

Block

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MDE-417: Distance Education: Economic Perspective

(New Course in place of ES-317: Distance Education: Economic Perspective)

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MDE-417: Distance Education: Economic Perspective

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 - Unit 3 : Comparative Cost Analysis in Distance Teacher Education (*Alison Richardson*)
 - Unit 4 : The Costs and Costing of Networked Learning (*Greville Rumble*)
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 - Unit 7 : Private Cost of Education: A Comparative Study of Distance and Campus-based University Students in Nigeria (*Felix Olakulehin & Santosh Panda*)
 - Unit 8 : Costing of Distance Learning: A Study of the Indian Mega Open University (*Ashok Gaba, Santosh Panda & C.R.K. Murthy*)
-

INTRODUCTION TO THE BLOCK

This is the fourth block in this course, and deals with costing of distance education (DE) from international perspectives. The four units provide for case studies from Asian open universities and dual-mode universities, Indian case, the available Chinese Study, and selected international cases from United Kingdom, Venezuela, and Japan.

The first unit is a compressed analysis of an earlier research study undertaken by Prof. V.C. Kulandai Swamy, former Vice-Chancellor of IGNOU. The study was conducted in 1991, however, in the absence of significant cost of DE studies in the Asian region, this was considered as important so as to provide a general perspective to cost of DE at the institutional level.

Prof. Xingfu Ding's study on cost of DE in China, with specific reference to RTVUs (now called as open universities), provides an indepth understanding of operation and costing of DE in various radio and television universities in the People's Republic of China.

The third unit reports a comprehensive study undertaken earlier by Pillai and Naidu on cost of DE in India, with specific reference to IGNOU. Only a few cost studies are reported subsequently; and this study stands out as foundational to costing in DE. The larger volume of the earlier study has been recast and a revised/compressed version has been prepared and presented by Prof. Santosh Panda.

The fourth unit contains three international case studies on costing of DE, compiled by Santosh Panda. Subsequent to these studies, a few more are available (especially by Prof. Greville Rumble), however these cases remain as foundational to costing of DE in these regions.

THE PEOPLE'S
UNIVERSITY

UNIT 1:

COST-EFFECTIVENESS OF DISTANCE EDUCATION IN ASIA

Structure

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- 1.2 Learning Objectives
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- 1.4 Distance Education in Asia: Costing Approach
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- 1.5 Case Studies of Some Asian Institutes of Distance Education
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 - 1.5.7 Open Learning Institute (OLI) Study
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 - 1.5.9 Allama Iqbal Open University (AIOU) Study
- 1.6 Cost Advantage
- 1.7 Success Rates and Learner Benefits
- 1.8 Let Us Sum Up
- 1.9 Reference/Suggested Readings
- 1.10 Model Answers to Activities

1.1 INTRODUCTION

There has been a rapid increase in the demand for higher education in Asian countries. This has been accompanied by heavy public subsidy to universities and their students. However, per student expenditure is declining in many countries, reflecting their increasing inability to maintain a high cost university system, and adversely affecting the quality of instruction offered. It is imperative that these countries adopt low cost strategies for providing public higher education of reasonable quality.

Several Asian countries have, in the last three decades, established open universities to provide public higher education. They include among others, Thailand, Sri Lanka, India, Indonesia, Pakistan and China. These institutions have an important role in national higher education systems. In Thailand, for example, the country's self-financing open universities account for more higher education enrolments than the conventional system. However, there is no systematic evaluation of the substance of the education provided by these institutions, particularly in terms of the standard of the courses and the quality of the course materials.

While much has been written in advocacy of open universities, surprisingly little is known about their:

- overall delivery mode;
- support services quality;
- patterns of staff recruitment;
- internal efficiency; and
- cost-effectiveness.

In particular, there is no study which effectively demonstrates that an open university system, by its flexibility, covers large numbers of students at reasonable cost. To fulfil this need, we have presented in this unit some aspects of cost pertaining to a few Asian open/distance education institutions.

The study describes the aims and objectives of open universities and the variations in their size, organization, financing and programmes in selected Asian countries and:

- i. examines the characteristics of the social demand for open universities, i.e., who attends open universities; what programmes are apt for the system and why? – for example, what is the representation of:
 - a. women;
 - b. students from rural areas;
 - c. socially and economically disadvantaged groups;
 - d. employed/mature students;
- ii. analyzes data on unit and programme cost of these institutions with a focus on sources of variation in component cost. Special attention is given to the determination of student fees and to remuneration of academic staff;
- iii. examines the quality of course materials and how and who prepares them;
- iv. compares data on the internal efficiency of instruction at the institutional and programme levels, including costs per graduate, wastage rates, and average length of time needed to complete programmes of study;
- v. presents information on the quality of programmes offered as measured by pass rates and success in externally administered examinations for professional certification; and
- vi. reviews studies of the external efficiency of open university programmes, i.e. employment of graduates, impact of training on careers and job performance. Many open universities have focussed on inservice teacher training, though other areas ought to have been covered.

The study was conducted in 1991, and therefore the data presented include that as the base year, though, other than costing results, the universities have undergone significant changes in their nature of programmes, student enrolment, and distance delivery. **[This was a report which has been summarised as much as possible, though still it is longer than a common Unit].**

1.2 LEARNING OBJECTIVES

After going through this unit, you should be able to:

- describe various cost types, costing approaches, and cost functions adopted in this case study, applicable to any cost study on distance education; and
- compare and contrast cost of distance education in some selected open universities and dual-mode universities in India.

1.3 CHOICE OF INSTITUTIONS

Thailand has three institutions that provide distance education in one form or another.

- i. Sukhothai Thammathirat Open University
- ii. Ramkamhaeng University
- iii. Centre for Educational Technology.

Sri Lanka has the National Institute of Education, besides the Open University of Sri Lanka. In India, besides the National University (IGNOU), there were 13 state open universities, one each in the states of Andhra Pradesh, Maharashtra, Rajasthan, Bihar, Gujarat, Madhya Pradesh, Assam, West Bengal, Uttar Pradesh, Uttarakhand, and Odisha.

In addition to these, there are more than one hundred and fifty conventional universities and higher-level institutions which are offering correspondence education through their Directorates/Institutes of Correspondence/Distance Education. These dual mode institutions have long been in existence and account for a substantial portion of the enrolment of distance learners in the country.

In Indonesia, there were six institutions offering university and sub-university level education using a distance teaching mode:

- i. The University Terbuka, Jakarta.
- ii. National Teachers Distance Education, UN Bandung.
- iii. Centre for Educational Communication Technology, Ministry of Education, Jakarta.
- iv. Centre for Educational Training for Programme Personnel, National Family Coordinating Board, Jakarta.
- v. Indonesia Banking Development Institute, Bureau of Distance Learning Programme, Jakarta.
- vi. PERUMTEL Training Centre, Division of Distance Learning System, Bandung.

In Pakistan, only Allama Iqbal Open University is known to offer open education at the higher education level. Besides, there is Virtual University of Pakistan offering virtual distance education for past decades.

There were six institutions currently offering open higher education in Hong Kong. The first of these is a single-mode institution and the rest are conventional institutions offering regular face-to-face education and distance education through department of continuing education: and

- i. Open Learning Institute, Hong Kong.
- ii. The School of Professional and Continuing Education, University of Hong Kong.
- iii. Extra Mural Studies Deptt., The Chinese University of Hong Kong.
- iv. The Continuing Education Deptt., Hong Kong Polytechnic.
- v. Centre for Continuing Education, City Polytechnic of Hong Kong.
- vi. School of Continuing Education, Baptist College, Hong Kong.

In the case of India, samples have been taken from all the three categories of institutions:

- i. National Open University;

- ii. State Open University; and
- iii. Institutes of Correspondence Course/Directorates of Distance Education.

Thus, the list of institutions included in the unit is:

- Thailand : Sukhothai Thammathirat Open University
- Sri Lanka : Open University of Sri Lanka
- Indonesia : Universitas Terbuka
- Pakistan : Allama Iqbal Open University
- India :
 - i. Indira Gandhi National Open University
 - ii. a. Dr. B.R. Ambedkar Open University
 - b. Yashwantrao Chavan Maharashtra Open University
 - c. Kota Open University
- iii. Select Institutes of Correspondence/Distance Education Courses

1.4 DISTANCE EDUCATION IN ASIA: COSTING APPROACH

The six sections (1.4.1 to 1.4.6) focus on the factors which determine the costing approach in the relevant institutions. The mission statement of individual institutions are computed with their respective student numbers, student profiles and the type of programmes on offer, and an explanation is given for the prevailing trends. In the light of the nature of social demands for education, costing models, cost types, costing terms and costing approaches appropriate for the institutions concerned are chosen and defined. The discussion has linkages with the cost analysis and cost benefits which are the themes of Units 3 and 4 of this Block.

1.4.1 Costing approach

The later half of the twentieth century has been witness to a revolution, the consequences of which can only be dimly visualised even today. Science and Technology have set a new pace and pattern for life and work; knowledge is generated at a faster rate than ever before in human history; the spectrum of applications of the new knowledge is ever widening; and the communication technology has brought people worldwide closer together than ever before. We have been witness to some of the consequences of these developments; the disintegration of empires and power blocks; the rise and fall of economic and political doctrines and dogmas; and the very optimistic expectations about the emergence of new world order yet undefined in many cases.

The post-war reconstruction of economics in America, Europe and Japan placed a higher emphasis on education in Science and Technology to promote research and development. The expansion of technical and professional education in these countries as against the traditional liberal arts education was phenomenal. The emergence of a new class of entrepreneurs and managers who were instrumental in accelerating the pace of economic development in these countries was a direct consequence of this change in the focus of higher education.

The emergence of a very large number of independent nation states, most of them acquiring freedom from their colonial masters, was another major development during this period. Each one of them was keen to establish a national identity, the major components of which included economic and

political independence. Both required human resources; their attention inevitably turned to developing their own human resource through the setting up of institutions of education and training. "Several countries have achieved rapid development in the post-war period; for the most part, they have two features in common. They invested in the education of men and women, and in physical capital" (*World Development Report 1991*: 31).

The classical view "education for enlightenment" surely gave way to the new approach 'education for development'. That made education an economic activity; an investment in people. "By improving people's ability to acquire and use information, education deepens their understanding of themselves and the world, enriches their minds by broadening their experiences, and improves the choice they make as consumers, producers and citizens. Education strengthens their ability to meet their wants and those of their family by increasing their productivity, and their potential to achieve a higher standard of living" (*World Development Report 1991*: 55-56).

The new approach 'education for development' has a sociological dimension too. Many of the newly independent countries, and some even in the developed world, had to encounter problems of equity, and of access of education. While in countries like the USA affirmative action by the state in favour of the less privileged tried to address these problems, in the developing countries, government had to allocate substantial resources for the creation of educational facilities to provide the necessary opportunities to ensure equity and access. The significant growth and development of distance education has been a response to all these challenges.

1.4.2 Cost function: Models

The economic interests, besides leading to significant developments in the concepts and delivery modes of higher education, led to a search for methods of assessing the cost-benefit (input-output) relationship in education. This, in turn, paved way for developing several models to study and analyse the costs. Cost analysis essentially involves four major steps:

1. *Identification of inputs which generate costs.* From the purely economic point of view, there are no "free" resources. Where such resources seem to be available freely, someone bears the cost, and a national value has to be assigned to those resources.
2. *Distinguishing the operating costs (recurring annuals costs) from the capital costs* (one-time investments that can be drawn upon over a number of years, and therefore can be assigned a derived annual value).
3. *Separating the variable cost*, which fluctuate more or less proportionately with the number of students.
4. *Analysing the cost function* to establish the relationship between the cost and the number of students, in terms of total costs, average costs and marginal costs.

Funding policy of governments in the domain of distance education varies from country to country. There is hardly any standard or universally accepted method of arriving at the per capita cost in distance education. Certain approaches have been developed by the academics for cost analysis. They are briefly discussed here to provide an introduction to cost analysis discussed in Unit 4 for various universities.

A sample equation which could be applied in any education system is:

$$TC = F + VN$$

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where:

TC = Total cost

F = Total fixed cost

V = Variable cost per unit

N = Number of units of output

(e.g. students/students hours, etc.)

The total cost function here is observed to be linear and the average cost (AC) is obtained simply by dividing the fixed cost (F) by the output (N) and adding it to the variable cost (V). Thus

$$AC = F/N + V$$

To describe the fundamental cost-inducing variable in distance education, a modified form of the above equation was developed in the mid 1970s by the U.K. Open University. This was based on two fundamental variables namely, the number of students and the number of courses under the development and on offer:

$$C = a + bx + cy$$

where:

C = total cost

a = the fixed cost

x = the number of courses (those under development weighted as 1.0 + those on offer weighted as 0.1*)

y = the number of students

b = the average cost per course

c = the average cost per student

For several years this equation was used as the basis for determining funds to be provided to the U.K. Open University. This approach was later taken up and modified by a number of other open universities. At Athabasca University, Snowden and Daniel (1983:76-82) developed a more sophisticated costing model.

$$TC = a_1x_1 + a_2x_2 + by + c$$

Where:

TC = Total Cost

x₁ = course credits 'in development'

x₂ = course credits 'in delivery'

y = 'weighted' course enrolments

and

a₁ = course development costs per credit

a₂ = course revision/maintenance/replacement costs per credit

b = 'delivery' cost per 'weighted' course enrolment

c = institutional costs (overhead)

Another dimension in the development of models has been to identify the sub-components within the fixed cost and variable cost pertaining to the sub-systems of distance education system, namely:

Production system (p)

Instructional system (i)

Evaluation system (e)

Administrative system (a)

Applying these sub-systems to the fixed cost (F) and the variable cost (V), the simple equation

$$TC = TF + TV$$

(Total cost = Total fixed cost + Total variable cost)

is expanded as

$$TC = (TF_p + TF_i + TF_e + TF_a) + (TV_p + TV_i + TV_e + TV_a)$$

Where:

TF_p = Total fixed cost for production

TF_i = Total fixed cost for instruction

TF_e = Total fixed cost for evaluation

TF_a = Total fixed cost for administration

* Different weights have been assigned, keeping in mind the cost for developing a course afresh and the cost for maintaining a course already on offer.

A number of other models have been developed. These models appear to be simple, but fail to specify the cost-affecting variables in sufficient details to be of any practical help in cost justification or estimates. Nevertheless, these models are useful in as much as they give an insight into the cost structure.

Activity 1.1

Describe the basic cost function in distance education.

1.4.3 Cost types

There are broadly five cost types (Birch & Cuthbert, 1981):

- i. Historical cost;
- ii. Replacement cost;
- iii. Standard cost;
- iv. Project cost;
- v. Opportunity cost.

Historical cost is an attempt to summarize in monetary terms the extent to which an activity has consumed or appropriated resources.

Replacement cost refers to the cost that would be incurred to acquire equivalent physical facilities or to buy comparable materials or services to replace those obtained in the past.

Standard costs are predetermined costs to serve as a norm or basis for comparison with actual costs.

Projected costs are estimates of future costs.

Opportunity costs relate to foregone resources or revenue as a result of choosing one alternative in lieu of another.

Only the first these five types of cost represent the actual cost – money's worth sacrificed – in performing an activity or acquiring an asset or receiving the goods and services. The rest depend, to a considerable extent, on hypotheses and assumptions. For purpose of a study of cost effectiveness, which *ipso facto* involves comparison of cost, we have to take recourse largely of the historical costs, the data for which can be had from the financial records of the institutions concerned. Other costs – replacement, standard and projected – might help in consolidating the findings of comparison of the historical costs. Opportunity costs are too complex to determine and too hypothetical in nature to be of any substantial help in assessing cost effectiveness.

1.4.4 Costing terms

The component of cost, whatever be the method of costing, can be classified as *direct* and *indirect* for some purpose, and as *fixed* and *variable* on certain other considerations.

Direct costs are those which are readily identifiable with a “cost centre”. If the concern is to determine the cost of running an academic department within an institution, then, the academic and administrative staff working exclusively for the department has to be identified. There may be other staff responsible for maintaining the institutional administration, the accounts, the campus, the library and such other common facilities. The department concerned, though has some staff working exclusively for it, may still not be able to function, if the other staff looking after the general administration and common facilities is not there. In this instance, the academic department is the cost centre, the salaries paid for the staff exclusively working for the department are the direct cost and a rational proportion of the salaries paid to the other staff is the indirect cost of the department. The indirect costs are also referred to as “overheads” and they are the costs which are not readily identifiable with a cost centre.

A rational process of determining the proportion of the indirect cost pertaining to a cost centre is known as *apportionment*. It is necessary to apportion indirect costs to a given cost centre. But there is no one correct method of doing it. All that could be said is that the apportionment should be governed by rational, equitable and practicable considerations. Different considerations/norms may be necessary for apportioning different costs.

A *variable cost* is that segment to the total cost which varies with the volume of output; the segment that remains constant irrespective of the volume of output is known as the *fixed cost*. The cost preparing a unit of course material (writing, editing, revising, composing) remains fixed whatever the number of students enrolled for it; but the production cost (printing, binding and

distributing) varies with every change in the number of students enrolled. The former constitutes the fixed segment while the later constitutes the variable segment of the total cost of course development.

1.4.5 Approaches to costing

Cost analysis may be done along several directions. But there are three basic approaches which are more commonly used in the context of costing education:

- i. Full (or absorption) costing;
- ii. Differential (or incremental) costing; and
- iii. Standard costing.

Full costing requires that all direct costs are allocated and indirect costs are apportioned to the cost centre. They may be subsequently related to cost units – units of output or activity, such as per capita cost, cost per credit, cost per programme, etc.

Differential costing attempts to identify the change in costs resulting from an option of a different level of activity or mode of operation. Suppose an institution desires to change over from telecasting its video lessons to distributing video cassettes to students, differential costing approach will provide details of the change in costing that would follow.

Standard costing attempts to compare actual costs with predetermined (norm) cost. A significant variation, if noticed, may necessitate further investigation. The variation might be due to circumstances outside the control of management or within. If within, remedial measures may have to be devised.

Standard costing may be useful to check and keep the expense of a school/division in an institution within targeted limits. Differential costing approach may be helpful whenever a change in the level of activity or mode of operations is contemplated. It may be relevant whenever questions of increase/decrease in enrolment, reduction/enlargement of option-range, launching/withdrawal of courses, etc. are planned or anticipated. The full costing approach is relevant to the purpose of reviewing/evaluating the cost performance or cost-effectiveness relationship.

1.4.6 A Costing Model for IGNOU

When a study of the cost analysis for IGNOU was taken up, it was realized that none of the theoretical models developed and available in the published documents are directly applicable. Taking into account the literature in the field, a method of approach was evolved by Pillai and Naidu (1991) to analyse the cost for 1989-90.

They set out on two purposes:

- i. defining and analysing the existing cost structure of IGNOU; and
- ii. norm-setting for the future.

The pursuit of the former results in the identification of the major cost factors and disaggregation of the total cost of IGNOU in terms of cost components

leading to the derivation of unit costs per measure of output. In pursuit of the latter, the authors have tried to develop, on the basis of the unit costs derived, 'productivity norms' for course development (in terms of time dimension) and 'cost norms' for different activities associated with production, delivery, etc.

In the study made by Pillai and Naidu the unit costs are determined and standardised at the outset. The course is identified as a unit. A student is identified as another unit. The unit of a course consists of 8 credits (240 hours of study) and a unit student is a 32 credit (960 hours of study) or equivalent curriculum load student. The authors then identify the major cost-heads. The cost heads are:

1. *Printed Materials Cost:*
 - A. The Development Phase
 - i. The non-faculty cost
 - ii. The faculty cost
 - B. The Production Phase
 - i. Printing costs
 - ii. Distribution costs
2. *Audio Video Materials Cost:*
 - A. The Development Cost
 - B. The Diffusion Cost
3. *Student Record Maintenance and Examination Processing Cost*
4. *Admission Cost*
5. *Student Counselling Cost*
6. *Library and Documentation Cost*
7. *General Administration Cost*
8. *Common Services and General Changes*
9. *Capital Costs.*

Along with the identification of major cost-heads, significant cost elements under each head are listed out. While listing out the cost elements, wherever the actual value of a cost element is not directly available, the authors have explained how the value may be worked out or deduced from the available cost data.

Using the cost details collected for the cost elements and the cost head for the sample courses, average cost of an 8-credit course is computed for the development phase and the printing phase separately. Similarly the average cost for producing audio-video material for an 8 credit course is worked out. Adding these average costs, the total (average) fixed cost for an 8-credit course is worked out. The total cost is then annualised applying the annualisation factor $a(r,n)$ using the formula:

$$a(r,n) = \frac{r(1+r)^n}{(1+r)^n - 1}$$

where:

$a(r,n)$ = annualisation factor

r = interest rate

n = lifetime of the material

To work out per student unit cost, the annual enrolment of students in different programmes of varying credit values has been standardised by weighting the students on the basis of the credit values they had enrolled for. To determine the annual unit cost per student, the total revenue expenditure for the given year is broken up under a number of cost elements and regrouped under major cost-heads, relating to three categories – fixed, semi

variable and variable. The annual unit cost are worked out for each of the cost elements and cost heads by dividing the recurrent costs per student for semi variable, variable and indirect cost are obtained and the total annual recurrent cost per student is arrived at.

Applying a uniform credit rating for all programmes and applying the unit costs derived, cost of launching an 8-credit course, fixed costs for materials preparation and programme delivery costs have been determined. The cost function in launching a new programme is defined as:

$$\text{CNP} = bx + cxy$$

where:

CNP = cost of developing and delivery of a new programme

x = number of 8-credit equivalent course in a programme

y = number of weighted 8-credit equivalent student in a programme

b = cost of developing a new 8-credit course

c = cost of delivery of services to an 8-credit equivalent student.

In the whole costing exercise described above, the capital cost has not been taken into account. Depreciation of infrastructure facilities has also not been considered. Based on the approach outlined above, the per capita cost for selected programmes in IGNOU has been worked out in Unit 3. Per capita cost at other institutions given in Unit 3 has not followed necessarily the same approach because of different cost orientation and/or non-availability of data along the suggested lines. The cost study of different institutions is discussed in Unit 3.

The study takes into account the sample method of costing, evolved in *Cost Analysis of Distance Education: IGNOU* (Pillai and Naidu 1991) as described above. Cost analysis and norm-setting, if worked out realistically for different open learning institutions, could provide a sound basis for inter-institutional comparison of cost-performance. Moreover, a uniform approach in costing is desired for any comparative study worth the effort.

Activity 1.2

What cost function is applicable while doing a cost analysis for developing a new programme?

1.5 CASE STUDIES OF SOME ASIAN INSTITUTES OF DISTANCE EDUCATION

In this Unit, an attempt has been made to present the details of cost study of the identified institutions of distance teaching in India, Sri Lanka, Indonesia, Hong Kong, Thailand and Pakistan. IGNOU, BRAOU, YCMOU, KOU and the CCIs in India, OUSL in Sri Lanka, UT in Indonesia, OLI in Hong Kong, STOU

in Thailand and AIOU in Pakistan are discussed, focusing on the various cost components in general and with a particular emphasis on the comparative per capita costs of these institutions in relation to the conventional universities in these respective countries.

A reference was made in the previous unit that cost analysis involves separation of the operating cost (recurrent annual costs) from the capital cost (investments in assets like building, equipment etc., which can be used for a number of years). In this study, we have separated the operating cost, but have not taken into account the capital costs, and its annualised value. This was for the simple reason that many of the open universities studied in this Block are still to make substantial investment in the creation of their assets.

Similarly, while computing unit costs, only institution costs have been taken into account. Private costs, including opportunity costs, have been kept out of the purview of the study, except where the information could be collected through some secondary source such as earlier studies. The decision to keep the private costs out was taken considering the complexity involved in computing the private costs and the opportunity costs.

In this Unit, most of the tables and figures have been taken from the papers presented at the Madras seminar. So the information on sources is given only in cases where the source happens to be other than the papers presented at the Madras seminar.

1.5.1 Indira Gandhi National Open University (IGNOU) Study

Institutional Average Per Capita Cost

In sub-section 1.4.6, we discussed the costing model adopted for IGNOU. Here, we analyse specifically the different components of average annual per capita cost of IGNOU in more detail.

IGNOU has worked out the annual institutional average per capita cost, the annual cost per capita and the annual cost per student for each of its programmes. The annual institutional average per capita cost has been worked out by dividing the total revenue cost by the number of weighted students registered in the year concerned. The total cost has been identified under three major headings:

- i. cost of course development and production;
- ii. cost of student support services; and
- iii. cost of institutional overheads.

Each of the above cost components has been further divided into subheads to give a more detailed analysis of costs. The cost items thus identified under each cost component, cost structure and the annual average per capita cost are significant indicators to judge the cost effectiveness of IGNOU. Under the cost components, we can identify three major areas such as i) Course development and production, ii) Student support services and iii) Institutional overheads. Course development in production includes the preparation and production of self-instructional materials in print, audio and video. Under student support, we include admission, maintenance of students' record, material distribution, counselling/tutoring and examination. Institutional overheads would mean library and documentation, general administration, estate management, general services, and miscellaneous items. Of the total cost in the year 1991-92, course development and production accounted for about 43 per cent,

student support services 25 per cent and the institutional overheads 32 per cent. With marginal variations the same trend prevailed in the previous two academic years as well as when IGNOU was actively engaged in course development and the expansion of other activities. The annual per capita costs for each of the components for the year 1991-92 were: Course development = Rs. 879 millions; student support Rs. 519 millions; Institutional overheads Rs. 648 millions. Table 1.1 shows the annual per capita cost of the IGNOU from 1989 to 1992.

Table 1.1: IGNOU: break up of annual per capita cost

Sl.No.	Cost Item	Total Cost (Rs. In millions)			Cost per student (Rs.)		
		1989-90	1990-91	1991-92	1989-90	1990-91	1991-92
A i.	Development of Course Material	10.05 (11.97)	12.10 (10.75)	13.78 (8.94)	209.54	181.94	183.03
A ii.	Production of Printing Material	19.94 (23.76)	28.70 (25.5)	47.61 (30.91)	415.83	431.45	632.29
A iii.	Production of Audio & Video	4.03 (4.8)	2.88 (2.56)	4.83 (3.13)	83.96	43.33	64.11
A	Total Development & Production of Material	34.01 (40.53)	43.68 (38.81)	66.21 (42.98)	709.33	656.72	879.43
B i.	Admission, Student Record Maintenance	2.38 (2.83)	3.79 (3.37)	4.61 (2.99)	49.67	57.03	61.22
B ii.	Student Counselling	11.87 (14.14)	16.48 (14.64)	22.12 (14.36)	247.52	247.76	293.81
B iii.	Examination	4.10 (4.89)	5.49 (4.88)	7.82 (5.08)	85.54	82.56	103.89
B iv.	Material Distribution	2.37 (2.82)	6.64 (5.9)	4.51 (2.92)	49.34	99.78	59.86
B	Total Student Support Service	20.71 (24.68)	32.40 (28.79)	39.06 (25.35)	432.07	487.13	518.78
C i.	Library and Documentation	0.87 (1.03)	1.23 (1.09)	1.39 (0.90)	18.13	18.51	18.52
C ii.	General Administration	5.16 (6.14)	5.57 (4.95)	6.23 (4.05)	107.55	83.81	82.77
C iii.	Common Services & General Charges	16.34 (19.48)	21.03 (18.69)	30.24 (19.64)	340.91	316.22	401.71
C iv.	Miscellaneous including Estate Management	6.83 (8.14)	8.63 (7.67)	10.9 (7.08)	142.42	129.76	144.73
C	Total Institutional overheads	29.20 (34.79)	36.47 (32.40)	48.77 (31.67)	609.01	548.30	647.73
D	Total Revenue Costs	8.92 (100.0)	112.55 (100.0)	154.03 (100.0)	1750.41	1692.15	2045.94

(Note: Figures in parenthesis denote % of costs to total revenue costs)

Programme-wise Annual Per Capita Cost

Programme-wise annual cost per student has been derived from the above annual average cost per student. The process of this programme-wise deduction of cost has been complex because:

- the programmes offered by IGNOU are at various levels;
- there are significant cost factors responsible for variation in cost between one programme and the other;
- the cost factors as far as production of materials is concerned, are determined by the number of constituent courses in the programme, the level of offering, and the efforts involved in development and production; and

iv. the cost factor concerning delivery are governed by such components as laboratory practical, student project, etc.

