



## **Operations Research In The Management Practices Of The College Of Education Lanlate Under A New Higher Education Management Paradigm: An Overview**

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### **ABSTRACT**

This paper proposes the application of Operations techniques to make management better in the face of emerging higher education management paradigm as a result of state government cut or zero grants to the college of education, Lanlate. This singular action of the state government has left the college naked and open to rising cost, declining rate of students' enrolment, income deterioration and academic quality palaver. These four areas are known as management decision problems which OR can help to solve and provide better management to the whole college as being experienced in some universities in Nigeria and the tertiary institutions in the advanced countries of the world.

**Keywords:** Operations Research, Decision Variables, System thinking, Methodology pluralism

### **INTRODUCTION**

"Higher Education changes lives. It is enriching and inspiring for students and it is vital to social mobility, future economic growth and our international standing" (HEFCE, 2011). It is on this note the founding father of progressive voices in Nigeria as championed by Unity party of Nigeria (UPN) between 1979 to 1983 under the able leadership of Chief Obafemi Awolowo carefully crafted the party's four cardinal programmes that included free education at all levels. Successive governments in Oyo State of Nigeria after the administration of Chief Bola Ige (as the UPN Governor of Oyo State between 1979 and 1983) used this as bait to secure people's mandates. But the evolving economic realities of 21st century is forcing the state government of the day to make the managers of tertiary institutions see their colleges/polytechnics/university as not relatively stable but complex and with uncertain future more than before (Morgan, 2006). Another force compelling higher education managers to make a shift is the fact of increasing level of unemployment, many Nigerians (over 70%) is living below poverty line and government debt crisis. Many graduates are becoming unemployable as results of unmatched skills for available jobs in the labour market. The two obvious problems the higher education managers have to contend with are unemployable graduates and funding in evolving complex and uncertain operating environment.

To free government from shackles of financial funding commitment to higher education in Nigeria, federal government is giving more recognition to privatization and establishment of private higher educational institutions than before and also the state government is demanding for judicious use and accountability of public fund allocated to her own established higher education from their managers as well as making higher education a fees funding institutions and self-sufficient and reliant like the advanced countries of the world; a new management practice and measurement of education quality.

This new management demand is a reason for the relevance of operations research (OR) tools in solving problem decisions management of the college will be facing to make decisions that will place the college in the right footing with others within and outside Nigeria. OR areas of relevance in Higher Education include: strategy formulation, budgeting, resource allocation, physical facility planning, faculty planning, performance, scheduling, efficiency, quality assurance, etc. This may not pose serious problem to The College of Education, Lanlate (COEL) if it can show high level of understanding for the needs for OR application especially now that enrolment rate into the college is cascading yearly. This threat is from many private universities, polytechnics and colleges that are being licensed to operate in Oyo state in particular and Nigeria in general as many prospective students prefer universities or polytechnics education to the state owned colleges of education where one cannot predict when next there will be a strike action either from the staff or students; and new demand for increase in internally generated revenue (this include tuition fees, levies and other sources) for funding the college.

The consequences of not being able to meet these demands: raise funds apart from the government grants and subventions and internally generated revenue to meet salaries and other running costs as it is being witnessed now are: increased decline in the purchasing powers of staff that brought many into bankruptcy or insolvency that opened doors for poor living conditions and unprecedented sickness rate, hunger, depleting physical structure; lack of capital development; and when it became unbearable strike action was embraced as solution, which could not bring various staff unions near solution. The staff, students and the quality of academic products that are being produced suffer from this ugly situation that only hopes to cut expenditure but not controlling expenditure and increase revenue bases for the colleges. Education is a significant institution given the shift to a knowledge economy therefore all tertiary institutions are expected to deliver high service quality (Adeleke, 2012 & Yousapronpaiboon, 2014)

The purpose of this paper is to highlight current management problems, the new operating environment of the college of education as being different from the operating environment the college was under 100% state government personnel funding; the effects of rising cost, declining enrolment rate, and quality of academic products under the new funding system; the implication of the new emerging higher education management paradigm as well as the role of operations research under this arrangement to enhance cost management practices of the college that can bring about better management decision making.

