Financial Management System in Open and Distance Learning:

An Example at Universitas Terbuka

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COMMONWEALTH *of* LEARNING
Commonwealth Educational Media Centre for Asia

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Introduction

Financial management in open and distance learning (ODL) institutions plays a central role. It is not only because it will help decision makers to choose alternative methods and media for ODL, but in some cases, it is also about the accountability of political decisions. In countries such as Indonesia, the choice of ODL method is very much political as well as educational. ODL is expected to solve social problems of access and equality to high quality education.

In accordance with that, ODL system has been acknowledged as an alternative method for education. It has been widely used by different countries since it was believed to be cost-effective. Studies have shown that ODL system can indeed be as effective as the conventional face-to-face learning system for instructional delivery (see for example Beare, 1989). Other studies concern with the cost of education has also shown that ODL can be cheaper than conventional face-to-face education when the economic of scale is met (see for example Laidlaw & Layard, 1974). Within the ODL operation, the focus of cost-effectiveness studies has been on question of whether one medium is more cost-effective than another.

This paper intends to discuss financial management system within ODL. More specifically, it will discuss the nature of funding and cost classification, strategies to generate financial resources and budgeting procedure, the measures of outcome/effectiveness, and the cost-effectiveness analysis in ODL. The discussion will be presented by using Universitas Terbuka as a case study.

ODL system has been acknowledged as an alternative method for education. It has been widely used by different countries since it was believed to be cost-effective. Studies have shown that ODL system can indeed be as the effective as the conventional face-to-face learning system for instructional delivery.

About Universitas Terbuka

Universitas Terbuka is a state university and the only university in Indonesia that is entirely using distance education mode of teaching. It was established in 1984 and was designed to be a flexible and inexpensive university focusing on serving people who do not have the opportunity to attend conventional face-to-face higher education institutions for various reasons, including lack of funding, living in isolated and rural areas, and working full-time. With this, it is expected that UT will increase access to higher education and at the same time promote equity of quality higher education to all citizens of Indonesia.

UT is a nation-wide university serving over 200 thousand students and offers over 1000 courses through 35 Study Programs under four faculties: the Faculty of Economics (FEKON), the Faculty of Social and Political Sciences (FISIP), the Faculty of Mathematics and Natural Sciences (FMIPA), and the Faculty of Teacher Training and Educational Studies (FKIP). To ensure the efficient operation of the daily activities, UT has a strong centralized management system with its Head Office (HO) located in the capital city of Jakarta and 37 Regional Offices (ROs) throughout the country. Although the offices are located in relatively big cities within the local area, it does not mean that they have the appropriate infrastructure for accessing electronic communication. Despites some development which have been carried out to develop the use of ICT, the communication between the ROs and the HO relies mostly on mail and courier services, telephone, facsimile. The use of ICT-based communication channel such as e-mails have only been started to be used more extensively within the last five years.

Printed materials are the main learning medium. The materials are developed by Course Teams that at least consist of a subject matter specialist, instructional designer, a media specialist, and a course manager (most likely to be the same person as the instructional designer). Each course, depending on its credit unit, would be presented in several modules in accordance with the course blue print for the standardized format. The modules are designed to be self-instructional so that they will be able to be used by students with minimum assistance from the tutors/mentors. Nevertheless, UT also uses non-printed materials for supplementary as well as enrichment materials. Those supplementary materials are delivered to students through various ways, including television and radio broadcasts, audio tapes, video CD, CD-ROM, and internet (termed as web-supplements). Starting in 2002, some courses are also delivered through multi media learning packages that consist of printed and non-printed materials.

Learning support services are very important for UT. The learning support system is designed to assist students from the beginning when they enter UT throughout their study process. Therefore, based on the availability and accessibility of different kind of technologies suitable for different characteristics of UT's students (from those of having access to and proficiency of higher technology such as computer and Internet to those of not having access to and illiterate of computer), UT has been employing a supermarket model of learning support services. As indicated by the term, the learning support services (i.e. tutorial services) are designed to employ various technologies from as low as print (or even hand-writing) technology (correspondence) to as high as the computer technology. The models include correspondent tutorials, face-to-face tutorials, tutorials through Radio, written tutorials through Internet; written tutorials through integration of Fax-Internet, and online tutorials through the internet. Furthermore, to maintain its flexibility, none of the provided tutorials are compulsory for most of the courses. Only some courses in particular study programs required students to attend either tutorials or to do practical works. Students may attend and join any tutorials when they need to, and for face-to-face tutorials there will be extra charges involved.

Student assessment level can be classified into two: at a program level and a course level. At the program level, students must pass a comprehensive examination to be awarded a degree. While at the course level, passing grade is determined from the combination of student achievement in various assessment types and assignments, as well as their final examination scores. The components of student assessment include self test, tutorial assignments, practice and practical works, and final examination at the end of every semester. Examination is conducted as supervised face-to-face exam and is conducted simultaneously throughout the country. For conducting the examinations, UT has established approximately 360 examination sites, which are usually located in local schools premises.

