

Role of Mass Media in Higher Education & its Economic Viability –

Part – 4 *Unit Cost Analysis*

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This study has been undertaken with an aim to find out whether the role of mass media in higher education could make it Economically viable. For this purpose, it has been considered necessary to analyze the cost per student in conventional system of education and to compare the cost per student in distance and open system of higher education, which has been using mass media for its inputs. To analyze the cost of education in conventional system, one renowned University's data (during Paradigm Shift years) has been selected for study, further in Distance Education category, IGNOU's data has been chosen for analysis, finally on the basis of available data (during that time) Unit Cost per student worked out for Economic Viability. Here years span selected for data was those which can be consider as "Paradigm Shift Era" for Indian Education System.

Key Words: Distance Education, Cost Analysis, Funding Pattern of Higher Education, Cost Effectiveness of Higher Education, Funding Pattern, Unit Cost Analysis

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Distance Education System

This review study is an attempt to analyse the costs of IGNOU at the level of individual courses and the institutional aggregate. The study establishes a relation between costs, courses and student numbers. It also addresses some of the issues and concerns, which have an impact on the economics of distance education as a system and explores some of the options available for improving efficiency and effectiveness of the system.

4.7 Evolution of Open Universities

Education is going through a process of transformation in a fundamental sense. Learning needs are expanding; learner groups are multiplying. New forms of knowledge transfer and exchange are being developed, and new resources are being mobilised. Universities are trying to adjust themselves to these changes, both in terms of their functions, and the ways in which they function.

The establishment of open universities in several countries and their success in providing extensive access to tertiary level education by large numbers of mature students is truly a significant development in the last two decades. Many of these universities are in the process of expanding their initial mandate of providing a 'second chance' to those who aspire for traditional university degrees. Their range of activities varies from offering education and training in sophisticated professional areas to developing and managing of large communication networks. In most countries, open universities have emerged as an essential and innovative

component of the higher education infrastructure and are looked upon by educational planners and policy makers as well as the wider community as a vital instrument of human resources development.

4.2 IGNOU: Functions Activities And Structure

Objects And Functions of IGNOU

According to the IGNOU Act¹, 1985, the major objects of the University are:

- Advance and disseminate learning and knowledge by a diversity of means
- Provide opportunities for higher education to a large segment of the population
- Promote the educational well-being of the community generally
- Encourage the open university and distance education systems in the educational pattern of the country
- Coordinate and determine the standards in the distance education system

The Instructional System

The instructional system of IGNOU is designed with multimedia learning packages at its core. The main components of the learning packages of IGNOU are self-instructional print material, supplemented with video and audio programmes. There are, in addition, face-to-face counselling sessions, student assignments and, where

necessary, practical work. Access to computing facilities and laboratories/work centers for practical and experimental work is provided through special arrangements with selected institutions. The mix of these components in the learning packages and the provision of various services provided to students through third-party contractual arrangements have a significant impact on the cost and its functions. There are variations in costs across programmes, depending upon the provision of programme-specific materials and services. For instance, students pursuing science programmes will have to be provided access to science laboratories, materials and consumables for experiments. Similarly, students pursuing computer education programmes should have access to computing facilities for hands-on experience; those doing engineering and technology programmes should have access to work centers; and those pursuing nursing education should have access to hospitals for clinical work experience.

In order to ensure access to various services, including tutorials and counselling, the University has set up a network of Regional Centers and Study centers and partner institute. The Study Centers are generally located in existing educational institutions and normally function during weekends/holidays or on working days in the evening hours. At these Study Centers, students have access to learning materials including audio/video packages as well as listening/viewing facilities. Academic Counsellors provide tutorials/counselling to students according to a prescribed schedule. All the personnel working at the Study Centers are paid remuneration for the specific functions performed by them. The services provided at the Study Centers do not commit the University to any long-term staffing cost; this eclectic approach enables the University to reduce its operational costs.

Activities And Operating Systems

In the fulfillment of its objects and the performance of its functions, the University has to formulate and implement a large variety of programmes and activities. These include:

- Formulation of academic programmes leading to the award of certificates, diplomas or degrees
- Preparation of learning packages for each of these programmes and courses which may include printed material and audio/video programmes
- Production of learning packages in large quantities and their storage and distribution
- Preparation of audio/video cassettes for national broadcast/telecast
- Establishment and maintenance of Study Centers and their co-ordination and supervision
- Admission of students, maintenance of their records and holding examinations from time to time

- Provision of various services to students including tutorials, counselling, assignments and their evaluation
- Development and maintenance of appropriate structures and mechanisms for the performance of various activities

The Organisation And Its Structure

At the core of the University's organizational structure are three major sub-systems. These are:

- i) Course Design, Development and Production;
- ii) Delivery of Programmes; and
- iii) Management of the System

Course Design, Development And Production

Each of these stages involves considerable expenditure on various activities. From the point of view of cost, the major activities relating to each of these three phases are:

- a) Planning Phase
 - Meetings of informal consultative groups of experts
 - Visits to specialized centers, where necessary
 - Related contingencies
- b) Development Stage
 - Meetings of expert committees and course writers
 - Course writing, editing and revision
 - Preparation of graphs, charts, diagrams, etc.
 - Preparation of camera ready copies
 - Preparation of audio/video scripts
 - Translation into other languages
- c) Production Stage
 - Printing of course materials
 - Production of audio/video programmes
 - Duplication of audio/video cassettes

Delivery of Programmes and Services

The detailed project report would indicate the instructional design, the teaching and learning strategies and the methods of delivery of various services. The major activities, which induce cost in one form or another in this area, are:

- Admission and registration of students for the courses and programmes of their choice
- Distribution of materials to students enrolled
- Provision of access to study material including media packages to students at study centers
- Teaching (counselling) including experiments and work experience

- Distribution of assignments, their collection and evaluation
- Holding examinations and assessing student performance
- Maintenance of student records

The Management of the System

The University as an organization has its own management structures and processes. There are statutory bodies (Board of Management, Planning Board, Academic Council) responsible for the policies and programmes of the University. The executive responsibility of the University is exercised by its Officers. There are organizational structures established for specific functions like personnel administration, finance and accounts, management of the university estate, etc. As in any other organization, the university also incurs a substantial cost on provision of various supplies and services (postage, telephones, transport, electricity, water, stationery, and so on).

The major centers of activity in the performance of these functions are:

- I) The offices of the Vice-Chancellor and the Pro-Vice-Chancellors.
- ii) Planning and Development Division
- iii) Registrar's office
- iv) Finance and Accounts Division
- v) Estate Management Division

4.3 Costing Units And Cost Centers

An education system does not have a single unique output; what it produces is, in a fundamental sense, the development of the potential in the people through learning to reflect, learning to do and learning to learn. In traditional education, the number of students who are certified to have successfully completed the education offered by the institution and qualified for the relevant award is assumed to be its student graduate output. To some extent, those who had enrolled in an institution but did not successfully complete the programme may also have derived some benefit. In this view, the students enrolled could be deemed to be a measure of the institution's output.

In the distance education system, it is possible to identify, in addition, certain other outputs as well. For instance, there are outputs like programmes, courses, and learning packages (in print as well as electronic media). It would therefore be appropriate to consider these products also as the output of the distance education system.

Costing Units

The costs incurred by a distance education system can be reckoned and analyzed in terms of the following units:

- a) Cost per student enrolled
- b) Cost per successful student
- c) Cost per course/programme
- d) Cost per credit
- e) Cost of learning packages
- f) Cost per annum

It is essential to define these units and standardize them so that comparisons across programmes, across institutions and across systems are relevant and realistic. With this perspective, this study defines the units in terms of the standards indicated below:

a) Student numbers

The programmes offered by the University are of varying durations; some programmes can be completed during a minimum period of six months while others take a minimum period of three years for completion. Since one of the units proposed for cost analysis in this study is the annual cost per student, it is necessary to standardize the student numbers in terms of annual registration. It follows therefore that the student numbers on those programmes which have a duration of less than one year have to be converted into one year equivalents. In other words, half the enrolments in six-month-long programmes are assumed to be the one-year equivalent of the enrolment in that programme. Table 4.1a provides the actual enrolment in each programme during the years covered by this study; Table 4.2a shows the number of weighted students on each programme during the same period.