### **Current Management Problem**

It is a welcomed idea to cut expenditure provided it will not impact negatively on the quality of academic products, staff development and living condition, instructional facilities, programmes development efforts, marketing and recruitment cost of students and other cost centres. The current efficient management practice of cost reduction strategy of the COEL in Oyo state is outright forcing or ignoring cost pressures and abdicates the most essential responsibilities that can move the college forward. The emerging facts from these management practices show that the new environment of complex and uncertain future the COEL faces in Oyo state are beyond what the traditional management techniques can resolve. While it may sound better to maximise revenue or minimise cost, it is reasonable to ask which cost or revenue to be minimised or maximised? As it is being contemplated in some quarters that retrenchment of staff is the most enterprising objective; the question is how many times will this be employed as the right solution in a situation where the students' enrolment is depleting at a faster rate? Let the truth be told, if the state government is not ready to fund the college, the college will suffocate to die naturally. It is the funding of the COEL by state government that will make it more viable, self-reliant and sufficient to pursue various ventures that will strengthen its' financial capacity to carry any staff load, provide employment opportunity (goal of the government), qualified for accreditation and enhance academic quality of the college now and in the nearest future when self-funding college will become a dream come true.

Presently, the only revenue source for a newly established college is entirely subventions or grants from the state government. Can a baby college be compared in ability and capacity to explore other sources with already established college, if government declines to release subventions and grants? Proactive thinking may also sound okay if this fails, then what can boost the revenue earning capacity of the

COEL? Where the only hope of sustained revenue of the college is on fees and levies from the students' enrolment, what other alternative options can be explored to stabilise the revenue earning capacity of the COEL if and only if fees and levies will not reduce enrolment intakes of the students? These questions can only be satisfactorily answered with best modern management practices that embrace information collection and analysis for funding model construction for all the relevant stakeholders: government, host community, the college and the students for decision making. This is the points. This is the facts. This is the emerging problems that must be attended to otherwise the college cannot move or forge ahead successfully.

Some tertiary institutions in advanced world cannot play this need off. They adopted management tools available to help control cost and revenue (Keller 1983; Rourke and Brooks, 1966) and they were able to weather the storm of government subvention and grant withdrawal especially in countries where education is classified as private goods like USA. This may be an exception in Nigeria, because self-centred tools which cannot be as effective as adopting various information, analysis, OR and accountability methods to improve planning and management abilities (see Baldrige and Tierney, 1979) is often preferred. Therefore the focus of the management should not be just cost cutting but improving the revenue earning capacity of the college through appropriate funding strategy. The concern should be what little investment could be made that would write off little expenses from becoming burden and or forming cost and spending pressure on the little income available from students' fees and levies (see Akintoye, 2008).

### **New Emerging Management Paradigm**

The position of the government on cutting subvention to the state colleges of education has given birth to new management methods to increase both their efficiency and effectiveness instead of the loose, unstructured, casual and age long methods of management that will stimulate enhanced income generation base apart from income from the students' fees and levies, efficient cost reduction strategy, improve students' enrolment in order to meet up with the various management pressures. What this new emerging management paradigm requires is embedded in the political will of the managers to engage in sincere and continuous strategic planning review that will match the colleges' missions and visions, reposition them for greater exploit and focus both external and internal operating environment, make projections for cost and revenues for various internally generating revenue vehicles to determining which one is financially self-supporting and one that requires subsidies to survive (see Bodhibrata, 2014). According to Newman, E. and Duwiejua, M. (2015), all these have consequences for: system governance, efficiency and enrolment, Management and planning, quality outcomes, autonomy and accountability.