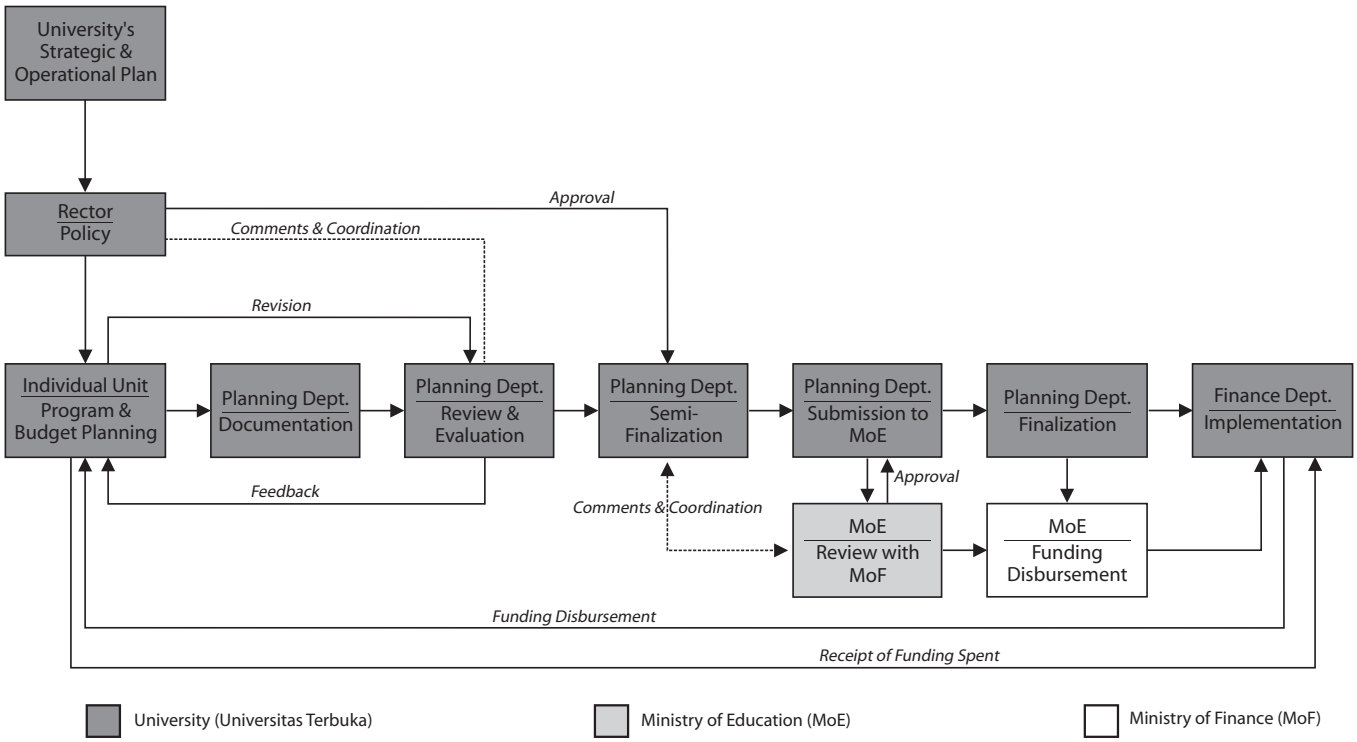
Open and distance learning system is used by many countries including Indonesia for its capability to reduce educational costs. Nevertheless, finance is an important, if not the most important, a part of ODL as well. The expectation of a low cost system has made budget allocation for ODL very limited.

Source of Funding and Budgeting Procedure

Open and distance learning system is used by many countries including Indonesia for its capability to reduce educational costs. Nevertheless, finance is an important, if not the most important, part of ODL as well. The expectation of a low cost system has made budget allocation for ODL very limited. The government allocates lower budget for UT than it does for other state conventional face-to-face higher education institutions. Students also expect to only pay low cost for their tuitions. It is therefore very important for ODL institutions such as UT to be creative in generating funding.

As a state university, UT has two main financial sources: the government and the students. The government funds personnel (salaries) and some capital expenditures, which include those for some physical development and procurement (e.g. land, building, heavy equipment, etc.), some maintenance and utility costs, and some new initiatives such as experiments, and research and development. Income generated from students include that from tuition fees, learning material sales, and face-to-face tutorial fees (when applied). Including within this source of funding is the scholarships for in-service teachers who are attending the teacher training program from provincial and district

Figure 1. Standard Procedure of Program and Budget Planning



governments throughout the country. For the past 15 years, UT has been closely collaborating with the government to upgrade the qualification of primary school teachers, who previously were produced by high-school level teacher training programs, into two-year diploma and full degree/bachelor level. Beside the two main sources, UT also generates funding from various research and collaboration activities with other institutions. However, the amount of such funding is not significant to UT's budget. Based on the budget for the last four years, the composition of funding generated from the government and from students (including scholarships) is on average around 20:80 percent. This composition is the opposite of that in the face-to-face state universities, which in general are heavily subsidized by the government.

With regard to budgeting, as a big organization, UT adopts the policy of decentralization for planning. Each year, each unit has to develop its own program and budget planning. Based on the university's Strategic and Operational Plans and an estimation of revenue, the Rector will define program and budget policies and priorities as guidance for the units. The standardized procedure for program and budget planning is depicted in Figure 1.

As seen in Figure 1, the planning is developed using both top-down and bottom-up approaches. The top-down mechanism is used in setting the policies on priorities for the particular year, while the bottom-up mechanism is used in developing the actual program and budget planning. The program planning of each unit should be based on the unit's own roles and functions (job responsibilities and descriptions) for the attainment of the Strategic and Operational Plans' goals and objectives. As an illustration, for an academic department within a faculty, the programs and activities would include but not limited to development and revision of masters of course materials and development of assignments and examination

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items. This is to meet one of the Strategic Plan's objectives about the novelty of course materials.

The budget for each program and activity is calculated based on the standardized unit cost that is applicable for all units. Those unit costs are calculated by a team and are reviewed and adjusted at least every two years.The unit costs are determined based on the feedback from resource people such as content experts, tutors, supervisors, as well as on other external costs and prices that have to be covered by UT (such as postal cost, courier cost, transportation cost, and printing cost).

Figure 1 also shows that UT has to seek approval from the government (through the Ministry of Education and the Ministry of Finance) for the planning to be implemented.This is because UT is a state university so that all generated income has to be reported and deposited first to the government's central account before it can be used.The mechanism involves intensive review among UT, the Ministry of Education (MoE) through the Directorate General of Higher Education (DGHE), and the Ministry of Finance (MoF) through the Directorate General of Budgeting (DGB) and its regional office of Tangerang (which is the city where UT's Head Office is physically located). Once the budget is approved by the MoF, UT's Finance Department will receive disbursement of funding in certain schedules throughout the year.