Precise data is not available to assess the cost of each programme separately. Yet an effort has been made to derive the programme costs on the basis of certain well defined parameters like the number of courses in a programme, the volume of materials produced, the number of study centres activated for the programme, etc., and applying them to the average costs. The cost of individual programmes so worked out is presented in Table 1.2.

Table 1.2: IGNOU: Programme-wise cost per student (in Rs.)

Sl. No.	Programme	1989-90	1990-91	1991-92
1.	Bachelor's Preparatory Programme	437.65	519.43	778.70
2.	Bachelor's Degree Programme	1842.18	1644.17	1996.96
3.	Bachelor of Library & Information Science	2315.35	2259.86	3117.51
4.	Management Programmes	1839.07	1702.20	1779.84
5.	Diploma in Distance Education	2059.25	3149.02	5671.59
6.	Diploma in Creative Writing in English	5189.95	7637.67	6247.14
7.	Diploma in Computers in Office Management	-	4459.40	4598.55
8.	Diploma in Rural Development	-	-	2301.86
9.	Diploma in Higher Education	-	-	3661.71
10.	Certificate in Food & Nutrition	767.86	731.18	779.82
	Average Cost for all programmes	1750.41	1692.15	2045.94

Note: The programmes listed against Sl. No. 1 and 10 are for six months.

1.5.2 Dr. B.R. Ambedkar Open University (BRAOU) Study

Expenditure and Receipts

Among the OUs in India, BRAOU has been in operation for the longest period. The yearly budgets for the University for the past 10 years provide the details of expenditure and receipts under different heads. Applying the total expense every year, average expenditure receipt per student and average government grant per student are worked out yearwise for the ten years. The details are presented in Table 1.3 and 1.4.

Table 1.3: BRAOU: Annual income and expenditure (1983-84 to 1992-93)

	Particulars	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93
A.	Income (00,000 Rs.)										
(i)	State Government Grants	-	107.00	150.00	52.50	75.13	70.39	125.64	95.40	118.00	146.80
(ii)	UGC/IGNOU Grants	-	-	-	10.00	23.00	7.45	-	3.00	11.00	-
(iii)	Fee Receipts	33.94	87.52	156.11	203.50	268.11	221.65	225.83	314.61	338.32	416.22
(iv)	Other Misc. Receipts	-	5.92	6.45	12.29	17.44	3.78	5.72	15.08	8.49	10.53
	Total Receipts	33.94	200.44	312.56	278.29	383.68	303.27	357.19	428.09	475.81	573.55
B.	Expenditure (00,000 Rs.)										
(i)	Administration & Direction	12.82	61.98	69.21	83.84	79.09	134.06	136.21	111.00	156.74	125.33
(ii)	Course Material	7.80	57.29	49.06	46.06	29.01	25.46	75.00	96.10	147.78	164.23
(iii)	Audio-Video	-	15.19	26.81	26.46	10.29	12.78	4.74	3.09	7.00	16.14
(iv)	Library	1.00	12.38	13.74	11.65	10.83	6.01	9.33	7.74	6.09	9.82
(v)	Study Centres	10.68	16.66	30.69	56.21	46.83	66.61	55.34	105.60	116.24	154.10
(vi)	Examination	1.67	9.81	14.80	31.04	28.42	42.68	39.65	50.15	66.15	84.84
	Total Expenditure	33.97	173.31	204.31	255.31	203.95	287.60	320.27	373.68	500.97	563.46

Table 1.4: BRAOU: Average income, expenditure and govt. grant per student
(1983-84 to 1992-93)

Particulars	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93
Total student strength	6,321	25,485	34,109	46,629	36,454	32,957	34,183	45,041	52,803	60,000
Average expenditure per student (in Rs.)	537	680	599	547	560	972	937	830	947	939
Average fee receipt per student (in Rs.)	536	343	458	436	735	673	660	698	641	694
Average grant per student (in Rs.)	-	420	440	113	206	214	368	212	223	245

Fee Income Vs Expenditure

The total indicates that a major portion of expenditure is met by student fee. Yearly averages over the ten years confirm this indication:

Yearly average expenditure ('00,000 Rs.) = 291.70
 Yearly average fee receipt ('00,000 Rs.) = 226.60
 Yearly average Govt. grants ('00,000 Rs.) = 94.10
 Yearly average student strength = 37,400
 Yearly average expenditure per student (in Rs.) = 780
 Yearly average fee income per student (in Rs.) = 606
 Yearly average Govt. grants per student (in Rs.) = 251

The total yearly average income per student exceeds total yearly average expenditure by Rs.77, because in the calculation here only recurrent costs are taken into consideration, leaving out fixed costs. The excess per capita income from the government source is for meeting the fixed cost requirement.

Detailed Cost Analysis

A detailed cost analysis for the three preceding years (1989-90, 1990-91, 1991-92) is carried out under three major heads of cost components: Course Development, Student Support Services and Institutional Overheads. These represent the fixed costs, variable costs and indirect costs respectively. Each head has been further subdivided into a number of cost-items. From the detail thus worked out, average per student cost under each of the three major heads has been calculated year-wise. By adding up the average cost per student under the three heads in a year, average unit cost per student per year has been calculated.

Project Cost of a BRAOU Programme

Having made an expert cost analysis of the preceding years, an attempt has also been made to compute the cost of an academic programme, given the operational factors governing an academic programme of BRAOU (see Table 1.4). Given below are the postulates, assumptions, and details of projected estimates.

An academic programme of one year duration leading to an award of degree or diploma consists of 6 to 8 courses. Each Course is divided into Blocks and each Block is subdivided into Units. The programme costs are arrived at by assuming the following:

- The duration of the programme in one year;
- The academic programme consists of 8 courses;
- The expected student enrolment is 5000 in one year;

- d. The course material is printed for one year;
- e. The print material consists of 25 Units; comes to 500 pages in double demi size;
- f. The number of counselling sessions will be 20 for one course;
- g. The programme is offered at 50 study centres;
- h. One internal faculty member will coordinate the course writing and it would take one year for the completion of course writing and printing;
- i. It would take Rs.10,000 for production of one video lesson and Rs.1000 for an audio/radio lesson;
- j. The audio-visual supplement consists of 2 audio lessons, 2 radio lessons and 2 video lessons for the course; and
- k. Travel expenses are restricted to first class train fares only.

1.5.3 Yashwantrao Chavan Maharashtra Open University (YCMOU) Study

Cost Components and Cost Centres

YCMOU was still at its formative stage. It was rather difficult, therefore, to find out realistic programme cost and unit cost. However, an attempt has been made to analyse the expenditure of the first three years to get idea of the costs involved.

The cost components of revenue expenditure as envisaged by the university are classified into operational costs and developmental costs.

The **operational costs** include:

- i. Cost of producing study texts;
- ii. Multi copying of audio/video tapes, floppies, experimental kits, etc;
- iii. Cost of delivery including costs of such activities as publicity, registration, study centre organisation, counselling, formative and summative evaluation and certification;
- iv. Cost of maintenance activities; and
- v. Cost of infrastructural support.

The **developmental costs** include:

- i. Cost of planning for the programmes; and
- ii. Cost of development of programme design, infrastructural materials, feedback and reforms.

YCMOU has eight Divisions. The likely distribution ratio between developmental and operational costs for each of these divisions is expected to be as follows:

Table 1.5: YCMOU: expected distribution of developmental and operational costs

Division/Centre	Proportions of Expenditure	
	Developmental Cost %	Operational Cost %
1. Academic Division	100	0
2. Academic Service Division (ASD)	100	9
3. Audio Visual Centre (AVC)	90	10
4. Print Production Centre (PPC)	0	100
5. Student Service Division (SSD)	0	100
6. Computer Centre	25	75
7. Library & Resource Centre (LARC)	100	0
8. Administrative Division (AD)	0	100

Annual Per Capita Cost

The revenue-expenditure for the first three consecutive years is given in Table 1.6. The expenditure has been divided into four main stages of operation, i.e. development, production, delivery and infrastructure.

Table 1.6: YCMOU: revenue expenditure by division and stages of operations
(Rs. in Lakhs)

Division	Development			Production			Delivery			Infrastructure		
	89-90	90-91	91-92	89-90	90-91	91-92	89-90	90-91	91-92	89-90	90-91	91-92
Academic	6.09	20.06	13.10	-	-	-	-	-	-	0.85	2.57	8.86
ASD	1.11	3.10	2.57	-	-	-	-	-	-	-	-	-
AVC	0.76	5.00	7.61	0.21	2.56	6.60	-	-	-	-	-	-
PPC	-	-	-	5.72	33.11	39.88	-	-	-	-	-	-
SSD	-	-	-	-	-	-	5.11	22.55	26.72	-	-	-
Computer & LARC	0.43	13.20	6.00	-	-	-	-	-	-	0.14	5.88	13.27
Administrative	-	-	-	-	-	-	-	-	-	10.43	22.25	67.80
	8.39	41.36	29.28	5.93	35.67	46.48	5.11	22.55	26.72	11.42	30.70	89.93

The year-wise total revenue expenditure is calculated and divided by the total number of students to give cost per student. The effective student number is arrived at by applying 0.5 weight to students enrolled on short term courses. So the student number is the number of students on year-long courses added to half the number of students on short-term courses.

The cost per student is around Rs. 2200/- which is “obviously high since the enrolment is quite low”.

Projected Cost per Student Course

Initially expenditure on various programmes and courses was not segregated. Further, the divisions were regrouped after the initial one and a half years. So the divisional expenditure cannot be disaggregated programme/course-wise. This may be possible shortly when the computerisation of expenditure materialises: calculation of unit cost per programme/course may not be possible till then. Hence an attempt has been made to estimate the likely cost of a course.

On the basis of costs incurred and the rates of honoraria, etc., paid by the university, the expenditure per student for an 8 credit point course in the BA/B.Com programme works out to be about Rs.237/-. Infrastructure cost for administrative support is taken at 40 per cent. On the basis of this estimate, the unit cost per student per year (32 credit points) will be about Rs.950/- and the entire programme cost of 12 courses to be completed in a minimum three years will be Rs. 2850/-.

1.5.4 CCIs Study

The CCIs function under dual mode universities, offering simultaneously both classroom teaching and correspondence course. Hence, all through the cost calculation, a tendency to compare the two modes within each university is maintained. The income details of three such institutions have been collected in Table 1.7.

Per student cost is worked out in Table 1.8 for weighted enrolments. The weighted costs have been worked out by dividing the total expenditure by the

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weighted enrolment. The following weights have been assigned to different levels of programmes to reflect higher costs at successive higher levels:

Certificate	0.25
Diploma	0.5
Undergraduate	1
Postgraduate	1.7
M.Phil	2.8
Ph.D.	2.8

The above weights have been assigned on subjective assessment of value attributed to knowledge at successive higher levels and the corresponding efforts to be put forth by the teaching institutions to cope with the needs.

Table 1.7: CCIs: source of income 1988-89

(Rs. in Lakh)

Heads of Income		Grants	Fess			Other	Total
Universities		(Govts.)	Tuition fees	Other than tuition fees	Sub-total	Receipts	
1	2	3	4	5	6	7	8
Annamalai	CS	101.7 (29.8)	-	109.6 (32.3)	109.6 (32.3)	128.6 (37.9)	339.9 (100.0)
	DLS	-	425.0 (65.5)	85.6 (13.2)	510.6 (78.7)	138.0 (21.3)	648.6 (100.)
Delhi	CS	1813.3 (89.1)	51.9 (2.6)	115.9 (5.7)	167.8 (8.3)	53.7 (2.6)	2034.8 (100.0)
	DLS	94.8 (46.9)	73.9 (36.6)	21.0 (10.4)	94.8 (47.0)	12.2 (6.1)	201.8 (100.0)
Mysore	CS	678.6 (89.5)	19.0 (2.5)	19.0 (2.5)	-	60.5 (8.0)	758.1 (100.0)
	DLS	-	110.3 (98.8)	-	110.3 (98.8)	1.3 (1.6)	111.6 (100.0)

Notes: Figures within parenthesis are the percentages to total

CS - Conventional System

DLS - Distance Learning System

Table 1.8: CCIs: institutional cost per student: 1988-89

Head of Exp./Cost		Per Student Cost Per (Weighted) (in Rs.)			Per Student DLS as % of CS
Universities		Salary	Non-salary	Total	
1	2	3	4	5	6
Annamalai	CS	2498 (48.6)	2645 (51.4)	5143 (100.0)	
	DLS	103 (8.4)	1124 (91.6)	1227 (100.0)	23
Delhi	CS	5278 (69.1)	2359 (30.9)	7637 (100.0)	
	DLS	536 (62.4)	323 (37.6)	8.59 (100.0)	11
Mysore	CS	6683 (70.0)	2860 (30.0)	9543 (100.0)	
	DLS	996 (48.2)	1071 (51.8)	2067 (100.0)	22

Notes: Figures within parenthesis are the percentages to total

CS - Conventional System;

DLS - Distance Learning System

1.5.5 Open University Of Sri Lanka (OUSL) Study

OUSL offers courses of different credit rating and the credit rating of course has direct relation to the amount of study materials. Hence, student-credit (number of students enrolled on a course multiplied by the credit value of the course) is taken as the basic cost centre.

For the year 1990, the total student credits in the three faculties were:

- Faculty of Engineering Technology = 3994.50;
- Faculty of Natural Sciences = 2027.75;
- Faculty of Humanities and Social Science = 11880.06

To work out the cost per student for a given programme, the total faculty specific costs and the total non-faculty costs are identified for each faculty. The academic staff salary (faculty specific) in 1990 were Faculty of Engineering Technology = Rs.4.125 millions; Faculty of Natural Science = Rs.3.606 millions; Faculty of Humanities and Social Science = Rs.1.975 millions in Sri Lankan rupees.

The overhead expenditure and the expenditure on student support services were distributed among the three faculties according to the number of student credits or courses. The production cost for books was distributed on the number of books produced for each faculty. Putting all these direct and indirect costs together, the total expenditure for the three faculties in 1990 were: Faculty of Engineering Technology = Rs.11.925 millions; Faculty of Natural Science = Rs. 10.720 millions; Faculty of Humanities and Social Sciences = Rs. 15.698 millions.

As each faculty was offering varying number of programmes, the total faculty cost was distributed among the academic programmes of the faculty according to the ratio of student credits in each programme. From the cost thus computed, cost per student per year for each programme is determined.

Table 1.9: OUSL: cost per student per year – programme-wise (1990)
(In Sri Lankan Rs.)

Certificate in Pre-School Education	1223.16
Diploma in Management	3271.73
Diploma in Technology	7681.07
Bachelor in Law (LLB)	2914.49
Bachelor in Science (B.Sc.)	10985.70

Details of institutional overhead costs, total cost of student support services and the total cost of production of course materials are not available. Similarly, details of computations of cost per programme and the number of students or student credits per programme are also not available.

An earlier study conducted in 1989 “Cost of course/programmes of study offered by OUSL-Nov.1989” by Dissenayake and others present data under the following heads:

- Variable cost of course per credit;
- Overheads;
- Total cost of course with present fees;
- Comparison of costs with present fees;
- Recoverable overheads with present fees;
- Salaries of staff; and
- Cost of programmes of study.

However, details of average cost for producing one unit of printed course material, one unit of audio material and one unit of video material are given, each individually. The cost of a printed book (100 pages in A4 size) was Rs. (Sri Lanka) 65 in the year 1991; the cost of one video programme of 30 minutes duration was Rs.52,350; and the cost of one radio programme of 30 minutes duration was Rs.3425.

1.5.6 University Terbuka (UT) Study

Cost Data

Government grants provide 57.9 per cent of UT revenue, and 42.1 per cent comes from student fees and the sale of material.

For computing unit costs, the following data are used:

- i. total costs for course development, course delivery and overhead management;
- ii. the number of credits offered; and
- iii. the level of enrolment for each course for five consecutive years.

The total cost for the UT courses and programmes during the study period (1985-86-1989-90) was 38.81 billion in Indonesian Rupiah (US\$20.98 million). The break up is as follows: Course development 8,480,978 (21%); Course delivery, 16,341,553 (42%); Overhead management, 13,987,387 (36%) (Musa, 1991).

Unit Costs

The cost per course was calculated on the basis of estimated total cost per credit for each type of UT course. The cost per student for each UT course is obtained by the number of students taking the course. Similarly the cost per credit is calculated by dividing the cost per student of each course by the credit load of the course. The total cost of the UT course and the costs per student and per credit are given below:

Table 1.10: UT: estimated total cost for the UT courses and unit costs per student and per credit (In Rupiah)

Course Category	No. of Courses		Credit	Total Cost per Course	Unit Cost per Student	Unit Cost per Credit
	Total	Average				
A By Credit Load						
1 credit course	180	360	2.00	12024092	31427	15714
2 credit course	243	729	3.00	24348786	32394	10798
3 credit course	17	68	4.00	2271217	56650	14163
B By Course Requirement						
Fundamental	1.2	25	2.08	835006	4396	2113
Pre-core	65	189	2.91	6312648	16954	5826
Core & Support	364	948	2.60	31663442	51309	19734
C By Field of Study						
Social & Political Science	85	242	2.85	8082862	14114	4952
Economics	74	221	2.97	7381456	34496	11615
Math & Physics	63	190	3.02	6346049	139596	46224
Education	20	484	2.34	16165724	102745	43908
Total	441	1162	2.63	38811097	32908	12512

Source: Musa (1991)

Note: The figures have been reproduced as they were found in the source; we find the figures given against 'Total UT' do not tally with the 'total' of different categories of figures.

Per student and per credit costs vary considerably within and between the groups of courses. The variations in the cost per credit, though the allocation of money has been constant for each credit, are due to the difference in the enrolments.

Cost and Fee Ratio

Table 1.10 above shows that the most expensive courses were those offered by the School of Mathematics and Physics; the least expensive were those by the School of Social and Political Science. The existing tuition fee (which averages to 5000 Rp) is generally equal to the unit cost for the course of the latter, it is about 50 per cent of the cost per credit for economics, 9 per cent for Maths and Physics and 10 per cent for Education courses.

1.5.7 Open Learning Institute (OLI) Study

The OLI, Hong Kong (now, the Open University of Hong Kong) was expected to be totally self-financing within a period of four years. With the target set thus, the government grant has been decreasing over the years, with a corresponding increase in the tuition fees. The details of revenue are given in Table 1.11.

Table 1.11: OLI revenue

Sources		1991-92	1990-91	1989-90
i.	Tuition fees (in million HK\$)			
	School of Arts and Social Sciences	17.5	12.2	2.2
	School of Business and Administration	56.9	30.8	6.2
	School of Science and Technology	45.7	23.1	3.2
	Total	120.1	66.1	11.6
ii.	Government Grant (in million HK\$)	20.9	41.3	42.8
	Percentage of Govt. grant to total revenue	13.9%	35.1%	69.0%

Source: Accounts for the year ending 31st March 1992, OLI

The expenditure is accounted under the major heads – direct cost, staff costs and other costs. Per credit costs under these heads have been added up to get the total cost per credit (20 credits of OLI are equivalent to 1 credit of UKOU; 40 credits are taken to be equivalent to the curriculum load of one year at the conventional institutions). Cost efficiency/effectiveness rates, reproduced below, have been worked out by Dhanarajan and Hope (1992:18).

Table 1.12: OLI: cost efficiency/effectiveness rates

	1992-92	1990-91	Oct. 1989
FTE academic staff FTE students*	1:63	1:56	1:27
Administrative cost to 'Academic' cost	1:1.47	1:1.25	1:0.8
All staff costs to 'Fee' income	1:1.99	1:1.43	1:0.8

* Academic staff calculated as full-time staff plus part-time tutor cost at midpoint of the lecturer scale.

Source: Dhanarajan and Hope (1992)

1.5.8 Sukhothai Thammathirat Open University (STOU) Study

The total expenses of Thailand's STOU in 1992 amounted to 645,544,100 Bahts. A break-up of this total expense against different expense types is as follows: Salaries and wages 150,232,400; Equipment, land and construction 70,210,400; Central fund 17,875,500 (Chaya-Ngam, 1987).

The expense types listed are primary types and the figures are approximate. The first type includes salaries and wages of employees, a majority of whom receive the full salary and benefit packages as fixed for government employees. The second category includes payment for a wide variety of services (such as course-writing, assessing exam scripts, seminar-teaching, overtime wages/fees, transportation and accommodation expenses, etc); and payment for consumable materials and utilities such as electricity, water, telephone, mailing. The third category includes audio-visual equipment, printing equipment, office equipment, etc. The fourth category represents a monetary sum over and above income allocated to the other three divisions.

Government Funding

STOU's primary source of income is the Thai Government. It received 136 million Bahts in 1992. Though this amount looks substantial, compared to budget allocation made to other universities/institutes in Thailand, it is the second lowest. This has to be viewed in the light of the fact that "STOU's student enrolment represents nearly the highest enrolment of any higher education institution in Thailand".

The annual government allocation is again meagre when viewed against the annual expenses: the government allocation for 1992 was just 21.12 per cent of the STOU total expenses for the year, 646 million Bahts. In the year 1989, only 14.51 per cent of STOU's annual expenditure was contributed by government (Chaya-Engam, 1987).

The Government budgetary allocation to STOU is earmarked for certain items on STOU's list of expenses. Out of the total allocation of 136 million Bahts for 1992, a major part 103 million Bahts (75%), was meant for the expenses under the head salaries and wages; the remaining was distributed to select items under otherheads. STOU had to self-support to the tune of 47.5 million Bahts for salaries and wages (about 31.62% of the total expenses under this head). The government contribution to expenses for air time was 0.02 per cent and to audio visual supplies was 0.09 per cent. Its contribution to expenses for printing, supplies, course writers and tutors was nil.

Thus, the funding from the government is very limited.

Revenue from Students

The other major source of funds for STOU is the revenue from students. For a two year degree programme a student has to pay about 5,600 Bahts, which is "admittedly low by any standard". The size of annual revenue received from students in the year 1989 was 279.5 million Bahts and in 1992 it was 319.4 million Bahts (Chaya-Engam, 1987).

Apart from revenue from students, STOU has other resources such as supplementary revenue, land donations and financial grants to supplement the limited government contribution.

No current information could be obtained for cost-study despite our efforts. We present below some relevant information pertaining to 1982, published in 1987.

Operating Cost per Head by Institution

The National Education Commission of Thailand conducted a study on operating and capital costs of government universities and private colleges in

1982. A comparison of operating costs per head of government universities (in 1982) with that of STOU (in 1982) is provided in Table 1.13. The operating cost per head at STOU is 2,341 Baht.

Table 1.13: *STOU: operating cost per head as percentage of cost per head of other universities (1982)*
(In Bahts)

Institution	Per head in other universities	STOU per head (2,341) as to other universities
Khon Kaen	49,635	4.72
Chiang Mai	40,210	5.82
Prince of Songkha	37,244	6.29
Kasetsart	24,683	9.48
Chulalongkorn	46,089	5.08
Thammasat	11,463	20.42
Mahidol	120,730	1.94
Srinakarinwirot, Prasarn Mit.	25,999	9.00
Silpakorn	27,394	8.55
King Mongkut's Institute of Technology	27,230	8.60

Source: Quoted in Srisa-an (1987:524)

Operating Cost per Graduate

The National Education Commission (1982) has also compared the operating cost per graduate at STOU with the corresponding cost at other institutions. It has been assumed that the success rate at STOU is 50 per cent of the cohort. The comparison is made in Table 1.14. STOU per graduate cost is fixed as 7,023 Baht.

Table 1.14: *STOU: operating cost per graduate as percentage of cost per graduate in other universities (1982)*
(In Bahts)

Institution	Per graduate cost in other universities	STOU per graduate cost as % to other universities
Khon Kaen	61,276	11.46
Chiang Mai	46,186	15.21
Prince of Songkha	46,791	15.01
Kasetsart	31,490	22.30
Chulalongkorn	53,532	13.12
Thammasat	12,790	54.91
Mahidol	145,064	4.84
Srinakarinwirot, Prasarn Mit.	30,756	22.83
Silpakorn	33,686	20.85
King Mongkut's Institute of Technology	38,000	18.48

Source: Quoted in Srisa-an (1987:525)

1.5.9 Allama Iqbal Open University (AIOU) Study

No current cost study report could be obtained on AIOU and we had to depend on whatever information was available through secondary sources.

Siddiqui (1987) refers to two UK Overseas Development Administration (ODA) sponsored studies undertaken in January/February 1979 and March 1983. The former was conducted by an Evaluation Mission in connection with the phasing of further assistance to the AIOU. Considering the amortization of capital costs, salaries and other recurrent expenditure together with student

numbers, the Mission felt that “the AIOU would progressively show considerable cost advantages over other conventional institutions” (ibid:218).

The ODA team, according to the country paper summaries presented in *Distance Education in South Asia* (1989), “demonstrated that the cost of a graduate at a conventional university was Rs.18,850 compared to the cost of graduate at AIOU which was in the range of Rs.8,670-Rs.12,000”. But about 35 per cent of AIOU cost mentioned above is met by the student fees. If this factor is taken into consideration “the net cost of a graduate at AIOU is in the range of Rs.5,680-Rs.8,500 which is between 30 per cent and 45 per cent of the cost in the conventional system” (ibid:144).

The second study referred to by Siddiqui is a Review of the University taken up jointly by the Government of Pakistan and the ODA. This concluded that the AIOU could provide graduate-level education more cheaply than conventional universities in Pakistan, provided that enrolments were sufficiently high.

Siddiqui observes that both the assessments were proved by subsequent analysis “which have indicated that with an enrolment of 5000, average student costs are approximately 30 per cent of the cost of educating a graduate at a conventional university” (Siddiqui, 1987:220).

1.6 COST ADVANTAGE

Any assessment of cost becomes meaningful only by comparative assessment of advantage in relation to the cost incurred by an alternative means to achieve the same objective. So a comparison of 'the like with like' is necessary to make any cost study worth its effort.

One measure of cost effectiveness that is meaningful in the present study is a comparison of the cost for a given programme in the open universities with the corresponding programme in the conventional system. Identical programmes in both the systems with scope for one to one comparison are not many. The conventional universities again have not maintained records in such a manner as to facilitate disaggregation of cost per individual for each programme. There are many common items of expenditure in the conventional system which cannot be easily apportioned to individual programmes and much less to individual courses.

Notwithstanding the above limitations, an attempt has been made (Pillai, 1992) to compare the cost of the Bachelor's Degree Programme offered by IGNOU with similar programmes offered by colleges affiliated to different universities in India. There were about 7400 such colleges in the country. Data from about 80 colleges distributed in different parts of the country, spread over six states, have been collected and analysed. The per student unit cost for the year 1989-90 (when the data were available) has been worked out. The annual average revenue expenditure of 79 colleges belongs to six states (Jammu and Kashmir 16; Madhya Pradesh 12; Orissa 7; Goa 5; Pondicherry 5; Tamil Nadu 34) with the total number of 75,378 students at Bachelor's Degree level. The per student cost arrived at was Rs.4141 (Pillai, 1992). The comparison of annual per capita cost of the Bachelor's Degree Programme of IGNOU, with the same programmes offered by some select conventional colleges, shows that IGNOU's annual average cost is less than 40 per cent of the cost of the select colleges.

Table 1.15: Annual revenue expenditure of colleges (in India) offering Bachelor's Degree Programmes
(Per capita cost in Rs.)