The new emerging problems call for analysis of the strength, weakness, opportunities and threat to the college of education, Lanlate. The only strength of the college lies in its staff quality and quantity in diverse areas of field of human endeavour. The college weakness is in the capacity development. This is as a result of low capital development. While the threat to the college, comes from low enrolment rate as a result of competitors activities, poor working environment, environmental beautification management and government policy on funding and education. The opportunities available to the college are in the form of training of qualified teachers, collaboration with some universities to run degree programmes in education, consultancy and research and publications. Other areas of opportunities are agribusiness, business ventures, and other commercial activities that can be captured to increase the revenue base of the college of education. From the analysis made above, the threats to the college make the staffing position to be over bloated and these undermine the potential contribution from the staff size. These also increase the tempo of the college weakness as they affect the flow of revenue/income to the college. And both the college weakness and its threats affect the college from taping the opportunities around.

**Table 1: The SWOT Analysis of The College of Education Lanlate**

<b>Strengths</b> Staffing Position Location (Agrarian Society)	<b>OPPORTUNITIES</b> Degree Affiliation, Collaboration, Franchising, Partnership within and outside the Country for Academic Programmes Counselling, Consultancy, Research and Publication Agribusiness Other Commercial Ventures
<b>WEAKNESS</b> Low capital Development Poor/Inadequate Capacity Development for Staff and Students Mobility (Transportation) Website	<b>THREATS</b> Low Enrolment/Unified Entry Qualification Poor Working Environment Poor Environmental Beautification Management Prospective Students' Interest in ND/HND Existence of Higher Certificate Awarding Institutions in the Region Globalisation and Internationalisation State Government Policy on Higher Education Funding

### Operations Research (OR) Tools

The emerging management paradigm in the management of higher education focuses on problem solving (Adeleke, 2015a), which is within the domain of operations research (Bell, Warwick & Galbraith, 2012) that makes the application of its tools much more relevant to any form and level of management. Operations research has three essential distinctive intellectual areas – Hard (Traditional) OR process, Soft OR (system thinking) and the emerging OR (Methodological pluralism) (see Bell, Warwick & Galbraith, 2012). All these areas make use of advanced analytical methods to make better decision. According to Bodhibrata, (2014), “the objective of decision making is often to maximize profit, minimize cost, better efficiency, better operational or strategic planning.....better risk management...” which promote the scientific manner of OR models of real life situation to arrive at optimal or near optimal decision that allow the decision maker to have a thorough understanding of the system better through sensitivity and scenario analysis. OR has been successfully applied to solve identified common problems in management practice, since the end of second world war after its success in helping to end the war quickly than earlier thought; such as inventory planning and control processes, resource allocation processes, product brand switching, financial planning and control processes, income projection and analysis, facilities replacement/maintenance processes, ratio analysis and other areas which data collection, mining and analysis are plausible. Whatever the objectives to be achieved, OR will assist greatly to search for needed information, validate it, construct appropriate model to explain the nature of the problem under the investigation, operationalise it and generate all possible outcomes for management decision making. Likewise in the COEL, appropriate feasible solutions can also be made through application of OR tools to improve effectiveness and efficiency in resources management. OR applications to short, medium and long term issues are common thing in the higher education of most advanced nations especially on cost reduction strategy and revenue management. This makes the efficacy of OR techniques to positively impact human and organizational behaviour through system thinking (Galbraith, 2004), creativity (Morgan, 1993) and resourcefulness through intelligent search and organizational context, stakeholders' view, requirements, understand societal context where the system development will occur (Oates & Fitzgerald, 2007). Under the management decision problems, efforts would be made to suggest the type of tools usable for each problem.

### Emerging Higher Education Management Operating Environment

When government was fully responsible for total funding of tertiary institutions in Oyo state, the newly established the college of education Lanlate has little to worry about the future funding of the institution.