During the implementation, each unit has to develop two reports (mid-year and end-of-year reports) to the Rector through the Planning Department and the Finance Department. The mid-year report is meant as a monitoring tool to see whether the implementation is conducted according to the plan, whether there are changes need to be and have been done, whether there are any obstacles in implementing the plan, and how the units are tackling those and why.The end-of-year report is the final report to see the performance of each unit.The report itself consists of two types: the financial report (submitted to the Finance Department) and the program implementation report (submitted to the Planning Department). Internally, the Rector is responsible to the university's senate.

The Structure and Classification of Costs

The cost structure of any institution will depend on that own institution's main program and activities. In face-to-face educational institutions where teaching and learning is conducted within classrooms, the nature of funding will very much depend on the number of students, which will dictate the requirement for sufficient number of needed lecturers/ teachers and classrooms.Therefore, the higher the number of students, the higher the funding needed would become.

For ODL institutions where the teaching and learning is done through the use of instructional media, the nature of funding is less sensitive to the number of students but is more influenced by the type of media being used. The choice of media will determine the initial funding needed for course development, which is significantly higher than that in face-to-face education.

For ODL institutions where the teaching and learning is done through the use of instructional media, the nature of funding is less sensitive to the number of students but is more influenced by the type of media being used. The choice of media will determine the initial funding needed for course development, which is significantly higher than that in face-to-face education (Rumble, 1997). Nevertheless, once the materials are developed and the economic of scale is met, the funding of ODL is relatively insensitive to the absolute number of students being served. Furthermore, funding of ODL is also influenced by the method of learning supports being provided to the students. The use of synchronous communication for learning supports requires much higher funding than the use of asynchronous one does. Learning supports such as tutorials using synchronous communication

Figure 2. Reporting Mechanism

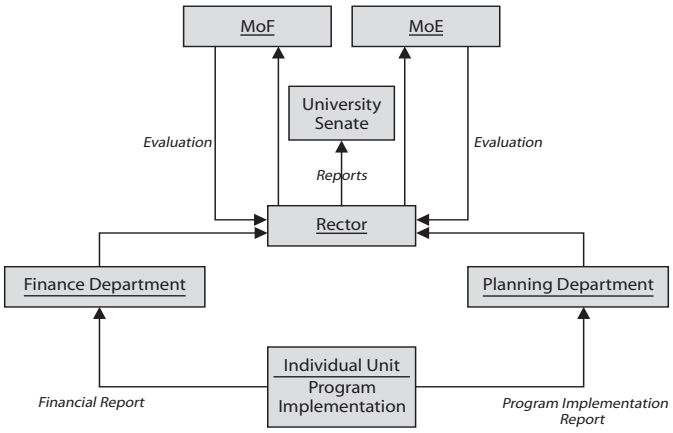


Table 1. Cost Structure of Universitas Terbuka

Household Costs/ Private Costs		Institutional Costs		
		Fixed Costs		Variable Costs
Direct	Indirect	Capital	Recurrent	Recurrent
■ Registration/ Tuition Fee ■ Examination Fee ■ Face-to-face Tutorial Fee (if applied) ■ Transports ■ Course Materials ■ Practical works (includes Practicum Kit charges) ■ Supplies	■ Opportunity costs ■ Forgone earnings	■ Land & Buildings (if applied) ■ Equipment (include computer & peripherals, audio & studio equipment, copy machines, etc.) ■ Master of Course Materials Development (including Practicum Kit development) ■ Student Assessment Items Development ■ Research & Development	■ General & Academic Administration ■ Personnel (salaries & wages) and Human Resource Development ■ Non-personnel (Maintenance and Utilities)	■ Course Materials Production ■ Learning supports (include course materials delivery, free tutorials at a distance, etc.) ■ Student Assessment

will require the balance of student – tutor ratios; and in the case of face-to-face tutorials, it will also require sufficient and appropriate number of classrooms.

In terms of cost classification, UNESCO (1977) classified costs of education into four groups: technical, economic, accountability, and financial. Technical classification refers to the costs of technical operation of education, economic classification consists of fixed and variable costs, accountability classification includes capital and operational costs, and financial classification refers to direct and indirect costs. In a more comprehensive way, Tsang (1988) grouped the cost of education into household and institutional costs. Household costs consist of direct and indirect costs which is what he called as opportunity costs or forgone earnings. While institutional costs include recurrent and capital costs. Following Tsang's categorization of costs, Table 1 shows the example of cost structures of the Indonesia Open University (Universitas Terbuka).

In terms of cost classification, UNESCO (1977) classified costs of education into four groups: technical, economic, accountability, and financial.

Household costs or sometimes termed as private costs are those paid by students, while institutional costs are those paid by the institution. Student's opportunity costs refer to estimated income that could have been earned by students if they work full time. Student's opportunity costs can also refer to time devoted to studying which otherwise could have been spent for leisure or with the family. The concept of opportunity costs is important since it represents the real cost of education (Tsang, 1988) and monetary price did not always reflect the true economic value of a resource of education (Jamison, Klees and Wells, 1978). In a more general definition, opportunity cost refers to the value of a resource would have in its best alternative use.

The fixed and variable cost model of analysis has been the most commonly used by studies which compare the cost of

different educational institutions using different teaching-learning systems, particularly between the ODL system and the conventional face-to-face system. The analysis is either the comparison of cost per course, cost per student per year, cost per graduate or the development of cost functions.

Fixed costs are usually defined as the expenses that are independent of the number of students, whereas variable costs are the expenses influenced by the number of students. Fixed costs can be divided into capital and recurrent costs. The fixed capital costs are costs for things that have an expected life time for more than one accounting period (usually one year), and the fixed recurrent costs are expenses for those with less than one year expected life time of use (Jamison, Klees, and Wells, 1978). For cost-benefit analysis purposes, the total cost per year has to be calculated based on the sum of the annualized fixed costs and the variable costs.

As an illustration, Figure 3 shows the composition of UT's fixed and variable costs based on its budget plan for 2006. The fixed costs can be further classified as the fixed capital costs and fixed recurrent costs. The fixed capital costs are those for:

(1) Land & Buildings (when applied),

(2) Equipment (include computer & peripherals, audio & studio equipment, copy machines, etc.),

(3) Master of Course Materials Development (including Practicum Kit development), and

(4) Research & Development.