Sl. No.	State	No. of Colleges	No. of Students	Per Student
1.	Jammu & Kashnir	16	12,976	4,235
2.	Madhya Pradesh	12	16,262	2,462
3.	Orissa	7	9,495	4,424
4.	Goa	5	3,709	2,307
5.	Pondicherry	5	9,394	8,206
6.	Tamil Nadu	34	29,542	4718
Average (all states)				4,141

Source: Pillai (1992)

The unit cost for the year 1989-90 was converted at current prices to estimate the annual costs for the year 1990-91 and 1991-92 for the purpose of comparison with the costs of IGNOU.

The YCMOU average cost per student per year (for 1991-92) was Rs.2214.35. By another calculation, assuming 5000 students on roll, the expenditure per student for one 8 credit course of B.A./B.Com. programme worked out as Rs.2371/-. On the basis of this estimate the unit cost per student per year works out to Rs.9481/-. The difference between the estimate the (Rs.9481/-) and the ex post computation of average cost per student per year for 1991-92 (Rs.2214/-) is too large to accept the estimate. Since about 77 per cent of the enrolment for the year 1991-92 is for the B.A./B.Com. programme, we incline to take the average cost per student per year for 1991-92 as the approximate annual cost for a B.A./B.Com. student. The actual cost may come down considerably, if the enrolment increases.

The per capita cost of the Bachelor's degree students of BRAOU has been calculated as Rs.777 for the year 1991-92.

The per student annual cost at the colleges and the corresponding cost at IGNOU, YCMOU and BRAOU are tabulated in Table 1.16. Ignoring the shortcomings, the study still gives a definite picture of the economy in per capital expenditure that is made possible in distance education.

Table 1.16: Comparison of annual average cost per student (Degree/Diploma Programmes, 1991-92: OU and Select Colleges)
Annual per student cost (in Rs.)

OUs	OUs	Select Colleges	OU cost as % to Select Colleges
IGNOU	1997	5476	36.5
BRAOU	777	5476	14.2
YCMOU	2214	5476	40.4

The size of enrolment and the limited number of courses/options on offer at BRAOU for the Bachelor's degree seem to keep the per capita cost low.

As for the CCIs, Rudder Datt (1993) carried out an exercise to compare cost per student in the School of Correspondence Courses and Continuing Education (SCC & CE), New Delhi, with corresponding cost at 12 of the 53 colleges affiliated to Delhi University. The sample comprised colleges with different enrolment levels to make the sample representative of the wide spectrum of enrolment range.

Cost per student for these colleges was computed for three consecutive years – 1985-86, 1986-87 and 1987-88. The cost was converted into cost per student

at 1987-88 prices and the average annual cost per student was worked out. The results of this exercise are given in Table 1.17.

Table 1.17: Average enrolment and cost per student for Delhi colleges

Colleges	Average Enrolment for 1985-86 to 1987-88	Average cost per student for 1985-86 to 1987-88
1. St. Stephen's College	987	5,814
2. Miranda House	2,105	5,364
3. K.M. College	2,087	4,710
4. I.P. College	1,833	4,952
5. Zakir Hussain College	2,030	4,601
6. SGTB Khalsa College	2,239	4,213
7. Vivekananda Mahila College	1,147	4,211
8. Swami Shraddhanand College	2,023	3,489
9. Satyawati College (M)*	1,636	3,750
10. Zakir Hussain College (E)**	1,326	3,466
11. SGTB Khalsa College (E)	1,325	2,746
12. Satyawati College (E)	1,057	2,569
Total	-	49,785
Average	-	4,157

Source: Datt (1993)

*Morning, **Evening.

The average of 12 colleges reveals that cost per student in regular colleges of Delhi University was Rs. 4157/-. A similar exercise was undertaken to determine the average annual cost per student at the SSC & CE for the three year period – 1986-87, 1987-88 and 1988-89. The average per student cost in this case is Rs. 611/-.

The two studies reveal that as against the annual average cost per student of SCC & CE, Rs.611/-, the corresponding cost at the regular colleges was Rs.4157/-. The SCC & CE cost works out to be 14.7 per cent of the cost of conventional education. The results of Ansari's (1992) study show that the three CCIs which have been represented show their per capita cost as ranging from 11 per cent to 23 per cent of the per capita cost of the conventional system.

While studying the cost of CCIs one needs to take into account certain cost determining factors. The CCIs function as subordinate units of the conventional universities to which they belong and they follow mostly the very same courses by and large of Arts, Humanities and Social Sciences (barring a few exceptions), offered by the parent organisations. As such, they do not generally have to incur any expenditure by way of designing courses; the preparation of courses itself does not cost much for the very same reason. Moreover, the student support services and the use of technology for course delivery are also kept at a low profile. Short intensive contact-sessions are held by some CCIs once or twice a year and some CCIs use radio broadcasts made available free of cost. Their instructional packages do not consist of audio/video cassettes. Study centres for student contact are too few in number and are run only by a few of the CCIs. Besides, the CCIs have large enrolments and less number of courses. Because of these factors the costs of CCIs are bound to be lower than the costs of conventional universities, and even lower than the costs of open universities.

In Indonesia, the Centre for Research and Community Service at the UT conducted a comparative cost study in collaboration with the Institute for International Research (IIR). It compared the cost effectiveness of UT's D2

Mathematics and D2 Bahasa Indonesia Programmes with those provided by four IKIPs (campus based post secondary Teacher Training Colleges) and two FKIPs (School of Education within the conventional university system). Both institutional and individual costs relating to the academic years 1987-88 and 1988-89 were taken up for comparison. The institutional costs (operational as well as fixed) were grouped into "credit hour costs". The cycle costs were based on a two year programme and the credit hour costs were based on an 80 semester credit hours requirement for a two year programme.

The comparison of costs per cycle and per credit are summarised in Table 1.18.

Table 1.18: UT: Operational costs and fixed costs per cycle and per credit at UT & corresponding conventional institutions (1987-88 and 1988-89)
(In Indonesian Rupiah thousands)

Unit Costs	IKIP's & FKIP's			UT			UT cost as % cost at IKIP's & FKIP's		
	Operation Costs	Fixed Costs	Total	Operation Costs	Fixed Costs	Total	Operation Costs	Fixed Costs	Total
D ₂ Mathematics									
Per Cycle	2,738	622	3,360	368	194	562	13	3 1	17
Per Credit	34	8	42	9	5	14	27	63	33
D ₂ Bahasa Indonesia									
Per Cycle	2,955	571	3,526	359	193	552	12	34	16
Per Credit	37	7	44	9	5	14	24	7 1	3 2

Source: Adapted from Musa (1991:42)

*Conventional Institutions

Table 1.18 shows that the unit costs are significantly lower for the UT distance education programmes compared to the programmes of the campus-based institutions. The UT unit cost per cycle (per graduate) is only 16-17 per cent fixed cost. The UT unit cost per credit is 32-33 per cent of the cost of campus based institutions (24-27% operational cost and 63-71 % fixed cost).

The comparison of individual costs (direct and foregone) is made in Table 1.18. The individual foregone cost is higher at UT for the Maths programme. Nevertheless, the total cost works out 40-50 per cent less compared to campus costs.

Thus the study shows that the distance education system is evidently less expensive than the face-to-face system.

A comparison of unit costs of UT and of the campus universities of Indonesia was attempted in 1986 by a project called "Improving the Efficiency of Educational System" (IEES). It computed the faculty-wise weighted average of operational costs per student per year. It did not take into account the number of courses offered by the faculty.

The estimated cost per student at UT is lower (weight average 34.9%) compared to the cost at public as well as private: campus universities (42.8%) for all fields of study except Education. The reason attributed for the higher cost of Education is the low enrolment level in the courses and programmes offered by the School of Education.

International Perspective

A joint project of Harvard Graduate School of Education and the USAID on *The Cost Effectiveness of Distance Education for Teacher Training* (1991) undertook a comparative cost study of teacher training programmes in the distance and the conventional modes offered in Sri Lanka and Indonesia. The study provides evidence that distance education was "clearly more cost effective" than the campus education in Sri Lanka. In Indonesia, the distance language programme was found more cost effective, but the distance programme in Maths was found less cost effective, compared to corresponding programmes in the conventional face-to-face mode. The distance education programmes were found more cost efficient in both the countries from the point of view of Government costs. The annual cost per capita was 116-315 of the cost of campus based education. Government costs ranged from 1/10 to 113 of the cost of campus based programmes in Sri Lanka, and 114 of the cost of the campus based programmes in Indonesia.

In Hong Kong there are 7 conventional tertiary institutions. An attempt was made to compare the unit cost per student of these institutions with the corresponding cost at OLI. Again, it goes to prove that the distance mode is significantly less expensive. The computation of the unit costs is summarised in Table 1.19. The cost details relate to the year 1991-92. The figures do not include capital and research grants. The FTE of OLI is calculated on the assumption of 40 OLI credits as equivalent to a full-time work load.

Table 1.19: *OLI: recurrent grant and unit cost-comparison with conventional Institutions*

	Student Numbers (FTE)	Recurring Grant (% of total & expenditure) in HK\$ millions	Average Recurrent Grant (FTE) in HK\$	Unit Cost per FTE (HK\$)
HK University of Science & Technology*	700	293.116 (93%)	418,737	455,140
HK University	8,899	1038.219 (82.6%)	116,667	141,243
Chinese University of HK	8,895	909.998 (73.7%)	102,304	138,812
City Polytechnic HK	9,074	674.465 (84.6%)	74,330	87,860
HK Polytechnic	13,881	843.148 (83.3%)	60,741	72,919
HK Baptist College	3306	239.032 (83%)	72,302	87,111
Lingnan College**	1,426	79.266 (83%)	55,586	66,971
Open Learning Institute***	7,4760	20.900 (13.9%)	2,797	16,076

* The HK University of Science & Technology is a new university. Its FTE costs, therefore, are unusually high. The University is expected to reach its full capacity in about four or five years when unit cost per FTE will drop to the levels of the mature institutions.

** Lingnan College is another new entrant to tertiary education. It is a liberal arts college and overheads are very low.

*** FTE figures for the OLI are extrapolated from the total credits delivered by the Institute. In the year 1991-92 OLI delivered 298,000 credits. For purposes of comparison with other institutions 40 of OLI credits are considered equivalent to a full academic year worth of student workload.

Source: Personal correspondence with Director, OLI

Column 4 (average recurrent grant) represents the amount of money the government of Hong Kong gives on an annual per capita basis to the Institutions: Column 5 (unit cost per FTE) is the actual cost of supporting a student in the institutions. The difference between column 4 and column 5 is met by student fees, endowments, donations etc.

In the case of OUSL, comparative cost details of similar programmes are available only for the Science and Law programmes (Ranasinghe, 1992).

The cost advantage at OUSL, in the case of the Law programme is meagre 38 per cent but in the case of Science Programme it is about 45.5 per cent. But it is relevant here to point out that the Bachelor in Law is the only programme which fetches more money to the OUSL through student fees than what it actually spends on it. The details of the total cost, present fees and difference are given in Table 1.20.

Table 1.20: *OUSL: difference between programme cost and student fee (Bachelor's Degree Programme in Law)*

Level	Total Cost (in Rs.)	Present Fee (in Rs.)	Difference (in Rs.)
3	1001.67	1620.00	+618.33
4	1360.19	1620.00	+259.81
5	1350.61	1620.00	+269.31
6	1063.27	1620.00	+556.73

Source: Dissenayake, 1989

In the case of AIOU, cost statistics of recent days is not available. Siddiqui (1987:221) has attempted a comparison of costs for two programmes. Based on project intakes for 1987-88 extrapolated from the earlier enrolments, he presents the costs for two levels of award. Intermediate and B.A. which cost 69 per cent and 72 per cent of the cost of the programmes of the same level offered by conventional institutions.

The cost for conventional institutions are based on estimated 1978 figures corrected for inflation by a cautious 25 per. cent.

Similarly, in the case of STOU the statistical information available on cost comparison relates to the year 1980. A comparison of operating costs per head in the same discipline is provided in Table 1.21.

Table 1.21: *STOU: comparison of cost by disciplines with conventional universities*

Discipline	Conventional Universities (Baht)	OUs (Baht)	OU cost as % of CU
1. Business Administration and Commerce	14,778.15	1,695.95	11.35
2. Natural Science	19,778.15	972.72	4.91
3. Education and Teacher Education	20,507.39'	638.08	3.1 1
4. Social Behaviour Science	13,435.97	59 1.84	4.40
5. Law	1 1,970.8 1	46 1.34	3.85
6. Humanities	14,332.56	305.36	2.13

Source: Chaya-Ngam (1987:348)

The figures given in Table 1.20 represent only the operating costs. Capital costs are not included. "The table demonstrates the economical effect of large-scale operations. The large number of students in the open university helps to reduce the average cost" (Chaya-Ngam, 1987:346). The open type universities represented in the Table include STOU and Ramkhamhaeng University. The operating cost of open type universities for different disciplines varies from 2.13 per cent to 11.35 per cent of the operating cost of the same disciplines at the conventional type universities. STOU operating cost per head as percentage of cost per head of conventional institutions varies from 1.94 per cent to 20.42 per cent. The operating cost per graduate of STOU is in the range of 4.84 per cent to 54.91 per cent of the cost per graduate of the conventional institutions.

Thus, wherever comparative studies have been made and the details of studies are made available, the figures speak positively in favour of the economic advantage of the distance education system and support the economic argument. But the question is whether the cost advantage claims can be sustained against the question of quality.

1.7 SUCCESS RATES AND LEARNER BENEFITS

What we need to consider in the light of the foregoing discussion is not a comparison of quality – comparison is worth only where 'like is compared with like' as we said earlier; we should rather concern ourselves with the target set, the achievement made and the cost suffered. With this assumption the success rate and the learner-benefits are studied in the following section.

The success rates as given in the papers presented at the Madras seminar are tabulated below. The success percentage represents the number graduated as against the number enrolled, or appeared for exams. Strictly speaking, the percentage of pass against those who have enrolled in a course will not reflect the true success rate in a system where student-paced learning is a declared policy. The comparison should, then, be with those 'active' in a given semester or term and those turning out successful.

Table 1.22: *Institutions under study: percentage of students passing examination*

OU	Pass % (enrolment)	Pass % (appearance)
IGNOU	22.5	-
YCMOU	-	56.2
BRAOU	29.14	-
OUSL	26.22	59.56
OLI	44.12	75.19
CCIs		
Delhi University	28.2	-
Annamalai University	40.4	-
Bombay University	41.2	-

Table 1.22 shows the highest pass percentage for OLI, whether it is against the enrolment or against the appearance. It should be remembered that at OLI the students have to meet almost the full cost of their education, whereas at the other institutions the cost is highly subsidised by the governments concerned. Considering the average pass percentage for the conventional institutions of India (Pillai, 1992:23), the pass percentage of Indian OUs/CCIs ranging from 22.5 per cent to 41.2 per cent may be taken as a positive indicator of performance, given the flexibility of OUs in terms of duration of studies besides, other differences.

Details of success rates concerning STOU are given by Sriprasad, et. al. (1988: 160). The percentages represent average graduation rate per year of the total enrolment in the relevant programmes: Two year continuing education Bachelor's Degree Programmes 38 per cent; Three year Bachelor's Degree Programmes 20 per cent; Four year Bachelor's Degree Programmes 15 per cent; One year Certificate Programmes 37 per cent.

One year and two year programmes show an average success rate of 37 per cent and 38 per cent. As programmes of longer duration show lesser success rates, the programme-duration perhaps has something to do with the

sustenance of interest and motivation. May be with part-time pursuers of learning, length of duration has a negative influence.

As for UT, Rakhmat et al. (1988) gave some details of success rates for the initial three years of UT operation. During 1984-85 to 1986-87 the cumulative enrolment for degree and diploma programmes was 131,743 out of which the active students were 67,446 (ibid: 175). UT did not graduate any students during the three year period; but it produced 2,607 diploma graduates (ibid: 183). As details of students enrolled for the diploma programmes are not available, it is not possible to work out success rates. However, the retention rates, based on 1984-85 cohort sample, show that only 60.5 per cent students stayed through all the four semesters; 19.8 per cent dropped out at the end of the first semester, 10.7 per cent at the end of the second semester and further 9 per cent at the end of the third. Challenges of a self-learning system, difficult learning materials, poor exam results, family and job related problems were some of the factors that inhibited students from further registration (ibid: 188).

Individual studies about the relevance of education to employment and to job performance have been carried out in Thailand. The research titled *Occupational Benefits of Open University Education* by Dr. Preeach Kamphirapakorn, et al. found a higher level of capability in their sample (Sriprasart, 1988: 160). Another study by Maethi Piyakhum found a different sample registering a high level of job satisfaction, using what they had learnt in their jobs at the OU and receiving much overall benefit (ibid:160). Statistical data on application of learning to jobs are given in Table 1.23.

Table 1.23: STOU: application of learning to jobs (percentage)

	1984	1985	1986	1987	1988
Very much	32.6	32.1	30.6	30.0	27.9
Much	55.6	53.8	54.0	53.5	53.3
Little	8.2	9.8	10.7	10.5	13.2
Very little	2.7	2.7	3.6	3.6	3.6
No response	0.9	1.7	1.1	2.3	2.0

Source: Ranasinghe, 1992

The statistics shows that about 30 per cent students every year find their learning "very much" useful in their jobs and around 54 per cent find it "much" useful.

A majority of STOU's students (an annual average of around 83 per cent) are government employees "who do not change their jobs following their studies". Their aim is to improve their qualification or knowledge and they are satisfied that they "can apply their knowledge so as to advance in their careers and increase their expertise" (Sriprasart, 1988: 161).

Information on similar studies undertaken in other Asian countries is not available. It is said in India, Indonesia and Sri Lanka the respective governments treat OU graduates on par with CU graduates. In Sri Lanka "the OUSL degrees are of the same standard as those of [the] other eight universities.... The professional bodies like the Council of Legal Education have recognized the OUSL Law Degree" (Ranasinghe, 1992:21)". Most of those who received the certificate in Pre School Education have started their own pre schools and others have been recruited in existing schools. The students qualified in the Diploma in Technology are working as Engineering Asst. Technicians, while continuing their studies for Bachelor of Technology.

Science graduates of OUSL are all either employed as teachers or holding executive posts in other organizations. Law graduates are all employed." (Ranasinghe, 1992: 13).

1.8 LET US SUM UP

The Premise

A study of cost effectiveness is a study of the relationship between the resources utilised (the cost) and the objectives fulfilled (the effectiveness). Often information about the cost and the effectiveness is meaningful only in a comparative context. A cost effectiveness study, therefore, has to follow four distinct steps:

- i. defining objectives;
- ii. determining the cost;
- iii. comparing costs; and
- iv. comparing effectiveness.

Any comparison of cost, to be valid and reliable, should ensure:

- i. methodological similarity in costing the two units compared (i.e., applications of identical costing concepts and costing methods); and
- ii. functional similarity of the two units (i.e., pursuit of similar objectives in identical operational situations).

Comparison of effectiveness is possible:

- i. only when the two units compared share similar ideologies and pursue similar objectives; and
- ii. only in cases of such objectives which are objectively measurable and quantifiable.

It is obvious that these conditions may not be met fully by any two institutions that belong to two different systems. One may only look for as much commonality as possible. Perhaps all comparisons in the real world situation have to accept this compromise.

A cost effectiveness study begins by defining objectives. Accommodating social demands for higher education is the broad objective in relation to which the cost effectiveness of Asian OUs is studied. Social demand in this study was analysed in terms of the broad parameters identified by Gooler, namely, numbers and egalitarianism, economy and quality of education to which we added 'continuing education'.

An attempt has been made in the course of the study to determine the extent of contribution made by Asian OUs in meeting social demands in terms of the broad parameters listed above. The question of numbers and necessity has been dealt with in terms of enrolment and in terms of programmes-types, levels and disciplines. Each of the OUs is found to accommodate a population several times larger than a traditional institution which similar resources can normally accommodate. The figures keep increasing – not only in terms of enrolment, but also in terms of number of institutions. Table 1.24 illustrates the point:

Table 1.24: *Institutions under study: trends in student enrolment*

Years	IGNOU	BRAOU	YCMOU	KOU	STOU	OUSL	OLI	UT
81-82					82,139			
82-83					69,046	2,360		
83-84		6,231			46,900	6,879		
84-85		11,244			83,640	5,873		
85-86		15,702			79,990	9,052		85,329
86-87	4,381	19,271			61,687	10,063		85,015
87-88	16,811	16,303		14,278	48,500	13,119		19,665
88-89	42,324	16,827		22,983	49,420	13,197		7,509
89-90	48,281	16,402	1,240	14,389	52,831	12,832	4,237	9,041
90-91	52,376	27,446	9,566	12,263	67,398	14,407	13,009	37,151
91-92	62,375	32,416	13,052		80,000		17,535	66,513
92-93	75,666		15,276					

Notes: In the case of STOU, OUSL and UT, the figures represent enrolment in a calendar year; while in the case of the rest the figures represent enrolment in an academic year. The former of the two numbers in Column 1 is to be taken to represent the calendar year in respect of STOU, OUSL & UT.

In India, the OUs and the CCIs collectively catered to 11.5 per cent of the total population enrolled for higher education. They were expected to increase their clientele to 16.5 per cent during the Eighth Five Year Plan. In absolute terms, this would mean a net addition of 400,000 students to the enrolment in open universities/distance institutions.

The annual intake at IGNOU and YCMOU show a record of consistent increase. While IGNOU has gone through seven cycles of enrolment, YCMOU has gone through four. Introduction of newer programmes in successive years is perhaps a factor contributing to the consistency in increase. The nine cycles of enrolment at BRAOU and OUSL show a steady growth, except on one or two occasions. STOU with ten cycles of enrolment showed a declining trend for a brief period from 1985 to 1987 after which it shows a trend of ascent. UT, for which figures for 8 years are available shows a steep declining trend up to 1989 after which it seems to have recovered comfortably, but not yet the level of its first two years. The decline is said to be part of a common trend in enrolment for higher education in Indonesia during the period because of economic reasons and also because of general trend among school-leavers to shift from university education to short-term vocational courses. Fear of difficulties in pursuing self-learning is also said to be a reason.

The enrolment at KOU is also on the decline. The reason attributed, in this case, is the need on the part of authorities "to man the house properly" so as to ensure maintenance of regularity in the calendar of activities. Among the CCIs of India, for which figures are available, a steady growth trend is seen in the case of four and mixed trend in the case of one, if one takes the figures since 1982-83. Figures for the remaining CCIs are not available. On the whole, therefore, there is a rising trend in enrolment, reflecting a constantly increasing social demand for higher education.

Age Spectrum

The profile of OU learners in terms of age indicates, in very clear terms, that OUs are catering to an age-specific population (21+) who may not have access to higher education institutions of the conventional type. The 21+ years population ranges from 1.37% (OUSL) to 12.65% (YCMOU) of the total enrolment. A large percentage of learners belong to 21-30 age group, ranging

from 45-49% (OUSL) to 79% (BRAOU). These are target groups outside the ambit of the conventional institutions.

Gender Ratio

The male-female distribution of learners corresponds more or less to the ratio in the conventional institutions. The largest female participation ratio is available at STOU (47.16%). The expectation that more women students would avail themselves of the OU opportunities is yet to be realized at least in the case of India. The reason could be traced to the nature of programmes/courses offered and the entry requirements stipulated. More programmes that suit women's interests and aptitude may have to be designed and introduced. For most of the rural women in India, the language of instruction could also be a hurdle, if instruction is offered in English or in languages other than their mother tongue or the regional language.

Employment Status

Participation of unemployed students is more in the OUs of India 47.33 per cent in IGNOU and around 43 per cent in BRAOU (BRAOU percentage is computed from 1986-87 figures). In the other OUs the percentage ranges from 2.9 per cent (Hong Kong) to 20 per cent (Sri Lanka). These figures again lend support to the premise that OUs cater to a population that has no access to higher education institutions of the conventional type. 80 per cent to 97 per cent of students enrolled at OUs are already on a job and pursue higher education for improving their qualification or skill.

Entry Qualification

Few of the students at the OUs have degree qualification. The percentage is 14 at STOU out of its total enrolment (5.2 at OL1 and 34.78 at IGNOU). The percentage-variation could be attributed to the levels of programmes offered. IGNOU offers quite a few postgraduate diploma and degree programmes in Management, Distance Education, Higher Education and Library Science which require a degree as entry qualification and these courses also enjoy a popularity among graduates employed in the fields concerned.

The learner profile, thus, allows a categorical assertion of the population served by the OUs-adult, mostly employed undergraduates, seeking to pursue higher education.

Programme Profile

The programme profile shows that all the OUs under study have been offering job-oriented programmes and programmes of life-long and continuing education, besides conventional programmes. Though the number and range of such programmes vary from one institution to another, the profile is a pointer to the commitment of OUs to meet the dual social demands for (i) conventional type of programmes, and (ii) programmes of relevance to life. Four of the OUs offer welfare oriented programmes which may be directly relevant to the promotion of social welfare programmes in such areas as food and nutrition, rural development, home economics, cultivation of crops, etc. The same four OUs have also been offering programmes that are not available elsewhere in the conventional system within the country: such programmes as on distance education and programmes of "non-formal stream" leading to Bachelor's Degree.

Thus, the learner profile and the programme profile together indicate clearly the OUs' orientation towards meeting social demands in terms of numbers and necessity as also the demands of continuing education, though any objective quantification of such service is not possible at this stage. Detailed classified data from the institutions concerned, if collected by the institutions in future, may help in quantification.

Equity

As far as the egalitarian dimension is concerned, though the provisions of education are thrown open to all by the OUs, irrespective of the local and social and economic stratification, we have little statistical evidence to show whether, and to what extent, disadvantaged sections of society receive benefits. The study attempted to collect data relating to:

- rural-urban distribution of students;
- income-based distribution of students; and
- the beneficiaries across the disadvantaged social sections.

We could collect data only from certain institutions with regard to the rural-urban distribution and the 'socially disadvantaged' distribution. The data collected was found to suffer from lack of precision for want of clear understanding of the terms 'rural' and 'urban' among the student population. Most of the employed students of OUs are migrants to urban locales and are not sure whether they should call themselves urban on the basis of their job-station or rural on the basis of their nativity. As for socially disadvantaged sections, a problem of different nature came to light in the course of the study. Disadvantage was along different lines in different countries – when caste and community could be a disadvantage in one country, race was in another, language or religion in yet another, and region in some other place. What makes one disadvantaged in a given country was not known definitely and data was not available when they were identified. As for the economic criterion, neither sufficient details of what economic condition can be termed as disadvantaged in a given country, nor enough data could be collected. The open universities covered in this study, with the exception of STOU, have not collected and compiled data on the income brackets to which their students (or their families) belong. The classification of students into high, middle and low income groups (UNESCO & NIME, 1992) indicates clearly that at least in the four OUs covered by this study, the majority of learners are from middle and low income groups.

The data collected for this study make it clear that the OUs serve the cause of those aspirants to higher education who, either because of their age or employment or material status, are unable to pursue higher education in conventional institutions (87 per cent of women enrolled at BRAOU according to 1986-87 figure were married).

The other parameters of social demand, namely, economy and quality of education were taken up in the discussion of the comparison of cost and comparison of effectiveness.

Cost Effectiveness

With regard to costing, the study envisaged collection of information on unit costs of each of the OUs and the unit costs of a corresponding conventional institution in the country concerned. Because of the complexities and the

differences in the cost concepts and cost methods applied in determining cost at different institutions, collecting identical data for comparison became difficult. This was in spite of our effort to collect comparable data through local experts of different institutions. Difficulties stemmed from a variety of cost-factors as well as non-cost factors.

As a result, we could collect identical pairs of unit cost only with regard to certain programmes and institutional average cost per student of certain institutions. The other dimension of comparison which we could try was the government contribution as against self-generation of funds. The direct comparison of unit costs across programmes could not be attempted because of inconsistencies in cost centres between the OUs and CUs. The comparable data thus collected were very limited, yet they do indicate the cost trend.