Flow of finance to pay staff salaries, operating costs and building, facilities procurement and other capital expenditure will certainly come (i.e. placid and uniform environment). But with the withdrawal, the future has become uncertain and complex to understand the operating environment (i.e. turbulent and differentiated environment). This complex and uncertain future outcomes of a given action need to be dealt with otherwise there cannot be success story to be recorded (i.e. complex and ill-structured problems). The future outcome depends on the objective(s) of a particular given action. For instance, the college may want to deal with how to maximise income or minimise cost as the situation is unfolding or not too sure of the type of objective to pursue, it may be safe to come up with a decision that may be merely adequate rather than been optimal (satisficing), Simon, (1997) asserted. The data availability will influence the choice of analysis and the OR tools to use not as one off solution system but usually solved in sequence. In many cases the total problems cannot be formulated in advance but the solution of one phase of it helps define the next phase as illustrated below in fig 1.

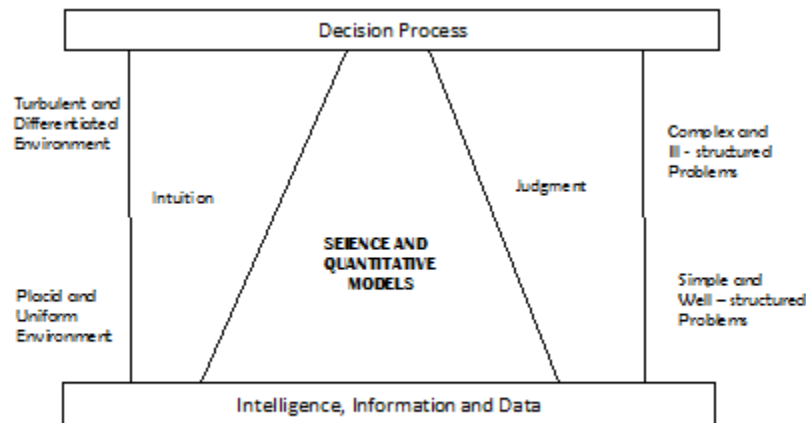


Fig. 1: Qualitative Thinking and Quantitative Models  
Source: Operations Research (second Edition) by P. Rama Murthy

### Decision Problems In The College Of Education, Lanlate

These decision problems can be categorized as:

1. Revenue dwindling problem
2. Cost pressure management problem.
3. Educational products' quality
4. Students enrolment process
5. Investment Problem

### Revenue

Tuition fees and levies are the main source of revenue the COEL generates internally since it becomes autonomous institution as pronounced by the state government early in 2015. Also from that moment, students' enrolment also truncated and reduced by half of what it used to be intakes yearly even to a ridiculous extent. There are many reasons for this drastic reduction in the intakes into the college. One of it is regulatory reforms embarked upon by JAMB that places it in charge of admitting students into all tertiary institutions in the country on equal terms and also high tuition fees and levies for teacher's education programme as well as unattractive infrastructural facilities present in the college. Another source of low enrolment and continued decrease in the enrolment rate is attitudinal problem of people seeking admission and people within the vicinity of the college to partner with the college. As the college increases fees and the students' enrolment declines, the internally generated revenue dwindles grievously. What is the way out? The way out is to float so many programmes both academic and non academic and carry out a strategic planning for each of the programmes that have the ability to bring about a reduction in the cost and spending pressures the college is facing. To embark on this effort, the capacity base for increased activities through various programmes to be pursued must be enhanced differently from what is

currently obtainable and be mindful of the college business competitive position, customer profiles, suppliers, creditors and also that of external environmental factors.

To secure necessary finances for these ventures, turn to state government for seed money or approval for debt financing; partnering with philanthropists and business minded people in the state or beyond becomes necessary as best strategy to take the college to its lofty height. It is becoming difficult for any institution to survive barely on the income being received from the students' fees and levies without government funding. According to Okebukola, (2015) The effects of inadequacy of funds and the injudicious utilisation of the meagre funds have been non-salutary as it affects low capacity for internal generation of funds, promotes weak management structures and corruption by the operators and aids neglect of capital development. Government funding at take off of the new college like COEL is very important otherwise it may not be able to withstand the storm of poor and inadequate funding.

