APPLICATION OF TIME DRIVEN ACTIVITY BASED COSTING IN BOTSWANA OPEN UNIVERSITY

E. Andalya, L. Lesetedi, Deputy Vice Chancellor,
Botswana Open University, Prof. R. Mohee, COL

Abstract: Financial planning should be premised on the mission and vision of the University. To develop reasonable and accurate financial plans, the institution must balance the supply and demand sides of the financial resources, identifying the average cost of maintaining one student per annum. The costing units are measured in Time (practical hours for labour and non-labour factors). Human labour is the main resource of the University. The direct labour time spent to perform individual activities is used as a measure of activity amount and a basis for calculating costs. This paper reviews the application of Time Driven – Activity Based Costing BOU, as an alternative to the incremental method currently in use. It addresses two significant drawbacks of incremental budgeting, the non-relationship between the budget and the organizational strategy and the imbalance between the demand and supply sides of the budget. From the experience at BOU University two conclusions can be made. At the Institutional level, time as primary cost driver allows allocating resource costs directly to objects. This enables management employ linear equations to explore variations in the demand for resource capacity for each variation in activity time. It facilitates calculation of program costs and variables important in management e.g. break even point of a program. At the national level, Government may consider funding specific activities based on actual budgets, recognizing that the University’s needs shift according to the dynamics in the higher education demand and advancement in technology, a key delivery mode at BOU. The state will know more accurately the actual cost for a student, the costs of infrastructure and equipment. Taking this approach, the State will be able to balance the increasing competing interests for public resources.

Keywords: Unit Cost, Budgeting, Organizational strategy, Time Driven Activity Based Costing

1. INTRODUCTION

State universities budgets are primarily funded from government subventions, student fees and rental income from facilities. The state determines its appropriations based on political, social and economic development needs. Other sources of finance such as donations and research grants are provided by special and specific interests, either philanthropy or industry based. In most of the African countries this is not a reliable source for funding higher education because of limited university level linkages with industry, little capacity or lack of cutting-edge research, innovation and knowledge transfer.

The budgeting practices in the government are largely founded on historical incremental models which follow through to Universities. Though the model is simple to implement, the experience at BOU is that it does not accurately provide the actual cost overheads for each department and usually results in either unutilized funds or deficits in the departments. Secondly, it is not clear to what extent fee determination exercises account for all program costs. Budgeting sessions at the University are therefore annual routine discussion of what and where cuts should be made to fit in the subvention.

The practice brings forth two challenges; (a) Non-relationship between the budget and the organizational strategy i.e. the planning and budgeting rift and (b) imbalance between the demand and supply sides of the budget process. On the demand side two challenges arise, i) Departmental resource allocation are not determined by the amount of resources a program/service consumes. ii) The interrelationships between departments in facilitating the provision of a program are not factored in budget determination. On the supply side, resources are not adjusted to inflation or to match increase in users or specific user needs.

Faced with a little or no choice delivering on their social and national obligation, Universities are operating under constrained budgets and not able to drive their strategic goals. Herein lays the major deficiency of this model in a public university setup.

2. ESTABLISHING A FRAMEWORK FOR ACTIVITY BASED COSTING

The budget funding at BOU is based on Government subvention (74%), students’ fee (23%) and other income (3%). It is based on an incremental model, where annual estimates are submitted to Government for each line-item allocation. This funding context presents significant challenges in ensuring adequate budgetary provision for its activities and actual needs to attain its strategic objectives.

As the institution transits into the dynamic competitive environment in the university education, characterized by new forms of student teacher contact in the ODL mode, managers need more information for quality, timeliness and efficiency of activities, cost management and profitability of individual services to learners.
This calls for a costing method that aligns resources with activities. The method should adopt seamlessly into the strategic planning tool in use.

For these reasons, the Time Driven Activity Based Costing (TD-ABC\(^1\)) was proposed. The method allows for information about costs of activities, facilitating planning on actual needs. Time is considered the key cost driver because resources can be measured by the amount of time they are available to work. The parameters needed to determine the value of each resource are the cost per time unit of supplying resource capacity and units of consumption of resource capacity by the activities, products, services and users.

Activities and programmes are time bound; fee is determined by the costs of instruction, mode of content delivery and support activities in which time is a key determinant of value. Faculty measure their value of input (hours of contact) and their output (graduates) using time. The length of tutorials, services such as library, online student access and counselling are measured with time element as the denominator.