The programme specific cost per student proves that OUs are less expensive than CUs. The cost per student for the Bachelor's (Arts & Commerce) programmes at IGNOU and YCMOU is about 1/3 of the cost for corresponding programmes in the conventional system. The cost per student for the Bachelor's programme in Science, at the OUSI, is less by 45 per cent compared to the corresponding programmes at conventional institutions in Sri Lanka. The per student cost of Mathematics Diploma Programme of UT is about 50 per cent of the corresponding programme at the conventional institutions in Indonesia. Similarly, the Indonesian Language Diploma Programme costs 60 per cent less than its counterpart in the conventional institutions.

The CCIs of India make more pronounced claims for cost advantage. The cost per student of the CCIs, worked out as percentages of cost per student of the conventional system (operating within the same university and mostly within the same campus), ranges from 10 per cent to 23 per cent. Other studies conducted on the CCIs confirm their cost advantages in different degrees. At any rate, there are some CFCIs in India which generate considerable surplus funds through economies of scale, and taking full advantage of the dual mode system that helps reduce costs. There are also, on the other hand, CCIs in India which depend on government grants to meet their deficit in the operating costs.

Government grants on account of the operating costs of CCIs/OUs range from 8 per cent (CCIs) to 67.67 per cent (IGNOU). Government grants to CUs range from 62 per cent to 90 per cent. IGNOU generates its own funds to the tune of 32.3 per cent of the total operating costs; BRAOU 74.41 per cent; KOU 50 per cent; STOU 78.88 per cent; OUSL 74 per cent, OLI 85 per cent and selected CCIs 92 per cent.

Comparison of effectiveness of programmes is difficult when programme objectives are not precisely defined. The problem becomes "particularly acute" because when we attempt to compare the effectiveness of OU programmes with that of CU programmes, we are attempting to compare "the effectiveness of one programme that has one set of intentions, with another programme that has a different set" (Gooler, 1981). Under such circumstances we need to make certain assumptions and allow for certain differences. In the absence of distinctly spelt programme objectives, we need to depend on pass percentage data as an indicator of effectiveness. The data on pass percentage against enrolment collected from OUs are reasonably acceptable, if we give due allowance to the flexibility permitted in the system. The percentage ranges from 22.5 to 41.2. The percentage of pass against the number of students appeared presently a fairly good ratio. In either case, the failure cannot be equated with "wastage".

The Bridges project which studied the teacher training programmes offered through distance and conventional modes in the countries of Sri Lanka and Indonesia, has come out with statistical evidence to prove cost effectiveness of the distance mode. But as for programme effectiveness, the study indicates mixed results.

Very little information is available about studies on programme effectiveness concerning distance education programmes in Asian countries. Subjective statements made in different contexts affirm that distance education programmes are equally effective, if not more, compared with conventional programmes.

Studies undertaken in Thailand confirm student acceptance of usefulness of the programmes in jobs.

The benefits of OU programmes along different dimensions have been acknowledged by Sriprasart et al. (1988), Rakhmat et al. (1988) and others. There are certain clear trends which are discernible from this study. These are:

1. Adult learners are increasingly interested in higher education and are looking for opportunities to improve their qualification and/or skills to seek employment, to change jobs or for their own personal development. This is a constituency not served by the conventional university and the OUs respond to their needs without having to undergo any dislocation in their life and work.
2. The enrolment of women in OUs in Asia as a proportion to the total enrolment seems to be low. However, considering the fact that a vast majority of them are adult women (21 + in age), most of whom might have settled in life after marriage, their number in absolute terms is significant. The OUs provide an institutional mechanism for the empowerment of women, raising their social and economic status and ensuring gender equality. Through appropriate measures to attract women to enrol in their programmes and retain them till the successful completion of their studies, OUs can become an instrument of social change, as far as gender equality is concerned.
3. The employment status of OU students in Asia is a clear indicator of the nature of emerging demands for higher education. The majority of OU students in Asia are already employed. Apparently, they seek new qualifications and wish to acquire new skills for advancement in their career. The structures and processes of the conventional system cannot respond to this demand. The built-in flexibility of the OUs permit them to address the needs to these new client groups and tailor programmes to meet them. The modular structure of the programmes adopted by the OUs permit mobility of students across programmes and also across institutions.
4. The conventional system of higher education does not produce a wide range of instructional materials of high quality and standard as the OUs do and make available to their students. The participation of a wide spectrum of top level experts – both in teaching and in the professions – in the development of these materials ensures their quality. That these materials are available openly, not only to the students of OUs but also to the students of the conventional universities and the general public is a distinct contribution that the OUs make to the needs of a learning society.

5. The OUs adopt communication technology to great advantage. They can reach a large number of students scattered at different places at a relatively low cost. OUs are thus instruments of mass education, while CUs of necessity, have to be selective in choosing their students in smaller numbers.
6. The OUs have signalled an era of national and international cooperation and have widened access to good quality education to students across nations. There are several instances where materials produced by one university are utilised by another to great advantage. There are also instances of adaptation and translation of materials for local use. The OLI, Hong Kong virtually buys programmes off the shelf and uses them in their programmes by incorporating minor changes to suit local needs. The emergence of OUs is surely a great opportunity for the less developed countries that do not have the resources to create the infrastructure required for higher education in their own countries. It augurs well for a new era of international cooperation in higher education.

1.9 REFERENCES/SUGGESTED READINGS

- AIU (1993). University Institutions in India, New Delhi: AIU.
- Ansari, M.M. (1992). 'Cost effectiveness of Distance Education Programmes: with reference to correspondence courses in India', paper presented at the Madras Seminar, 22-24 Dec. 1992.
- Ansari, M.M. (1992A). Economics of Distance Higher Education, New Delhi: Concept Publishing House.
- Birch, D.W. & Cuthbert, R.E. (1981). Costing Open Learning in Further Education; London: C.E.T.
- Chaya-Ngam, I. (1987). "Distance Education in Thailand", in Distance Education in Asia and the Pacific, Volume 11, Manila: Asian Development Bank.
- Curran, C. (1988). 'Resource Factors' in Developments in Distance Education in Asia: An analysis of five studies, UNESCO/IICDE.
- Daniel, J. (1987). 'World Trends in Higher Distance Education and Opportunities for International Cooperation', in Higher Level Distance Education (Perspectives for International Cooperation and New Developments in Technology), UNESCO-Deakin University Co-publication.
- Dissenayake, N.et.al. (1989). 'Cost of courses/programmes of study offered by OUSL', Nov. 1989 (unpublished).
- Datt, R. (1993). 'Cost of Distance Education Institutions', in Open Learning System in India, K.D. Sharma and D.V. Sharma (Eds.), New Delhi: Allied Publishers Ltd.
- Dhanarajan, G. & Hope, A. (1992). 'Planning towards self-financing: A question of quality, access and economics', paper presented at the Madras Seminar, 22-24 Dec. 1992.

- Gupta, M.L. (1986). *Finances of Correspondence Education*, Journal of Higher Education, 12(1-3), New Delhi, University Grants Commission.
- Gooler, D.D. (1981). 'Critical Issues in Evaluating Distance Teaching Programmes', paper presented at the Regional Symposium on Distance Teaching in Asia, 4-7 May 1981, Universiti Sains Malaysia.
- Hawkrige, D. (1987). 'General Operational view of Distance Education', Discussion Paper on Education and Training Series, Report No. EDT 68, The World Bank.
- Koul, B.N. (ed). (1993). *A Vision*, New Delhi, Indira Gandhi National Open University (mimeographed).
- Musa, I. (1991). *Policy Implications of the Scale Economies of the Universitas Terbuka Courses and Programmes*, unpublished Ph.D. Thesis submitted to the School of Education, Dept. of Educational Administration and Policy Studies, State University of New York at Albany
- Neilson, D.H. et al. (1991). *The Cost Effectiveness of Distance Education for Teacher Training*, BRIDGFS Research Report Series, April 1991, No. 9.
- Pillai, C.R. (1992). 'Accommodating Social Demand for Higher Education: Cost Effectiveness of IGNOU', Paper presented at the Madras Seminar, 22-24 Dec. 1992.
- Pillai, C.R. & Naidu C.G. (1991). *Cost Analysis of Distance Education: IWU*, New Delhi: Indira Gandhi National Open University.
- POA (1992). *Programme of Action 1992*, New Delhi: University Grants Commission.
- Prasad, V.S. (1993). 'Andhra Pradesh Open University – A Profile', in *Open Learning System in India*, K.D. Sharma & V.D. Sharma (eds), New Delhi: Allied Publishers Ltd.
- Rakhmat, et al. (1988). "The Indonesian Open Learning University", UNESCO Project Report in *Developments in Distance Education in Asia*, UNESCOIICDE.
- Ranasinghe, A. (1992). 'Accommodating Social Demand for Higher Education: Cost effectiveness of OUSL', paper presented at the Madras Seminar, 22-24 Dec. 1992.
- Rao, K. (1992). 'Unit Costs: a case study of Dr. B.R. Ambedkar Open University', paper presented at the Madras Seminar, 22-24 Dec. 1992.
- Rojanasang, C. (1992). 'Accommodating Social Demand for Higher Education: Cost effectiveness of Sukhothai Thammathirat Open University', paper presented at the Madras Seminar, 22-24 Dec. 1992.
- Rumble, G. (1986). *The Planning and Management of Distance Education*, London: Croom Helm.
- Selim, M. (1987). 'Distance Education in Asia and the Pacific', in *Distance Education in Asia and the Pacific*, Volume I, Manila, Asian Development Bank.

International Perspective

- Shanna, Y. (1992). 'Accommodating Social Demands for Higher Education and the Cost-effectiveness of Open Universities in Asian countries with special reference to Rajasthan', paper presented at the Madras Seminar. 22-24 Dec. 1992.
- Siddiqui, S.A. (1987). 'Distance Education in Pakistan' in *Distance Education in Asia and the Pacific*, Volume 11, Manila, Asian Development Bank.
- Singh, B. (1992). *Correspondence/Distance Education in India: An Indepth Study*, New Delhi: IGNOU (Research Project).
- Snowden, B.L. & Daniel, J.S. (1983). 'The Economics and Management of Small Post-Secondary Distance Education Systems', in *Distance Education: International Perspectives*, David Sewart, et al. (eds), St. Martin's Press.
- Srinivasan, T.R. (1992). 'Accommodating Social Demands for Higher Education: Cost effectiveness of Universitas Terbuka, Indonesia', paper presented at the Madras Seminar, 22-24 Dec. 1992.
- Sriprasart, P. et al. (1988). 'An Asian Institution Making Large Scale use of Communications Technologies for Educational Purposes: A Case Study of Sukhothai Thammathirat Open University', Unesco Project Report in *Developments in Distance Education in Asia*, Unesco/ICDE.
- Srisa-an, W. (1987). 'Financing and Cost effectiveness of Distance Education', in *Distance Education in Asia and the Pacific*, Volume I, Manila, Asian Development Bank.
- Swamy, V.C. Kulandai (1991). 'Distance Education: Status and Prospects', in *Higher Education in India: Retrospect and Prospect*, Moonis Raza (ed.), New Delhi: AIU.
- Swamy, V.C.Kulandai (1992). 'New Pattern of Education: Distance Education', paper presented at the Madras Seminar, 22-24 Dec. 1992.

1.10 MODEL ANSWERS TO ACTIVITIES

Activity 1.1

The basic cost function in distance education includes:

$$TC=TF+TV$$

Where the total cost includes the total fixed cost and total variable cost. Both of these costs concern with production, instruction, evaluation, and administration of distance education.

Activity 1.2

For calculating cost of developing a new programme, before the programme is developed and delivered, the following formula is used:

$$CNP = bx + cxy$$

Where, cost of a new programme includes the total of number of course credits, student number, development cost, and course delivery cost.

UNIT 2:

COST OF DISTANCE EDUCATION IN CHINA

Structure

- 2.1 Introduction
- 2.2 Learning Objectives
- 2.3 Distance Education at Tertiary Level in China
- 2.4 Theories and Methods for the Economic Analysis of RTVUs in China
 - 2.4.1 Economic analysis of RTVUs in China: The funding base
 - 2.4.2 Expenditure
 - 2.4.3 Average cost per student for the CRTVUS
- 2.5 A Comparative Analysis of Economics of Distance versus Conventional Education System on China
- 2.6 Comparison of Cost Structures
 - 2.6.1 The economic advantage of China's RTVUs
 - 2.6.2 The role of educational technologies
 - 2.6.3 The RTVUE's contribution to higher education and the development of socio-economy of China
 - 2.6.4 New changes and trends
 - 2.6.5 Prospects of TRVUE in China
- 2.7 Let Us Sum Up
- 2.8 References
- 2.9 Model Answers to Activities

2.1 INTRODUCTION

This case study by Prof. Xingfu Ding is basically on the erstwhile Central Radio and Television University (CRTVU) in Beijing which has now been renamed as Open University of China. The term 'TV University' has to be read in that context as given this unit.

China is a developing country with a vast territory, huge population, a developing education system (especially higher education), a fast growing but still relatively poor economy, and major social changes. Distance education has served and will continue to serve China's economic and social development. Chinese distance educators have an interest in the economic of distance education. I have followed this researched subject in the past ten years and have conducted and published several research works (Ding 1983a; Ding, 1983b; Ding, 1991). Other Chinese and Western researchers have also contributed to the economic and educational analysis of the quality of the Central Radio and TV University System (CRTVUS) and some **Provincial Radio and TV Universities (PRTVUs)** (Hawkrige and McCormik, 1983; Huang and Zhao, 1990; Orivel, 1982; Peng, 1986; Zhang, 1991). This paper provides a systematic economic analysis of the Chinese Radio and TV Universities Education (RTVUE), incorporating and integrating some of the earlier research.

Before starting the economic analysis, however, a brief description of China's distance education system and its unique characteristics in management, programs and multi-media teaching is given. Then the write-up provides an economic analysis of the RTVUE, including a comparison with conventional universities in China. In the conclusion, I will go back to the framework of the rationale for the development of distance education and examine the implications of the economic analysis of RTVUEs for general higher education policy in China.

2.2 LEARNING OBJECTIVES

After going through this unit, you should be able to:

- describe the status of distance higher education in the Peoples' Republic of China;
- analyse the sources of income and expenditure for distance education in China; and
- compare the economic status of conventional and distance education in China, and the cost advantage for the latter.

2.3 DISTANCE EDUCATION AT TERTIARY LEVEL IN CHINA

Distance education at tertiary level in China has two major forms: one is the correspondence education provided by conventional universities and colleges, and several independent correspondence schools. China began its correspondence education at university level in 1953. In correspondence students reached 5,36,200. From 1982 to 1991 there were 1.453 million graduates from RTVUs, which equals 31% of the total graduates from conventional universities and colleges over the same period, and 58% of the graduates from other adult institutions of higher education. This means that about 17 out of 100 total university graduates in China during 1982-1991 were from RTVUs.

The other new form is radio and TV education provided by RTVUs and the Chinese Radio and TV Normal Institute (CRTVNI). The RTVUE of China started from 1960, when several metropolitan RTVUs were set up in Beijing, Shanghai, Shangyang, Changchun, Harbin and Guangzhou. China's CRTVU system was founded in 1979, constituted by a Central Radio and TV University (CRTVU) and 28 Provincial RTVUs (PRTVUs). By 1990, the CRTVUS has become a huge national system with a Central Radio and TV University, 43 PRTVUs, 666 Branch Schools (BS) at city level, over one thousand Work Stations (WS) at country level and over ten thousand TV Classes (TVCL) in various grass-roots units. The total enrolment in the CRTVUS in 1990-91 was 875,001 in which 407,726 were studying for Short-cycle Higher Education Diploma (SHED) and all others for professional, vocational and technical training. The CRTVNI was set up in 1987 for in-service training teachers at primary and secondary schools. The total enrolment of CRTVNI in 1989 was over 300,000. Table 2.1 summarizes the status of this system, as at 1990-91.

Table 2.1: *Status of China's Radio and TV Universities System, 1990-91*

Undergraduate programs of short-cycle courses:	
Entrants	112,214
Enrolments:	407,726
Graduates:	120,532
Total Graduates (1982-1990):	1,296,000
Technical, vocational and continuing education programs:	
Entrants:	534,837
Enrolments:	467,275
Students completing the courses:	399,363
Total enrolment (1990-1991)	875,001
Full-time staff members:	36,069
Full-time academic members:	14,196
Par-time academic members:	13,035
Total fixed capital:	1,170,000,000 RMB
Equipment:	309,000,000 RMB
Print and audio-visual material collection:	110,000,000 RMB

Source: Zhang (1991)

Four characteristics of its Unique Teaching System

- Audio-Visual materials, both broadcasting (TV and radio programs) and non-broadcasting (audio and video cassettes) are used on a large scale. TV and radio programs have become the main media for passing on core materials and teaching information for the courses.
- The design level of educational technology for most audio-visual materials is still at the very beginning stage. Most broadcast programs and cassettes are not far different from face-to-face lectures in classrooms at regular universities and colleges, i.e., most TV programs (video cassettes) are just like 'moving the blackboard to the TV screen', or even 'talking head'; most radio programs (audio cassettes) are based on reading item by item from lecture notes.
- Most print materials are similar to the standard textbooks used in regular universities and colleges, and quite different from correspondence learning materials.
- Face-to-face tutorials take a lot of time and play an important role in the multimedia teaching model.

Table 2.2 records the quantitative growth of the system.

Table 2.2: *The number of institution of five levels of China's CRTVU system (1990-1991)*

CRTVU	PRTVUS	Branch Schools	Work Stations	TV Classes
1	43	666	over one thousand	ten thousand

Source: Zhang (1991)

Five Characteristics of its Unique Administrative System

- The entrance policy is changing from relatively open to more closed.
- Educational programs and curricula run on three levels; central, provincial, and local. This helps to guarantee educational quality and cost-effectiveness, and to fit to the needs of local societies.

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- The academic programs and curricula, the credit and course selection system are basically similar to those of regular higher education. Some programs and curricula are outdated and inflexible, and are not suitable for in-service adult students.
- Most students are organized in TV classes. Most learning activities are organized in TV classrooms. There is too much unification, concentration, and compulsion in the space, time and pace of learning activities for students.
- There is a huge multi-level system of complicated relations between various RTVUs and various governments. The social system engineering required to run such a system to gain both higher educational quality and cost-effectiveness is difficult. It is also a difficult task to keep the balance between national planning, control, and management, and local autonomy, independence, and operation.

From the perspective of educational economics all relevant components at various levels, from the State Council and its departments, local governments, to students and their families and work-units, contribute financially to the system; and all institutions and units (including broadcasting organisations) at different levels and students themselves expend some of the financial resources.

A Great Variety of Programs and Levels, and Types of Students

A great range of educational programmes, from higher education in various study fields (10), disciplines (30) and specialties (295) in the 1990-91 academic year, to technical, vocational and continuing education and training, are provided by the RTVUs. Also the RTVUs of China have various types of students as well.

A Unique Multi-Media Teaching and Learning Model

A large amount of audio-visual course materials (including a high quantity of broadcast programmes and a great number of audio and video cassettes) and a substantial component of face-to-face tutorials based on group learning in classrooms located in students' working places are typical characteristics of the distance teaching and learning model in China.

At present, China Education Television (CPTV) is using two channels to transmit the courses offered by CRTVU for 12 hours per day, accounting for 4368 hours per year via the satellite located in longitude east 110.5 degrees. The China Central Television (CCTV) transmits the courses offered by CRTVU for 22 hours per week, accounting for 880 hours per year. So in total the courses of CRTVU are transmitted for 5248 hours every year.

In addition to this, the CETV transmits 310 hours of programs of rural education and training courses for CRTVU. Besides, regional radio and TV networks transmit some audio-visual teaching programs of standard courses and some courses offered by provincial and local RTVUs.

The TV broadcasts are transmitted mainly by the CCTV through the national microwave network (1320 hours per year) and by CETV through two special satellite TV channels (3964 hours per year). Some TV programs and all radio programs are broadcast by provincial and local networks (see Table 2.3).

Table 2.3: *Timetable for TV programs nationally offered by CRTVU and for radio programs in Beijing (1989-1990)*

Type	Area	Channels	Time	Level	Total hours		
					P/D	P/W	P/Y
TV	China	China Central TV (CCTV) National Microwave Network	8.30 Mon- 11.20 Sat 13.30-Sun 16.30	Under graduate No	5.5	33	1320
		China Education TV (CETV) 3823 MH	16.50-Mon- 23.00 Sat Sun	Under graduate N-gener	7	49	2520
		International Communication Satellite 3923 MH	8.00-Mon- 11/.28 Sat Sun	Undergraduate N-gener	4	28	1444
Radio	Beijing	Beijing Radio Station (BRS) 1026 KH 927 KH	7.30- 12.00 Sat 16.20- Sun 21.40	Mon-College	4.5	31.5	1500

Source: Ding (1989)

Another feature of media teaching is that various courses use different media, e.g., scientific and engineering courses use a lot of TV instruction programmes and video cassettes and humanities courses mainly use radio broadcasting and audio materials etc., and of course different media have a variety of cost structures.

2.4 THEORIES AND METHODS FOR THE ECONOMIC ANALYSIS OF RTVUs IN CHINA

In my research on economic analysis of China's RTVUs, I have introduced and adapted some basic concepts and formulations of western distance education researchers (e.g., Kaye and Rumble, 1981; Sewart, Keegan, and Holmberg, 1983; Rumble, 1986; and Keegan, 1986). My main contribution is to introduce the basic theories and methods of educational economics to the Chinese context, especially to China's distance education system, and to create some new ideas, specific approach schemes, mathematical models and so on.

From a variety of possible approaches, I chose use cost-effectiveness and other qualitative and quantitative analyses of RTVUEs' contributions to higher education, and economic and social development of China as the basis of my economic analysis. In particular, my aim was as follows:

- to compare the quality of educational outcomes between RTVUEs and conventional universities in China;
- to estimate and compare cost-effectiveness by calculating cost-efficiency using a comprehensive variable (average cost) and some single-item variables;
- to analyse the contributions of RTVUs to higher education;
- to analyse the contributions of RTVUs to China's economic and social development.

Relevant theories and methods of educational economics, statistics and sampling have been applied to the cost calculation and analysis. In particular, I have applied and adapted some specific methods of classifying various costs in different ways, and have developed some suitable mathematical models for the calculation and analysis.

I applied educational evaluation theory, trace study methods by sampling graduates, and modern mathematical theories (i.e., multi-variable statistics, statistical deduction, stratification analysis theory (AHP), fuzzy mathematical theory, and model-recognising techniques, etc.) and built up a special mathematical model by using these theories and methods. Relevant data was collected through a general survey combined with some sampling surveys. For full details of the methodology used, see Ding (1991).

2.4.1 Economic analysis of RTVUs in China: The funding base

There are four quite different sources of funding for the CRTVU: government funding (at three levels: central, provincial and local); funding from various organisations, mainly work units; funding from students themselves or their families through student fees; and a mix of other sources. Table 2.4 breaks down the overall funding by these four sources:

Table 2.4: Sources of funding for CRTVUS

Government	
Central	3.6%
Provincial	20.4%
Local	27.7%
Sub-total	51.6%
Work units	40.0%
Students'	5.1%
Other sources	3.3%
Total	100%

Table 2.4 shows that the CRTVU received financial resources from governments at various levels which in the academic year of 1988-1989 covered about 51.6% of the total funding. An important fact is that the central government provided only 3.6% of total funding; another 48.0% came from provincial and local governments. The educational investment from organizations such as work units made a significant contribution to the RTVUE by providing nearly 40.0% of total funding. Student tuition fees made up 5.1% of the total funding.

Capital investment for the CRTVU occupied 45.4% of total funding in the academic year 1988-1989, and recurrent expenditure 54.6%. Equipment was the major item of capital investment (62.6% of all capital expenditure). This reflects the fact that the CRTVUS is an educational system with modern communication technology as its main delivery media and in 1988-1989 it was still in its stage of infrastructure construction.

2.4.2 Expenditure

Table 2.5 breaks down expenditure by personnel/management and other costs; Table 2.6 breaks down expenditure by the different levels of administrative structure. Table 2.7 breaks down teaching costs by different media.

The figures show that the personnel and management costs were the leading two items of the current expenditure of the CRTVU, and academic costs were only 19.5% of the total current expenditure. The expenditure for media-based instruction covers only a relatively small percentage of total cost.

A large percentage of total cost was consumed by TV classes, students, and local and provincial RTVUs (including the Branch Schools and the Work Stations). The institutions at central level involved in the CRTVUS – both CRTVU and the central broadcast organisations (CCTV and CETV) – spent only a small part of the total expenditure.

Table 2.5: *Personnel/non-personnel costs*

Personnel	46.2%
Non-personnel:	
Academic	19.5%
Management	15.8%
Maintenance	9.5%
Other	9.0%
Sub-total	53.8%
Total	100%

Table 2.6: *Total cost structure by administrative division*

RTVUs	44.8%
TV classes	26.3%
Student costs	26.3%
Central broadcast organization	2.6%
Total	100%

Table 2.7: *Proportion of teaching costs spent on different media*

Radio and TV	28.0%
Experiments	9.6%
Print materials	2.8%
Others (CT classes, etc.)	59.6%
Total	100%

Table 2.8: *Cost structures for TV classes*

Non-personnel	50.5%
Personnel	45.9%
Capital depreciation	3.6%
Total	100%

The main cost consumed by TV classes was personnel (including tuition fee for recruiting face-to-face tutor from various institutions) and the management fee for running TV classes (Table 2.8). TV classes usually use the spare rooms of the students' working units as their classrooms and have minimum shared facilities such as TV set, audio and/or video recorders, so the capital depreciation of running TV classes has covered only a small percentage of total cost.

2.4.3 Average costs per student for the CRTVUS

I calculated a number of average costs, depending on the factors included. The simplest average cost is the combination of total fixed cost + total variable cost divided by the number of students. However, the additional living costs

incurred by students could also be added. Lastly, one could also add the average potential cost. Potential cost means that cost lost by the whole society, because some adult students of RTVUs leave their work part-time, or even full-time to study and cannot therefore contribute to the GDP. Table 2.9 shows the average cost broken down by source of contribution and by average real cost (ACr, i.e. all costs excluding potential costs), average potential costs (i.e. lost work time), and all costs (AC, everything included).

Table 2.9: Average cost per full-time equivalent student of the CRTVUS (1988-1989)

	RMB yuan	% of ACr	% of AC
Average fixed cost (central, provincial and local combined)	452.4	48.0%	37.7%
Average variable costs			
TV classes	250.4	26.3%	20.9%
Student costs	250.1	26.3%	20.9%
Sub-total (ACr)	952.9	100%	79.5%
Potential cost	245.7		20.5%
Total average cost (AC)	1198.6		100%

Table 2.9 shows that the average cost (AC) of the CRTVU (1988-1989) was RMB 1198.6 yuan per full-time equivalent undergraduate student and the average real cost (i.e. excluding potential costs) was 952.9 yuan. In ACr, the fixed costs account for 48%, which is a higher percentage than in the conventional system. This is because the CRTVUS has national multi-level institutions, including a national broadcasting organisation, to provide the distance educational services. Such a national system needs a great deal of capital investment for building its infrastructure. Actually, due to the huge number of enrolled students, the average fixed cost is not very high (452.4 RMB yuan per student annually), and the more students enrolled, the lower the average fixed cost. The average variable cost (52%) was a little larger than the average fixed cost.

Another important fact is that the additional living expenditure (102.3 Chinese yuan per student on average) was nearly 40.9% of total cost consumed by students individually. This item was specially introduced in the research project as a new dimension of the expenditure for a student of RTVU. In research into educational economics, this factor is often not included in the total cost. If the additional living expenditure consumed by students individually is disregarded, the average available cost consumed by TV classes accounts for about two thirds of the average variable cost, and the average learning expenditure consumed by students individually nearly one third.