From the above, the emerging funding mix can be represented by the following mathematical model:  $F = f(P, H, C, S, I, G, A)$

Where  $F$  is funding model for the College of Education, Lanlate,

$P$  is the proprietor of the College,

$H$  is the host community,

$C$  is the college income from non fees and levies ventures,

$S$  is the levies and fees from the students (NCCE and Non-NCCE academic programmes),

$I$  is the private individuals that have interest in the college development,

$G$  is the products of the college from counselling, research and publication and

$A$  is alumni contribution.

### **Cost Pressure Management**

There are so many cost pressures the management of the COEL faces on daily basis competing with the scarce income coming from the only source of revenue generation of the college. If the government withdraws its' funding from the college, the college staff will become more miserable than what they have experienced so far; the college will not be able to replace the fast wearing out of facilities and environmental beautification management will become impossible and campaigning for new students to be recruited will become herculean task. Already the intending students of the college capitalise on the poor environmental condition and poor physical structures, absence of hygienic lavatory system in the college as excuse for them not to choose the college for their NCE programme. To ameliorate this problem especially for facilities and environmental beautification management, it becomes necessary, according to Waggaman (1991), to gather data and research as basis of making and expand efforts to develop objective criteria for making decision on the allocation of resources instead of leaving these matters entirely to the play of campus pressure or the force of tradition.

As a guide against these cost pressures on the lean purse of the college, budget preparation should be campus based activities rather than management sole responsibility. The management should be willing to call for budget estimates from all the functional units, departments, schools and other centres and listen to why they belief they need what they are demanding for. Secondly, ask them to tell the management the income they hope to generate from such demand for fund. This process will inform the management better on how to optimise the use of fund.

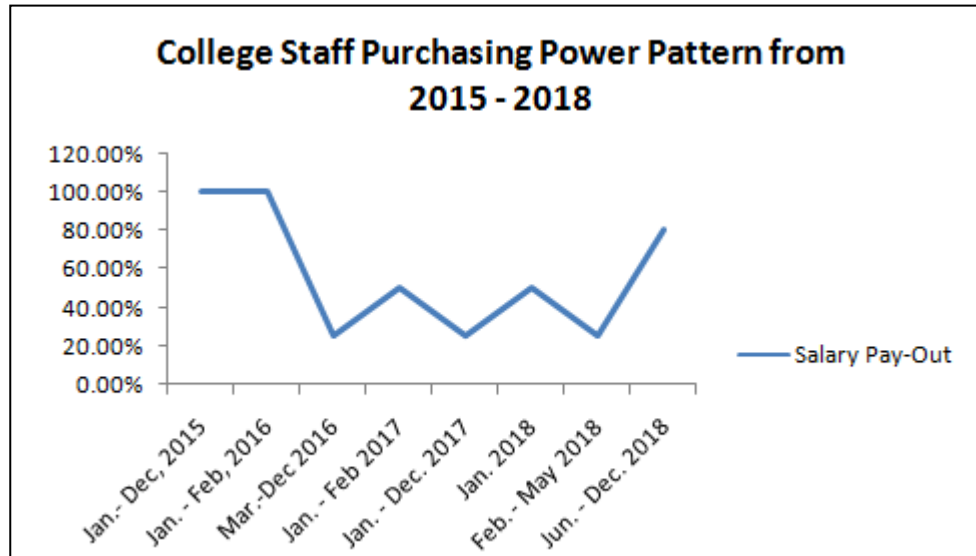


Fig 2: Staff Salary Subvention from the Government from 2015 to 2018

There is a need to classify and reclassify cost and spending pressures the management is facing as: 1. Important but viable or draining and 2. Unimportant but viable or draining (see Baldridge and Tierney, 1379).