While the fixed recurrent costs include those for:

(1) General & Academic Administration;

(2) Personnel (salaries & wages) and Human Resource Development, and

(3) Non-personnel or maintenance and utilities.

Fixed costs are usually defined as the expenses that are independent of the number of students, whereas variable costs are the expenses influenced by the number of students.

Variable costs on the other hand are those for:

(1) Course Materials Production and

(2) Learning supports (include course materials delivery, free tutorials at a distance, etc.).

As shown by Figure 3, the fixed cost makes up over 60% of the total budget plan. For budgeting purposes, the fixed cost in Figure 3 is not annualized.

This large proportion of fixed cost is understandable since the fixed cost consists of fixed capital (26%) and fixed recurrent (74%) costs that include budget for buildings and equipment as well as development of masters of course materials. In total, the proportion of the fixed capital, fixed recurrent and variable costs is 16%, 45%, and 39% of the total 2006 budget (see Figure 4)

For accountability purposes, as classified by UNESCO, UT's cost structure can also be categorized as capital and operational costs. As shown by Table 2, this classification can be further broken down to refer to the main activities that are conducted by the distance and open learning institutions. For example, the operational activities within UT can be differentiated into academic, (general and academic) administration, maintenance and utilities.

Figure 3. Budget Composition by Fixed and Variable Cost

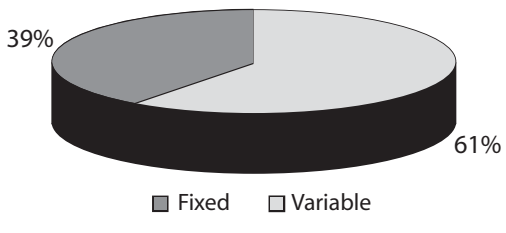


Figure 4. Budget Composition by Fixed Capital, Fixed Recurrent, and Variable Cost

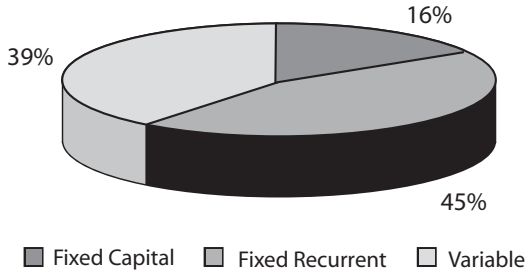


Table 2. Cost Classification by Capital and Operational Costs

Capital	Operational		
	Academic	**Administration**	**Maintenance & Utilities**
■ Land & Buildings (if applied) ■ Equipment (include computer & peripherals, audio & studio equipment, copy machines, etc.)	■ Master of Course Materials Development (including Practicum Kit development) ■ Course Materials Production ■ Learning supports (include course materials delivery, free tutorials at a distance, etc.) ■ Student Assessment ■ Research & Development	■ General & Academic Administration ■ Personnel (salaries & wages) and Human Resource Development	■ Maintenance ■ Utilities

If we categorized the cost according to the capital and operational cost system, the proportion of UT's 2006 budget plan consists of 7% for capital and 93% for operation. Figure 5 shows the composition of UT's budget when the operational cost is further broken down into academic, administration, and maintenance and utilities. As shown by Figure 5, the biggest percentage of operational cost is for administration followed by academic expenses.

The cost for academic activities consists of those for course development (36%), learning supports (44%), student assessment or evaluation (13%), and research (7%); while the cost of administrative activities consists of general (28%) and academic administration (5%), and salaries and wages (HR) and human resource development (67%). Figure 6 and 7 show the composition of those costs.

In total, the composition of UT's 2006 budget plan based on the whole categories of capital and operational costs is shown in Figure 8.

Figure 5. Budget Composition by Capital and Operational Costs

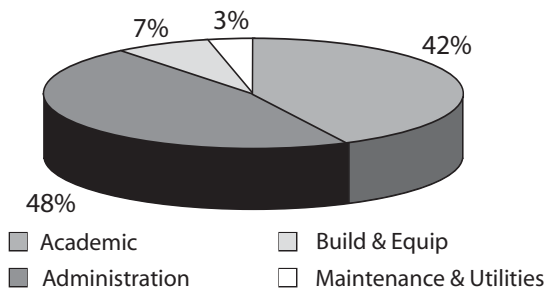


Figure 6. Academic Budget Composition

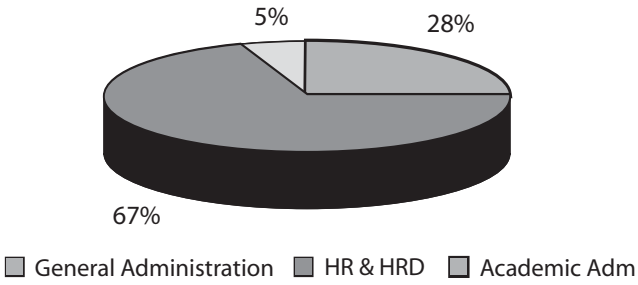


Figure 7. Administration Budget Composition

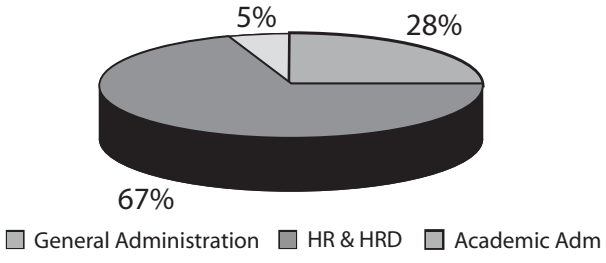
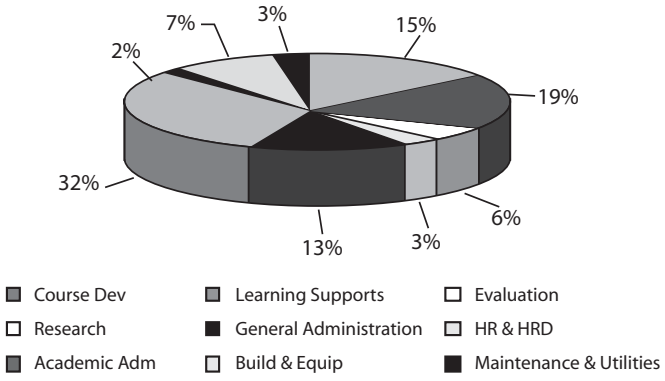