All governments' financial contributions from various levels covered less than 65% of institutional costs or less than 38% of total costs, that is, less than 459 RMB yuan per student. This is because the cost consumed by all PRTVUs and Local BS draws a significant component from social investment and students. The social investment mainly comes from students' working units, and the great percentage of this investment is contributed to running the TV classes, with some tuition fee to be taken by provisional and local RTVUS for their employees – students of RTVUs. Roughly speaking, the contribution from work units covers more than 34.7% of institutional cost or more than 21% of total cost that is more than 244 RMB yuan per student. If part-time pay and other assistance to their employee/students is included, the figure becomes more than 490 RMB yuan per student.

The students are mainly responsible for their individual expenditure in both learning activities and additional living cost (Table 2.10). In some cases, a small percentage of students need to pay tuition fees to TV classes, local and provincial RTVUs. So the cost from students families has covered more than 21% of total cost, that is more than 250 RMB yuan per student. However, if the additional living expenditure was not included, the figure changes to 148 RMB yuan per student (13% of total cost). It is also important to note that almost all of the adult students still get fully paid from their work units, whether they are full-time, part-time or studying in their own time.

Table 2.10: *Cost structures for students*

Learning materials from TVCL	18.8%
Learning materials brought by students	12.0%
Travelling fee	9.4%
Learning stationery	8.7%
Other learning costs	10.2%
Additional cost of living	40.9%
Total	100%

2.5 A COMPARATIVE ANALYSIS OF ECONOMICS OF DISTANCE VERSUS CONVENTIONAL EDUCATION SYSTEMS IN CHINA

All China's conventional universities receive financial support from governments and their departments at central and provincial levels. These allocations are divided into two parts: recurrent revenue and capital investment. Up to now, almost all departments, institutions and organisations and units funded by government have not been required to conduct an economic analysis of their cost structures and capital depreciation. As a result there are no economic records for any of China's conventional universities, institutes and colleges, regarding capital depreciation and average cost per student. Where average student costs are given in some books and papers in China, this has been based on a simple formula of dividing the annual total current revenue (or expenditure) by the annual enrolled student numbers. All capital depreciation, expenditures from other public and social financial resources, and all expenditure contributed by students themselves have been totally neglected.

In previous research (see Orivel, 1982; Ding, 1991 and 1993), the comparison of average student costs between the CRTVU and conventional universities was not equivalent. The average student cost of the CRTVU included not only average public expenditure (both current expenditure and capital depreciation) but also average private expenditure (both learning expenditure and additional living expenditure), and even the average potential costs. However, the average student costs for conventional universities excluded everything except recurrent government expenditure. This was partly because of the absence of complete statistics about the average student cost of conventional universities. Even on this non-equivalent basis, the average student cost for the CRTVUS was still about one third that of the conventional universities, and if potential cost is excluded, the difference comes down to about one fourth to one fifth. However, to make the comparison more

equivalent, some modifications have been made in this paper (see Table 2.11.) In Table 2.11, the ACi is the average institutional cost (ACi) or called the average public cost in some references, i.e. including all average fixed costs consumed by various RTVUs and broadcasting organisations from central level to local level, and the average variable cost consumed by TV classes. The per student cost of conventional universities is only the average current expenditure, so the results of such a comparison is still not equivalent. A more equivalent comparison has been made by calculating the average current expenditure as the per student cost for both the CRTVU and the conventional universities. The results show that average current expenditure of the CRTVU is just about one fifth nationwide. Similar results were obtained by comparing the Beijing RTVU with conventional universities in the Beijing area. In the province of Hubei, this ratio comes to about one fourth mainly because of the lower figure of the conventional universities in Hubei.

Table 2.11: *Comparison of average institutional cost per student between the CRTVU and conventional universities, 1988-1989*

	RMB Yuan/student		
	CRTVU	Conventional universities	CRTVU/ conventional universities (%)
ACi	702.8	2758.3	25.5%
Current exp.	598.8	2758.3	21.7%

Of course, the complete equivalent comparison should be done with average costs including all fixed, variable and potential costs. But this is a task for the future due to the absence of relevant statistics on the total cost structure of conventional universities. Educational economics have suggested that the capital depreciation should be calculated into the total cost.

Also, the tuition fees for undergraduate students and their private expenditure individually are increasing rapidly in China. Because nearly of the undergraduate students in China study full-time and have accommodation on campus of conventional universities, the additional living expenditures are more expensive in comparison with those of RTVUs' students, most of whom are home-based. In addition, the students of conventional universities do not make any contributions to the GDP, so there are some potential costs that should be counted into their total costs.

When all these components of the total cost are calculated (they are not counted in at present), the per student average cost of the conventional universities in China will be higher than is currently stated. As a result, the economic advantage of the CRTVUS in cost-effectiveness will be seen more clearly.

It has been shown (Table 2.4) that 40% of total funding comes from various societies (including the student's working units) and the central government's financial budget has covered only 3.6% of total funding. At the other extreme, in China, all conventional universities receive most of their funding (90% or more) mainly from the governments' budgets. The CRTVUS is a suitable and feasible way to provide qualified higher education and other technical, vocational and continuing education and training by mobilising whole social and financial forces.

Activity 2.1

Describe how do conventional universities and distance teaching universities in China compare in their economic aspects.

2.6 COMPARISON OF COST STRUCTURES

From the above discussion it is clear that the CRTVUS as a huge national system of distance education possesses a great amount of fixed capital investment, but as the system has enrolled a great number of students, its average fixed cost is low. Also, as the CRTVUS has a unique system of course delivery, its average variable cost could be reduced significantly. On the other hand, the average variable cost usually accounts for about 70% or more of the whole average cost for the conventional universities in China. This results partly from the very low student-teacher ratio (about 5-6) and student-staff ratio (nearly 2 only), and also from the full-time study and on-campus accommodation in China's context.

2.6.1 The economic advantages of China's RTVUs

China's RTVU system as a nationwide and multi-level distance education provision has a number of economic advantages in comparison with the conventional universities and other adult higher education institutions in China.

- The average student cost is much lower than that of the conventional universities. The average institutional costs (including all fixed costs consumed by RTVUs and broadcasting organisations at various levels and variables costs consumed by TV classes in both current expenditure and capital depreciation) of RTVUs was only about one fourth of the average current expenditure of the conventional universities in 1988-1989. Excluding capital depreciation, the average current expenditure of RTVUs was only about one fifth that of the conventional universities in the same academic year. The average success rate (i.e. the proportion of graduates awarded qualification within the minimum time) was more than 80% in the RTVUs.

- From the single-item variables such as student-teacher ratio, student-staff ratio, per student allocated capital value, per student occupied building area and campus area, the RTVUs (73 students per teacher, 65 students per staff, RMB 1308 yuan, 10.8 square meters, 0.13 acres per student respectively) have economic advantages in the efficiency of using various education resources in comparison with both conventional universities (5.5 students per teacher, 2.2 students per staff, 16860 yuan, and 41.8 square meters per student) and other adult higher education institutions.
- From the viewpoint of funding, unlike the conventional universities which receive most of their funding mainly from governments's budgets, the RTVUs are a suitable and feasible way to provide qualified higher education and other technical, vocational and continuing education and training by using various social resources. The results show that the RTVUs receive financial budget from governments at various levels which has in the academic year of 1988-1989 covered about 52% of the total funding. An important fact is that the central government offers 7% of the institutional budget (4% of total funding) only, and the other 93% of the institutional budget (48% of total) comes from provincial and local governments. The educational investment from work units and other societies makes a significant contribution to the RTVUE by providing nearly 43% of total funding. The tuition fee for students accounts for 5% of the total funding.
- Research on cost structure has shown that the RTVUs could reduce their average fixed cost per student sharply by increasing their number of total enrolled students, unlike the conventional universities where it is difficult to reduce the average cost in both academic and accommodation expenditures.

2.6.2 The role of educational technologies

The economic advantages of distance education system mainly come from the use of educational technologies, the development of institutional design, and the advance of educational organisation and management, in which information and telecommunication technologies, including various educational media, play an important role. The CRTVU uses a large amount of broadcast television and radio, enabling large numbers to be educated, thus reducing average fixed costs.

2.6.3 The RTVUE's contribution to higher education and the development of socio-economy of China

The CRTVU has made a great contribution to China's higher education system and China's economic and social development. RTVUs mainly offer higher education of short-cycle courses in two-three years of full-time study or three-five years of part-time and spare time study. From 1982 to 1991 there were 1.453 million graduates from RTVUs, which equals 31% of the total graduates from conventional universities and colleges over the same period, and 58% of the graduates from other adult institutions of higher education. This means that about 17 out of 100 total university graduates China during 1982-1991 were from RTVUs. In 1992 there were 146,000 entrants, 121,000 graduates and 330,400 enrolments.

The results of the tracer survey on RTVUs graduates [Huang & Zhao, 1990; and a study evaluating the educational quality and investment effectiveness of China's RTVUs (Ding, 1991)] have shown that RTVUs provide not only a good quality education, but also qualified graduates with high competence and sound performance. The comments from employers indicate most of RTVUs' graduates (80-90%) are well qualified in their professional career and equal or better in their performance comparison with graduates from other institutions of higher education.

RTVUs have become an important part of China's higher education system. They make a significant contribution not only extending the scale of higher education, but also in adjusting the proportion of normal to short-cycle course in higher education, changing the structure of student fields, disciplines and specialties for higher education, and addressing the imbalance of the geographical distribution of higher education.

Since 1986 the CRTVU has co-operated with some ministries of the State Council to provide 38 professional, vocational and technical education and training programs for which there have been more than 3 million participants, addition, the regional RTVUs also have provided their own programs according to local needs, so the total number of learners involved in these programs has been over 10 million. China's RTVUs system has made its great contribution to economic construction and social development by producing a significant number of qualified professional personnel and skilled workers.

2.6.4 New changes and trends

The research has indicated some new changes and trends.

- The infrastructure of RTVUs including a national broadcasting network with both CCTV, and CETV involved via satellite and microwave system has reached its optimum level after continuing investment from the governments at various levels since the later part of 1980s (including the World Bank Loan Project). But the number of entrants and enrolments for short-cycle courses of higher education of China's RTVUs have dropped since 1985 (273,100 and 673,600 in 1985, 103,500 and 334,700 in 1991 respectively).
- The total number of transmission hours of TV programs has been increased from 1320 in 1985 to 5558 in 1991, but the average number of enrolments for each course and the recipient ratio (the percentage of TV program audience over total enrolments in a certain course) have decreased significantly. On the other hand, the average number of face-to-face tutorials (even lecturing) for each course has been increased.
- Due to the above two facts and other relevant factors, the cost-effectiveness of RTVUE and the cost-efficiency of various educational resources have been reduced since 1985/1986. Both average fixed and variable costs have increased since 1985/1986. As a result the average cost per student increased as well. Several factors, both internal and external to the CRTVUS, have influenced those changes and trends mentioned above.
- China is a highly centralised country in all aspects of the society. The policy making and development planning of RTVU's system are under the control of the State Education Commission. There has been a significant shift of entrance policy from open to closed and a limited annual plan of recruiting new entrance since 1985/1986.

- The development of the CRTVUS during the 1980s appealed to many of the generation which received little or no formal higher education during the Cultural Revolution. However, China's economic reform is now fully under way. In such a transformation period, some government officers and employers pay attention only to the present economic benefits and have not developed an awareness of the importance of the RTVUs in training their employees.
- There have been some problems in the development and delivery of multimedia course materials for a long time. For instance, how to design the course materials suitable to independent study in student's spare time and the learning psychology and habits of Chinese adults are still open questions.

2.6.5 Prospects of RTVUE in China

The economic advantages achieved by RTVUs in 1980s could be retained and improved by deepening educational reform and the continuing development of distance education in the 1990s. More open access policy and improvement of the quality of course materials and of multi-media teaching will be the key measures.

As the information society arrives, modern telecommunication transforms the earth into a village, and much more international competition arises between various countries. Highly educated professional personnel and a skilled labour force are the key elements for developing the economy and increasing the comprehensive power of any nation. So all governments and societies in the world are putting their emphasis on education and training, and high priority is being given to distance education and open learning as a strategic direction.

Economic considerations play a central role in educational policy-making, but they are not everything. Modern society should not have only the strong economic power and wealthy material life, but also developed democratic politics and a rich social and cultural life. The future world will be a learning society, in which knowledge and culture will have unique functions. Adult and life long education and training, and open and independent learning have a bright future. Distance education will play a significant role in the future. The ideal of educational equality and life long continuing education, training and learning will be reaching its goal step by step in the next few centuries.

Activity 2.2

Describe the factors that contribute to cost advantage to RTVUs in China.

2.7 LET US SUM UP

This unit presented the case of economics/cost of DE in China. Since no subsequent comprehensive study is available, this study provides comprehensive idea on the economics of conventional and distance higher education in P.R.China. The conventional universities had full funding advantage from the government, where as the TRVUs got little above half of their expenses from the government, while still maintaining a cost advantage to the tune of one-fourth by extensive use of ICTS, social infrastructure, and due to large number of students.

2.8 REFERENCES

- Ding, Xingfu (1983a) Less input and more output – and economic analysis of cost structure of China's RTVUs, *China's RTVU Education*, No. 7.
- Ding, Xingfu (1983b) A strategic way of educating and training qualified personnel – on the important role of RTVUE in the China's higher education system, *China's RTVU Education*, No. 8.
- Ding, Xingfu (ed.) (1988) *An introduction to Distance Higher Education*, Beijing: CRTVU Publishing House.
- Ding, Xingfu (1989a) The essential driving forces for historical development of distance education, *Education Research*, 12 Beijing.
- Ding, Xingfu (ed.) (1989b) *An Introduction to Distance Higher Education in the World*, Beijing: CRTVU Publishing House.
- Ding, Xingfu (ed.) (1991) *Evaluating Educational Quality and the Cost Effectiveness of China's RTVUs*, China: Wuhan Publishing House.
- Hawkrige, D. & McCormick, R. (1983) China's television universities, *British Journal of Educational Technology*, 3 (14).
- Huang, Y. & Zhao, Y. (1990) The report on first trace study of graduates for China's RTVUs, *China's RTVU Education*, 9.
- Kaye, A. & Rumble, G. (eds) (1981) *Distance Teaching for Higher and Adult Education*, London: Croom Helm.
- Keegan, D. (1986) *The Foundations of Distance Education*, London: Croom Helm.
- Orivel, F. (1982) *Economic Justification – Preparation of a Proposed World Bank Project in China: Television University*, IRPDU-Dijon.
- Peng, Chen (1986) On the benefit from running Radio and TV Universities, *Liaoning Higher Educational Research*, No. 1.
- Rumble, G. (1986) *The Planning and Management of Distance Education*, London: Croom Helm.
- Sewart, D., Keegan, D. & Holmberg, B. (eds) (1983) *Distance Education: International Perspectives*, London: Routledge.
- Zhang, Q. (ed.) (1991) *Basic Statistics of China's Radio and TV Universities (1990-1991)*, Beijing: CRTVU information Team.

2.9 MODEL ANSWERS TO ACTIVITIES

Activity 2.1

The funding of higher education in conventional universities differs from that of distance teaching universities. While the student cost at DTUs includes private costs, this is not the case for conventional universities. The average current expenditure for the former is about 22% that of the latter; and the average institutional cost for DE is about one-fourth of that of conventional education.

Activity 2.2

The radio and television universities in China used to reap the benefit of economy of scale, and so low cost advantage. While the conventional universities received full government funding, the RTVUs get about 52% of their expenses from the government. The cost advantage for RTVUs is based on extensive use of information and communication technologies, large student numbers, use of social capital/infrastructure for offer of DE programmes, besides others.

UNIT 3:

COSTING OPEN AND DISTANCE EDUCATION IN INDIA

Structure

- 3.1 Introduction
- 3.2 Learning Objectives
- 3.3 Cost of Distance Education: A Case
 - 3.3.1 Cost heads
 - 3.3.2 Cost types
- 3.4 Cost Per Course
 - 3.4.1 Development and production of print materials
 - 3.4.2 Development and production of audio and video materials
- 3.5 Cost Per Student
 - 3.5.1 Semi-variable and variable costs
 - 3.5.2 Indirect costs
 - 3.5.3 Annual recurrent unit cost
- 3.6 Cost of Learning a Programme and Economies of Scale
 - 3.6.1 Cost of learning a new programme
 - 3.6.2 Cost of a new programme (preparation and delivery)
 - 3.6.3 Cost of increasing student enrolment
 - 3.6.4 Cost of maintaining a course
- 3.7 Economics of Scale
- 3.8 Let Us Sum Up
- 3.9 Model Answer to Activities

3.1 INTRODUCTION

This is the third Unit of this Block in which we deal with the cost of distance education, with special reference to the Indira Gandhi National Open University (IGNOU). The perspective that was developed through Block 1 (Unit 3) and Block 3 (Units 1, 2, and 3) should help you comprehend and formulate various costs of distance education in an emerging and new system of education in India.

Instead of presenting all the cost studies on distance education available in India so far, you would notice, we have consciously selected IGNOU as a case. The following consideration guided our selection:

- Without having cost studies on both face-to-face and distance teaching institutions with national perspective, it would be unreasonable to compare the costs of correspondence education and the open universities on the one hand, and distance education and face-to-face education on the other.
- We were interested more in the study of a system or an institution that provides for a nation-wide operation, and a system that incorporates all the developments in this field. Moreover, there was the question of a full-

fledged cost study being available for this purpose. Obviously, the choice got focused on the cost study of the national open university conducted for the year 1989-90, and published in 1991.

- In the present Unit, we present IGNOU as a case, and discuss the cost per course and cost per student. In the case of the course cost, the focus is on the development and production of materials; and for the student cost, we have discussed semi-variable and variable costs, indirect costs, and the annual recurrent cost per student/unit. In the last section of the Unit, you will find a discussion about the cost involved in launching a fresh programme, and the implications of economics of scale for IGNOU.

3.2 LEARNING OBJECTIVES

After going through this unit, you should be able to:

- describe various types of costs in distance education, and analyse the cost per course in the case of IGNOU;
- analyse the cost per student at IGNOU; and
- describe to what extent economy of scale is applicable to the national open university.

3.3 COST OF DISTANCE EDUCATION: A CASE

As was noted in the introduction to this Unit, we shall discuss the cost of distance education in India with the help of case – the IGNOU case. The knowledge gained from this study and the major cost indicators identified should help you develop a fairly comprehensive idea about the cost pattern of the open university system in the country. The case that we shall be presenting below is based on the work of Pillai and Naidu (1991).

Before looking into the detailed costing at IGNOU, let us get acquainted with the various cost heads and cost types that have been taken into consideration in calculation costs.

3.3.1 Cost heads

The major cost heads include the following:

- Course design and development (print)
- Course design and development (audio and video components)
- Printing and distribution of print (and audio-video materials)
- Student support services
- Institutional overheads.

3.3.2 Cost types

The different types of cost considered here are given below. You can relate these costs to what you have read in Unit 3, Block 1 and Unit 3, Block 2 of this course.

- i) **Direct Costs:** These are the costs that are directly identifiable with a product. For example, if a School of Studies is identified as a “cost centre”, the direct cost would include the salary paid to the teachers and the secretarial staff of that School. Similarly, if course design and development is identified as the “product”, the direct costs would indicate the expenditure incurred on these activities for a particular course within a School.
- ii) **Indirect costs:** There are certain expenditure heads that are not directly related to a cost centre or a product, and the expenditure incurred on them can be aggregated to find out the cost. For example, the expenditure on postage of study materials and other communications to learners and others concerned with the University is for the entire university. Similarly, the salary of the head of the institution cannot be included under any School of Studies, though it is an expenditure on the part of the institution.
- iii) **Fixed costs:** As you have seen in the previous two Blocks, fixed costs are those that are fixed irrespective of the increase or decrease in student numbers. In a Distance Teaching Institute (DTI), there are certain items on which a fixed expenditure has to be incurred to make the institute functional. These fixed costs pertain to the following items:
- development of the master copy of the printed course materials;
 - development of the master copy of the audio and video components; and
 - institutional overhead, viz., library, general administration, common services like telephone, electricity, water, etc.

We may note here that because the fixed costs are fixed for a few years to come, the calculation of fixed costs is done on annual basis. Therefore, “annualisation” of fixed cost is carried out (by using certain available formula) for each of the fixed cost heads. The two factors that are taken into consideration for this annualisation are the total number of years that a particular course would be in operation (the original as well as the revised version) and an assumed annual rate of interest.

- iv) **Variable costs:** These are the costs that vary with the increase or decrease in student numbers. However, there are certain variable costs that increase after a limit, i.e., the costs remain fixed up to a specified level of an activity after which additional costs are required. These costs are called *semi-variable costs*. For instance, the staff salary in the Divisions of Admission, Computer, Material Distribution, Regional Services and Evaluation, and the expenditure incurred on various orientation programmes for academic-counsellors and coordinators of study centres are considered as semi-variable cost. There are certain variable costs that directly vary with the changes in an activity. These are called the *directly variable costs* that include expenditure on printing and distribution of study materials, academic-counselling activities, assessment of assignment-responses, term-end examinations, etc.

In the present case, we shall specifically talk about cost per student and cost per course. In case of the former, the cost has been calculated in terms of “student year”, i.e., all the students undertaking a particular course with varied durations have been converted into one-year equivalents. For example, if there are 10 students undergoing a one-year course, the number of “student years” counted is 10, while in the case of another group of 10 students undergoing a six month course, the number has been considered as 5 (i.e., one

year equivalent). For the cost per course, all courses have been converted in terms of a standardised unit of analysis, i.e., a credit. A credit is equivalent to 30 student study hours, and comprises academic activities of cost per course is based on a standardised calculation for 8 credits; therefore, courses with varied credit values can be further calculated on the basis of these standardisation. The fornoted points essentially suggest that the calculation of costs has been made for units (i.e., unit costs), student and course being the two units under consideration.

Let us now look into the calculation of costs on the basis of courses and students. In the following two sections we shall discuss costs in relation to courses and students separately.

3.4 COST PER COURSE

The cost for an 8 credit course is based on the cost involved in the development and production of both print and audio & video materials. Let us describe them in detail in the sub-section that follow.

3.4.1 Development and production of print materials

The stages involved in the final production of print materials can broadly be classified as the development phase and the production phase. So, the cost calculation is also based on these two heads separately for an 8-credit course.

i) *Development of print materials*

Though variations exist in the development procedures across various Schools of Studies, we have considered here the common and essential stages. After the identification and approval of an academic programme, the faculty designs the detailed structure of the programme with the help of an expert committee in which subject experts from outside the university participate. The course writers and the course editor are also identified, and one of the faculty coordinates the programme and/or one of the courses within a programme. The faculty along with the outside experts develop the course units which are edited from the point of view of content, language and self-instructional format.

The costs involved in the development of course units can broadly be categorised into two: *the faculty cost* and *the non-faculty cost*. The faculty cost amounts to be the salary paid to the academics during the development of the course concerned. In case an academic was involved in the development of more than one course, the salary paid during the period was apportioned equally among the courses he/was associated with. In the case of the non-faculty costs, we put together two costs, namely the expenditure on meetings of the expert committee and course writers, and the honorarium paid to the course writers and editors for the course. The calculation of course costs was based on the data collected from a sample of 10 courses from various Schools of Studies. The costs under different heads are given in Table 3.1.

Table 3.1: Cost for the development of course materials of an 8-credit course

Cost heads	Expenditure (Rs.)	%
Organising expert committee meetings	25,752	(12.74)
Fees paid to course writers	28,000	(13.86)
Fees paid to editors	7,334	(03.65)
Faculty salaries	1,40,978	(69.75)
Total	2,02,114	(100.00)

You will notice from Table 3.1 that the major chunk goes to the faculty salary (i.e., 69.75%), followed by fees paid to course writers, organising expert committee meetings, and the editorial charges. Since the above calculation is the average for an 8-credit course, there are variations across various courses. For instance, while the expenditure in the case of three courses was above this average, the remaining seven courses incurred expenditures below it.

ii) Production of print materials

The expenditure incurred at this stage includes payments made for data entry operation, art work and illustrations, designing and composing of the text (all fixed costs), plate making, paper, printing and binding (these later four heads being variable with the number of students). Though the number of pages in each Block (or booklet) varies from course to course, for standardisation, the average was taken into consideration; i.e., an 8-credit course, consisting of 8 Blocks, and each Block containing 64 A4 size pages. The calculation is also based on the 10 sampled courses of the University. The salary paid to the non-academic staff working for the production activities has been apportioned in the same way as was done for the teaching staff (see above). The cost for the production of an 8-credit course is given in Table 3.2 below.

Table 3.2: Cost of producing an 8-credit course

Heads	Cost (Rs.)	%
Typing charges paid to agencies other than University staff	3,849	3.27
Internal staff salary (for typing, data processing, etc.)	30,975	26.28
Charges for illustrations, drawings, etc.	5,504	4.58
Charges for designing of texts	18,750	15.91
Charges for composing of texts	58,880	49.96
Total	1,17,859	100.00

You may notice from Table 3.2 that nearly 50 per cent of the expenditure was incurred on composing 8 Blocks, consisting of 512 A4 size pages, while typing and artist charges were negligible, i.e., nearly 3 and 5 per cent respectively.

Now, let us turn to the costing of audio and video components.

3.4.2 Development and production of audio and video materials

As you have seen in the case of print materials, in media production also the entire process is a joint endeavour, i.e., many specialists are involved in developing and producing a programme. Unlike in the case of print materials here we shall combine the various cost heads for the development and production of audio and video programmes.

In the case of the development of both audio and video materials the academics, from various Schools of Studies develop the academic brief and also the academic note. On the basis of this brief and note, the academic concerned and a producer develop the *script* to be used for production.

Sometimes, outside script writers are also invited to undertake this task. However, since data on this account were not readily available, these have not been included in our calculations of the cost for such programmes. Further, it was difficult to apportion the staff, studio and location time devoted to each programme or each producer. Therefore, a simpler procedure was followed – the total cost of the Communication Division (which produces such programmes) was divided by the number of audio and video programmes produced to get at the average cost of audio and video programmes.

The following two points pertaining to the calculation of total cost may be noted before looking into the actual data.

- The cost heads for the entire Communication Division were categorised broadly into five types viz., staff salary, materials (like cables, connectors, components, etc.), consumable (like tapes, bulbs, etc.), software (used for producing the programmes), and programme production.
- The cost of ten audio programmes was considered equivalent to that of one video programme.

The total cost of the audio and video programmes for the year 1989-90 is given in Table 3.3.

Table 3.3: Total cost of audio and video programmes (development and production for the year 1989-1990)

Heads	Total Cost (Rs.)	%
Staff Salary	22,47,196	55.84
Materials	39,210	0.97
Consumable	14,87,902	36.97
Programme production	2,21,383	5.50
Software	29,038	0.72
Total	40,24,729	100.00

We find from Table 3.3 that more than half of the expenditure was on staff salary and a little above one-third was spent on consumable items like tapes and bulbs, and the expenditure on software was quite negligible (i.e., less than one per cent). From the above cost structure, the expenditure per video programme (or say a video equivalent programme) was Rs. 55,899 (though the cost of an audio programme was Rs. 5,410 i.e., ten audio programmes were made equivalent to one video programme in terms of cost). In the calculation of the cost of audio-video programmes, 63 video and 93 audio programmes produced in the year 1989-90 have been considered. The 93 audio programmes have been made equivalent to 9 video programmes; therefore, the cost calculation is based on 72 video programmes (i.e., 63 video and 9 audio-equivalent video). The University had fixed a standardised provision of 4 video and 5 audio programmes per 8-credit course. Therefore, the cost of audio-video programmes for 8 credit course comes to Rs. 250,644.