3. APPLYING THE TD-ABC FOR BOTSWANA OPEN UNIVERSITY

For ease of resource classification, the University structure was divided into; (i) Management (the Vice Chancellor and related departments), (ii) Logistical Management support (Non-teaching departments) and (iii) Teaching departments and student services. Each resource in each classification was mapped to its functions and to output, using a factor (daily rate) to establish the value of the output vis-à-vis the resources used. Value was determined by the rate at which each resource is compensated for its effort in producing the final output. The result was divided by the projected student population to determine the cost of one student in a programme.

To implement this, a nine step process illustrated in FIG. 1, was followed. The purpose was to develop the necessary conditions that will enable the researcher derive the TD-ABC formula. Each step is described in detail below.

![Diagram](Image)

**Fig. 1 Process flow in Developing the proposed Model**

3.1. **Review of financial information and operational processes:** In here, interviews with departmental heads, a review of financial reports, financial policies and the strategic planning process was done. Process mapping survey was conducted in all the departments, to determine the efficiency of operational systems. Interviews were conducted with relevant national government departments to have an overview of the tertiary education funding and its strategic position in the country’s development.

3.2. **Activity Survey - Developing personnel effort allocation Report.** Employee surveys were conducted to determine the time needed to perform their activities. The results were; a Personnel Effort Allocation Report for the non-teaching staff and Academic Workload Allocation Report for the faculty. These surveys provided a basis for calculating the cost of unused capacity. To derive the actual time spent on tasks, the practical capacity of the resource was calculated using a formula as described below.

**Calculating Personnel Effort:** Assuming a 40-hour week, and annual leave of an average of 4 weeks, the maximum hours put to work are 1444 per annum. This is derived by the following formula

\[^1\text{Kaplan and Anderson (2004, 2007)}\]
Maximum Working weeks = \( \sum_{n=1}^{m} \{(c_n - (a_l - p_h - w_k)) + a_g\} \)

Where:
- \( m = \) Staff,
- \( c_n = \) calendar weeks,
- \( a_l = \) annual leave,
- \( p_h = \) public holidays,
- \( w_k = \) weekends,
- \( a_g = \) admission and graduation duties etc.

The TABLE 1 below illustrates the working of this formula

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Weeks</th>
<th>Hours (40) per week</th>
<th>Working Hours (Weeks x Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Calendar week</td>
<td>52</td>
<td>40</td>
<td>2,080</td>
</tr>
<tr>
<td>B</td>
<td>Annual leave</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Holidays (13 days)</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Weekends</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Two weeks for admission/registration duty</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>(Theoretical capacity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working weeks ( {(a - (b+c+d)) +f} )</td>
<td>36.1</td>
<td>40</td>
<td>1,444</td>
</tr>
<tr>
<td></td>
<td>( = {(52+4+1.9+12) +2} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( = {34.1 +2} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Estimated breaks (annual)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breaks in week – 2 hours per day x 5 working days=10 hours per week 10 hours x 36.1 week = 361 hours</td>
<td>9</td>
<td>40</td>
<td>360</td>
</tr>
<tr>
<td>I</td>
<td>Practical Capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( g-h = ) Theoretical capacity – Estimated breaks</td>
<td>27</td>
<td>1,080</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field study

The time available in a given period (theoretical capacity) was subtracted from the time of anticipated breaks, (job training, equipment maintenance and repairs, industrial labour stoppages etc.) to obtain the practical capacity of labour. In deriving WAM, the Formal Scheduled Teaching (FST) or Notional working hours and the non-learner contact hours activities normally - Duties Related to Formal Scheduled Teaching (DRFST) were calculated.

3.3. Review of financial performance - Prior year’s surplus or deficit-A review of the financial reports from 2013 to 2017 was done to establish the Institution’s financial strength and how it responds to this through the planning process.

3.4. Identifying Cost Centers i.e. services and funds usage. A detailed financial mapping exercise using the general ledger for FY 2016-2017 generated a resource flow map for the proposed model. Cost centres and revenue generating departments were identified. This exercise identified a host of cost pools which were allocated across the programs range to determine the cost of a program.

3.5. Tracing resources to output by isolating allowable cost components. At this stage traced each resource to output. Costs were isolated based on allowability, allocability and reasonableness to address the legitimacy of a cost charged to a resource. On allowability, costs were considered against the GAAP appropriate to the specific circumstances. Allocability; in assigning costs to a specific cost objective, reasonable and realistic proportion of the output or departmental interrelationship was considered; Reasonableness of the cost components. The cost must be appropriate to the output.