Table 4.1a Students Enrolled: 1998-90 to 1993-94

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
1.	Management	9687	14316	17601	26095	32429
2.	BPP	12366	11237	7664	11872	9772
3.	B.A./B.Com.	20900	20390	23351	21564	22522
4.	B.Sc.	-	-	1210	2003	2587
5.	BLS	1527	1872	1461	1473	1280
6.	PGDDE	1228	825	484	485	445
7.	PGDHE	-	-	862	938	396
8.	DCE	441	333	468	574	484
9.	DCO	-	484	621	853	1099
10.	DRD	-	-	2998	2370	1733
11.	CFN	2132	2919	5655	5957	3376

12.	CIG	-	-	-	1081	801
13.	DCH	-	-	-	213	165
14.	MADE	-	-	-	188	49
15.	DNHE	-	-	-	-	1227
	Total	48281	52376	62375	75666	78365

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Note: In addition ACC and ANC Courses are offered as awareness courses in 1993-93 for which 268 and 60 students are enrolled respectively.

Table 4.2a Weighted Students: 1989-90 to 1993-94

Sl.No.	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
1.	Management	9687	14316	17601	26095	32429
2.	BPP	6183	5619	3832	5936	4886
3.	B.A./B.Com.	20900	20390	23351	21564	22522
4.	B.Sc.	-	-	1210	2003	2587
5.	BLS	1527	1872	1461	1473	1280
6.	PGDDE	1228	825	484	485	445
7.	PGDHE	-	-	862	938	396
8.	DCE	441	333	468	574	484
9.	DCO	-	484	621	853	1099
10.	DRD	-	-	2998	2370	1733
11.	CFN	1066	1459	2828	2979	1688
12.	CIG	-	-	-	540	401
13.	DCH	-	-	-	213	165
14.	MADE	-	-	-	188	49
15.	DNHE	-	-	-	-	1227
	Total	41032	45298	55716	66211	71391

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

b) Successful students

It is difficult to define this concept for a variety of reasons. In the first place, the graduation ratio in any distance education system, relative to enrolment, is very low. This is primarily because the distance education system focuses on mature and motivated self-learners, many among whom may not necessarily be interested in the end-certification of their learning outcome.

There may also be a large number of students whose main interest would be confined to a course, or a module, in a programme and therefore may not pursue the whole programme to its logical end. There may still be a few others who might find self-learning a frustrating experience or who may not be able to allocate adequate time for self-study. These variations in student objectives render any attempts at standardization unrealistic; graduation may be the long-term objective only of a smaller number enrolled on a particular programme. Therefore, the cost per graduate may not be a true reflection of the effectiveness of the programme though for distance education planners and managers, it would still be a useful indicator for purposes of comparison across institutions and systems. In this study, we have not attempted the analysis of graduate cost, as in many cases, the programmes are in the initial phases, and many students still have opportunities for completing the programmes on which they are enrolled.

c) Programmes and courses

Academic programmes, and the courses, which comprise those programmes, are the major instruments through which a university seeks to attain its objectives. While designing these programmes, the universities generally determine the curricula, and prescribe the syllabi, textbooks and other teaching materials along with supplementary learning methods like laboratory experiments, project work, and so on. The programmes and courses are offered by universities at various levels leading to award of qualifications of certificates, diplomas and degrees.

The programmes prescribed by the IGNOU follow the same pattern, and they belong to the same types. There are however certain feature, which distinguishes IGNOU, programmes and those, which are offered by the traditional institutions. The major distinguishing features are:

- Modularity in structure
- Multiple entry and exit points
- Flexibility in combinations of courses
- Greater learner autonomy in pacing the programme of study in terms of structure and duration

During 1993-94, the IGNOU was offering several programmes. These included 4 certificate programmes, 16 diplomas, Bachelor's degree programmes in 14 disciplines and Master's degree in 3 subjects. Normally, a certificate programme consists of 3 courses, and a diploma programme consists of 5-6 courses. The Bachelor's degree in Arts, Science and Commerce consists of 12 courses of 8 credits each spread over a period of three years. However the Bachelor's degree in Library and Information Science which takes only one year for completion (a first degree is the minimum requirement for admission) has 7 courses. The

Master's degree in Business Administration comprises 21 courses and the Master's degree in Distance Education has 10 courses. The University offers its programmes through the medium of English and Hindi and selectively through other regional languages. Most of the courses are originally developed in English; they are then translated into Hindi and other languages. However, courses in Hindi language are developed in Hindi itself. There are also a few courses developed by the University in other regional languages. Table 4.3a shows the number of courses in each programme. Since the University offers some programmes in two or more languages, some costs have to be incurred on their translation. The number of translated courses are shown separately in Table 4.3b.

Table 4.3a Programmes on offer and the number of Courses (cumulative)

Sl. No.	Programme	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
A.1	Management	5	11	11	11	22	26	29	32
A.2	BPP	-	3	3	3	3	3	3	3
A.3	BDP								
a)	Foundati on	-	-	16	16	16	16	16	16
b)	Appl. Oriented	-	-	9	15	28	33	37	45
c)	B.A. (Elect.)	-	-	1	5	11	11	11	11
d)	B.Com (Elect.)	-	-	-	2	4	15	31	34
e)	B.Sc. (Elect.)	-	-	-	-	-	-	-	-
A.4	BLS	-	-	-	9	9	9	9	9
A.5	PGDDE	5	5	5	5	5	5	5	5
A.6	PGDHE	-	-	-	-	-	5	5	5
A.7	DCE	-	6	6	6	6	6	6	6
A.8	DCO	-	-	-	-	5	5	5	5
A.9	DRD	-	-	-	-	-	5	5	5
A.10	CFN	-	-	3	3	3	3	3	3
A.11	CIG	-	-	-	-	-	-	4	4
A.12	DCH	-	-	-	-	-	-	5	7
A.13	MADE	-	-	-	-	-	-	5	5
A.14	DNHE	-	-	-	-	-	-	-	4
	Total	10	25	54	75	119	152	189	211

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Note 1. * includes a project course
2. Do not include certificate in Rural Development which has 3 courses

Table 4.3b Translated Programmes on offer and the number of courses (Cumulative)

Sl. No.	Programme	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
B.1	BPP	-	3	3	3	3	3	3	3
B.2	BDP								
a)	Foundati on	-	-	2	16	2	2	2	2
b)	Appl. Oriented	-	-	6	15	11	23	26	32
c)	B.A. (Elect.)	-	-	1	5	5	11	11	11
d)	B.Com (Elect.)	-	-	-	2	2	15	31	34
e)	B.Sc. (Elect.)	-	-	-	-	-	-	-	-
B.3	DRD	-	-	-	11	-	5	5	5
B.4	CFN	-	-	-	9	12	18	24	24
B.5	CIG	-	3	12	5	-	-	-	4
	Total	-	3	24	35	56	82	107	122

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Note: 1. * includes a project course
2. Do not include Certificate in Rural Development which has 3 courses

For the purposes of costing, a programme is treated as a unit for apportioning a total cost to that programme. Because of the wide variations in the content, structure and duration, a programme is not a standardized unit. Nevertheless, it is a unit around which considerable expenditure is incurred and all recovery of costs in terms of student fees is accounted in respect of a programme as a whole. It is therefore essential for planners and policy makers to know whether a particular programme is viable and whether or not it should continue to remain on offer and whether it needs modification or revision. In short, a programme cost is an aggregation of the cost of several components including design, development and production; maintenance and delivery; and the administrative support involved in its presentation.

d) Credits

In the instructional design of the University, a credit is defined as the equivalent of 30 hours of study time for a student, which includes studying the learning packages (print and electronic media), participation in tutorials and counseling, and doing the assignments. Most courses developed by the University are structured on the basis of a certain assigned number of credits, varying between 2 and 8. This structure essentially reflects the modular nature of the programmes; it also enables the University to develop courses around coherent themes or topics of study irrespective of the time involved in the study of that particular theme or topic. Moreover, a student who pursues a programme at his pace and convenience can choose a specific number of courses from a range of options available within that programme and accumulate credits earned by him till he/she completes the required number of credits to become eligible for the award of the certificate, diploma or degree.