Till now, we have discussed the cost per course for print materials and for audio-video components separately. Not let us see the cost pattern of an 8-credit course (consisting of 8 Blocks of 512 A4 size pages, 4 audio programmes and 5 video programmes) under various heads. We shall also find out the

annual fixed cost under all the heads of expenditure and for the 8 credit course as a whole (see Table 3.4)

Table 3.4: Total fixed cost and annual fixed cost of an 8-credit course

Heads	Total fixed cost (Rs.)	%	Annual fixed cost (Rs.)
Development of print material	2,02,114	35.42	49,922
Setting the text for printing	1,17,859	20.65	29,111
Five audio programmes (production)	27,048	4.74	6,681
Four video programmes (production)	2,23,596	39.19	55,228
Total	5,70,617	100.00	1,40,942

In the above calculation for the annual fixed cost, the life of a course (print, audio and video) has been assumed to be 5 years. The total cost is for 5 years, and the annual fixed cost has been calculated from the total fixed cost by taking into account the interest rate (i.e., 7.5 per cent in this case) and the life time of the materials (i.e., 5 years in this case). If these courses can run for more than 5 years (i.e., without any major revision), the annual fixed cost would automatically get reduced. For instance, if the course can be offered for 10 years without any major revision, the annual fixed cost under different heads noted in Table 3.4 would get reduced by 50 per cent under each head.

Activity 3.1

What cost requirements will be there in the development of self-learning resources within a course? Describe in the space given below.

3.5 COST PER STUDENT

Now let's look into the cost per student. The unit cost (i.e., cost per student), in the present case, is based on the annual recurrent cost, viz., semi-variable cost, directly variable cost (henceforth called as variable cost), and indirect cost (or the institutional overheads) for the financial year 1989-90, in relation to the number of students enrolled to various programmes for that year. In the year 1989-90, the total student enrolment to various programmes was 56,020. The programmes were of varying credit values, viz., 12-16 credit for certificate programmes, 24-32 credits for diploma programmes and 32 credits per year for the undergraduate programme. This suggests that students of varying credit requirements utilised the services of the University in the given financial year. Since 32 credits worth course load is considered to be the standard full-time student work load per academic year, all the calculations

have to be done according to this standard. Accordingly, it was necessary to convert all the student numbers into equivalents of 32 credits per year. For this conversion, the student numbers working for 32 credits per year were given a weight of 1, while those working for 24 credits per year were assigned a weight of 0.75 and a weight of 0.50 was given to those working for 12-16 credits per year. For instance, the weighted full-time student number for the BPP (Bachelor's Preparatory Programme) of 16 credits came to be 6,574 on the basis of the actual enrolled number of 13,149, while the number for the DDE programme with 24/30 credits became 922, instead of the actual enrolment of 1,229. For all the programmes for the year 1989-90 taken together, the actual total student number of 56,020 got converted to 45,859 full-time student equivalent on the basis of which the unit cost was calculated. The final calculation of the annual recurrent unit cost, based on the semi-variable and variable costs, and indirect costs is given as follows. Let's start with the semi-variable costs.

3.5.1 Semi-variable and variable costs

It will be helpful to recall what you have read about various cost types given above so that you may relate them to the calculation of various types of costs in this and the subsequent sub-sections. As noted above, the semi-variable costs include the salaries paid to the staff of various divisions like Admission, Evaluation, Computer, Material Distribution and Regional Services and academic counselling provided to the students.

In Table 3.5 are given the total and student costs for various items (or heads) noted above.

Table 3.5: *Semi-variable costs per students (total number of students = 45,859)*

Cost heads (Divisional activities)	Total cost (Rs. In '000s)	% to total	Unit cost (Rs.)
Admission Division (student admission)	4.73	3.78	10.31
Evaluation Division (examination processing)	6.77	5.41	14.76
Computer Division (student record maintenance)	12.24	9.79	26.69
Material Distribution Division (material distribution)	3.67	2.93	8.00
Regional Services Division (academic Counselling activities)	97.67	78.09	212.98
Total	125.08	100.00	272.75

You will notice from Table 3.5 that the highest proportion of the semi-variable cost (i.e., 78.09%) was spent on conducting orientation programmes for coordinators of study centres and academic counsellors, followed by student record maintenance service (9.79%), examination processing service (2.93%). The semi-variable unit cost for the year 1989-90 with a total weighted full-time student number of 45,859 was Rs.272.75, out of which the unit cost for academic counselling was the highest and that for material distribution was the lowest.

The variable cost, as noted earlier, vary directly with the number of students enrolled to various academic programmes. The different cost heads noted in Table 3.5 also involve costs that are variable, except the student admission activities. Instead, an addition to this can be made of material printing and publication, the activities of which are directly related to student numbers. The various Divisions included in this cost calculation are: Computer Division (i.e., student record and maintenance), Printing and Publication Division (PPD)

for printing and publication of materials, Material Distribution Division (MDD) (i.e. distribution of materials to students), Regional Services Division (RSD) (i.e., academic counselling of students), and Evaluation Division (i.e., examination processing). The sum-total of the variable costs and the unit variable cost for the year 1989-90 are given in Table 3.6.

Total 3.6: Variable costs per student (total number of students = 45,859)

Cost heads (Divisional activities)	Total cost	% to total (Rs. in '000s)	Unit cost (Rs.)
Student record maintenance (Computer Division)	6,84	2.50	14.92
Printing and publication of materials (PPD)	1,91,75	70.03	418.13
Distribution of materials (MDD)	19,98	7.30	43.57
Academic-counselling (RSD)	21,00	7.67	45.79
Examination processing (Evaluation Division)	32,24	12.50	74.66
Total	2,73,81	100.00	597.07

The details about the cost items for the five cost heads noted above are as follows:

- Student record and maintenance: Computer stationery, computer maintenance, and other contingency charges.
- Printing and publication of material: Cost of paper (other than for course materials), printing related contingency expenditure, printing of student application forms and brochures, etc.
- Distribution of materials: The actual postage paid for the dispatch of materials to students.
- Academic counselling: Academic counselling charges only.
- Examination processing: Printing of question papers and confidential stationery, answer books and response sheets, payment to evaluators and expenditure incurred on the examination centres for conducting examinations.
- You may note that while the costs include under various divisional activities recorded in Table 3.5 are for staff salary and expenditure incurred on orientation programmes, the same heads noted in Table 3.6 above include the operational activities that directly vary in volume with the number of students. You may notice from Table 3.6 that the major cost head was printing and publication of materials (i.e., a little above 70 per cent of the variable cost). Another important cost head, i.e., examination processing that was only a little more than six and a half per cent with regard to the semi-variable cost (see Table 3.5), accounted for twelve and a half per cent of the variable cost. You will also observe greater variance of costs (semi-variable and variable) in the case of other cost heads. The unit variable cost for all the students taken together was Rs. 597.07 out of which printing and publication head accounted for the highest amount (i.e., Rs. 43.57 per student). As a whole the variable costs were higher than the semi-variable costs.

The total variable costs for the year 1989-90 (the semi-variable costs given in Table 3.5 and the variable costs given in Table 3.6 put together are given in Table 3.7.

Table 3.7: Total variable costs (total number of students = 45,859) for the year 1989-90

Cost heads (Divisional activities)	Total variable cost (Rs. in '000s)	% to total	Unit cost (Rs.)
Admission	4,73	1.19	10.31
Maintenance of student records	19,08	4.78	41.61
Printing and publication of materials	11,75	8.07	418.13
Distribution of materials	23,65	5.93	51.57
Academic-counselling	1,18,67	29.75	258.77
Examination processing	41,01	10.28	89.42
Total	3,98,89	100.00	869.82

3.5.2 Indirect costs

You have seen above that the indirect costs refer to institutional overheads which are not directly related to particular cost centre or product. The expenditure incurred in this case is shared by various cost centres of the University. The indirect costs include the following:

- Salary of the staff of the Library and Documentation Division
- Salary of the staff of the General Administration that includes the offices of the VC, PVCs, Finance and Planning and Teacher's Affairs.
- Salary of the staff of the Estate Management Division
- Expenditure on common services and general charges that include expenditure on: travelling, postage and telegrams, telephone, stationery, printing of forms and registers, water and electricity, taxi maintenance of staff cars, advertisements, rent for hired buildings, etc.
- Miscellaneous expenditure incurred on items like medical charges, LTC and festival advance, PF and pensions, convocation, purchase of conveyance by the staff, cultural programmes, visiting and guest faculty, etc.

Table 3.8: Indirect costs per student for 1989-90 (total number of students = 45,859)

Cost heads	Total indirect cost (Rs. in '000s)	% to total	Unit cost (Rs.)
Library and documentation	8,69	2.98	18.95
General administration	51,56	17.66	112.43
Estate management	18,96	6.49	41.34
Common services and general charges	1,63,44	55.98	356.40
Miscellaneous expenditure	49,32	16.89	107.55
Total	2,91,97	100.00	636.67

The highest expenditure was incurred on the common services and general charges; therefore, the unit indirect cost was the highest (i.e., Rs. 356.40) under this cost head. On the other hand, the expenditure was the lowest in the case of Library and Documentation; so this head had the lowest unit cost (i.e., Rs. 18.95 per student). If you compare Table 3.7 and Table 3.8, you will notice that while the total variable cost was Rs. 3,98,89 thousand, the cost of the institutional overheads was Rs. 2,91,97, was lower than the per unit total variable cost, i.e., Rs. 869.82.

3.5.3 Annual recurrent unit cost

We have noted above that costs on account of the development of print materials and the audio-video components and those under institutional overheads (i.e., indirect cost) were taken as the fixed costs. Further, we presented the costs involved in the development of print materials (up to the stage of text setting) in Tables 3.1 and 3.2, and the costs involved in the production of audio-video components in Table 3.4. There was no discussion about the total expenditure on various Schools and Divisions except the total expenditure on the Communication Division.

We need to have the fixed costs, semi-variable costs, variable costs, and indirect costs to arrive at the annual recurrent cost. We have already calculated these costs except the fixed cost, which we shall take up now. The fixed costs include the total revenue expenditure on the salaries of the staff in all Schools of Studies, the Distance Education Divisions, the Communication Division, and the PPD. In Table 3.9 below are given the total fixed costs and the unit fixed cost under the four beads noted above.

Table 3.9: Fixed costs per student in 1989-90 (total number of students = 45,859)

Cost heads	Total indirect cost (Rs. in '000s)	% to total	Unit cost (Rs.)
School of Studies	96.33	64.95	210.06
Distance Education Division	4.13	2.78	9.00
Communication Division	40.25	27.14	87.77
Printing and Publication Division	7.61	5.13	16.59
Total	1,48,32	100.00	323.42

From Table 3.9 you will find that the unit fixed cost was the highest for the School of Studies, and the lowest unit cost was for the Distance Education Division. In order of ranking, the School of Studies (i.e., staff salary) accounted for the highest unit cost; followed by the Communication Division (i.e., materials, consumables, programme production, software, and staff salary) (see also Table 3.3); the PPD (i.e., setting the text); and the Distance Education Division (i.e., format editing).

Now let's record together the total and per student recurrent costs (i.e., fixed costs, semi-variable costs, variable costs, and indirect costs) in Table 3.10 below to have a comprehensive view of them all.

Table 3.10: Total and per student annual recurrent costs
(total number of students = 45,859)

Costs	Total cost (Rs. in '000s)	% to total	Unit cost (Rs.)
Fixed costs (direct)	1,48,32	17.67	323.42
Semi-variable costs	1,25,08	14.91	272.75
Variable costs	2,73,81	32.63	597.07
Indirect costs	2,91,97	34.79	636.67
Annual recurrent costs	8,39,18	100.00	1829.91

You will notice from Table 3.10 that the total recurrent expenditure for the year 1989-90 on 45,859 full-time equivalent student was Rs. 8,39,18 thousand, out of which the fixed costs (direct and indirect costs) accounted for 52.46 per cent, and the total variable costs (semi-variable and variable costs) accounted for the rest, i.e., 47.54 per cent. This cost pattern reveals that both

the total recurrent cost and the per student recurrent cost were highest in the case of indirect costs, followed by, in rank order, variable costs, fixed direct costs, and semi-variable costs. The per student annual recurrent cost for 1989-90 was Rs. 1829.91. It may be noted here that the salary component accounted for 36.45 per cent and the non-salary component 63.55 per cent of the total recurrent cost.

Activity 3.2

Describe the various activities in a distance teaching institution which can be categorised as 'variable' cost and 'semi-variable' cost while calculating unit cost. Write your answer in the space given below.

3.6 COST OF LAUNCHING A PROGRAMME AND ECONOMIES OF SCALE

Up to this stage, we have examined the cost per course and the cost per student. In the case of student cost, more specifically we talked about variable costs (semi-variable and directly variable costs), fixed costs, and indirect costs (i.e., the institutional overheads), and also presented the cost profile of IGNOU for the year 1989-90. The knowledge of these costs would help us to estimate these costs for the University with respect to variations in the number of courses and students and other activities. Depending on the different cost calculations, i.e., cost per course and cost per student, in this section, we shall focus on the following three aspects of future cost projections.

- cost of launching a new programme (with a minimum of 5000 students);
- cost of increasing student enrolment in a programme already launched; and
- cost of maintaining a course already launched.

Let's discuss these three cost projections in the following three sub-sections. Subsequently, we shall take up for discussion the theme of economics of scale in the fourth sub-section.

3.6.1 Cost of launching a new programme

As already noted in the case of the cost per course and the cost per student, the calculations were made on the basis of an 8-credit course, with the student numbers for various programmes of varying credit values converted into full-time equivalent students. We have already noted that the development of the master copies of both print and audio-video materials incurs costs that remain fixed, irrespective of the number of student enrolled. For an 8-credit course the development and preparation of master copies (design and composing) cost Rs.242 thousand and Rs.78 thousand respectively. On the other hand, the preparation of the master copies of five audio and four video programmes for an 8-credit course Rs.251 thousand rupees. Let us now examine the detailed cost elements for both print and audio-video materials, ranging from 8 to 96 credits, as given in Table 3.11.

Table 3.11: Fixed costs of courses/programmes ranging from 8-96 credits (Rs. in '000s)

Cost elements	Cost of an 8-credit course		Cost of a certificate programme (16-credits)	Cost of a diploma programme (24-32 credits)	Cost of an Under graduate programme (96-credits)
<i>Preparation of Print Material (A)</i>					
• Expert committee & course writers meeting	26	52	78	1,04	3,12
• Course writers' fee	28	56	84	1,12	3,36
• Editors' fee	7	14	21	28	84
• Faculty salary	1,41	2,82	4,23	5,64	16,92
• Typing (outside agencies)	4	8	12	16	48
• Non-academic staff salary	31	62	93	1,24	3,72
• Artists' fee	5	10	15	20	60
• Design of print (i.e., processing)	19	38	57	76	2,28
• Composing of print (i.e., plate making and printing)	59	1,18	1,77	2,36	7,08
Total (A)	3,20	6,40	9,60	12,80	38,40
<i>Preparation of Audio/Video Materials (B)</i>	27				
• Master copy of audio	2,24	54	81	1,08	3,24
• Master copy of video	2,51	4,48	6,72	8,96	26,88
Total (B)	5,71	5,02	7,53	10,04	30,12
Grand Total (A+B)		11,42	17,13	22,84	68,52

Table 3.11 presents a fairly consolidated and comprehensive picture of the cost of preparing the master copies of the various components of instructional materials. For a certificate course worth 16 credits, while the preparation of 16 blocks (an average of 1024 A4 size pages) costs Rs.640 thousand, the preparation of ten audio and eight video programmes costs Rs.502 thousand. Similarly, for launching a new diploma programme worth 24 or 32 credits the preparation of, the master copies of the print and media materials would cost Rs.17,13 thousand and Rs.22,84 thousand respectively. For a three-year degree programme (worth 96 credits), the University has to spend a total of Rs.68,52 thousand for the preparation of instructional materials (i.e., print audio and video materials).

In Table 3.12 we record the various cost elements, which constitute the cost of delivering a certificate, a diploma and degree programme at a distance.

The data presented in Table 3.12 have been derived from what we have presented in the earlier tables. From Table 3.12 you will notice that the delivery of an academic programme would cost higher than its development (e.g. while the cost of preparing master copies of course materials for a certificate programme would be Rs.11,42 thousand, the delivery of such a programme would cost Rs.18,96 thousand).

Table 3.12: Cost of delivering course/programmes ranging from 8-96 credits
(Rs. in '000s)

Cost elements	Cost of an 8-credit course		Cost of a certificate programme (16-credits)	Cost of a diploma programme (24-32 credits)	Cost of an undergraduate programme (96-credits)
<i>Printing and Distribution of Materials</i>					
• Printing of courses	2,81	5,62	8,43	11,24	33,72
• Printing of related miscellaneous materials	1,04	2,08	3,12	4,16	12,48
• Distribution of print materials	54	1,08	1,62	2,16	6,48
• Staff salary (MDD)	10	20	30	40	1,20
<i>Student Support</i>					
• Academic counselling	57	1,14	1,71	2,28	6,84
• Staff Salary (RSD)	2,66	5,32	7,98	10,64	31,92
• Special stationery	19	38	57	76	2,28
• Staff salary (Computer Division)	33	66	99	1,32	3,96
• Staff salary (Admission Division)	13	26	39	52	1,56
• Printing of exam materials	29	58	87	1,16	3,48
• Exam-related remunerations	64	1,28	1,92	2,56	7,68
• Staff salary (Evaluation Division)	18	36	54	72	2,16
Total	9,48	18,96	28,44	37,92	1,13,76

You will also notice that the major cost elements are printing of course materials and the salary of the staff of the RSD. Let's look into the salary and non-salary components of the costs of developing and delivering academic programmes as given in Table 3.13.

Table 3.13: Costs of preparation and delivery of an academic programme (Rs. in '000s)

Cost elements	% of total	Cost of an 8-credit course	Cost of 16-credit programme (certificate)	Cost of a 32-credit programme (certificate)	Cost of a 96-credit programme (degree)
<i>Material Preparation (A)</i>					
• Staff salary	54.64	3,12	6,24	12,48	37,44
• Other Charges	45.36	2,59	5,18	10,36	31,08
Total (A)	100.00	5,71	11,42	22,84	68,52
<i>Programme Delivery (B)</i>					
• Staff salary	35.86	3,40	6,80	13,60	40,80
• Other charges	64.14	6,08	12,16	24,32	72,96
Total (B)	100.00	9,48	18,96	37,92	1,13,76
Grand Total (A+B)	-	15,19	30,38	60,76	1,82,28

From Table 3.13 you would notice a few important points, which should be taken into consideration when we decide on launching an academic programme:

- While in the case of material preparation the staff salary would account for 54.64 per cent of the total cost, it would be 35.86 per cent for programme delivery.
- The costs involved in material preparation are fixed, while in case of programme delivery they would vary with the number of students. The cost pattern for programme delivery noted in Table 13 is based on the assumption that there will be a minimum of 5,000 students in a programme. While the material preparation costs would remain the same, the programme delivery costs would increase with the increase in student enrolment.

Time is an important input in both programme development and programme delivery. While no fixed time has been traced out so far for various programme development activities, the time for programme delivery is fixed for various programmes, viz., 6 months for certificate programmes, 1 year for diploma programmes, 3 years for degree programmes, and so on. Therefore, the programme delivery costs have to take into account the costs involved for various durations of implementation. It should be noted here that the delivery cost of a programme will increase not only with the increase in student numbers but also with the persistence of students in that programme for longer period of time.

On the basis of the various cost calculations presented in this Unit, and taking into account the cost calculations for 8-credit equivalent courses and weighted student enrolment, the following cost function is suggested:

3.6.2 Cost of a new programme (preparation and delivery)

The costing of a new programme may be based on the following formula:

$$= bx + cy$$

$$= x(b + cy)$$

Where

b = cost of preparing a new 8-credit course.

x = number of 8-credit equivalent courses in a programme (e.g. two for a certificate programme).

c = cost of delivery of services to an 8-credit equivalent students.

y = number of 8-credit equivalent weighted students in a programme.

3.6.3 Cost of increasing student enrolment

With an increase in student enrolment the total cost is going to increase (see Table 3.15). While at the same time, the average cost would increase, the marginal cost would show a declining trend and get established, say after an enrollment of 50 thousand students. The calculation of fixed and variable costs for the year 1989-90 presented in earlier sections show that with increasing student enrolment, there is an increase in the variable cost, though the programme development costs and institutional overheads would remain constant and also get distributed among an increasing number of additional students, thereby bringing down the averages in these cases.

3.6.4 Cost of maintaining a course

Over a course/programme has been offered, it has to be maintained till a major revision or restructuring of the course takes place, or it is replaced altogether. It is very difficult to calculate the exact maintenance cost of a course (i.e., 8-credit course in this case) because of the difficulty involved in allocating the exact staff time needed for course development and course maintenance. Therefore, the maximum maintenance cost per course per year can be calculated using the following formula. It is based on two assumptions: that the total accumulated cost of maintaining a course over its life is not greater than its replacement cost and that the replacement cost of a new course is not greater than its development cost. The formula is given as under:

$$MC = \frac{TDC}{L}$$

where

MC = maintenance cost of a course per annum.
 TDC = total development cost of a course.
 L = life of a course in years.

Since the life of a course has been assumed to be of 5 years, the course maintenance activities have to be undertaken for at least five year; and the maintenance cost per year would be 20 per cent of the total maintenance cost calculated for five years. Given in Table 3.14 are the total preparation cost (i.e., TDC) and the maintenance cost of an 8-credit course and programmes ranging from 16 to 96 credits.

Table 3.14: Preparation and maintenance costs of courses/programmes
(Rs. in '000s)

Cost heads (preparation/ maintenance)	8-credit course	16 credit programme (certificate)	32 credit programme (diploma)	96 credit programme (degree)
Preparation cost	3,20	6,40	12,80	38,40
Maintenance cost (20% of preparation)	64	1,28	2,56	7,68

To maintain an 8-credit course for five years from the date of its offer, the University has to spend Rs.64 thousand per annum; for a certificate programme, Rs.1,28 thousand; and for a 3 year degree programme, Rs.7,68 thousand. It may be noted here that:

- The course maintenance cost per annum will rise if the costs involved in maintaining audio and video programmes are also taken into consideration. In the calculations given in Table 3.14, such costs have not been included as most of those programmes were produced around 1989-90, and the maintenance of the audio and video programmes did not arise.
- Once a course/programme is offered for more than five years without revision, the maintenance cost will be reduced accordingly, i.e., higher the years of offer, lower is the maintenance cost.

Activity 3.3

When you prepare to launch an academic programme/course, list down various activities to be carried out alongside the expenditure to be incurred.

3.7 ECONOMICS OF SCALE

“Economics of scale” is the most important indicator of the viability of distance education programmes. In a study on the cost of conventional campus-based and correspondence education programmes in Indian universities, Datt (1988) pointed out that to be economically viable a university has to have at least ten thousand correspondence education students. Let’s examine this in the context of IGNOU and see to what extent the university can attain economics of scale. While discussing this aspect in the present sub-section we shall make references to fixed, average and marginal costs. You may recall what you have read about these cost concepts in Unit 3, Block 2 of this course.

We make the following assumptions for working out the optimum size of enrolment for which the University can reap the benefit of the economies of scale:

- Whatever be the size of enrolment, the total fixed cost (both direct and indirect) would remain fixed.
- Certain proportion of semi-variable costs (viz., staff salary) has been incurred in the past, irrespective of the present decision of enrolling either large or small numbers of students. For instance, the University had incurred an expenditure of Rs.1,25,08 thousand on the salary of the staff of Division like Admission Division, Evaluation Division, Communication Division, Regional Services Division, Material Distribution Division, etc., and on orientation programmes for the year 1989-90, with 45,859 weighted 32-credit equivalent students. Therefore, this expenditure may be considered as fixed up to an enrollment of 45,859 weighted full time

equivalent students, and further expenditure incurred on additional enrolled students would be considered as the marginal cost.

- For an additional enrollment, beyond weighted full-time equivalent students in the year 1989-90, the total variable cost of Rs. 597.07 per student has to be added to the total cost.
- There will not be a decrease in the student enrolment (of 45,859 student for the year 1989-90) in the subsequent years.

The total cost, average cost and marginal cost for student enrolment ranging from 5,000 to 3,00,000 are given in Table 3.15 and these have been graphically shown in Fig 3.1 (total cost) and Fig. 3.2 (average and marginal costs). These cost calculations are based on the data on various cost types presented in this Unit so far.

Table 3.15: Total average and marginal costs for different levels of student enrolment

Student enrolment	Total cost (Rs. in '000s)	Average cost (Rs.)	Marginal cost (Rs.)
5,000	5,95,22	11,904.47	597.07
10,000	6,25,08	6,250.77	597.07
20,000	6,84,78	3,423.92	597.07
30,000	7,44,49	2,481.64	597.07
40,000	8,04,20	2,010.50	597.07
46,000	8,40,02	1,826.14	597.07
50,000	8,75,20	1,750.40	869.82
60,000	9,62,18	1,603.64	869.82
70,000	10,49,16	1,498.81	869.82
80,000	11,36,15	1,420.18	869.82
90,000	12,23,13	1,359.03	869.82
1,00,000	13,10,11	1,310.11	869.82
2,00,000	21,79,93	1,089.97	869.82
3,00,000	30,49,75	1,016.58	869.82

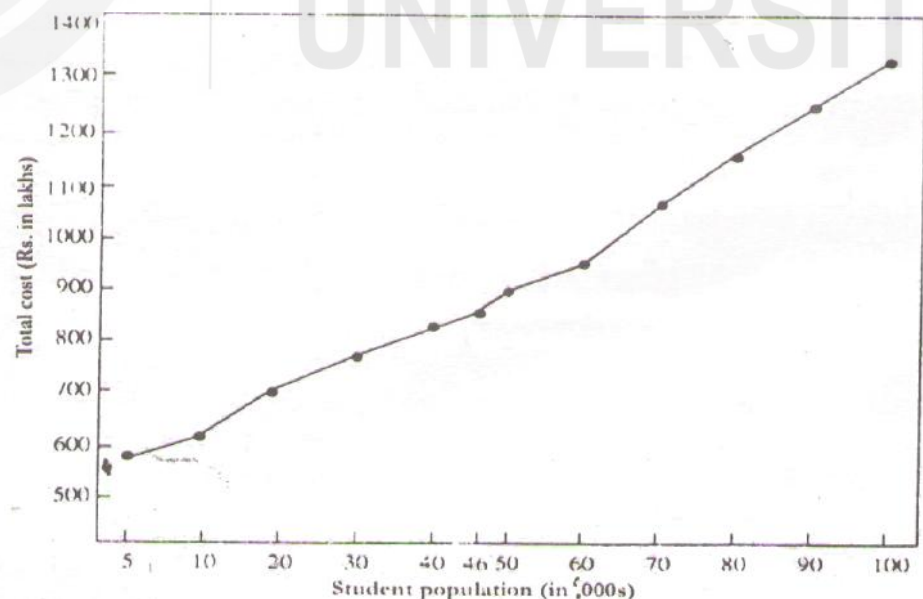


Figure 3.1: Total cost at different levels of student enrolment

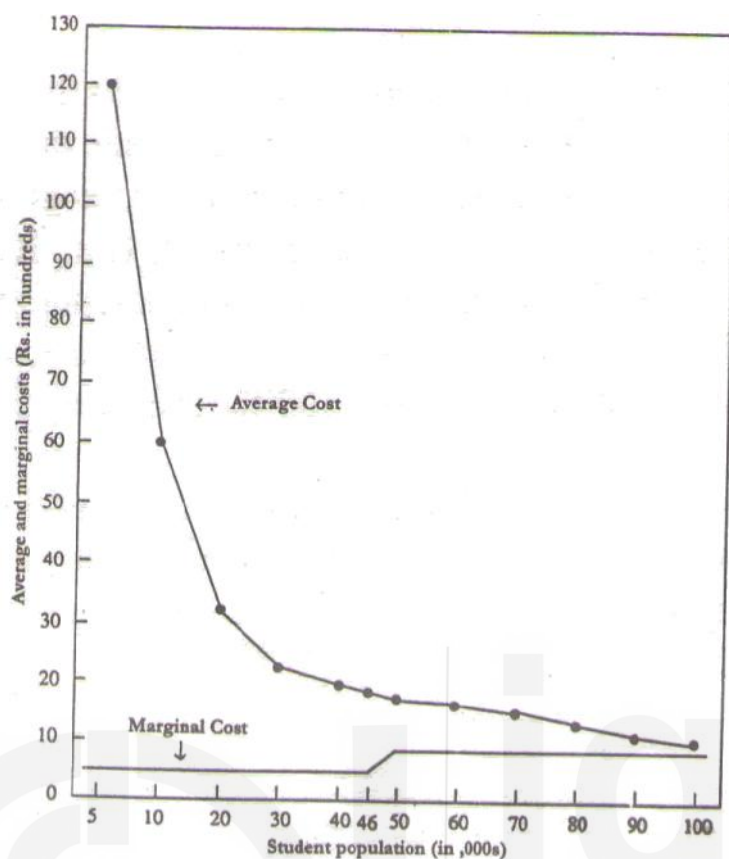


Figure 3.2: Average and marginal cost at different levels of student

From Table 3.15 and Fig. 3.1 and 3.2 we arrive at the following conclusions.

