey, is attached for easy reference. (See **Appendix A**)
- g. Motor vehicles should not be included unless they are used specifically and exclusively for under- and/or postgraduate teaching and research purposes.
- h. If possible, provide the “Year of purchase” and the “Purchase cost” of the items or cluster of items in columns 7 and 8 of tables B1 and B2. The year of purchase and the purchase cost can then be used to determine an estimated replacement cost in 2009 by using the price index

values in the excel workbook: **HESA – Equipment Survey, Sheet Price Indices**. (See the example at the bottom of the table). If the year of purchase and purchase cost is not known please provide a considered estimate of the replacement cost in column 6 of the tables.

- i. It is important that replacement values of an equipment item must be provided even when the age of the item exceeds its prescribed life cycle as far as the depreciation specifications for financial reporting is concerned.

## 4

### NOTES ON TABLES IN SECTION C

- a. Section C concerns the inventory of centrally managed equipment. Tables C1 and C2 are essentially the same as Tables B1 and B2 for Faculties/Schools/Departments or other organisational units, but contain equipment which does not fall under the management/control of an academic entity.
- b. The budgeting and management processes for equipment within an institution will, to a large extent, determine the reporting of centrally managed equipment. At some institutions, for instance, the equipment (e.g. audio/visual equipment) in centrally managed lecture halls or IT equipment in centrally managed computer laboratories is cascaded down to a faculty/academic department which then becomes the custodian of the equipment. In such cases the equipment will form part of and should be reported under Section B.
- c. The notes on tables in Section B also apply to the tables in Section C.

Updated: November 2009

**SECTION A: ACTUAL INSTITUTIONAL EXPENDITURE ON TEACHING AND RESEARCH EQUIPMENT**

<b>UNIVERSITY:</b>		<b>DATE:</b>	
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**Total number of FTE students per Level of study (Course level) and mode of instruction (contact/distance) for the institution. To be supplied by the HEMIS office (See table to the right)**

Mode of instruction	FTEs according to Study Level			
	Undergraduate	Honours or equivalent	Masters or equivalent	Doctoral or equivalent
Contact				
Distance				

**Important Notes: (also see Notes to Respondents)**

- Table A1 is for Academic Organisational units and Table A2 for (Academic) Support Service Units
- Indicate the aggregate amount (R'000 in respective years) expended by the University (from council-controlled funds and other funds) for teaching and research equipment since 2006 (if possible by faculty and organisational academic unit).
- Total value spent (should include all equipment expended and capitalised)
- Expenses on academic staff computers (including laptops) and printers/copiers(owned or leased) are to be included in Table A2.
- Indicate also for 2009 the amount spent on maintenance contracts for teaching and research equipment
- Expenditure on customised furniture for computing equipment in laboratories which is a fixture of the building should not be included.

**Please insert additional rows in the tables as required**

Table A1: Academic Organisational Units

1		2		3		4		5		6
ACADEMIC		2006		2007		2008		2009 **		Maintenance contracts
Faculty	Organisational Unit (School, Centre, Department, etc.)	Council controlled funds (R'000) *	Other funds (R'000) *	Council controlled funds (R'000) *	Other funds (R'000) *	Council controlled funds (R'000) *	Other funds (R'000) *	Council controlled funds (R'000) *	Other funds (R'000) *	2009
	TOTAL									

Table A2: (Academic) Support Service Units

1	2		3		4		5		6
(ACADEMIC) SUPPORT SERVICES (e.g. IT, Library, etc)***	2006		2007		2008		2009 **		Maintenance contracts
Organisational Unit	Council controlled funds (R'000) *	Other funds (R'000) *	Council controlled funds (R'000) *	Other funds (R'000) *	Council controlled funds (R'000) *	Other funds (R'000) *	Council controlled funds (R'000) *	Other funds (R'000) *	2009
TOTAL									

\* See definition in notes

\*\* Budgeted amount for the year 2009

\*\*\* Equipment expenses directly supporting teaching and research







UNIVERSITY:	
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DATE:	
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Total number of FTE students per Level of study (Course level) and mode of instruction (contact/distance) for the institution. To be supplied by the HEMIS office (See table to the right)

Mode of instruction	FTEs according to Study Level			
	Undergraduate	Honours or equivalent	Masters or equivalent	Doctoral or equivalent
Contact				
Distance				

(a) Classroom (space code 1110), Classroom Service (space code 1115)  
(b) Class Laboratory (space code 1210), Class Laboratory Service (space code 1215)  
(c) Research/Non-class Laboratory (space code 1250), Research/Non-class Laboratory Service (space code 1255)  
(d) Open Laboratory (space code 1220), Open Laboratory Service (space code 1225)  
(e) Study Space (space code 1410), Study Service (space code 1455)  
(f) Office (space code 1310), Office Service (space code 1315)  
(g) Conference Room (space code 1350), Conference Room Service (space code 1355)

(2) Add explanatory notes in the last column of the table in this worksheet

TABLE C1: INVENTORY OF CENTRALLY MANAGED UNIT EQUIPMENT VALUED AT <= R100,000 PER ITEM

[illegible]

\*\*\*\* If not known provide a considered estimate

[illegible]

\*\*\*\* If not known provide a considered estimate

**PRICE INDEX FOR TEACHING AND RESEARCH EQUIPMENT:1985-2009**

Year	Price index <sup>1)</sup> Base year = 2000
1985	83
1986	85
1987	85
1988	86
1989	88
1990	90
1991	91
1992	91
1993	92
1994	93
1995	94
1996	95
1997	96
1998	93
1999	98
2000	100
2001	106
2002	120
2003	114
2004	107
2005	104
2006	105
2007	112
2008	114
2009	118

1) Weighted index based on the following subgroups of the Producer Price Index

for imported commodities: 2.16 - Non-electrical machinery and equipment;

2.17 - Office, accounting and computing machinery

2.18 - Electrical machinery and apparatus

2.19 - Radio, television and communications equipments and parts thereof

2.20 - Medical appliances, precision and optical instruments, watches and clocks

**Example of utilisation of index**

The estimated replacement cost in 2009 of a piece of equipment purchased in 2004 for a value of R45000 is calculated as follows when the above index is used:

$$\text{Replacement cost in Rand} = (118/107) * 45000 = 49626$$