In this pattern, a certificate programme comprises upto 16 credits, a diploma programme 32 credits, and a Bachelor's degree in Science, Arts and commerce 96 credits. There are certain specialized programmes, which are necessarily course-based. For example, the diploma programmes in Management and other specialized areas are structured with a specified number of courses. Nevertheless, in order to enable the University to standardize the structure of these programmes, a credit value has been assigned to each of the courses. There are courses consisting of 2,4,6 or

8 credit depending upon the specific topics which each of these courses deals with.

During 1993-94, the University was offering several programmes comprising 333 courses in English, Hindi and other regional languages. Of the 333 courses, 185 were offered through the medium of English, 116 through Hindi and 32 in other Indian languages. In terms of credits, the University had developed 1838 credits till 1993-94 of which 1172 were in original form and 666 were in translation. Tables 4.4a, 4.4b, 4.5a and 4.5b give the details of the programmes, courses, their credit values, and also the number of credits translated into various languages.

Table 4.4a Programmes, Courses and their Credit Classification (1993-94) (cumulative)

Sl.No.	Programme	2 credit	4 credit	6 credit	8 credit	Total
A.1	Management	-	-	31	-	31
A.2	BPP	-	-	-	3	3
A.3	BDP					
	a) Foundation	-	14	-	2	16
	b) Appl. Oriented	-	8	-	4	12
	c) B.A. (Elect.)	-	2	-	43	45
	d) B.Com (Elect.)	-	10	-	1	11
	e) B.Sc. (Elect.)	9	25	-	-	34
A.4	BLS	2	7	-	-	9
A.5	PGDDE [*]	-	-	5	-	5
A.6	PGDHE [*]	-	-	5	-	5
A.7	DCE [*]	-	6	-	-	6
A.8	DCO	-	-	5	-	5
A.9	DRD [*]	-	-	5	-	5
A.10	CFN	-	1	2	-	3
A.11	CIG	-	4	-	-	4
A.12	DCH [*]	-	7	-	-	7
A.13	MADE	-	-	5	-	5
A.14	DNHE [*]	-	-	-	-	4
	Total	11	84	58	54	210

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Note: 1. * in addition a project course (equivalent to 12 credits)
is offered for MBA students
2. ** assumed credit (non-credit programme)

Table 4.4b Translated Programmes, courses and their credit classification (1993-94) (cumulative)

S.No	Programme	2 credit	4 credit	6 credit	8 credit	Total
B.1	BPP	-	-	-	3	3
B.2	BDP ^{**}					
	a) Foundation	-	-	-	2	2
	b) Appl. Oriented	-	4	-	3	7
	c) B.A. (Elect.)	-	2	-	30	32
	d) B.Com (Elect.)	-	10	-	1	11
	e) B.Sc. (Elect.)	9	25	-	-	34
B.3	DRD	-	-	5	-	5
B.4	CFN ^{**}	-	8	16	-	24
B.5	CIG	-	4	-	-	4
	Total	9	53	21	36	122

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Note: 1. * in addition a project course (equivalent to 12 credits)
2. ** assumed credit (non-credit programme)

Table 4.5a Programmes and Credits on offer (cumulative)

S. No	Programme	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
A.1	Management	30	66	66	66	138	162	180	198
A.2	BPP	-	24	24	24	24	24	24	24
A.3	BDP								
	a) Foundation	-	-	72	72	72	72	72	72
	b) Appl. Oriented	-	-	72	120	32	56	56	64
	c) B.A. (Elect.)	-	-	4	20	48	48	48	48
	d) B.Com (Elect.)	-	-	-	8	16	52	108	116
	e) B.Sc. (Elect.)	-	-	-	-	-	-	-	-
A.4	BLS	-	-	-	32	32	32	32	32
A.5	PGDDE [*]	30	30	30	30	30	30	30	30
A.6	PGDHE [*]	-	-	-	-	-	30	30	30
A.7	DCE [*]	-	24	24	24	24	24	24	24
A.8	DCO	-	-	-	-	30	30	30	30
A.9	DRD [*]	-	-	-	-	-	30	30	30
A.10	CFN	-	-	16	16	16	16	16	16
A.11	CIG	-	-	-	-	-	-	16	16
A.12	DCH [*]	-	-	-	-	-	-	20	28
A.13	MADE	-	-	-	-	-	-	30	30
A.14	DNHE [*]	-	-	-	-	-	-	-	32
	Total	60	144	308	412	682	866	1034	211

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Note 1. * includes a project course
2. ** assumed credits (non credit programme)

e) Learning Packages

The multimedia learning packages produced by the University comprise self-instructional printed material and audio/video programmes, which supplement them. The electronic media packages are not compulsory components; however, students can use them to supplement their learning efforts. Considering the fact that a large number of students in the country would not have free access to viewing and listening facilities at their homes, the University has not yet made the electronic media packages a compulsory component of its instructional system. Nevertheless, these packages are made available at the study centers where students have free access to the packages as well as playback facilities.

The learning packages of the university are its major products. Since they are widely distributed to students enrolled on various programmes and courses, they are available to anybody who wishes to use them. There is no confidentiality or exclusiveness about these materials as in the case of the curricular transaction between the teacher and the student in a classroom. Moreover, the learning packages are also available to non-students. In other words, any person who wants to use these materials for self-learning (this includes students enrolled on programmes of conventional

institutions or those preparing for various examinations) can buy them for use. This easy access to the learning packages also renders them open to assessment of quality and standards by the public. Therefore, the quality of the university's programmes and courses and its academic standards are, in no small measure, determined by the learning packages produced by it. The cost and quality of these packages are crucial in determining the effectiveness of IGNOU programmes and courses.

There is at present no standardization of the components of the learning packages. Generally, the total curricular content is comprehensively covered by the printed text. Specific components of this text are treated separately through audio/video programmes. These components are selected for their potential impact on the learning process. There is no rigid media-mix, which requires that a course should have a specific number of audio tapes and video cassettes. These numbers are determined on the basis of the themes that can be carved out from each course topic and treated effectively through the electronic media.

From the cost point of view, however, there is another significance to these products as they are also openly sold in the market. Therefore, while analyzing the cost of IGNOU, it is worthwhile to consider the cost of the print and electronic media packages separately.

f) Annual Cost

The annual cost is a significant indicator of the unit cost. These costs are worked out on the basis of the total expenditure incurred by the University in a particular year divided by the number of students on roll in that year. The total cost for this purpose would include the following components:

- i) The annualized cost on the design and development of the course materials
- ii) The actual cost of production and distribution of those materials for the specified number of students
- iii) The overall delivery cost (counseling, assignments, examinations, record maintenance, etc.)
- iv) The overall management cost in supporting the system and its structures during that year
- v) The annualized capital cost involved in infrastructure

Cost Centers

A cost center within an organization is that unit which is identified with the performance of a specific activity or function on which some expenditure is incurred. For example, while the Schools of Studies are the cost centers for the design and development of course materials, the Communication Division is the cost center for production of audio/video packages; the Regional Services Division is the cost center for such services as admission, counseling, assignments, etc. and the Evaluation Division is the cost

center for examinations and declaration of results. Generally, within an organization, it is difficult to identify a unit of the structure exclusively for each activity. Generally, most of the structures perform a number of activities. In IGNOU, for example, the Regional Services Division performs several functions for provision of various forms of support to students. These include admission and collection of fees, dissemination of information about programmes, counseling schedules, examinations, etc., appointment and training of Counsellors, organization of counseling sessions, collection and evaluation of student assignments and so on. It follows that the Regional Services cost encompasses a wide range of activities.