- The total cost rises with increase in student enrolment.
- The average cost declines with increase in student enrolment and gets established at the enrolment size of 70-80 thousand students.
- The marginal cost remains constant up to about the mid-point of the above mentioned size, i.e., up to about 40-50 thousand students (i.e., 45,859 students in our case for the year 1989-90) beyond which it increases and gets established with an enrolment of 50,000 students.

For obtaining a clearer and comparative picture, the figures/data presented in Table 3.15 and Fig. 3.1 and 3.2 on fixed, average and marginal costs are presented in one diagram (see Fig. 3.3).

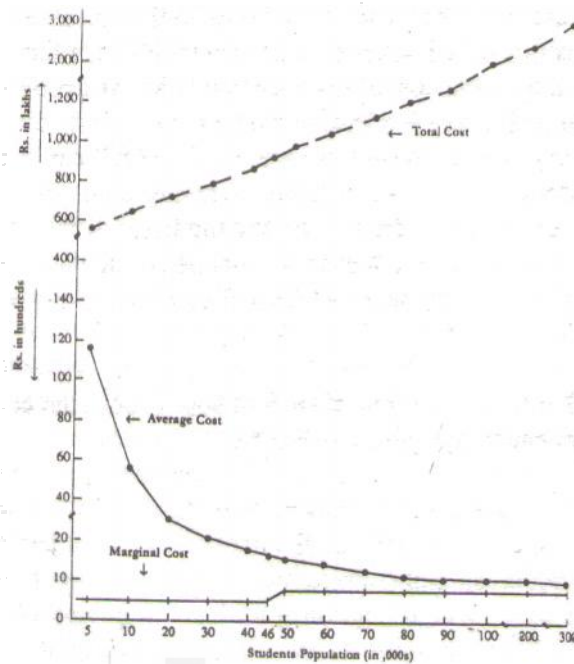


Figure 3.3: Total, average and marginal costs at different levels of student enrolment

You would notice from Fig 3.3 (and also from Table 3.15) that the total cost increases at a steady rate due to decrease in the average cost and stabilisation of the marginal cost. The marginal cost got established at student enrolment of around 50,000. The figure shows that the university (i.e., IGNOU) can reap economics of scale up to an enrolment of 80,000 students. However, since marginal cost is still lower than the average cost, further economics of scale are possible up to an enrolment of even 300 thousand students.

At this stage, it is imperative to take note of the cost functions of conventional as well as distance education as have been shown on the cover page of the Block that you are studying right now. We are reproducing the two figures below (see Fig. 3.4 and Fig. 3.5)

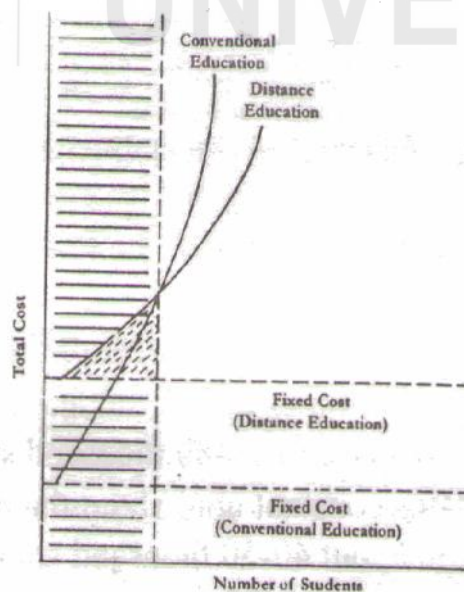


Figure 3.4: Cost functions (total cost) of the conventional and the distance education system

You will find from Fig. 3.4 that though the fixed cost of distance education is higher than that of conventional education the cost of distance education increases at a far more decreasing rate in comparison to conventional education. This further implies that the total cost of conventional education does not decrease much because of the limits to the increase in student enrolment in campus-based colleges and universities. On the other hand, there is an increase in the total cost of distance education at a progressively decreasing rate with every increase in student enrolment; and since the distance teaching institution (in this case, IGNOU) can enrol an increasing number of students (which can certainly be higher than what a conventional college or university can) there is a decreasing trend in the increase of the total cost due to decrease in the average cost per student and the stabilisation of the marginal cost per student. (Refer to Table 3.15 and Fig 3.3 for a comparison)

Now let's look into the function of student cost in both the conventional and the distance education systems (see Fig. 3.5).

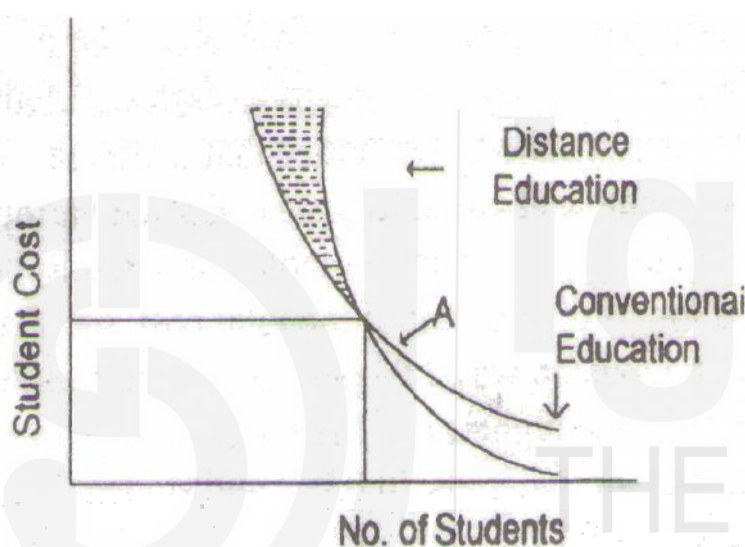


Figure 3.5: Cost functions (student cost) of the conventional and distance education systems

Fig. 3.5 shows that at low student enrolment the student cost in distance education is higher than that in the conventional education. But this trend gets reversed at point A where the student cost and student enrolment are the same for both the conventional and the distance education systems. Subsequently, with the increase in student enrolment in the case of distance education, the student cost (i.e., cost per student, or say the unit cost) goes on falling. You have seen in Table 3.15 that with this decrease in average student cost, the distance teaching institution can reap economies of scale upto an enrolment of even 300 thousand students, after which the costs may show an increasing trend.

3.8 LET US SUM UP

This Unit was developed to a discussion on the cost of distance education in the Indian context, and we presented a full-fledged cost study on an institution, i.e., IGNOU which provides for a nation-wide operation. The various cost types which we include in this case study are direct costs, indirect costs, fixed costs, and variable costs (i.e., semi-variable costs and directly variable costs). While the direct costs directly vary with the cost

centre, the indirect costs don't. The fixed costs are incurred irrespective of any increase or decrease in the number in students. Semi-variable costs are additional costs after a specified level of activity, while there are costs that directly vary with the changes in any activity.

You have seen that the costs have been calculated under two broad heads – per course and per student. For calculating costs per 8-credit course, the activities of the development and production of print as well as audio-video materials were considered. In the case of the development of course units, the faculty salary consumed the major chunk of funds; and for the production of print materials nearly half of the expenditure was incurred on composing of texts. In case of audio-video materials (where all such programmes were converted into video equivalents, with the formula: 10 audios = one video), more than half of the expenditure was on staff salaries, and a little above one-third was shared by the consumable item. The percentages to total cost shared by the four major cost heads are the following: development of print materials (35.42%), setting the text for printing (20.65%), production of audio programmes (4.74%) and production of video programmes (39.19%).

In the case of the costs per student, the semi-variable, variable and indirect costs were taken into consideration, on the basis on which the annual recurrent unit cost was calculated. We notice that there are variations in the shares of the semi-variable and variable costs under the various cost heads. For instance, while in the case of semi-variable cost, the Regional Services Division accounted for 78.09 per cent of the total cost, the share to the Material Distribution Division was 2.93 per cent. When variable costs are taken into consideration the highest and the lowest shares were those of the printing and publication of materials (70.03%) and student record maintenance (2.50%) respectively. As for the indirect costs, the highest expenditure was on the common services and general charges (55.98%) and the lowest on library and documentation (2.98%).

On the basis of the total fixed costs, semi-variable costs, variable costs and indirect costs, the annual recurrent cost per student was calculated, and it came to Rs. 323.42 when the various cost heads were taken into consideration, the share of the Schools of Studies was the highest (64.95%) and that of the Distance Education Division was the lowest (2.78%). As for different cost types, the indirect cost accounted for with highest costs (34.79%) and the lowest share was that of the semi-variable costs (14.91%).

We also notice that the cost of launching a new 16 credit certificate programme of six-months duration was Rs. 11,42,000.00 while for a 32 credit one-year diploma programme it was Rs. 22,84,000.00. So far as the maintenance of a course/programme is concerned, it accounted for 20 per cent of the preparation cost of the course/programme. An important objective undertaking such cost calculations as discussed in this section was to find out as to what extent the University can maintain economics of scale. Through Table 3.15 and various figures (from Fig 1 to Fig. 5) you have seen that economics of scale can be achieved with an enrolment of 46,000 students, which can be maintained up to an enrolment of 300,000 students. This is so because with increasing student enrolment, the average cost per student would decrease, and the marginal cost per student will get established after an enrolment figure of 50,000 students.

*** Note: Prepared by Santosh Panda based on: C.R. Pillai and C.G. Naidu (1991). *Cost Analysis of Distance Education*: IGNOU. New Delhi: IGNOU.**

3.9 MODEL ANSWERS TO ACTIVITIES

Activity 3.1

Basically, for the development of a course (in this Unit, for an 8-credit course), the self-learning resources include in print format as well as in audio-video format. For printed self-learning materials, the cost heads will include development as well as production; and for both audio and video learning materials, it will include scripting, presentation and production.

Activity 3.2

While calculating the unit cost, i.e. cost per student, the variable costs shall include the activities and expenditure thereof relating to maintenance of student records, printing and despatch of materials (and duplication of audio-video cassettes/ CDs), academic counselling provided to students at study centres, and conduct of examinations. Whereas, the semi-variable costs shall include the activities and concomitant expenditure of salary of staff of especially the service divisions like admission, regional support, student evaluation.

Activity 3.3

Before developing an academic programme or courses within it, we need to prepare the blueprint in which various activities and expenditure thereof are to be listed. The activities shall pertain to three aspects—course design and development, course delivery, and course maintenance. The course design and development involves preparation of self-learning materials (conduct of expert committee meetings, course writing/writers, course editing/editors, typing and copy editing, preparation of master copy of A/V materials, salary of faculty and staff). The course delivery tasks/costs shall include printing of materials and duplication of A/V resources, despatch/distribution, salary of materials distribution staff, student centre staff, academic counsellors, and overheads/incidentals. The course maintenance activities/expenditure shall include maintenance of revision files, carrying out minor revision, preparation of fresh assignments per semester/session, and revision to other related learning resources.

UNIT 4:

COSTING IN SELECTIVE DISTANCE LEARNING SYSTEMS: INTERNATIONAL CASE STUDIES

Structure

- 4.1 Introduction
- 4.2 Learning Objectives
- 4.3 Factors Affecting Cost of Distance Education
 - 4.3.1 Number of courses offered
 - 4.3.2 Process of course development
 - 4.3.3 Use of part-time faculty
 - 4.3.4 Choice of instructional media
 - 4.3.5 Enrolment at the institution
- 4.4 The United Kingdom Open University
 - 4.4.1 Average student cost
 - 4.4.2 Cost of OU
- 4.5 The Universidad Nacional Abierta, Venezuela
 - 4.5.1 Courses and instructional process
 - 4.5.2 Determinants of cost at UNA
 - 4.5.3 Average cost per student
- 4.6 The University of the Air, Japan
 - 4.6.1 Cost per student
 - 4.6.2 Cost per graduate
 - 4.6.3 Cost per credit
- 4.7 Let Us Sum Up
- 4.8 Model Answers to Activities
- 4.9 Glossary
- 4.10 Sources

4.1 INTRODUCTION

The present model/block is devoted to providing international perspective to costing of distance education/teaching. You have studied in Unit 1 about case studies in Asia (based on a research study conducted by Prof. V.C. Kulandai Swamy, former Vice Chancellor, IGNOU); Unit 2 is devoted to Chinese then RTVUs (not covered in the study of Kulandai Swamy); Unit 3 captures the comprehensive cost study conducted on IGNOU in the past. Based on these at the backdrop, the present Unit captures the essence of costing of DE for UKOU (UK), UNA (Venezuela) and UOA (Japan) based on published research studies on costing of DE. There are broadly two types of costs: fixed and variable. Yet another type, i.e., the student cost assumes great importance because of its variations due to increase/decrease in the number of courses offered/maintained, and the number of students enrolled. Besides other cost types, the institutional case studies presented below have largely focused on this aspect of unit cost. In the present Unit, we shall discuss three specific

cases – those of the cost studies of three open universities, viz., the United Kingdom Open University (UKOU), U.K., the Universidad Nacional Abierta (UNA), Venezuela, and the University of the Air (UAJ), Japan. While the UKOU was established in 1969, its first cost study appeared in 1972 and subsequently in 1977. The cost study of the UNA appeared in 1982, five years after its establishment and the UAJ was established in 1983 while its cost study was published in 1985 and, subsequently in 1989.

We shall be specifically discussing the expenditure pattern of those universities and the average student cost. While the UKOU was the first open university of its kind in the world, established in a developed country in Europe, the UNA is in a developing country in Latin America, and the UAJ is in a developed country in Asia. On the one hand, non-availability of a sufficient number of cost studies on open universities has restricted our choice, and on the other, these three case studies were deliberately selected to give you a fairly varied view on the cost of distance education. You may notice that the three cases do not follow the same pattern of presentation, nor are the various items and sub-items used in one study the same as those used in another. This is understandable in so far as we have yet to develop a standardised pattern of cost studies, which could be used uniformly all over the world. In all probability we may not develop such a pattern for quite some time to come, as there are hardly any two institutions which are guided by the same concerns and priorities. Nevertheless, the insight gained from these three studies would help you understand the cost of distance education in these countries, and also your own country/institution.

4.2 LEARNING OBJECTIVES

After going through this Unit, you should be able to:

- list and describe various factors affecting the costs of distance education in a distance teaching institution;
- describe and explain the cost functions used at the United Kingdom Open University, U.K.;
- list and describe the instructional process, cost determinants and average student cost at the Universidad Nacional Abierta, Venezuela; and
- describe and explain the student, graduate and credit costs at the University of the Air, Japan.

4.3 FACTORS AFFECTING COST OF DISTANCE EDUCATION

As you have seen in Unit 3, the major costs involved in distance education can be broadly classified into two categories: fixed and variable. The fixed costs are those that are incurred before the distance teaching institute (DTI) starts operating. Markowitz (1987:149) appropriately remarks that the “fixed costs are the costs of opening the front door of one’s store before any customer comes in”. These costs do not vary with the number of the students or the courses. They refer to buildings, equipment, and, to a larger extent, course production cost and permanent staff salaries. On the other hand, the variable costs vary directly with the number of the students registered for a course/programme. In other words, with increase in the registration of the students, the variable costs like those for course booklets, assignments,

programme guides, reading, audio/video cassettes, academic counselling, and a lot of service expenditure increase proportionately. To reduce the overall cost, a DTI tries to balance these two types of cost by reducing items under fixed cost and increasing the expenditure on items or heads that vary with the increase in the student numbers (i.e. the variable cost).

Before discussing in detail the cost structure of the three DTIs, let us examine the factors that affect the cost of an academic programme. We shall discuss five factors that are considered the most important by most of the DTIs:

- i) number of courses offered;
- ii) process of course development;
- iii) use of part-time faculty;
- iv) choice of instructional media; and
- v) enrolment of the institution.

These factors are in addition to the general factors that you have seen in section 3.6 of this Block. The five factors noted above are more specific to the operation of any DTI. In the case studies of the three DTIs that we have presented in this Unit, some or all of these factors have been considered by each one of the cases for the calculation of cost. Let us briefly discuss each of these five factors.

4.3.1 Number of courses offered

Since most DTIs use print as the primary medium, the cost of a programme has a direct relationship with the number of courses offered under the programme. The greater the variety in the courses, the higher the cost is likely to be – both for course production and implementation, as well as for course evaluation and revision (including maintenance). If the DTI considers the student enrolment/registration as the outcome of the institution, the cost for course development becomes a fixed cost; on the other hand, if course development is perceived as a product in itself, it gets treated as a variable cost.

4.3.2 Process of course development

The decisions that you take regarding your approach to course development are crucial to the cost. Whether you prefer to have a course team of individual specialists to develop your courses; whether you decide to develop fresh courses or to adopt courses already developed by another DTI; what ratio of part-time and full-time staff you intend to employ—these and similar factors affect the programme cost. While adoption of a course team approach may become cost intensive, the coordinator-writer-editor approach (Panda et. al., 1999) may not. Similarly, while provision for full-time staff increases cost, part-time specialists might reduce it. But, in any case, it is the personnel cost that accounts for the major portion of the course development cost; and the larger the number of full-time staff, the higher is the fixed cost.

4.3.3 Use of part-time faculty

We have touched upon this factor in sub-section 4.3.2 above, but only with reference to the course development team. Perry (1976) noted that because the British Open University employed a large number of part-time staff (those

who were full-time employees of other educational institutions), it did not have to pay full salaries and the other benefits given to a full-time staff, and this approach to hiring of personnel service drastically checked the overall costs or expenditure of the university. In Australian universities and other dual mode institutions, the full-time face-to-face teachers also have the additional responsibilities of teaching at a distance. In American universities, “a few distance education programmes have teaching faculty assigned to the permanent staff, though even in these cases there are far more part-time faculty employed” (Markowitz, 1987). These part-time provisions match favourably with the overall programme cost; the permanent staff increase the fixed cost for the DTI as their salary is fixed irrespective of the quantum of their workload or actual output.

4.3.4 Choice of instructional media

Though most of the DTIs use sophisticated media as either supplementary/complementary components of the print media or integrated them with it, there are institutes that use the sophisticated media like the TV as the master medium. It must be noted here that inspite of the facilities available in a country, the use of sophisticated media like interactive video, computer, teleconferencing, etc. increases the fixed costs. If the courses themselves are considered products, large scale use of sophisticated media would drastically increase the cost of course production. On the other hand, with every increase in the student enrolment for that particular course the cost per student would tend to decrease, thereby resulting in the multi-media distance education, at some stage, becoming cheaper than the traditional system of education.

4.3.5 Enrolment at the institution

You have seen above that if student enrolment is considered as the outcome, in spite of the increase in the variable cost, the fixed cost gets distributed over an increasing number of students, and thereby, reduces the cost per student. If the programme cost has to be reduced, either the student enrolment or the fees per student (or even both) has to be increased. With low student enrolment, concentration on the variable cost is profitable; and with increases in the number of the students, it is always beneficial to shift some of the expenditure heads under variable costs to the fixed costs, so that economies of scale are achieved.

The five factors affecting programme costs as mentioned above represent the major cost factors. Besides, there are other cost factors that directly or indirectly influence the overall cost of a DTI. The three institutional case studies that we are going to discuss in the following three sections, in one way or the other involve these factors affecting the programme costs. However, in our discussion on costs across these institutional case studies, we may not take all the five factors into consideration, because institutional decisions about the nature of courses, course production procedures, provision for student support, and institutional structures vary from institution to institution. And these decisions affect the distance education costs considerably. But, at least, the underlying cost structures would be similar in all of them, with differences existing only in their implementation.

Activity 4.1

- i. What are the five factors that affect the cost of a distance education programme?
- ii. Compare the relative effects of the number of courses and of enrolment strength on the total costs of a distance teaching institution.

Notes: i) Space is given below for writing your answer.
ii) Compare your answer with that given at the end of the Unit.

Now let's take up the cost study of the three select distance teaching institutions located outside India.

4.4 THE UNITED KINGDOM OPEN UNIVERSITY

The UKOU, popularly known as the Open University (OU), was established in 1969 as the first open university in the world. The OU started offering courses in 1971 with 25,000 students. Wagner (1972:159) has noted: "The main interest in the University has focused on its role as an educational experiment providing part-time tuition to unqualified mature students through the use of a range of media". The OU concentrates mainly on undergraduate students. The continuing education programmes are offered on an on-off basis in particular areas. From the point of view of cost calculation for the OU, it is relevant to note that while the central academic staff of the OU are expected to devote half of their time to research and other professional development activities, only 10% of the total recurrent expenditure is allocated for research; and the figure on this account for conventional universities in the UK is about 35%.

The OU uses five types of media for instructional delivery: print materials, radio programmes, television programmes, tutoring at local study centres, and tuition at summer schools. Besides, direct teacher-student contact is also established through the provision of counselling of non-academic problems. At regular intervals, students receive printed blocks, slides/films/records/home kits (where relevant) and both tutor-marked assignments (TMA) and computer-marked assignments (CMA). The printed blocks, also contain,

besides the text, self-test questions, references for additional reading and guide to relevant radio and television programmes. The calculation of costs at the OU discussed in the following sub-section is based on the reports by Wagner (1972, 1977). Types of costs are presented in the two sub-sections: the average student cost, and the cost of OU.

4.4.1 Average student cost

You will notice from Table 4.1 that the average recurrent cost per equivalent undergraduate at the OU fell from £ 278 (estimated) to £ 258 (revised), with 38,424 finally registered students in 1973. Comparatively, this cost figure was much higher in a conventional university, and the OU average cost advantage was 4:1. This calculation does not include expenditure on research that would reduce the OU cost advantage to 3:1. This cost calculation has also to take into account the graduation rate of the OU, because in the open university system there is not only a higher dropout rate, but the OU student also persists in a course for a longer period of time than a corresponding student in the conventional system. With a survival rate of nearly 25%, the average cost per graduate at the OU would be below half of that at the conventional university.

Table 4.1: Average cost for the OU and conventional university
(estimated and revised) in 1973 at 1971 prices

Cost type	Open University		Conventional University	
	1973 estimated	1973 revised	1973 estimated	1973 revised
1. Average recurrent cost per equivalent undergraduate:	278	258	940	960
2. Average recurrent cost including the imputed rental cost of capital per equivalent undergraduate:	300	272	1200	1111
3. Average recurrent cost per graduate:	1200 (with 50% dropout rate) 4000 (with 85% dropout rate)	2719 (in 1973) 1842 (in the long run)	4000	4049-4801
4. Resource cost per equivalent undergraduate:	295	272 (minimum)	1577	1647-1947

Note: •Figures in Sterling (£)
•Source: Wagner (1977)

You would have also noticed from Table 4.1 that the resource cost, that measures the cost to the economy and takes into account the opportunity cost, is in favour of the OU with a ratio of 6:1 because most of its students are employed and they remain socio-economically productive while on their courses/study programmes.

4.4.2 Cost of OU

Let us examine the growth of the OU student numbers as well as the expenditure and costs in the subsequent three years (see Table 4.2).

Table 4.2: Average recurrent cost per equivalent undergraduate 1974-76

Year	Recurrent expenditure at current prices (in million £s)	Student numbers	Average recurrent cost per student (current prices)	Average recurrent cost per student (1971 prices)
1974	14.60	42,636	342	255
1975	19.60	49,358	397	240
1976	26.10	50,994	512	249

Note: • Figures in Sterling (£)
• Source: Wagner (1977)

From Table 4.2, you would find that in 1975, in comparison with 1973, in real terms, the average recurrent cost per student fell (at 1971 prices) due to increase in the student enrolment. But, in the subsequent year, the cost increased due to minimal increase in the number of students. Similarly, in real terms the total expenditure also increased, partly because of extra staffing and accumulated study leave and research by the staff existing in 1976.

The allocation of costs for different heads like central academic, regional academic, broadcasting, administration, summer school and direct student cost in relation to the number of the students and courses, given by Wagner, suggests that economies of scale did exist in the case of the student cost and also that of summer schools. As has been noted by Muta and Sakamoto (1989) for the Japanese Open University, which you will study in section 4.5 below, Wagner (1977) also noted that very large increase in the student numbers at the OU may produce diseconomies of scale. For instance, even a relatively small increase in student numbers (compare figures for 1975 and 1976 in Table 4.2) has pushed up the average recurrent cost per student. Obviously, economies of scale operate till a critical maximum is reached in student numbers, beyond which costs go up again.

For the subsequent years, i.e., 1976-79 the average recurrent costs per equivalent OU undergraduate are given in Table 4.3 below.

Table 4.3: Average recurrent expenditure per student at 1976 prices

Year	Fixed costs	New course costs	Maintained course	New Student costs	Total costs	Average cost per student
1	2	3	4	5	6	7
1976	19.824	3.924	2.427	—	26.20	513*
1977	19.824	5.668	2.757	1.111	29.20	520
1978	19.824	5.232	3.175	1.901	30.10	498
1979	19.824	5.232	3.395	2.301	30.80	493

Note: • Columns 2 to 6 in million £ and column 7 in £ only
• Source: Wagner (1977)
• *Slightly different from Table 4.2 due to rounding of figures

Figures from columns 1 to 6 in Table 4.3 will help you to understand the average cost presented in column 7. Figures in column 7 indicate that in the years between 1976-79, there has not been any significant fall in the average student cost. Because of the OU following the pattern of a conventional university with little increase in productivity in the subsequent years, it could be concluded that, in only the first few years of its operation, the OU had reaped most of the economies of scale. This is so because the increase in student registrations was neutralised by the significant increase in the number of courses offered to students.

On the basis of the foregoing presentation, we can conclude that in constant prices, the average cost per equivalent undergraduate has stabilised at the 1976 level, and this has been a little more than a quarter of that at the conventional universities. And when research cost is taken into consideration, the cost at OU still remains one third of that at the conventional universities.

Activity 4.2

- i) How does the average cost per student of the UKOU compare with the average cost per student of conventional universities in U.K.?
- ii) You will notice from Table 4.2 that the average recurrent cost per student stabilised around the 1976 figure. List the reasons for the stabilisation around this figure.

Notes: i) Space is given below for writing your answer.
ii) Compare your answer with that given at the end of the Unit.

4.5 THE UNIVERSIDAD NACIONAL ABIERTA, VENEZUELA

The preceding case study was of an autonomous open university (the first of its kind in the world), situated in a developed country. The present case deals with the distance teaching university of Venezuela, which is a developing country. It was established eight years after the UKOU. The two major problems that the higher education system in Venezuela was facing in the seventies were:

- increasing social demand for university education on the one hand, and rising cost of such education on the other; and
- the very traditional nature of the university curricula to meet the manpower needs of the country.