Table 2: Cost/Spending Pressure Management Matrix

Nature of cost/Spending Pressure	Viable	Draining
Important	CELL1 (Good)	CELL2 (Weak)
Unimportant	CELL3 (Fair)	CELL4 (Worse)

If during the 100% subventions from state government, the bulk of college cost and spending pressures were in CELL4 or CELL3 or CELL2, then, the college has to restrict its cost and spending pressures to CELL1, which is good cost management practice. Good cost management practice will focus relevant cost/spending pressure mostly that will minimise trajectory implication of such on academic product quality. The question here is how can the college determine which cost is important but viable or draining and unimportant but viable or draining? This is possible through the employment of OR tools (Adeleke, 2015b) that will help to improve the budgeting process; develop a strategic plan and implement or modify a management information system; connect planning with budgeting and locate the link necessary to make strategic planning a success.

The total cost pressure of the college may either be recurrent (RC) or capital cost (CC) i.e.  $CTC = f(TRC, TCC)$ . The appropriate OR techniques will use variable costing method to determine the cost of training per student per year or linear programming to propose differential cost per student according to their course of studies and also tell us number of desirable students in each department in the college.

### Academic Quality Management

The welfare of the staff is non - negotiable as well as that of the students. The paucity of the fund available needs to be judiciously managed to reflect a satisfactory level of welfarism in the college. The continued slashing of salaries, strike actions (of both staff and students) are pointers to academic quality management problems as a result of sudden withdrawals of government funding to a newly founded college. From fig. 2 above, the drastic reduction in the take home pay of staff shows the precarious

situation of the college funding and the effects of it on the quality of academic products as the number of months devoted for academic activities are always shortened (see fig 3 below).



Fig 3: Effects of Cut in Staff and Strike actions

### Students' enrolment process

Students' enrolment process needs to be looked into. How do we source for the students? Do we believe students will voluntarily come to a college whose physical appearances betray its human resources capacity and quality? This calls for branding and rebranding of the college. The insinuation from some quarters is the college have over bloated staff. This is far below NCCE requirement. Another issue is low enrolment. How can this be resolved? There are so many ways. The host community has a great job to do on this note. The community needs to direct its assistance towards getting more of its children into the college of education as students because of both economic and political reasons associated with having the college first and secondly for supporting the college to attract prospective students from both Ibarapa region and other parts of the country. The college alone cannot do it; it has to be through collaborative efforts of the host community. If this works, the students' fees will not be sufficient to run the college. So I submit that low enrolment is a partial problem and solving this will give us partial solution only given the imposed system constraints. When tuition fees were within the range of ten thousand naira and differential admission requirement rather than unified policy of JAMB, more students came to the college for admission. As the tuition fees gradually increased, students' enrolment started falling and capital development becomes non-salutary too.

From the interaction among the people within and outside the college, the following factors contribute to the low enrolment of the college:

- Poor and untimely recruitment process of students as evidenced in the late release of postal, pamphlet, radio and television announcement/adverts, inappropriate use of online facilities, etc.,
- JAMB unified admission policy places colleges of education at a disadvantage. Students with five credits including Mathematics and English Language will prefer seeking university admission first.
- College Hub. The payment gate needs to be secured so that the many payment options will be available to both old students and prospective students. The current hub is not making the college to be competitive,
- Physical structure of the college,
- Admission requirement and policy of the college give other neighbouring sister colleges upper hand in the recruitment process,
- New Students' Recruiters. The college has not been using this medium,
- Poor College Networking System. College networking system should embrace Religious body networking, Social networking, Political networking, Business Networking,



Artisan/craftsmanship Association networking, High School Networking, Traders networking, transporters networking, etc.,

- h. Prospective students' interest as well as their parents' interest in NCE programme,
- i. High tuition profile for teacher's education,
- j. Social life on the campus,
- k. Academic success rate of the students and
- l. Strike.

OR will produce a descriptive model to explain the impact of these factors on low enrolment and the management will now go into actions to address the most grievous factor-impact. If the specific effect of each of the factors is not known, it becomes difficult for the management to initiate corrective actions.