These complexities in the organizational structure do affect the analysis of cost and its accurate and precise apportionment. For a variety of reasons, the specific cost of a particular activity may not lend itself to be assessed with any degree of precision; this is mainly due to the fact that the records of staff-time involved in the performance of different activities are not maintained. For the purpose of cost analysis, therefore, some effort will have to be made to apportion the costs on the basis of reasonable estimates of the expenditure incurred by a particular cost center in the performance of each activity associated with it.

In this study, we have identified certain major clusters of activities with the following cost centers:

S. N	Clusters of Activity	Cost Centers
a)	Design, development and preparation of courses (planning and development stages) a) Print material b) Audio/Video Programmes	a) Schools of studies b) Communication Division
b)	Production of print material	Printing and Publication div.
c)	Distribution	Material distribution div.
d)	Admission	Admission Div.
e)	Evaluation	Evaluation Div.
f)	Student Record Maintenance	Computer Div.
g)	Student Support Network	Regional Support Div
h)	Academic Support System a) Human Resources Development b) Research & Development c) Library & Documentation	a) Staff Training and Research b) Schools c) Library & Documentation Division
i)	General Administrative Support	Offices of the Vice-Chancellor and Pro-Vice-Chancellor, Divisions of Administration, Finance & Accounts, Estate Management

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Annualisation of Fixed Cost

The methodology usually followed in cost analysis is to amortise the value of these investments over the life

span of the concerned assets, and reckon the amortised value as the annual cost.

Jamison, Klees and Wells (1978) had suggested a method for amortization of fixed costs into annual costs by using the following formula:

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

a(r,n) = Annualisation factor

r = Interest Rate

n = Life time of the Material

According to this formula, fixed cost can be converted into annual cost, by multiplying the former with the annualisation factor a(r,n). Studies on economics of education have generally assumed a rate of interest of 7.5 to 15% and six years as the life of Course materials. To calculate the annualized costs at the three interest rates, viz., 0%, 7.5% and 15% and different life expectancies, I have used different coefficients, available in reference book's appendix. The coefficient for a capital item with a life expectancy of 6 years and 7.5% interest rate is 0.213. The annualized cost of a given item costing Rs.10,000, will work out to Rs. 2130 (0.213 * Rs.1 0,000). We have made an attempt to amortise the fixed cost on development of print material and the audio video programmes on the assumption that the life expectancy of Course materials is 6 years and the interest rate 7.5%. The results are presented in Tables 4.6A, 4.6b, 4.7A and 4.7B.

Table 4.6A Annual costs on Print Material (Development and Production Fixed): Total Cost (Rs. in lakhs)

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
A1.	Management	4.49	8.88	10.40	11.64	12.82
A2.	BPP	3.17	3.17	3.17	3.17	3.17
A3.	B.A./B.Com.	27.65	48.23	54.61	57.99	67.07
A4.	B.Sc.	-	-	14.33	27.11	28.98
A5.	BLS	3.68	3.68	3.68	3.68	3.68
A6.	PGDDE	2.00	2.00	2.00	2.00	2.00
A7.	PGDHE	-	-	3.83	3.83	3.83
A8.	DCE	2.95	2.95	2.95	2.95	2.95
A9.	DCO	-	2.72	2.72	2.72	2.72
A10.	DRD	-	-	4.19	4.19	4.19
A11.	CFN	2.01	2.01	2.45	2.89	2.89
A12.	CIG	-	-	-	2.31	2.31
A13.	DCH	-	-	-	2.78	3.88
A14.	MADE	-	-	-	2.50	2.50
A15.	DNHE	-	-	-	-	3.05

Total: All Programmes	45.95	73.64	104.34	129.77	146.04
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(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Table 4.6b Annual costs on print material (Development and Production Fixed): Per Student Cost (Rs.)

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
B1.	Management	46.37	62.01	59.03	44.61	39.53
B2.	BPP	25.65	28.22	41.38	26.71	32.46
B3.	B.A./B.Com.	132.28	236.55	233.96	268.93	297.80
B4.	B.Sc.	-	-	1184.00	1353.50	1120.25
B5.	BLS	241.04	196.62	251.93	249.87	287.55
B6.	PGDDE	163.22	242.95	414.12	413.26	450.41
B7.	PGDHE	-	-	444.78	408.74	968.18
B8.	DCE	667.98	884.62	629.44	513.20	608.62
B9.	DCO	-	561.99	438.00	318.88	247.50
B10.	DRD	-	-	140.36	176.96	242.01
B11.	CFN	94.21	68.81	43.35	48.49	85.55
B12.	CIG	-	-	-	213.59	288.25
B13.	DCH	-	-	-	1307.00	2349.45
B14.	MADE	-	-	-	1330.12	5103.31
B15.	DNHE	-	-	-	-	248.24
Total: All Programmes		111.99	162.57	187.27	196.30	204.57

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Table 4.7A Annual costs on Audio/Video Programmes Production:: Total Cost (Rs. in lakhs)

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
A1.	Management	6.78	7.81	9.14	10.19	10.97
A2.	BPP	1.21	1.21	1.21	1.21	1.21
A3.	B.A./B.Com.	5.76	8.50	12.06	16.08	22.78
A4.	B.Sc.	-	-	1.76	2.50	5.72
A5.	BLS	1.01	2.50	3.17	3.33	3.52
A6.	PGDDE	1.33	1.33	1.33	1.33	1.52
A7.	PGDHE	-	-	0.61	0.79	1.39
A8.	DCE	0.64	0.64	0.64	0.64	0.83
A9.	DCO	-	0.11	1.19	1.35	1.35
A10.	DRD	-	-	1.56	2.96	2.96
A11.	CFN	1.38	1.38	1.52	1.68	1.68
A12.	CIG	-	-	-	-	-
A13.	DCH	-	-	-	-	-
A14.	MADE	-	-	-	-	-
A15.	DNHE	-	-	-	-	0.04
Total: All Programmes		18.10	23.49	34.18	42.06	53.97

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Table 4.7B Annual costs on Audio/Video Programmes Production:: Total Cost (Rs. in lakhs)

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
B1.	Management	69.94	54.59	51.84	39.05	33.84
B2.	BPP	9.77	10.75	15.76	10.17	12.36

B3.	B.A./B.Com.	27.54	41.69	51.67	74.58	101.16
B4.	B.Sc.	-	-	145.23	124.84	220.99
B5.	BLS	65.98	133.47	217.23	226.01	275.07
B6.	PGDDE	108.06	160.85	274.17	273.61	341.28
B7.	PGDHE	-	-	70.42	84.70	350.16
B8.	DCE	145.86	193.17	137.45	112.07	172.07
B9.	DCO	-	23.32	191.73	158.06	122.68
B10.	DRD	-	-	52.32	125.01	170.97
B11.	CFN	69.94	47.43	26.86	28.14	49.65
B12.	CIG	-	-	-	-	-
B13.	DCH	-	-	-	-	-
B14.	MADE	-	-	-	-	-
B15.	DNHE	-	-	-	-	3.12
Total: All Programmes		44.11	51.86	61.35	63.53	75.59

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Annual Cost on Maintenance of Courses

The activities involved in the maintenance of a course when it is on offer include minor revision and updating of materials, and the preparation of student assignments. The core faculty is primarily responsible for maintenance of courses. Most of them would also be engaged simultaneously with the development of new courses. This makes it difficult to apportion the specific faculty time between maintenance and development activities.