In the seventies, the Supervised University Studies (SUS) programmes were started by a number of universities in Venezuela that combined off-campus study (print and A/V materials) and tutorials/counselling sessions conducted

by university staff. With this, along with other such measures, the percentage of the student population (age group 18-24) at higher education stage increased from 6.51 in 1971-72 to 15.00 in 1978-79 (Rumble, 1982). On the basis of the above preliminary experiments, in 1977 the Universidad Nacional Abierta (UNA) was established by the Government of Venezuela. The major aims that UNA were to meet are as follows:

- to expand general opportunities for higher education, especially to the working people;
- to develop human resources as per the national need;
- to provide higher education, complementary to the existing higher educational institutions, and bring innovations in the teaching-learning strategies resulting in individualised learning; and
- to reduce the cost (especially the unit cost) of higher education.

We present below a brief note on the courses and process of instruction that will help you to understand this case properly.

4.5.1 Courses and instructional process

The UNA, though established in 1977, started its academic programmes in 1978. These programmes are at the degree level and consist of Introductory Courses (IC), General Studies (GS), and Professional Studies (PS). The IC deals with the university structure and the distance teaching-learning practices. Its successful clearance leads to taking up certain courses at the GS level which provides an inter-disciplinary foundation to the degree programme. With the completion of the required number of GS courses, one moves on to the PS courses that can be completed within either five and a half years (full courses) or three years (technical level short courses). By 1982, the UNA was offering 481 credit courses in Administration, 636 credit courses in Education, 323 credit courses in Engineering, and 164 credit courses in Mathematics. (One credit is equivalent to 27 hours of student work. A student is normally expected to clear 16 credits per semester consisting of 18 weeks, and must put in 24 study hours per week.) The course is the unit of study, and the credit value per course ranges from two to eight, with most the courses having four credits.

The multi-media courses are dominated by the printed self-instructional materials accompanied by study containing mainly self-assessment questions, and supported by tutorials, audio-visual material and TV programmes. The courses are developed by the *integrated design team* (IDT), consisting of the subject specialists (full-time academic staff and/or external contracted academic specialists), instructional designers, evaluation experts and media experts. The TV programmes are generally produced externally, and these programmes along with those of the radio (meant for public announcements) are broadcast on the national channels for which the UNA does not have to pay any separate costs.

Once a student gets registered at a local or regional centre, he/she is attached to a full-time counsellor till he/she completes the degree programme. At set hours, part-time tutors are also available for academic consultation. There is also provision for study groups and individual consultation with the tutor. Full-time subject-area tutors are also available to supervise the part-time tutors of certain subjects at the PS level. Besides, a student has access to the Guided Learning System (GLS), a form of computer assisted instruction,

which one can use to get the feedback on one's progress from a centrally located question bank. However, face-to-face tutorial facility is very low, and the average tutor-student ratio is 1:450.

4.5.2 Determinants of cost at UNA

Given below is a brief description of the major determinants of the cost at the UNA. They are course design, course production, course presentation, local centres, and students.

At UNA, courses are presented on a semester basis. Once a course is produced and offered in the first semester, it is simultaneously evaluated in that semester. Modifications are made during the second semester; and the modified course is presented from the third semester onwards for the next four years or eight semesters. Generally, the design and production of a course respectively takes 8 months and 4 months. The **course design** costs are directly related to the course credits; therefore, a decision on the design of a certain number of credits determines the costs to be involved in a particular year. Such costs include payment to the external course writers and the cost of the course team members. 'Redesign' of a course consists of nearly one-fourth of the original design effort, and therefore, such costs contribute twenty five per cent to the total course design cost. Let us take an example and consider a certain amount of credits that are to be designed in a six month planning period. Let us also consider that:

- A_{ti} is the number of credits to be "designed" in the planning period t_i
- E_{ti} is the number of credits "to be presented or presented" in the planning period t_i

At UNA, then, the number of course credits that are to be designed in a particular planning period can be determined using the following formula:

$$A_t = E_{ti+2} + 0.25(E_{ti-1})$$

where, besides the explanation provided for A_{ti} and E_{ti} above, ' t_{i+2} ' is the total number of credits to be presented for the first time in the planning period ' t_i ', and ' t_{i-1} ' is the number of credits first presented in the previous planning period. The above equation is used in the decisions related to the design of courses at UNA.

Course production is the second determinant of the cost. While the production of the print materials is credit-related (i.e., one credit equivalent to 125 pages), the production of the TV programmes is course-related (i.e., a maximum of four programmes per course). Besides the print and TV, other materials include experimental equipment, and other audio-visual materials. The production cost in a particular period of time would include the total number of credits in new courses to be produced and the redesign of courses already presented in that period of time.

A third cost component is the **presentation of courses**. These costs include expenditure incurred on material distribution to the local centres, and assessment and monitoring of examinations. The fourth cost determinant is the local centre(s), the expenditure on which includes components such as the full-time counsellor and administrative staff, and the facilities like library and audio-visual equipment. The last determinant of cost at UNA is the **student**

costs which include tuition and counselling costs and those incurred on the processing of student records.

Besides the five determinants of direct costs presented above, there are certain **overhead costs** that indirectly contribute to the total cost. The more important among them include the planning and project control, support services, studio and publishing facilities, extension programme, and research. Therefore, the total recurrent cost at UNA is a function of the following:

- the number of credits of courses to be designed and redesigned in a particular planning period;
- the number of credits of courses to be produced and reproduced in that period;
- the number of credits of courses to be presented in that period;
- the number of local and regional centres under operation in that period;
- the number of students taking admission in that period; and
- the overhead costs of the university.

For a six-month planning period, Rumble (1982) calculated the following unit costs for various activities at UNA at 1980 price level (see Table 4.4).

Table 4.4: Activity-wise unit cost for the UNA

Activity/heads	Unit of measure	Unit cost (US \$)
Course design	credit	7,959.0
Course production (print, etc.)	credit	2,962.0
Course production (broadcasting)	course	8,911.0
Course presentation	course	6,000.0
Local centres	centre	55,400.0
Students	student	93.7

At UNA, the cost structure for different media provisions suggested that an additional forty courses would cost \$0.5 million and the corresponding tutorial support another \$1.2 million. Therefore, you would notice from Table 4.4 that the television broadcasting and tutorial support at the Local Centres results in higher costs than the printed course material.

4.5.3 Average cost per student

In the case of UNA, the calculation of the average student cost is based on the “student enrolment per year”. In 1980, UNA had 13,357 students, but the enrolment decreased to 11,650 in the subsequent year, whereas the number of courses offered increased from 45 to 172.

Based on the average cost calculation formula, i.e., the total cost divided by the number of registered students, the average cost for 1980 was \$1,560, which was projected to increase to \$1,955 in the subsequent year. UNA expenditure and the student enrolment patterns show that if there was an increase in student enrolment, the average cost would decrease in which case the university would gain significant economies of scales, and vice versa.

You would have seen in section 4.3 above that the economies of scale at OU were gained in the first few years which decreased in later years with an increase in the number of courses (to provide a wider range for course choice) and a decrease in the size of student enrolment. At UNA there is a limited course choice but even the nature of the courses offered is so restricted (because of the narrow specialisation within the degree and diploma courses) that it could not possibly achieve increases in student registrations. On the other hand, the cost structure of UNA shows that with a little increase in

student registrations, the university could achieve significant economies of scale and decrease average student costs.

Activity 4.3

What are the factors that determine the average recurrent cost at UNA?

What were the factors responsible for the increase in the average student cost between 1980 and 1981? How do you think UNA can achieve economies of scale?

Answer in about 15 lines.

- Notes:** i) Space is given below for writing your answer.
ii) Compare your answer with that given at the end of the Unit.

4.6 THE UNIVERSITY OF THE AIR, JAPAN

Established in 1983, the University of the Air, Japan (UAJ) started offering courses in 1985. The purposes of the University are “to offer flexible opportunities of higher education as an institution for life-long education, to promote credit transfer and interchange of faculty, and to contribute to the improvement of university education in Japan” (Muta and Sakamoto, 1989: 587).

The University has adopted a multi-media system of education where radio and television broadcasts are used on a large scale, along with prescribed textbooks. The students take a test (or submit a paper) at the end of an eight week term. Both evaluation and guidance are provided through correspondence. Classroom instruction is provided and term-end examinations are carried out at the seven regional study centres. Classroom instruction is provided and students must complete five ‘classes’ per credit per term, and each class lasts for two hours and fifteen minutes.

Three categories of students study at UAJ: regular degree-course students pursue liberal arts courses worth 124 credits; area-course students take up courses on an yearly and term basis respectively; and special students who do not have qualifications to enrol in universities, but get registered in degree courses on a regular basis after they earn 16 credits. One credit at UAJ is “given for 15 hours of lectures requiring 30 hours of preparation in total” (Muta and Sakamoto, 1989:588).

While non-electronic media materials are produced at UAJ, the radio and television programmes are produced at the National Institute of Multi Media

Education (NIME). Though NIME, as a national institute, could be used by the national/local public and private universities most of the facilities of the institute are utilised by UAJ for the production of electronic media programmes. Therefore, in the calculation of costs per student, per graduate credit, 90% of the studio expenses and 50% of other operational expenses of the NIME have been taken into consideration. The discussion on costs for the three heads mentioned above (which are given in the following three sub-sections) are based on the expenditures incurred in 1986, as reported by Muta and Sakamoto (1989). UAJ costs have also been compared with those of other correspondence programmes, national university, public university, and private university (day and night programmes).

4.6.1 Cost per student

The per-student course expenditure of the six types of institutes are given in Table 4.5 below. For comparison of the cost per student at UAJ and the conventional universities, students other than undergraduate students were converted into undergraduate equivalents by assigning weights of 2.1, and 0.5 to graduate students, full-time non-degree course students, and auditors (those who aim at earning credits but not graduation) respectively. For the same purpose, the undergraduate students were given a weightage of 1 each.

Table 4.5: *Per-student current expenditure*

Institutions	Courses student	Expenditure
University of the Air, Japan	NA	449.30
Correspondence Programmes	NA	58.80
National University	Liberal Arts	948.90
	Science, Technology	1,278.20
	Agriculture	1,846.80
	Public Health	1,419.70
	Education	1,79.10
	Arts	944.20
	Home Economics	813.60
Public University	Liberal Arts	819.80
	Science, Technology	1,908.20
	Agriculture	1,969.50
	Public Health	1,746.30
	Arts	1,462.10
	Home Economics	948.40
Private University(day programmes)	Liberal Arts	545.40
	Science, Technology	773.30
	Agriculture	876.20
	Public Health	1,096.90
	Education	717.80
	Arts	915.90
	Home Economics	842.50
Private University (night programmes)	Liberal Arts	350.90
	Science, Technology	366.40

Note:

Each unit Japanese Yen 1,000

Each Data pertain to 1986

Source: Muta and Sakamot (1989)

NA = not available

You will notice from Table 4.5 that per student current expenditure (i.e., in 1986) at UAJ is higher than that of the private university (night programmes as well as the correspondence programmes, and lower than that of the national

university, public university, and private university (day programmes). These expenditure figures indicate that per student cost at UAJ is 1.1 times and 6.7 times higher than that of the private university (night) and the correspondence programmes respectively. Similarly, it is two-fifth, half and three-fourth that of per student cost at the national university, public university, and private university (day programme) respectively. UAJ's cost per student is lower than that of the conventional system in general.

4.5.2 Cost per graduate

In an open university system, the students generally take more time to graduate than the conventional university students. In 1986, UAJ had enrolled 3,600 students, and there has not been any increasing trend in the enrolment in later years. In Table 4.6 the expenditure figures per graduate of the six types of institutes are presented. You might note that while the figures for other institutes are for 1986, the expenditure figures for UAJ are for the year 1988 since the first batch graduated in that year.

Table 4.6: *Per-graduate current expenditure*

Institutions	Courses	Expenditure per graduate
University of the Air, Japan	N/A	13,664.10 (1988 figure) 4,372.50 (afterwards)
Correspondence Programme	N/A	2,264.30
National University	Liberal Arts	4,771.50
	Science, Technology	4,962.50
	Agriculture	7,410.00
	Public Health	4,724.30
	Education	4,528.70
	Arts	3,167.80
	Home Economics	3,281.50
Public University	Liberal Arts	3,840.80
	Science, Technology	7,812.40
	Agriculture	6,905.50
	Public Health	6,496.80
	Arts	5,391.10
	Home Economics	4,155.90
Private University (day programme)	Liberal Arts	2,357.60
	Science, Technology	3,503.60
	Agriculture	3,565.20
	Public Health	5,164.30
	Education	3,180.10
	Arts	4,003.90
	Home Economics	3,561.30
Private University (night programme)	Liberal Arts	1,877.80
	Science, Technology	2,698.00

Note:

- Each unit Japanese Yen 1,000
- (Source: Muta and Sakamoto 1989)
- NA = not available

If you compare the figures given in Table 4.5 and Table 4.6, you will notice large differences in the expenditure of various institutes of higher learning in Japan. While the cost per student at UAJ is lower than that of many comparable types of conventional universities, cost per graduate at UAJ in 1988 is higher than that of all the other institutes. As far as the correspondence programmes of the private universities are concerned, the cost per student and

the cost per graduate were considerably lowest, though the cost per graduate was slightly higher than that of the private university night programme.

4.6.3 Cost per credit

It is useful to calculate the cost per credit at UAJ and compare it with that of other universities because all the universities concerned do not cater at the same levels of instruction, nor to the same number of students at comparable levels. This problem has been resolved by converting the other-than-undergraduate students, into equivalent undergraduate students for purposes of calculating student cost. Because of the non-availability of data on the number of credits required to complete graduation from the conventional universities, the number of credits stipulated for graduation at the UAJ is also taken as the number of credits required for graduation elsewhere. As noted earlier in the beginning of this section, 124 credits are required to graduate from UAJ; and this requirement has been applied equally in the case of all other types of universities in the analysis of cost per credit. The formula for calculating cost per credit is given as:

$$\text{Cost per credit} = \frac{\text{Annual cost}}{\text{Number of credits offered}}$$

where, “number of credits offered” can be further explained as:

$$\text{No. of students} \times \frac{\text{Graduation rate} \times \text{Credits required for graduation}}{\text{Average number of years the graduates take to complete requirements}}$$

So cost per credit =

$$\frac{\text{Annual cost}}{\text{No. of students} \times \text{Graduation rate} \times \text{Credits required for graduation} \times \text{Average number of years the graduates take to complete requirements}}$$

For calculating cost per credit, all the types of students (i.e., regular, part-time, and special) have been converted into equivalent regular students, the cost for various types of institutes are given in Table 4.7.

Table 4.7: Per-credit expenditure (1986)

Institutions	Courses	Expenditure per credit
University of the Air, Japan	N/A	45.00 (45.20 for 1987) (45.21 for 1988)
Correspondence Programmes	N/A	8.80
National University	Liberal Arts	30.70
	Science, Technology	42.60
	Agriculture	57.50
	Public Health	39.90
	Education	33.70
	Arts	29.90
	Home Economics	25.00

Institutions	Courses	Expenditure per credit
Public University	Liberal Arts	27.10
	Science, Technology	63.20
	Agriculture	57.90
	Public Health	53.40
	Arts	45.70
	Home Economics	30.40
Private University (day programmes)	Liberal Arts	18.60
	Science, Technology	28.90
	Agriculture	28.60
	Public Health	33.90
	Arts	30.70
	Home Economics	26.70
Private University (night programmes)	Liberal Arts	16.70
	Science, Technology	23.40

Note :

- Each unit Japanese Yen 1,000
- Source: Muta and Sakamoto (1989)
- NA = not available

You will notice from Table 4.7 that for all courses taken together, the per-credit cost at UAJ was:

1.3 times higher than that of the national university;
1.5 times higher than that of the public university;
2.2 times higher than that of the private university (day programmes);
2.4 times higher than that of the private university (night programmes); and
4.6 times higher than that of the correspondence programmes of the private universities.

The per-credit cost figures suggest that while per-student cost was low at UAJ, the per-credit cost was very high. This could be due to two reasons:

the number of the area-course students (i.e., those who take several subjects in a specific area on a yearly basis) getting registered for the entire degree programme was very low; and

the number of credits earned by both area-course and regular students was also very small. For example, each degree-course of the UAJ earns only two-third of the credits which the regular students of the national universities earn normally (i.e., 33 credits per year).

This discussion suggests that UAJ is not as cost-effective as was expected by the planners. One of the very strong reasons could be the low registration of the students, as the fixed cost was very high, while the variable cost was very low, i.e., 16% of the total current expenditure. Muta and Sakamoto (1989) noted that UAJ could be cost-effective if the number of the students at the university exceeds twenty thousand, the printed materials are improved in content and design, and there is a decrease in the use of the broadcasting systems that are very expensive.

Activity 4.4

State the cost pattern and compare the reasons for variations in cost per student, per graduate and per credit of UAJ vis-a-vis the other types of institutes that you have studied in this Unit. What conclusion do you draw from such a comparison? Answer in about 20 lines.

- Notes:**
- i) Space is given below for writing your answer.
 - ii) Compare your answer with that given at the end of the Unit.

4.7 LET US SUM UP

In this Unit, you studied about the costs of three selected distance teaching institutions from outside India. You have seen that, irrespective of the type of institute, five factors, viz., number of courses, process of course development, use of part-time faculty, choice of instructional media, and total student enrolment influence the cost of distance education. In the UK, the average student cost of distance education at UKOU was lower (nearly one-fourth) than that of the conventional universities. Minor subsequent increase was due to the small increase in student enrolments and the high increase in the number of courses on offer. Even if expenditure on research is taken into consideration, UKOU cost still remains one-third of the conventional universities.

Though in the case of UNA there was no comparison with the conventional universities, the average student cost in 1981 was higher than what it was in 1980, because of the decrease in student enrolments and increase in the number of courses on offer. UNA can achieve sufficient economies of scale if student enrolments are increased considerably.

Unlike the above two institutes, the cost per graduate and the cost per-credit at UAJ were higher than these at most of the other institutes compared with it, viz., national university, public university and private university. In comparison, the cost of the correspondence programmes of the private universities was the lowest of all. The case study of UAJ indicates that it is not cost-effective at present and that it could be made so if student enrolment rises above 20,000 and the expenditure on broadcasting is drastically reduced.

4.8 MODEL ANSWERS TO ACTIVITIES

Activity 4.1

- i) The five factors are: a) the number of courses on offer, b) the process of course development c) the use of part-time faculty, d) the choice of instructional media, and e) the total enrolment of the DTI.
- ii) When the number of courses on offer in a DTI increases, the cost of production, implementation and maintenance increase; and this situation leads to a rise in the total cost. A DTI spends a fixed amount of money on the development of a course, irrespective of the number of students to be enrolled. On the other hand, with an increase in the enrolment, the total cost does not increase significantly because the course development cost (which is a fixed cost) gets distributed over the increasing number of students.

Activity 4.2

- i) In 1976, the average cost of an Open University student was a little above one-fourth of that at the conventional university, if we ignored the research cost at OU; if the research cost is taken into consideration, OU cost comes to one-third of that at the conventional university in the United Kingdom.
- ii) Up to 1975, the average cost per student kept falling progressively, and stabilised around the figure obtained in 1976, i.e., the figure did not change significantly in the subsequent years. It was so because of:
 - increase in student enrolment;
 - increase in the number of courses;
 - increase in the number of staff; and
 - staff going on leave for research purposes.

Activity 4.3

- i) The factors or determinants of the average recurrent cost include expenditure on course design, course production (print materials that are credit-related, and A/V materials that are course-related), course presentation, local centres, students, and overheads.
- ii) The average student increased from \$1,560 in 1980 to \$1,955 (projected) in 1981 because of the decrease in student enrolment from 13,357 in 1980 to 11,650 in 1981 and the increase in the number of courses on offer from 45 to 172. Since UNA does not offer a wide range of course choice, and no increase in the number of courses is planned in the future, UNA can achieve economies of scale and bring down the average student cost by increasing the enrolment.

Activity 4.4

The cost pattern of UAJ, in comparison to that of other comparable institutes, shows that the cost per-student at UAJ was lower than that at the national university, the public university and the private university (day programmes), and was higher than that of correspondence programmes and the private university (night programmes). Except for the national university, the cost per graduate was higher than that of the rest of the institutes; and the cost per-credit of UAJ was higher than that at the rest of the institutes. The higher cost per graduate was due to a low level of increase in the enrolment, longer time taken by a student to graduate, and increasing expenditure on broadcasting. In other words, higher cost per-credit could be explained in terms of low enrolment of area-course students and low accumulation of credits by both area-course and regular students.

The conclusion that can be drawn from the cost analysis of higher education in Japan is that: i) correspondence programmes of private universities are of the lowest cost, ii) the distance education programmes at UAJ are costlier than those at other universities, iii) UAJ could be cost-effective if the student enrolment exceeds 20,000 and the broadcasting is kept at a low key.

4.9 GLOSSARY

Constant Price: Price expressed relative to the price of a fixed year, called the base year. Due to inflation, i.e., rising prices, the purchasing power of money decreases. Hence, in terms of the purchasing power the investment of a certain amount of money in a particular year is not equal to that of the same amount a few years back. If, for instance, the prices have doubled between 1980 and 1990 then an investment of Rs. 1000.00 in 1990 is worth as investment to as Rs. 500.00 in 1980, this expression of Rs. 1000.00 as Rs. 500.00 in 1980 prices is called investment in terms of constant prices—constant at 1980 rates/level.

Cost Curves: The cost of production in money terms (say, in rupees) varies with units of output produced. If a graph is plotted with units of output of the X-axis and cost of production on the Y-axis, such a graph is termed a cost curve.

Cross-section Data: These are data on a variable measured from all the segments of the population. These segments may be different geographical areas, income groups, education levels, age, etc.

Current Price: The amount of investment expressed in terms of ongoing or prevailing prices. (*See constant price* also)

Direct Cost: Also termed as price cost or variable cost, this refers to that part of cost which varies directly with the level of output.

Economies of Scale: When the average cost of production decreases because of a larger scale of production, the firm derives economies of scale. This may be due to optimum efficiency achieved at a higher level of output. Similarly, the firm derives diseconomies of scale if the average cost goes up as the output level is increased.

Gestation Period: The time period between the beginning of a project and the reaping of its output. In case of human capital, it refers to the time period

between the beginning of education and getting returns out of it by way of securing a job or self-employment.

Imputed Cost: The value of assets which are not hired from the market but owned by the authority is added to the cost of the market rate. If an educational institution is operating in a building of its own, the market rate of the rent for the premises is added to the cost of production in that institution. Similarly, the market rent of the residential buildings provided officially to the teachers is added to their salaries to arrive at the total teacher cost. Such a value of the facility which is not marketed actually is called the imputed value of the facility (e.g., the residential building).

Indirect Cost: Also termed fixed cost, it refers to that part of cost that does not vary with the level of output. This can be changed only in the long run. Examples include costs of buildings, machinery, salary of upper level officials, etc.

Marginal Productivity: Refers to the increase in production due to a unit increase in a particular input. If the number of workers, for example, is increased by one unit and the output increases by two units consequently, the marginal productivity of workers is two units of output.

Nominal Cost: The incurred cost that is expressed in terms of money; for example, Rs. 50,000/-.

Per Capita: Per person.

Private Benefit: The benefit reaped by an individual out of the economic activity that he/she undertakes. It must be noted here that apart from the individual concerned, others also benefit from such an activity. Such benefits are called “externalities”. After getting a job, the salary and other perks received by the worker are the direct benefits of education to that worker. However, society also gains from the activities of the worker by way of creating good will, expanding socio-economic activities, etc. These gains to society are termed externalities.

Real Cost: The incurred cost when expressed in terms of real inputs is termed *real cost*; for example, two units of labour, three units of land, etc.

Real GNP: Also called GNP at constant prices. The increase in GNP over time may be due to rise in the prices of goods and commodities in a period of inflation. So to measure the real increase in GNP, it is valued at the prices of a particular year, called the base year.

Social Benefit: The benefit accruing to the society as a whole out of any economic activity. This equals the sum of private benefits and externalities.

4.10 SOURCES

AIU (1998). *State Funding of Higher Education*, New Delhi: Association of Indian Universities.

Ansari, M.M. (1991). *Economics of Distance Higher Education*, New Delhi: Concept Pub. Co.

Datt, R. (1988). ‘Distance Education vs. Traditional Higher Education: A Cost Comparison’, in Koul, B.N. et al. (eds.) *Studies in Distance Education*, New Delhi: AIU and IGNOU.

- Eicher, J.C. *et al.* (eds.) (1982). *The Economics of New Educational Media, Vol. 3, Cost and Effectiveness*, Paris: UNESCO.
- Faure, P. (1972). *Learning To Be*, Paris: UNESCO.
- Gaba, A. (1997). 'Indian Open Schooling: Is it Cost Effective', in Mukhopadyay, M. and Parhar, M. (Eds) *Open and Distance Education*, New Delhi: Jawahar Publication.
- Jamison, D. (1977). *Cost Factors in Planning Educational Technology System*, Paris: UNESCO.
- Jamison, D. & Orival, F. (1982). 'Cost-effectiveness of Distance Teaching for School Equivalency', in Perraton, H. (ed.) *Alternative Routes to Formal Education*, Baltimore: Johns Hopkins University.
- Kaye, A. & Rumble, G. (1981). *Distance Teaching for Higher and Adult Education*, London: Croom Helm and Milton Keynes: Open University Press.
- Laidlaw, B. & Layard, R. (1974). Traditional versus Open University Teaching Methods: A Cost Comparison, *Higher Education*, 3, 439-468.
- Markowitz, Jr. H. (1987). Financial Decision Making – Calculating the Costs of Distance Education, *Distance Education*, 8 (2), 147-161.
- MHRD (1996). *Annual Report*, Department of Education, Govt. of India, New Delhi.
- Murao, B. (1979). *Budgeting*, New Delhi: Meenakshi Publishers
- Muta, H. (1985). The Economics of the University of the Air of Japan, *Higher Education*, 14, 269-296.
- Muta, H. & Sakamoto, T. (1989). The Economics of the University of the Air of Japan Revisited, *Higher Education*, 18, 585-611.
- Panda, S; Khan, A.R. & Garg, S. (1999). 'Growth and Development of the National Open University', in Panda, S. (ed.) *Open and Distance Education: Policies, Practices and Quality Concerns*, New Delhi: ABI.
- Perraton, H. (1982). *The Cost of Distance Education*, Cambridge: International Extension College.
- Perry, W. (1976). *Open University*, Milton Keynes: Open University Press.
- Pillai, C.R. & Naidu, C.G. (1999). 'Cost Effectiveness of Distance Higher Education', in Panda, Santosh (ed.) *Open and Distance Education: Policies, Practices and Quality Concerns*, New Delhi: ABI.
- Pyrr, Peter, A. (1972). "Zero Based Budgeting", Speech Delivered at the International Conference of the Planning Executive Institutes, New York.
- Rumble, G. (1981). The Cost Analysis of Distance Teaching: Costa Rica's Universidad Estatal a Distancia, *Higher Education*, 10, 375-401.

- Rumble, G. (1982). The Cost Analysis of learning at a Distance: Venezuela's Universidad Nacional Abierta, *Distance Education*, 3(1), 116-140
- Rumble, G. (1997). *The Cost and Economics of Open and Distance Learning*, London, Kogan Page.
- Sahoo, P.K. (1985). *A Study of Correspondence Education in an Indian University*, Ph.D. Thesis, M.S. University, Baroda.
- Sahoo, P.K. (1986). Financing of Distance Education at University Level, *University News*, 8.
- Shukla, P.D. (1983). *Administration of Education in India*, New Delhi: Vikas Publishing House.
- Singh, Amrik & Sharma, G.D. (eds.) (1989). *Higher Education: The Institutional Context*, New Delhi: Konark Publishers.
- Wagner, L. (1972). The Economics of the Open University, *Higher Education*, 1, 159-183.
- Wagner, L. (1973). The Open University and the Cost of Expanding Higher Education, *Universities Quarterly*, Autumn.
- Wagner, L. (1977). The Economics of the Open University Revisited, *Higher Education*, 6, 359-381.
- Ziderman, A. & Albercht, D. (1995). *Financing Universities in Developing Countries*, London: Falmer Press.