Figure 8. Budget Composition by Capital and All Operational Costs



It is important to note that the largest percentage falls in the cost category of HR and HRD (32%). This is because UT has over 1,700 staff consisting of 751 academic and 1,025 administrative/ support staff. The costs for course development, learning supports, and general administration also have significant percentages. The course development budget includes that for new course development as well as revisions. UT has the policy of revising its course materials every seven years. Therefore, with the total of over 1000 courses, UT has to revise at least 143 courses every year. Learning supports and administration are also big cost drivers at UT. This is because UT operates nation-wide so that the two cost categories are to cover all expenses throughout Indonesia, including those to be managed by the 37 Regional Offices.

Based on the combination of the two above categorizations, the composition of UT's annual budget can be seen in Table 3. Even though there are some changes in the percentage of individual cost category from year to year, the composition represented by this 2006 budget plan is somewhat consistent from year to year.

More specific to media in ODL, the analysis of costs can be further classified into three types, namely production, distribution, and reception costs (Spuck, 1981). Spuck further stated that besides those costs, factors that should be included in estimating costs of technology are information about students to be served (their number as well as their frequency and duration of using the media) and the life expectancy of the courseware and hardware. In accordance with Spuck, Bates (1995) argued that the costs of any given educational technology or medium were influenced by the fixed costs (defined as costs that are irrespective of levels of production or utilization or overheads), the production and delivery costs, the amount of material produced (volume), the number of students, and the life expectancy of the materials. Bates (1990) also argued that the use of technology in ODL would also require support costs. The support costs are, for example, administration costs, local support costs, and institutional overheads. Although there are such general classifications of costs, studies usually develop their own cost structures that are in accordance with their context.

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Table 3. Matrix of Budget Composition (in percentage)

Category	Fixed		Variable	Total
	Capital	Recurrent		
Course Development	3,97	-	11,27	15,29
Learning Supports	0,51	0,95	17,14	17,28
Evaluation	1,07	0,56	3,98	5,27
R & D	2,56	0,46	-	3,02
General Administration	0,54	6,31	6,12	14,29
Academic Administration	-	2,23	0,18	2,43
HR & HRD	-	31,44	-	31,44
Maintenance & Utilities	-	3,03	0,45	3,74
Building & Equipment	7,24	-	-	7,24
TOTAL	15,88	44,98	39,14	100,00
	60,86			

Table 4. Cost Structure of the UT's Learning Materials Development

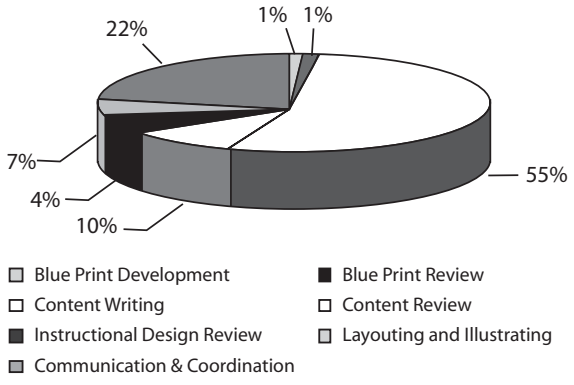
Category	Fixed		Variable*
	Capital	Recurrent	
Printed Materials			
Production	■ Building ■ Equipment	■ Personnel ■ Maintenance	■ Blue Print Development & Review ■ Content Development & Review ■ Lay outing (Illustrating) ■ Supplies (i.e. paper, printer's ink, etc.) ■ Communication & Coordination
Transmission			■ Postal/Courier
Reception***			■ Supplies
	Non-Printed Materials		
Production	■ Studio Building ■ Equipment	■ Personnel ■ Maintenance	■ Blue Print Development ■ Script Development ■ Production (including editing, previewing, mixing, revising) ■ Printed Supplementary materials** ■ Supplies (i.e. Audio & Video tapes, CD, light bulbs) ■ Communication & Coordination
Transmission		■ Broadcasting fees (when applied)	■ Supplementary materials delivery ■ Postal/Courier
Reception***	■ Television ■ Radio Set		■ Supplies

* Variable to the number of /credit unit program produced (and not to the number of students)
** Some audio and video graphic programs required printed supplementary materials (e.g. graphics, diagrams, etc.)
*** Reception costs are students' private costs for taking advantage of the broadcast/pre-recorded programs

As an example, Table 4 shows the categorization of costs for producing UT's course materials. As the table shows, the costs can be classified into capital and recurrent costs as well as initial, fixed, and variable costs.

UT has never really calculated the total cost of producing individual learning materials, but has set the unit costs for each element/activity for producing the materials. The capital costs of the building and equipment as well as the recurrent costs for personnel and maintenance are parts of the total university budget, and therefore are very difficult to be specifically separated for the purpose of calculating the costs of the media production. Based on the standardized unit costs however, Figure 9 shows the cost composition for producing a master of printed materials at UT. From the figure, it is significant that content writing and communication and coordination make up the two biggest portions of the funding needed for printed

Figure 9. Cost Composition of UT's Printed Materials Development



materials development. At UT, content experts are mostly (95%) not UT's full time academic staff but are hired from other universities. Therefore, monitoring and progress checking need to be conducted in regular basis, and they usually involve a lot of travels and meetings.

For non-printed materials development, Figure 10 presents the composition of variable cost for producing non-printed course materials/programs at UT.

The above review shows that there are various procedures for categorizing educational costs. Although there is some kind of universal categorization of costs, the cost elements will vary from one institution to another in accordance with the organizational and operation systems of the individual distance learning institution.