4-5 IGNOU Programmes: Delivery Costs

In this section, we consider all those components of the IGNOU's costs which are associated with its endeavour to reach its products and services to the students, for whom they are ultimately intended. Broadly classified as delivery costs, these include teaching costs, costs of services like admission, examination, distribution of materials and record maintenance, as well as the costs of management and administration. Also included in this Chapter are the costs of infrastructure which are essential for both development and delivery.

Delivery Strategies

From its inception in 1985, the IGNOU has been following a more or less uniform pattern for the delivery of all its programmes. The broad delivery strategies adopted by the IGNOU include:

- Every student registered on any programme is assigned to a study center of his/her choice.
- The student will have access at the Study Center to all learning resources, namely, course materials including media packages, supplementary reading materials, counselling and tutorial services, media equipment for

using audio-video tapes, facilities for collection and submission of assignments and sitting in the term-end examinations.

- Wherever specialized facilities like computing, science laboratories, etc. are necessary, the Study Centers will procure/provide these facilities to the students.
- For all practical purposes, study centers would function as the link between the University and its students in the provision of teaching/learning support.

Teaching Costs

After a student is enrolled on a programme, the process of curriculum transaction between the student and the University involves the following:

- Organization of counselling/tutorial sessions for groups of students according to a pre-determined time schedule.
- Collection of assignments done by the students, and their evaluation. The Counsellors also grade the assignments (which influence the end-results of students). These grades are sent to the University's headquarters for maintenance of student records and the assignments are returned to the students to provide them feedback of their performance.
- Where practical/experimental work is involved, arrangements are made at the study centers, or at other appropriate locations where the required facilities are procured, for conducting the experiments/practicals under proper supervision. The records of performance at these practical/experimental sessions are part of the overall student records.
- The study centers store all learning packages in print as well as electronic media alongwith supplementary reading material. They also provide to students the facility of using audio/video equipment for playback of the tapes.
- All these services, as also the expenditure involved in the maintenance of the network of study centers, directly support the teaching efforts of the University. The entire cost of this network therefore is a major component of the teaching cost.

The University also provides presently the facility for tele-conferencing through a one-way video and two-way audio network, which links the headquarters of the University with the Regional Centers. To participate in these tele-conferencing sessions, the schedules of which are announced well in advance, students have to travel to the Regional Centers. This experiment started only from the year 1995. Since our study does not extend to the period beyond 31.3.94, we have not taken into account the cost of tele-conferencing in this analysis.

The programmes of the University are also telecast on the separate National Television Network. In addition, some programmes are broadcast over the Radio Broadcasting Network from selected centers. Since the National Network without any direct cost carries these telecasts/broadcasts to the University, the expenditure incurred on them is not reckoned in the records of the University. However, from the point of view of an objective assessment of the teaching cost, it is necessary that these costs are also taken into account. However, in this study, we have not taken these costs into account.

There are other incidental costs, which contribute towards the total teaching cost. These include the training and orientation of study center personnel and the academic Counsellors. Since the total number of personnel involved is several thousands, the cost incurred on their training and orientation is fairly substantial and are included in the total teaching costs in this study. The total teaching costs for all programmes have been worked out and are presented in Table 4.8a.

Table 4.8a Pattern of expenditure : Teaching

S.No		1989-90	1990-91	1991-92	1992-93	1993-94
1.	Salary of regional services: Head quarters (include daily rated staff & security) (Two-thirds of the total cost)	28.52	44.09	52.24	67.37	86.39
2.	Remuneration to study center employees	43.71	57.69	81.23	86.19	91.97
3.	Seminar/training/coordinators/meeting	1.69	9.31	17.73	13.38	12.87
4.	Contact programmes	9.49	3.02	-	-	-
5.	Hiring of computer time	-	-	-	2.27	5.98
6.	Hiring of laboratory for science practicals	-	-	-	-	5.44
7.	Counseling	21.00	28.62	43.89	48.50	53.62
Total expenditure on teaching (Rs. in lakhs)		104.41	142.73	195.09	217.71	256.27
Total students (weighted)		41032	45298	55716	66211	71391
Cost per student (Rs.)		254.46	315.09	350.15	328.81	358.96

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

While it is relatively easy to identify the university-wise teaching cost on the basis of an analysis of the components mentioned above, there are difficulties in apportioning the teaching cost among different programmes. These difficulties are mainly due to the fact that records at the study centers are not systematically analyzed programme-wise or course-wise. There are no reliable records of the counseling sessions held or the number of students who participated in them. The study center expenditure covers all the programmes offered at that center and includes the expenditure on counseling, assignment evaluation, communication with the students, practicals/experiments and other student-related expenditure.

All the programmes offered by the University are not offered at all study centers. While all the high-enrolment

programmes like Management and the Bachelor's Degree are offered at a large number of study centers, the low-enrolment programmes are distributed selectively across study centers. The programme-wise enrolment at study centers varies from single digit numbers to a few hundreds. What is important however is the fact that when a programme is presented at a study center, it has to make all the arrangements for delivering all the services associated with it irrespective of the number of students who eventually avail of those services. Apparently, the average cost per student incurred by the centers on these services will vary depending upon the strength of students at different centers.

In order to reflect this variation in per capita cost, we have attempted an estimate of the teaching cost in terms of student courses. Student courses for this purpose are the multiples of the number of courses comprised in each programme and the number of Study Centers at which the programme is presented. For instance, the student courses in the programme of Diploma in Distance Education in 1993-94 is 185 (5 Courses x 37 Study Centers). The teaching costs worked out on the basis of student courses for each programme are presented in Tables 4.9A and 4.10A. The wide variation in teaching costs is primarily due to the fact that a large number of programmes are presented at too many Study Centers with too low enrolments at several of them.

The delivery of programmes involves provision of several other services to students. These services range from admission and collection of fees, registration and maintenance of records, distribution of learning packages and holding examinations to awarding qualifications. The library and documentation services of the University, also support the academic efforts of both the faculty and the students.

Table 4.9A Annual costs on teaching : total cost (Rs. in lakhs)

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
A1.	Management	17.02	31.88	35.61	43.56	57.40
A2.	BPP	25.04	29.10	24.80	29.13	28.92
A3.	B.A./B.Com.	41.09	54.78	64.31	63.76	72.21
A4.	B.Sc.	-	-	5.68	6.93	15.44
A5.	BLS	4.98	5.60	5.05	4.44	4.35
A6.	PGDDE	5.24	5.09	4.26	3.82	3.62
A7.	PGDHE	-	-	5.32	5.20	4.63
A8.	DCE	4.22	4.40	3.71	3.29	3.17
A9.	DCO	-	3.50	3.03	4.79	10.34
A10.	DRD	-	-	20.77	20.21	19.93
A11.	CFN	6.83	8.38	22.54	22.80	20.81
A12.	CIG	-	-	-	5.98	8.75
A13.	DCH	-	-	-	3.80	3.47
A14.	MADE	-	-	-	-	-

A15.	DNHE	-	-	-	-	3.23
Total: All Programmes		104.41	142.73	195.09	217.71	256.27

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Table 4.10A Annual costs on teaching : cost per student (Rs. in lakhs)

S.No	Programme	1989-90	1990-91	1991-92	1992-93	1993-94
B1.	Management	175.68	222.67	202.08	166.93	177.00
B2.	BPP	202.45	259.00	323.54	245.36	295.92
B3.	B.A./B.Com.	196.59	268.65	275.55	295.69	320.63
B4.	B.Sc.	-	-	469.69	345.96	596.70
B5.	BLS	326.16	298.91	345.51	301.56	340.14
B6.	PGDDE	426.67	616.83	880.17	787.88	812.73
B7.	PGDHE	-	-	617.31	554.20	1168.47
B8.	DCE	956.01	1321.05	793.29	573.78	655.52
B9.	DCO	-	723.57	488.42	561.12	940.69
B10.	DRD	-	-	695.08	852.63	1150.31
B11.	CFN	320.49	287.25	398.62	383.75	616.45
B12.	CIG	-	-	-	553.07	1091.90
B13.	DCH	-	-	-	1783.08	2102.63
B14.	MADE	-	-	-	-	-
B15.	DNHE	-	-	-	-	263.15
Average : All Programmes		254.46	315.09	350.15	328.81	358.96

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Delivery of Services

The cost of various services provided to the students constitutes a significant element of the programme delivery costs of the University. There are separate units of organization responsible for delivery of services. Since the existing structures are based on a functional division of various services, the total expenditure booked under each of these units is taken as the expenditure on the relevant services. The specific components of these services include the salary of staff, and the cost of materials and services, which are necessary for the performance of the concerned function.