It is assumed that all departments participate in admission and graduation activities

These have not been factored in the table as it is not practical to estimate them. Kaplan and Anderson (2004) a rough estimate is quite sufficient....
Managers were asked to estimate the amount of time required for performing each activity in their departments. The following process was employed.

a) The first step was to calculate the time it takes to perform a standard activity including all its variations.

b) The second step was to calculate the activity cost. To do this, a time equation was for each activity was derived as follows;

\[ T = a_0 + a_1 x_1 + \ldots + a_n x_n \]

Where:

- \( T \) = the time needed to complete an activity in the department, (Unit Time of Activity)
- \( a_0 \) = standard time (minutes or hours) for performing the basic activity
- \( a_f \) = the estimated time (minutes or hours) for the incremental activity \( f \), \( f = 1, \ldots, n \),
- \( x_f \) = the quantity of incremental activity \( f \), \( f = 1, \ldots, n \), e.g. number of specific level items like different approval levels.

3.6. Assigning traceable and allowable costs. Costs that have a direct cause and effect relationship to output were isolated tested for allowability, allocability and reasonableness. Resources traced on these costs were considered for their suitability in line with the effort allocation Report. The cost of capacity, i.e. unit cost was derived by dividing total cost of capacity available to perform activities by practical capacity of resources available.

3.7. Determining total cost of each service - matching output and resources- All departments’ resources towards a service/output were pulled and summed together. Output was then matched to the resources and value examined within the concepts of allowability, allocability, reasonableness as well as through the effort allocation report. At this point, the finance team was able to determine the efficiency of the processes, at each stage in the value chain and adjust as appropriate. Policy issues that needed to improve efficiency were escalated to management.

3.8. Dividing Service Costs by projected Usage Each output has target population i.e. projected users. Using this method, the fee for each program was determined.

3.9. Evaluating Rates and adjustments. Cost driver rates are based on the practical capacity of the resources supplied to perform the activity. To calculate the activity cost driver rate: the activity unit time was multiplied by the unit cost of capacity.

The above steps can be summarized in the TABLE 2 below.

<table>
<thead>
<tr>
<th>TABLE 2. DERIVING TD-ABC FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulars</td>
</tr>
<tr>
<td>1 Available Resources</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3 Activity Cost Driver</td>
</tr>
<tr>
<td>4 Number of activities in department</td>
</tr>
<tr>
<td>5 Total Cost per activity in department</td>
</tr>
</tbody>
</table>

Source: Field study

Therefore TD-ABC for BOU will be derived by the following equation

\[ TC = \left\{ (A_{cd} \times B) + (A_{cd} \times f) + (A_{cd} \times n) + \ldots + (A_{cd} \times f + 1) \right\} \]

Where:

- \( A_{cd} \) = Activity Cost Driver
- \( B \) = number of activities in the department
- \( n+1 \) = all departments in the University
4. **TD-ABC APPLIED IN PROGRAM COSTING**

Using TD-ABC Managers developed a framework for different pricing scenarios strategies i.e. (i) Cost recovery pricing, (ii) Competitive Pricing, (iii) Breakeven levels and (iv) Return on Investment. To determine unit pricing, Fixed Costs and Variable costs were examined as they relate to the University’s programs. The formulae derived are illustrated below:

4.1 **Fixed costs – Indirect Costs / Overheads.** These include capital and program development Costs.

**Capital Costs** ;This includes; Web server acquisition, Programming Languages, Photo Editor and Domain Name Registration – for online programing distribution.

\[ K = \left( (A_{cd} \times \beta)_1 + (A_{cd} \times \beta)_2 + (A_{cd} \times n)_3 + (A_{cd} \times \beta)_{n+1} \right) \]

Where:
- \( K \) = Capital program costs
- \( A_{cd} \) = Activity Cost Driver
- \( \beta \) = number of activities in the department
- \( n+1 \) = all departments in the University

4.2 **Program Development Costs.**

These will comprise of; academic staff content development, non-academic staff time and required resources in packaging for online or face to face delivery channels. These costs are summarized below.

a) **Academic staff costs in content development** - The academic staff time is calculated using the Academic Workload Formula as illustrated below;

\[
\text{Academic staff} = \sum_{n=1}^{m} \{(FST+DRFST) \times (f_a \times f_b \times f_c \times f_d \times f_e \times f_g \times f_h \times f_d ... f_y) \}
\]

Where:
- \( AWL_d \) = Academic workload – the total hours of the lecturer to develop content
- \( m \) = the number of groups / courses that the lecturer will handle
- \( FST \) = Formal scheduled teaching – the contact programmed contact hours
- \( DRFST \) = Duties Related to formal scheduled teaching
- \( f_y \) = Specific load Tariff applicable to the lecturer.