### **Investment problem**

As it was pointed out above, solving low enrolment problems into the college cannot solve its funding problem. Even, if there is considerable spending on the physical structure of the college to increase the carrying capacity for the numbers of students that can completely fund the college, the cost structure will continue to change and accumulate to wish off expectation to fund the college from fees and levies to be paid by the students. There is also the need to look both inward and outward for investment opportunities in our society. Through many outlets college can increase its income (Zimmermann, 2000). These can be academic and non academic programme. From the Academic programme; full-time, NCE, Degree and professional teacher's diploma and others can be floated. According to Aitbach and Knight, (2007), franchising arrangement, partnership with academic institutions, off shore academic programme, collaborations with universities within and outside the country to offer academic degrees and others; Non-academic programme; Business Units, Consultancy, Research and Publications and Agribusiness are possible main streams of investment the college can embark upon (see Eva, 2006). College based analysis of internal strength and weakness, external threat and opportunities through campus wide participation will point to the right way out of funding ailment. Higher institutions attain stronger academic institutions because of their wealth, long academic traditions, size, language and other factors (see Altbach, Reisberg and Rumbley, 2009). The little drop of income especially from non-academic programme will sour up the college income. For the interest of the college this is the available choice as minimum (200 students per programme in a year) and maximum (600 students for a programme for three years) carrying capacity of the college as approved by the NCCE cannot solve or resolve the revenue earning problem of the college as earlier noted.. Let the management sees it as a duty to source for seed money from different sources. This can come from the catchment local government areas in the state, if state government backs it; from individual members of the state that have passion for educational development, from philanthropists, business morgues, religious organisations, trade/craft associations in the community and even the students.

### **Can Operation Research (OR) Help To Profer A Better Decision To The College Of Education, Lanlate Decision Problems?**

The point here is the application of OR tools in advanced countries' tertiary institutions, was found to be successful; OR played tremendous roles when they were facing similar and greater problems than what the COEL is facing. The issue first, is the government ready to fund or privatise the COEL? In the mind of the government, privatisation is not the next thing but funding or closes down. If the government is ready to fund the college then the college must participate in the funding; this is the signal from funding withdrawal tactics of the government. If the college will participate in the funding a gradual policy rate of contribution must be put in place like 2% upward to the point the college will be self-reliant and sustainable. This policy was first introduced during Gen. Ibrahim Babangida to all Nigerian Universities between middle of 1980s and 1990s, where they were sourcing certain percentage of their budget. It was this that led so many universities to start up universities' ventures, such as consultancy, human resources management centres, bookshops, research and publication, water, bread, evening programmes, distance learning programmes, transport services, etc. One of the universities that first started various ventures is University of Lagos<sup>1</sup>. In the middle of 1990s to its end, the then Vice Chancellor, Professor Jelili Omotola

went as far as collecting toll gate fees from all the parks in the university, introducing work study programme, construction of event centres, commercialisation of halls and refurbishing all the unserviceable vehicles of the university through partnership with Peugeot Assembly Nigeria (PAN) to add to the existing ventures. It is now coming to the COEL, what can be done? One of the intellectual areas of OR is system thinking. System thinking will allow us to know how the college system is and how it can be positioned for this greater responsibility through sensitivity and scenario analysis because system implies an interconnected complex of functionally related components. The COEL strength cannot match that of the universities; but the opportunities opened to it are far greater than that of most universities. For instance COEL is located in the rural area (agrarian society) that is close to two major urban centres in the south western cities (Ibadan and Abeokuta) of Nigeria. Does the COEL have the capacity to take on these opportunities?

In the college strategic planning, assessment of internal strengths and weaknesses, threats and opportunities of the college must be carried out to identify a range of possibly attractive opportunities (Pearce & Robinson., 2000); then collect data and analyse each of the actions to be taken that can produce optimal solution. Another phase of the OR is HARD or TRADITIONAL approaches that address optimality. Optimality techniques are many; it includes linear programme, integer programming, non-integer programming, quadratic programming, mixed integer linear programming, pure integer linear programming, binary programming, stochastic programming, dynamic programming, goal programming, etc (Luenberger & Ye, 2005 and Lingefjärd, 2006). Before any of these can be used, decision variables must be specified, and then a modelling process will specify the objective function and objective function coefficient, followed by specification of system process constraints (technological constraints). The solutions from these tools give a wider basis for choosing an action for implementation.