The overall expenditure incurred by the University in a year for the performance of a cluster of services is divided by the number of students serviced in that year to arrive at the unit cost which will be uniform across all programmes. The analysis of this expenditure is presented in Table 4.11a.

Table 4.11a Pattern of expenditure : Delivery of services

S.No.	Cost item	1989-90	1990-91	1991-92	1992-93	1993-94
	Expenditure (Rs. in lakhs)					
	Regional services : Headquarters & RCs (one-third of the total cost)	14.26	22.04	26.12	33.69	43.19
	Admission	19.99	36.51	61.95	67.74	50.94

		41.01	59.49	78.21	100.10	133.04
	Evaluation	41.01	59.49	78.21	100.10	133.04
	Computer Division	19.08	30.46	37.95	35.42	41.89
	Library & Documentation	8.69	12.31	13.94	16.99	20.57
	Material Distribution	23.65	66.36	45.07	52.11	54.32
	Total expenditure on teaching (Rs. in lakhs)	126.68	227.17	263.24	306.05	343.95
	Total students (weighted)	41032	45298	55716	66211	71391
	Cost per student (Rs.)	308.73	501.50	472.47	462.23	481.78

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Management Cost

The University is an organization; it has its own management structures and processes. These consist of various statutory bodies, and the officers and staff of the organizational units which constitute the managerial and administrative systems.

While we have separately analyzed the cost of those operating systems, which directly support students and the teaching and learning functions, there are other sub-systems, which contribute indirectly to the overall costs. These are not directly relatable to course development, production and their delivery. In this category are included the costs on the establishment and maintenance of the mechanisms which run the University as an organization and its infrastructure. The various components in this category include the salary of the Officers (the Vice-Chancellor and the Pro-Vice-Chancellors) the Divisions of Planning & Development, Administration, Finance & Accounts and Estate Management. There is also the expenditure on various common services provided by the University to all its organizational units, namely, expenditure on travel, postage and stationery, electricity and water, transport, rents and rates, and so on.

The total expenditure incurred by the University under these heads in a year is divided by the number of students serviced in that year to arrive at the per capita cost. In order to determine the cost of a programme, the number of students enrolled on that programme in that year multiplies this unit cost. The per capita cost on management during the period of the study is presented in Table 4.12A.

Table 4.12A Pattern of expenditure : Management

S.No	Cost item	1989-90	1990-91	1991-92	1992-93	1993-94
	Cost Rs. in lakhs					
	General Administration	55.56	55.74	62.32	81.67	95.80
	Estate Management	13.37	23.90	30.16	35.18	42.55
	Administrative Expenses	159.10	193.13	262.00	314.19	366.49
	Miscellaneous and other expenditure	30.22	42.67	59.25	67.61	65.11
	Total expenditure on teaching (Rs. in lakhs)	258.25	315.44	413.73	498.65	569.95
	Total students (weighted)	41032	45298	55716	66211	71391
	Cost per student (Rs.)	629.39	696.37	742.57	753.12	798.35

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Total Delivery Costs

A consolidated statement showing all the delivery costs per student for all programmes during the five years 1989-94 is presented in Table 4.13A.

Table 4.13A : Summary of Delivery Costs

Cost item	1989-90	1990-91	1991-92	1992-93	1993-94
Teaching cost (Rs. in lakhs)	104.41	142.73	195.09	217.71	256.27
Other services (Rs. in lakhs)	126.68	227.17	263.24	306.05	343.95
Management (Rs. in lakhs)	258.25	315.44	413.73	498.65	569.95
Total expenses (Rs. in lakhs)	489.34	685.34	872.06	1022.41	1170.71
Total weighted enrolment	41032	45298	55716	66211	71391
Per student cost (Rs.)	1192.58	1512.96	1565.19	1544.17	1639.10

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

Infrastructure Cost

The infrastructure cost generally includes all capital expenditure representing investments in land, buildings and other durable assets. These assets are not used up in the year in which they are acquired. A building, for instance, can be used for more than 50 years; the period during which equipment and furniture can be used may vary from 10 to 20 years. In all these cases, however, the expenditure is incurred only once. In order to relate these one-time costs to the value of outputs on an annual basis, it is necessary to establish an annualized cost of the capital expenditure. The simplest way is to divide the total initial investment by the expected life of the asset created by that investment.

Economists however argue that the investment made in acquiring capital is frozen during the period of its use and is not available for expenditure for any other purpose. The alternative use of that frozen investment could have yielded some returns equal to the interest rates in the money market. It is necessary to take into account this 'opportunity cost', which was forgone. Since there is no unique interest rate which represents the opportunity cost, certain assumed rates of interest are applied to calculate annualized capital cost. These assumed rates vary from zero percent (acceptable to those opposed to the concept of opportunity cost) and 15 per cent (considered to be the highest rate of interest in the money market). Most economic studies use the mid-point of 7.5%.

The IGNOU has yet to complete its infrastructure development. Most of its main campus buildings are still to

be constructed. The present accommodation of the IGNOU is purely temporary construction. When the permanent campus comes up, the investment would be several times higher than what the value of its buildings presently reflects. At this stage, therefore, making an attempt to annualize the capital cost of the IGNOU will be unrealistic. Nevertheless, in order that a methodological framework is provided for future attempts at analyzing capital cost, we have indicated in Table 4.14a the pattern of the existing capital expenditure and its Annualisation.

Table 4.14a Pattern of expenditure : Capital cost

S.No	Cost item	Life in years	1989-90	1990-91	1991-92	1992-93	1993-94
A	Expenditure (Rs. in lakhs)						
A.1	Land and buildings	50	725.21	783.51	930.40	1088.64	1378.56
A.2	Furniture, equipment, vehicles and computers	10	1710.81	1935.37	2015.59	2112.10	2177.43
A.3	Library books	20	10.32	168.87	214.41	263.17	296.23
	Total expenditure (Rs. in lakhs)		2544.34	2887.75	3160.40	3463.91	3852.22
B	Expenditure (Rs. in lakhs)						
B.1	Land and buildings		55.84	60.33	71.64	83.83	106.15
B.2	Furniture, equipment, vehicles and computers		259.78	282.56	294.28	308.37	317.90
B.3	Library books		10.62	16.55	21.01	25.79	29.03
	Total expenditure (Rs. in lakhs)		316.24	359.44	386.93	417.99	453.08
	Total students (weighted)		41032	45298	55716	66211	71391
	Per student cost (Rs.)		770.72	793.50	694.47	631.30	634.65

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

IGNOU's Annual Cost Per Student

On the basis of the previous analysis we now present a consolidated statement of the annual cost per student (excluding infrastructure cost) for all IGNOU programmes in Table 4.15a.

Table 4.15a: Summary of total per student unit costs : cost per student (Rs.)