b) **Non-academic Staff-time for content development** - Unit time of activity

These include costs for packaging the content, Print or electronic and other delivery support services. They are calculated as – Unit time of activity, i.e. how long a specific resource unit takes in delivery and divided by the cost of that resource unit to the nearest 1 hour.

\[
T = \frac{(a_0 + a_1 x_1 + ... + a_n x_n)}{t}
\]

Where:
- \( T \) = the time needed to complete an activity in the department, (Unit Time of Activity)
- \( a_0 \) = standard time (minutes or hours) for performing the basic activity –
- \( a_f \) = the estimated time (minutes or hours) for the incremental activity \( f \) (\( f=1...n \)),
- \( x_f \) = the quantity of incremental whether additional resources are required for online adaptation.
- \( t \) = the cost of the resource to the nearest 1 hour.

c) **Program Independent Costs**

These costs include; Designing interaction tools (chats, discussion boards) writing HTML pages layouts and hyperlinks, designing administration tools (log in / log out, grading) writing HTML pages layouts and hyperlinks, Designing Support tools (online board, online help) writing HTML pages layouts and hyperlinks and Testing.

\[
\text{PICt} = \frac{(p_0 + p_1 q_c + ... + p_n q_d)}{t}
\]

Where:
- \( \text{PICt} \) = the time needed to complete an activity in the department, (Unit Time of Activity)
- \( p_0 \) = standard time (minutes or hours) for performing the basic activity –
p_{i} = \text{the estimated time (minutes or hours) for the incremental activity } f_{i}, (f = 1 \ldots n), \qquad q_{i} = \text{the quantity of incremental whether additional resources are required.}

\begin{align*}
t & = \text{the cost of the resource to the nearest 1 hour}
\end{align*}

\textbf{d) Institutional Based Program costs.} These include: Accreditation Fees, Cost of Tablet, Course marketing Adverts, Initial Development (Cost of Specialized Equip), Learner Material Cost, Library Books, License Fees/Affiliation Fees, Reference Texts, Reflective Journal and Student Induction Costs etc.

\[ IBC = \{(A_{cd} x \beta)_{1+} (A_{cd} x \beta)_{2+} (A_{cd} x n)_{3+} (A_{cd} x \beta)_{n+1}\}\]

Where:
IBC – Institutional based program costs
Acd = Activity Cost Driver
\beta = number of activities in the department
n+1 = all departments in the University

\section*{4.3 Variable costs}
\textbf{a) Instructor costs; Academic} functions of Teaching, Scholarship and Service are integrated here to avoid piecemeal additional remuneration for academic tasks such as, Tuition, support and assessment.

\[ AWL= \sum_{n-1}^{m} \{(FST+DRFST) x (fa x fb x fc x fd x fe x fg x fh x fi \ldots fy)\}_{a} \]

Where \( AWL = \text{Academic workload – the total hours of the lecturer to deliver} \)
\( m = \text{the number of groups / courses that the lecturer will handle} \)
\( FST = \text{Formal scheduled teaching – the programmed contact hours.} \)
\( DRFST = \text{Duties Related to formal scheduled teaching} \)
\( f_{y} = \text{Specific load Tariff applicable to the lecturer.} \)

\textbf{b) Non-Teaching Costs - Unit Cost of Activity}

\textbf{T A B L E 3. NON-TEACHING COSTS - UNIT COST OF ACTIVITY}

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Variables</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Resources</td>
<td>Cost of capacity / Practical Capacity</td>
<td>c) Capacity Cost rate</td>
</tr>
<tr>
<td>2</td>
<td>T = a_{0} + a_{1}x_{1} + \ldots + a_{n} x_{n}</td>
<td>d) Unit of time of activity</td>
</tr>
<tr>
<td>3</td>
<td>Activity Cost Driver</td>
<td>a x b = c</td>
</tr>
<tr>
<td>4</td>
<td>Number of activities in department</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>Total Cost per activity in department</td>
<td>c x \beta</td>
</tr>
</tbody>
</table>

\[ NCAC = \{(A_{cd} x \beta)_{1+} (A_{cd} x \beta)_{2+} (A_{cd} x n)_{3+} (A_{cd} x \beta)_{n+1}\}\]

Where:
Acd = Activity Cost Driver
\beta = number of activities in the department
n+1 = all departments in the University

c) Institutional Based Variable Costs
This include among others, Assignment Folders, Certificate Fee, Consumables, Graduation Cost, Invigilation Cost, Practicum Cost - Specialist Supervisors, Practicum Cost - Staff Cost, Tutor Travel & subsistence.
IBVC = \{(A_{cd} \times \beta)^1 + (A_{cd} \times \beta)^2 + \ldots + (A_{cd} \times n)^{n+1}\}

Where:
\(A_{cd} = \text{Activity Cost Driver}\)
\(\beta = \text{number of activities in the department}\)
\(n+1 = \text{all departments in the University}\)

d) Recurrent Costs
These costs will include: Running Web Server, Site Maintenance, Connection, Virtual web server (rent) Facilities Cost - Rented Space, Field Trips, Office Costs (stationery, communication etc.), Periodicals, Staff Travel, Written Short Assignment and Administration etc.