If the college can consider the above for use with the right vigour, closing the college will not be possible in the first instance. To foreclose the possibility, COEL needs to establish a business strategic planning unit that will be doggedly involved in the collection of data and analysis of it for management decisions on all possible programmes that are to be floated by the college and put in place sound cost and revenue/income generation capacity building management.

OR will now identify sources of each of the problems identified above, assign preference to each factor and identify conflict areas within. This task will not be carried out through mental noting it has to be carried out through some procedures like development of survey, data collection and using of OR optimality tools like goal programming, dynamic programming or linear programming to determine feasible solution and lastly select feasible solution and test for long run effect through simulation modelling (Kaiser, Blomhoj & Sriraman, (2006).

In summary, OR framework to the decision problems could be carried out thus (see Eva, 2006):

- a. Problems
  - Define and Identify sources of each of the problems,
  - Assign preference to each factor and identify conflict areas within.
- b. Approaches/Methods/Tools
  - Develop survey and Collect relevant data,
  - Use OR optimality tools for selection of feasible solution.
- c. Results and Impact
  - Make fast and fair assignment on all actions consider bringing about feasible solution,
  - Construct simulation model to analyze long-term effect.

<sup>1</sup> The author worked in the University of Lagos between 1995 and 2003. He served as Projects Accounts Officer in the University of Lagos Consultancy Services and Press Accountant as well as secretary to Press Tender Board and Financial Committee of the Press.

## CONCLUSION

The new emerging management paradigm calls for a scientific approach to decision making in the face of complex and uncertain future that surrounds the state government position on self-reliant/sufficiency of the COEL which was established barely three years ago. The problem facing the college is enormous, ranging from poor funding by the state government, reduction in students intakes yearly, poor facility/environmental beautification management, poor living conditions of staff, poor office/classroom accommodation and lighting, poor attitude to investment. Government withdrawal of grants and subventions has succeeded in aggravating the tempo of these problems. Now the reality is the college should learn how to manage the paucity of fund available to it and increase its revenue generation. To increase revenue/income many programmes can be embarked upon; but where is the fund to float them? This is the primary reason for state government to release take off grant and 100% subventions to COEL for a short period of five to ten years, and gradual withdrawal of subventions until the college is self-sustaining; before the time set, the college would have developed a matched capacity for internally generated revenue through appropriate capital development the college deserves. To put in place sound cost management practice, there is need to embrace the tenets of OR. The application of OR tools will help the management to make sound decision to move the college ahead. Most institutions in United State of America, United Kingdom, even some universities in Nigeria, etc. found the relevance of the application of OR in the strategic planning, budgeting process, inventory planning and control, risk management, quality improvement, etc. useful to fulfil their mandate of creating jobs and sustaining the same, carry out researches and contributing positively towards educational advancement of the country. If the college should fail in helping the society to fulfil its social and economic goals then it is unwelcome to aggravate it.

It is attested facts that scientific basis for making managerial decision has not only become popular but necessary for good governance of higher education management, especially now that most governments are facing debt crisis to properly fund higher education in Nigeria. The dominant discipline that focuses data collection, mining, analysis for managerial decision making is operations research, which allows participative modelling to support strategic planning (Akkermans, 1993). Operations research has been found to offer range of tools that can optimise and offer best and sound solution to myriad of decisions educational managers face or may face in complex structured or unstructured situations with attended uncertain future in their day to day activities. OR is the new life solution that must be embraced and incorporated into the college management process as demanded by the new higher education management paradigm because of search for knowledge on potential ventures and cost management, strategy (tools), that can enhance income generating capacity of the college of education, quality of its products, effectiveness and efficiency of management is a must in the evolving higher education management in Oyo state.

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