S. N	Cost item	1989-90	1990-91	1991-92	1992-93	1993-94
1.	Development and production of (Print/Audio/Video) materials and maintenance of courses	525.12	600.43	646.66	678.52	724.21
2.	Teaching cost	254.46	315.09	350.15	328.81	358.96
3.	Other delivery services	308.73	501.50	472.47	462.33	481.78
4.	Management	629.39	696.37	742.57	753.12	798.35
	Total	1717.70	2113.39	2211.85	2222.68	2363.30

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

4-6 Structure and Behaviour of Costs

For the purpose of analysis, we have divided the total costs into two major categories, namely, development costs and delivery costs. However, for the purpose of a proper appreciation of the structure and behaviour of costs, it would be worthwhile to identify the major functional areas, which influence the costs of IGNOU. These are:

- i) Development and production of learning packages, which include printed material as well as electronic media packages.
- ii) Delivery of student services which include teaching and learning support as well as other services like admission, distribution of materials, maintenance of records, etc.
- iii) Management system which includes institutional expenditure on organization, infrastructure and its maintenance.

From our analysis of the expenditure incurred by IGNOU during the five-year period 1989-94, it is possible to identify the costs under each of these major functional areas. We have indicated a method by which programme costs can be computed on the basis of the past experience as far as development and production of materials are concerned, and the remaining costs comprising delivery of student services as well as management by a system of apportionment. We shall now proceed to discuss some issues and concerns, which are relevant not only to IGNOU but also to the distance education system as a whole in determining its efficiency and effectiveness.

Factors Influencing Costs

A. Design and Development of Courses and Programmes

While discussing the process involved in the design and development of learning packages in Section 4.4, we have mentioned that the university is presently following several models of course development and preparation. The focus of all these efforts is that for all the programmes, the University produces its own instructional material. As a distance teaching institution, the IGNOU has gained considerable reputation and credibility for the high quality and standard of its learning packages both in print as well as the electronic media. These products of the university have also attracted international attention; some of them are being used for the programmes offered by such institutions as the Open Learning Institute in Hong Kong.

The in-house preparation of learning packages has certain obvious advantages; the university gets identified with the quality of its output of intellectual properties. At the same time, it also raises certain issues, which have implications for the efficiency of the programmes of Open Universities. In the first place, openness of the programmes, and the relatively easy access to the learning packages make them almost a non-exclusive property, which can be acquired by anyone at a price. Secondly, this easy accessibility makes it possible for any distance teaching institution to acquire the learning packages of another and

utilize them through the process of adaptation, adaptation or translation on mutually negotiated terms and conditions. This flexibility in acquiring and utilising instructional materials provides many open universities with an opportunity for an early start-up of their activities; many of them would otherwise have invested substantial resources in the development of learning packages and waited for a minimum period of two to three years to see the first volumes of their course materials in print.

The IGNOU also functions as an apex body for Open Universities and Distance Education Institutions in India. In the performance of this role, IGNOU is expected to provide development support to Open Universities established by State Governments. As in the case of other national agencies like the University Grants Commission (UGC), and the All India Council for Technical Education (AICTE), the IGNOU also provides development funding to the State Open Universities through the Distance Education Council (DEC) established under the IGNOU Act as a statutory body. More importantly, in providing such development support, the DEC has emphasised the advantages of acquiring and utilising the available learning packages by New State Open Universities. The DEC is also endeavoring to establish a net work of Open Universities (OPENET) in the country and a common pool of programmes, with contributions from existing Open Universities, which can then be drawn upon by all the members of the network.

These developments open up new possibilities, and offers several strategic options, all of which will have a significant impact on the growth of the distance education system, and its efficiency and cost structure. Some of these options are:

- a) acquisition of learning packages from other distance teaching institutions and using them through adoption, adaptation or translation
- b) use of text books and other standard works already available in the market with specially prepared and user-friendly learning manuals
- c) Commissioning the preparation and production of text books specially for identified programmes
- d) Preparation of multimedia packages on a large scale
- e) reuse of textual material already prepared with appropriate additions, modifications and updating

B. Production and Distribution of Learning Materials

Efficient and timely distribution of the instructional materials is a major element that contributes to the reliability and credibility of a distance teaching institution. All the students would be expecting that these materials are available with them as soon as admissions are over. In order

to fulfil this expectation, the institutions should put in place all operating systems that can respond quickly and effectively to student needs. It is also important that the system should be able to save both expenditure and time.

There are several possibilities that can be considered most of which could also influence cost. These include:

- a) Efficient inventory management
- b) Strict adherence to time schedules in printing and stocking course materials and assignments
- c) Improvements in forecasting student numbers on various programmes/courses
- d) Advance preparation of dispatch schedules

There have been attempts at decentralization of the distribution system by the IGNOU. This involves transfer of materials in bulk to regional centers who then redistribute them to Study Centers and inform students to collect them at a given time. The argument in favour of this experiment is that it reduces pressure on the central distribution machinery, decreases postage costs, and saves time in delivery and reduces errors. The argument against such a decentralized distribution system is that it is more inconvenient to students (they are required to travel a distance on specified days), creates heavier regional workload and storage needs, and increases the chances of errors especially in getting the correct combination of materials for students, besides leading to greater complexity in the maintenance of student records. There are no simple and straight solutions to all these problems. Each institution has to develop its own systems and procedures that lead to efficiency and economy.

In recent times, a wide range of choice has become available to improve the efficiency of the distribution system. The options available are:

- a) Distribution of materials through private courier services, specially in large cities and towns
- b) Electronic transfer of printed texts to specified distribution centers for copying and redistribution
- c) A wider dispersal of printing tasks among different regions to save the cost of freight and reduce delays
- d) Just-in-time production of materials (when enrolments are low) to save the cost of storage and reduce dead assets

C. Curriculum Transaction (Teaching)

A major assumption in the methodology of distance education is that communication technology, in one form or another, can substitute, in a large measure, face-to-face teaching in a classroom. This substitution takes place through a wide range of media replacing the classroom teacher. Nevertheless, a student at a distance might require certain guidance and advice; he/she may have to do some practical or experimental work; and he/she may still be

looking for a personal or institutional support to make him/her feel psychologically at home as a student. The curriculum design in distance teaching takes into account almost all these considerations. The instructional design adopted by IGNOU, and the services provided to the student on the basis of this design are:

I) Counseling

The counseling system is designed to assist students through interactive sessions with teachers and/or professionals in the concerned field, to assimilate the learning packages. These are not designed to be lecture sessions. Functionally, this system requires IGNOU to select and appoint suitable Counsellors, provide them necessary orientation and also schedule and conduct the required number of sessions as planned in the instructional design.

ii) Assignments

Student assignments are an essential component of the continuous evaluation of the student progress. A fixed number of assignments are prepared and given to students who work on them and return them to the Counsellors. The latter evaluate these assignments, grade them and also provide the feedback to students. The system has to arrange for the distribution and collection of the assignments, their evaluation and feed back to the students, and maintenance of the grades and other data in respect of each student.

iii) Practicals/Experiments

Certain programmes and courses require the students to do some practical or experimental work. To enable students to fulfil this requirement, necessary facilities have to be organized, practical sessions have to be scheduled and conducted, and records indicating performance levels have to be maintained.

iv) Student Access to Learning Packages

Most students will require additional learning resource support in the form of reading material, library resources and other learning-related problem solving. Finally, they will also require access to examination centers for testing their learning outcome.

Provision of these facilities and services is directly related to the teaching/learning strategies envisaged in each course design and will depend upon many factors including the media-mix and the delivery technologies applied in each case.

D. Methods of Delivery

From the beginning, IGNOU has followed a uniform system of delivery for all its programmes. Considering the

vastness of the country and the remoteness of several regions, the initial design envisaged the establishment of study centers in different parts of the country and regional centers to co-ordinate and supervise the functioning of a cluster of study centers.

Every student registered on any programme is allotted a Study Center where he/she has access to learning materials including electronic media packages, viewing/listening facilities, counselling support from tutors, facilities for collection and submission of assignments and finally, to sit the term-end examinations. Although, on an average, there is a study center for every two districts, many study centers established in the far-flung areas require several hours of travel for the students to reach them.