RC = \{(A_{cd} \times \beta)^1 + (A_{cd} \times \beta)^2 + \ldots + (A_{cd} \times n)^{n+1}\}

Where:
\(A_{cd} = \text{Activity Cost Driver}\)
\(\beta = \text{number of activities in the department}\)
\(n+1 = \text{all departments in the University}\)

Example: Calculation of Break even, Revenue and Break-even enrolment level,
Assuming fixed costs of P6, 000, Variable Costs at P1, 500 a fee of P30, the program will break even with 250 Students. At this point, the break-even enrolment is equal to the students enrolled, and the revenue is equal to the fee charged per unit. Contribution margin is at 80%. At the breakeven level, an increment of one more student, keeping the price constant, will necessitate a marginal increase in variable costs to reach a new breakeven point. See TABLES 4 & 5 below.

<table>
<thead>
<tr>
<th>TABLE 4. PROGRAMME COSTING AND BREAKEVEN POINT- 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Institution Operations</td>
</tr>
<tr>
<td>Total Fixed Costs</td>
</tr>
<tr>
<td>Estimated variable costs</td>
</tr>
<tr>
<td>VC Percentage</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>Contribution Margin</td>
</tr>
<tr>
<td>Fee charged / Unit</td>
</tr>
<tr>
<td>Variable Costs/Unit</td>
</tr>
<tr>
<td>Contribution Margin</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>Break-even Enrolment</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Costs per Unit</td>
</tr>
<tr>
<td>Variable Cost /Unit</td>
</tr>
<tr>
<td>Variable Cost %</td>
</tr>
<tr>
<td>Fixed Cost / Unit</td>
</tr>
<tr>
<td>Estimated Units</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>Break Even Fee Amount</td>
</tr>
</tbody>
</table>

Source: Field study
TABLE 5. PROGRAMME COSTING AFTER ADJUSTMENT

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Units</th>
<th>Fee Amount</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Institution Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fixed Costs</td>
<td>P.6,000.00</td>
<td>P.6,000.00</td>
<td>P.6,000.00</td>
</tr>
<tr>
<td>Estimated variable costs</td>
<td>P.1,530.00</td>
<td>P.1,530.00</td>
<td>P.1,530.00</td>
</tr>
<tr>
<td>VC Percentage</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>2 Contribution Margin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fee charged / Unit</td>
<td>P.30</td>
<td>P.30</td>
<td>P.30</td>
</tr>
<tr>
<td>Variable Costs/Unit</td>
<td>P.6.10</td>
<td>P.6.10</td>
<td>P.6.10</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>3 Break-even Enrolment</td>
<td>251</td>
<td>N/A</td>
<td>7,530.00</td>
</tr>
<tr>
<td>4 Costs per Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable Cost /Unit</td>
<td>6.1</td>
<td>6.1</td>
<td>6.1</td>
</tr>
<tr>
<td>Variable Cost %</td>
<td>20.3%</td>
<td>20.3%</td>
<td>20.3%</td>
</tr>
<tr>
<td>Fixed Cost / Unit</td>
<td>23.90</td>
<td>23.90</td>
<td>23.90</td>
</tr>
<tr>
<td>Estimated Units</td>
<td>251</td>
<td>251</td>
<td>251</td>
</tr>
<tr>
<td>5 Break Even Fee Amount</td>
<td>N/A</td>
<td>30</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Field study

5. CONCLUSION:

Deriving from the experience at BOU University, two conclusions can be made; Time is primary cost driver that allows the University allocate costs directly to objects. Using linear equations management can model variations in resource capacity demand and project program costs and the breakeven point of a program. It’s only upon the determination of these costs that the University can prepare reasonably accurate estimates for planned activities of its strategic plan.

At the national level, the Government may consider funding specific activities, recognizing that the University’s needs shift with the dynamics for higher education demand and advancement in technology. The state will know more accurately, the actual cost for a student, the costs of infrastructure and equipment. This approach will help the State to target scarce resources to a specific determined impact point in its strategic higher education agenda, while balancing the increasing competing interests for public resources.

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