Measures of Effectiveness

The procedure to measure educational effectiveness is not as well defined as the procedure to calculate costs. The measurement of effectiveness involves more subjective judgment about what is meant by 'outcome' or 'output'. Thus, the measurement of educational outcome requires a very well designed procedure and careful control so that the effects measured are exclusively (to some extent) due to the educational process.

The effectiveness analysis can be the analysis of the institution as a whole or of a specific/particular teaching-learning outcome depending on the purpose of the analysis. Carter (in Wagner, 1982) classified three main products of a university, namely

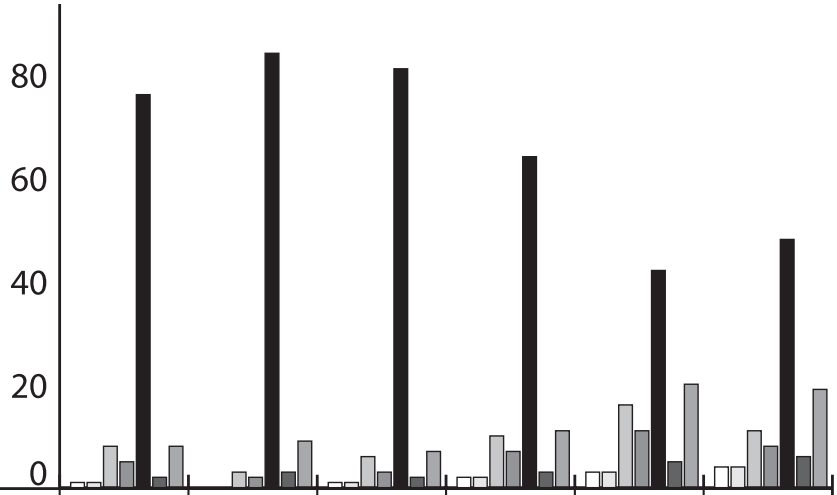
(1) men and women with degrees,

(2) research, and

(3) storage of knowledge and maintenance of cultural standards.

The ODL institution outcomes could then include number of students, number of graduates, number of course materials

Figure 10. Cost Composition of UT's Non-Printed Materials Development



	Video/TV Feature (30')	TV Talk Show (30')	Video Interactive on CD	CAI on CD-ROM	Audio (30')	Radio (30')
Blue Print Development	1	-	1	2	3	4
Blue Print Review	1	-	1	2	3	4
Script Development	8	3	6	10	16	11
Script Review	5	2	3	7	11	8
Program Production	76	84	81	64	42	48
Program Review	2	3	2	3	5	6
Communication & Coordination	8	9	7	11	20	19

produced, and amount of research conducted in a particular period. In longer periods, products can be approached by the measurement of graduates' earning, promotion, or social status mobilization. Even more important in the measurement of ODL effectiveness is the invaluable value added of the system. As previously mentioned, in some (developing) countries such as Indonesia, applying ODL method for education is political as well as educational: it is expected to solve bigger issues of equity and access to quality education. It is for the reason of those non-measurable outcomes of ODL, the comparison of effectiveness between distance and a conventional learning method is then no longer important.

More specifically, to measure the specific learning outcomes from the use of particular media, most studies employ the experimental research method. This method allows the researcher to control the learning conditions and measure the effects of the treatment as the learning outcomes. The teaching-learning output can be measured by skill of varying kinds, gain of cognitive skills (exit level-entry level), and number of papers or words written (Wagner, 1982). The effectiveness of different instructional media can also be measured by, for example, the number of students who have access to the media as well as students' control over the frequency and duration of using the media.

Nevertheless, this method is not without any weaknesses, because the control procedure makes the learning condition very unnatural. This may cause a difference between the experimental outcome and the 'real' outcome if the condition was the natural one. Bates (1981) suspected two main reasons why the experimental method has been unsuccessful in determining the effectiveness of different media in education. First, researcher failed to understand or apply the basic scientific rationale on which the method depends. This means that researchers failed to control all the variables besides the treatment that could affect the learning outcome. Secondly, the method is quite inappropriate for many of the situations in which decision-makers find themselves. According to Bates (1981), the experimental-controlled experiments ignore the potential of each medium to treat the same material in different ways or to bring in new material which could not be handled so well in other ways, ignore the variable of the quality of presentation, ignore the difference of individual response, and fail to give enough consideration to the natural context in which media are used for education. Furthermore, the problems of effectiveness measurement, specifically that of the cognitive gain which is the most commonly used, are:

(1) the time gap between the exposure of learning and the administration of effectiveness measurement, and

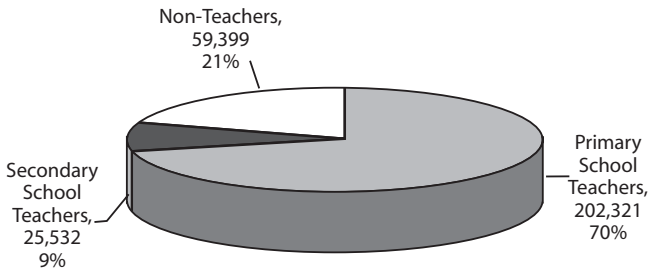
(2) the isolation of the specific effect of educational processes on performance (Wells in Wagner, 1982).

Based on the above discussion, it is apparent that measuring effectiveness of ODL is not simple. It has to begin with determining the purpose of the analysis by defining the objectives of CEA, identifying the best indicator of outcomes to meet the objectives, and finally measuring the level of cost-effectiveness performance based on the identified indicators.

In the case of UT, the main missions are to widen access of higher education to the Indonesian people and to up-grade the qualification of teachers up to two-year diploma level and bachelor level. Therefore, the main effectiveness indicators of UT should be the number of students and the number of teachers taking the in-service teacher training programs. Figure 11 shows that the number of UT's active students in Semester 2006.1 as per January 6, 2006 (the registration will still open until March 10, 2006) is about 287.252 students, and almost 80% of which is teachers who are taking in-service training programs. Among those 227.853 student teachers, 202.321 or 89% are primary school teachers who are doing both two-year diploma and full degree (bachelor) programs. As stated earlier, primary school teachers in Indonesia were mostly graduated from high school level teacher training programs. Therefore, when the minimum qualification was increased in 1990 into at least two-year diploma level, almost 1.2 million teachers needed to up-grade their qualifications. UT, being an ODL institution, is viewed as the most suitable system for them because it allows them to do their education without having to leave their teaching jobs. Ever since, the

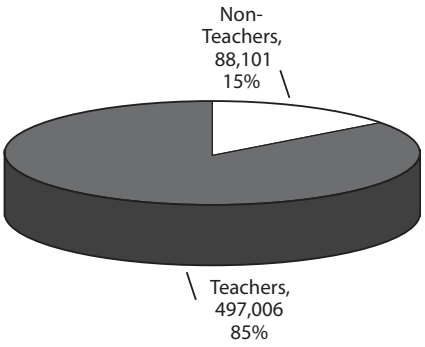
More specifically to measure the specific learning outcomes from the use of particular media, most studies employ the experimental research method. This method allows the researcher to control the learning conditions and measure the effects of the treatment as the learning outcomes.

Figure 11. Composition of 2006.1 UT's Students



The issue of cost-effectiveness is always interesting, only because it will help decision makers to choose alternative methods and media for education, but in some cases, because it is also about the accountability of political decisions. ODL is expected to solve social problems of equality of access to high quality education. It has been widely used by different countries since it was believed to be cost-effective.

Figure 12. Composition of UT's Alumni



study program of Diploma II Primary School Education (DII PGSD) has been the biggest program at UT. Furthermore, some of those teachers even continue to take the full degree (S1) in PGSD major since UT offers the program in 2001. This S1 PGSD program will soon become a big program as well since the government has recently increased, again, the minimum requirement for primary school teachers up to bachelor level.

With regard to the output, Figure 12 shows that up to December 2005, UT has graduated 585,107 students. Likewise, the biggest percentage of those graduates are teachers (85%).

Cost-Effectiveness Analysis

The issue of cost-effectiveness is always interesting. only because it will help decision makers to choose alternative methods and media for education, but in some cases, it is also about the accountability of political decisions. ODL is expected to solve social problems of access and equality to high quality education. It has been widely used by different countries since it was believed to be cost-effective. Studies have shown that ODL system can indeed be as effective as conventional face-to-face learning system for instructional delivery. Other studies concern with the cost of education have also shown that ODL can be cheaper than conventional face-to-face education when the economic of scale is met (see for example Laidlaw & Layard, 1974). Within the ODL operation, the focus of cost-effectiveness studies have been on question of whether one medium is more cost-effective than another.

Cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA) are techniques that most utilized in evaluating 'project' alternatives (Peterson, 1986). Although both techniques compare the costs and the probable outcomes of an alternative, the two are different in terms of objectives and approaches to measure the probable outcomes. To conduct CBA, the probable outcomes must be estimated and calculated in terms of 'dollar' values. In CBA, all tangible and intangible phenomena are based on estimating and comparing the total costs and the total benefits. The objective of CBA is usually to determine if the project being evaluated is economically feasible.

Cost-effectiveness analysis (CEA) is a tool for estimating the returns expected from different alternative methods to achieve an objective, especially when the 'outcomes' cannot be easily measured in monetary terms. The concern here is not to find out whether the 'objective' being evaluated is economically feasible, but rather to explore how the objective might be efficiently achieved and which costs are attached to them for reaching different levels of the desired outcomes. In other words, CEA is usually designed to include an assessment of several different plans to meet a specified objective which is assumed to be worthwhile. The results of a CEA is usually in terms of ratios comparing the total effects of an alternative plan/course of action in numerical terms, into the total costs of the specified alternatives.

According to Peterson (1986), there were at least three specific approaches to conducting CEA, namely:

(1) a constant-cost analysis,

(2) a least cost-analysis, and

(3) an objective-level analysis.

The constant-cost analysis focuses on the attainment of optimum outcomes that can be achieved within a particular amount of budget. In other words, the analysts would first determine the degree to which the objective could be attained within the limits of the cost involved. The least cost-analysis main concern is to identify the cheapest alternative method to attain some pre-determined level of the objective. Here, the analysts are to find the alternative which will achieve the stated level of objective in the least expensive way. And the objective-level analysis is to estimate the costs of achieving performance levels under a single alternative method. Therefore, the analysts here will have to determine costs according to different levels of objective attainment (e.g. 10%, 20%, 30%, etc.).

Nevertheless, regardless of whether the analysis is constant-cost, least-cost, or objective-level based, CEA is always about efficiency. Coombs and Jacques (1977) divided efficiency into two categories: external efficiency or external productivity and internal efficiency, while Wagner (1982) and Tsang (1988) divided it into internal, external, technical and economic efficiency. In education, internal efficiency compares the cost of education to the outputs or the effects within education such as the acquisition of cognitive and non-cognitive skills (Tsang, 1988). External efficiency, on the other hand, compares the cost of education to the external benefits of education such as productivity in post schooling work (Tsang, 1988). According to Wagner (1982), external efficiency correlates the different component that make up a complete educational system.

Technical efficiency basically measures the relationship between physical inputs and outputs (Wagner, 1982). While economic efficiency attaches monetary values to the inputs and outputs (Wagner, 1982) and therefore is the same as the concept of CBA. Education is economically efficient *... when, given prices, technology, and financial resources, the maximum amount of ... outcome is produced by selecting the right combination of inputs ... [and] is economically inefficient [when] ... outcome can be raised without incurring additional cost, just by altering the combination of inputs* (Tsang, 1988, p. 184).

The C/E ratios are useful tools to help decision makers in choosing the alternative to be implemented. However, some considerations need to be taken into account. For example, although the provision of study guides requires the lowest cost to produce, it only increases GPA by 0.25 points.

There are at least eight steps to conduct a CEA, namely:

(1) stating the general problem situation;

(2) defining objectives;

(3) identifying alternatives to reach objectives;

(4) determining a common measure of effectiveness;

(5) formulating a model for analysis;

(6) estimating and recording the costs of each alternative;

(7) calculating effectiveness of each alternative; and

(8) performing cost-effectiveness computations.

The way the CEA is reported depends on the approach of analysis used. If the constant-cost approach was used, the analyst might report that for a given budget of , say $200,000; 100, 000 students can be reached at a cost of $2 ($200,000/100,000) per student per year via tutorial centers; 150,000 students can be supported at a cost of approximately $1.5 ($200,000/150,000) via establishment of study groups; or 300,000 students can be reached at a cost of $0.6 ($200,000/300,000) via provision of study guides. If the least-cost approach used, the report might be: "tutorial centers will cost $160,000 per year to operate and will reach about 100,000 students (or $2.13 per student per year); study groups will need $150,000 per year to run and will approximately serve 150,000 students(or $1 per student per year); and pre-produced study guides will cost 100,500 per year and will be able to reach 300,000 students (or $0.3 per student per year). The example in Table 4 follows this least-cost approach.

The C/E ratios are useful tools to help decision makers in choosing the alternative to be implemented. However, some considerations need to be taken into account For example, although the provision of study guides requires the lowest cost to produce, it only increases GPA by 0.25 point. Tutorial centers, although it is rather costly but it was estimated to increase GPA by 0.75. And study groups seems to be the most effective one in terms of increasing students' GPA (1.5 points). On the other hand, the capability of each alternative to reach students seems to favor study guides. Therefore, decision makers have to decide whether they are willing to trade a loss of 150,000 students not reached by study groups for an increase

of 1.25 points in GPA. In other words, is the equality of provision (number of students reached by the method) more important than the increase in quality of the learning outcomes (GPA) or vice versa. In our example, however, it seems to be apparent that tutorial centers would be the least favorable alternative method.

Using the constant-cost approach, the cost –effectiveness of UT can be calculated as the cost per student. Based on 2006 budget plan and the estimation of number of students within two semesters in 2006, the total institutional cost per student per year at UT is about IDR 732 thousands or equal to about USD 81.33 (I USD=IDR 9,000) or around USD 40.05 per semester. It is important to note that this low cost has been made possible because UT's instructional system still relies on printed materials and asynchronous communication. This, under the circumstances, is considered to remain the most suitable and accessible system for most UT's students. Should UT employs more online and synchronous teaching strategies, this operational cost increases in a significant way. For example, for the primary school teacher training programs, which involved intensive face-to-face tutorials and teaching practices, the operational cost per student per year goes up to IDR 2 million (or equal to about USD 222.22). Based on those figures, UT can definitely be considered cost-effective compared to the conventional face-to-face universities. As a comparison, the average cost for studying in 'middle class' Indonesian state face-to-face universities is around IDR 4 million (USD 444.44) per semester or about USD 888.88 per semester . That is only the cost paid by the students, which mostly only covers about 25% of the required total costs (or the universities' budget). This means that roughly, the cost of ODL in Indonesia is about 9-25% of that in conventional face-to-face education. This percentage will be much lower if the cost is compared with that of 'high class' private face-to-face education.

Concluding Remarks

Universitas Terbuka's financial management system adopts both top-down and bottom-up approaches. The budget planning is based on activity-based costing, which is derived from the university's Strategic and Operational Plans and is based on the estimation of revenue. As UT is a state university, the annual budget plan has to be approved by the government. Likewise, the realization of the plan is also monitored by and reported to the government.

As other educational institutions, UT's cost categorization can be classified into fixed capital, fixed recurrent and variable costs as well as capital and operational costs. The operational cost category can be further classified as academic, administration, and maintenance and utilities. More specifically, the academic costs include those for course materials development, learning supports provision, student assessment or evaluation, and research and development. While administration costs are those for general and academic administration, personnel and human resource development, and maintenance and utilities.

Based on budget plan of 2006, UT can definitely be considered as a cost-effective system. As a rough comparison, the cost for studying at UT is approximately about 9-25% of that in Indonesian state face-to-face universities. This percentage will be much lower if it is compared to the cost for studying at private face-to-face universities.

References

Bates, T. 1981. Towards a better research framework for evaluating the effectiveness of educational media. *British Journal of Educational Technology, 12*(3), pp. 215-233.

_____1990. *Application of new technologies (including computers) in distance education: Implications for the training of distance educators*. Vancouver, B.C.: The Open Learning Agency.

_____ 1995. *Technology, open learning and distance education*. New York: Rouledge.

Beare, P.L. 1989. The comparative effectiveness of videotape, audiotape, and tele-lecture in delivering continuing teacher education. *The American Journal of Distance Education, 3*(2), pp. 57-68.

Belawati, T. 1997. *The anatomy of Universitas Terbuka's cost structure*.[draft]. Unpublished article for intern seminar. Jakarta: Universitas Terbuka.

Coombs, P.H. & Jacques, H. 1977. Cost analysis in education. A tool for policy and planning. Baltimore: The John Hopkins University Press.

Jamison, D.R., Klees, S.J. & Wells, S.J. 1978. *The cost of educational media. Guidelines for planning and evaluation*. Beverly Hills: Sage Publications.

Laidlaw, B. and Layard, R. 1974. Traditional versus open university teaching methods: A cost comparison. *Higher Education, 3*, pp. 439-468.

Okwudishu, C.O. & Klasek, C.B. 1986. An analysis of the cost-effectiveness of Educational Radio in Nepal. *British Journal of Educational Technology, 17*(3), pp. 173-185.

Peterson, R.D. 1986. The anatomy of cost-effectiveness analysis. *Evaluation Review, 10*(1), pp. 29-44.

Tsang, M.C. 1988. Cost analysis of the cost-effectiveness of CAI and factors associated with its successful implementation in higher education. *AEDS Journal, 15*(1), pp. 10-22.

UNESCO. 1977. *The economics of new educational media. Educational methods and techniques*. Paris: UN Educational, Scientific and Cultural Organization.

Wagner, L. 1982. *The economics of educational media*. London: The MacMillan Press Ltd.

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