The teaching strategies also remained uniform for all programmes in their essence. The only variations were in respect of programme-specific requirements like science practicals, computing experience, etc. In the determination of these strategies, the estimated enrolment on each programme, and the dispersal of students across the country have not been major considerations. Consequently, the teaching costs for all programmes, except the programme-specific services, have remained uniform. Since there are wide variations in enrolment across programmes and courses, it is necessary, from the point of view of costs that the delivery strategies are reviewed, and diversified delivery mechanisms are developed. For instance:

- a) Teaching support to some programmes and courses with enrolments of only a few hundred students could be provided directly by the Schools;
- b) Some programmes could be supported by specially selected individuals, especially in remote areas, to function as animators or resource persons, who could guide students to access learning resources rather than directly providing teaching support;
- c) Programmes which require specialized facilities like laboratories/work centers could be supported directly by the Schools if they are delivered only at selected programme centers by an "institution as counsellor", model rather than delivering them through the study center network.

What is important is the fact that no one pattern will suit all programmes. Considerable cost efficiency can be achieved through diversification of the processes. New programmes will also need a creative and flexible approach to the provision of student support.

E. Technology Options

Printed text remains the mainstay for all IGNOU programmes. All students registered on all programmes are supplied printed course materials. Audio tapes and video

cassettes have so far remained supplementary learning resources. Although these electronic media packages are available to students at all the study centers, they do not still, constitute a compulsory component of the instructional materials. Obviously, the system confronts a dilemma; it wants communication technology to be an essential component of the instructional design, but not every student in the country has convenient access to the technology.

In addition to access to media packages at the study centers, the video programmes of the IGNOU are telecast on the National Television Network three days a week, for half an hour each, early in the morning since, 1991.

There have been no attempts so far to systematically study the pattern of utilization of the media packages by IGNOU students. There have however, been some effort to make a quick assessment through independent studies conducted for specific purposes, and also from the feedback of audience response to IGNOU telecast. The general conclusion from these studies is that about 25% of the IGNOU students utilize the electronic media packages either by accessing them at the study centers or by watching them on the television network.

Although it might seem too small a proportion, in the context of the constraints on access to technology, and also the distances that students have to travel to reach the study centers, utilization of the media by 25% students is significant.

The relation between successful completion of a programme and the pattern of utilization of learning packages, both printed as well as electronic, would be an interesting area to investigate in determining the media mix in the learning packages for future programmes. At this stage, however, what is significant is that technology has made an impact on education and that the IGNOU experiment has established that it can penetrate even the remotest areas of the country. An increasingly larger number of students, if they are provided access to new technologies, would be drawing upon them for their educational advancement and professional improvement.

F Student Services

We have already discussed the teaching and learning support provided to the students in the context of the strategies envisaged in the design of various programmes and courses. While the Schools of Studies are primarily responsible for the design of these teaching/learning strategies, the actual delivery of services to students is the responsibility of the regional services network.

In addition to the provision of teaching support to students enrolled on various programmes, the regional services network performs several other functions. It has

greater interaction with the immediate environs in which it is functioning and, therefore, can provide several useful local inputs to what is essentially a national effort. It can also assist the central system in many ways including establishment of linkages with local agencies, mobilizing local resources for delivery and providing feedback. This system support functions performed by the regional services network includes:

- i) Resource mapping for delivery: selection of study centers/programme centers, selection and appointment of Counsellors, identification of learning resources (libraries, laboratories, work centers, other infrastructure), and networking these resources with the central facilities.
- ii) Programme promotion: dissemination of information about IGNOU programme and courses, visibility for the university before the public and the students, linkages with local agencies, etc.
- iii) Feedback: because of its contact with the public and the students, the network is in a position to provide feedback information to the Schools of Studies on student expectations, employer response, alumni experience, market trends both existing and emerging, etc.

Besides these broad system support functions, the regional services network has also been assigned certain specific responsibilities as part of the on-going process of decentralization of IGNOU's operations. Some of these functions which are performed by the Regional Centers include admission of students, collection of fees, distribution of materials for selected programmes, maintenance of student records, arrangements for holding examinations, etc.

The Regional Centers are University's own establishments. All the study centers are institutions independent of IGNOU with which it has only contractual relations for provision of certain services. By and large, it could be assumed that while most of the study center costs are direct teaching costs, a part of the regional center costs also goes to support the system as a whole rather than the student body specifically. In this study, therefore, we have assumed that about 1/3rd of the Regional Center costs should be treated as system support costs while the entire study center costs and two-thirds of the Regional Center costs should be classified as teaching costs.

Efficiency And Effectiveness

Cost efficiency and effectiveness are functions of several variables. It is not necessary that all distance education programmes remain low cost options. Several factors contribute to increase in cost. If the courses on offer are few, the number of students is high, the learning packages and assessment practices are standardized, and the technologies employed are low cost, the total cost will be

low, and there would be significant economies of scale. On the other hand, if a large number of courses are offered and each course is of a highly specialized nature, the learning packages, the delivery system and the assessment procedures will correspondingly get diversified and more and more person-oriented. In such cases, if high-cost technology like open circuit television is also used the total costs are likely to be very high as there are no economies of scale to be had.

The structure and behaviour of costs and their impact on efficiency in different contexts are illustrated in the following charts:

How costs Behave?	
Scenario 1	<p>Costs are lowest when</p> <ol style="list-style-type: none"> a) Courses are fewer b) Students numbers are large c) Learning packages are standardized print and AV materials d) Technology is low cost (video) e) Assessment practices are standardized (TMA, CMA and Term-End Exam)
Scenario 2	<p>Costs rise when</p> <ol style="list-style-type: none"> a) More courses are added as electives or specialization b) Enrolment on individual courses is small though large in the aggregate c) Assessment procedures get diversified to meet specialization needs
Scenario 3	<p>Costs are high when</p> <ol style="list-style-type: none"> a) Programme are more b) Student groups on each programme c) Learning resources needs are small programme-specific d) Learning packages are standardized e) Technology is low cost f) Assessment procedures are standardized though with minor exceptions
Scenario 4	<p>Costs are the highest when</p> <ol style="list-style-type: none"> a) Specialized programmes are more b) Programme become individualized (M.Phil/Ph.d) c) There is more project/work-based learning d) Technology is high cost (TV diffusion) e) Testing is competency-based

(Source: Economics of Distance Education, C R Pillai & C G Naidu)

4.6 Case study of an Institute for Unit cost Analysis

The renowned institute at Pilani its model & data been worked out for case study, it is located in Vidya Vihar campus adjacent to Pilani town in Rajasthan. Pilani is the hometown of the Birla family and has a population of about 41,000. It is about 200 km west of Delhi and about 220 km north of Jaipur. The campus is spread over 328 acres. It is privately supported, fully residential and admit both men and women students. The institute was initially registered as a Society under the Rajasthan Societies Registration Act of 1958 in May 1964. In June 1964, the Government of India declared "deemed to be University". It adopted the semester system like MIT USA. It also created linkage with the

industries. Over a period of time the institute also developed several flexible educational programmes and courses.

4.7 Education System - A three tier education system

-Ph. D Degree			
Higher Degree			
On Campus Programmes		Off Campus Distance learning and collaborative Programmes	
M.E. Bio Engineering, Chemical, Civil, Communication Engineering, Computer Science, Electronics and Control, Internet Technology and e-business, Management System, Mechanical Engineering, Microelectronics, Software System etc.		M.E. (Collaborative) Project Engineering	
M. Pharm. Biological science, Chemistry, Economics, English, Management, Mathematics, Physics etc.		M. Phil. Hospital and Health Systems Management.	
		M.S. Consultancy Management, e-Business, Engineering Management, Microelectronics, Quality Management, Software Engineering, Software System, Telecommunication and Software Engineering etc.	
Integrated First Degree			
On Campus Programmes			Off Campus Distance learning and collaborative Programmes
Group A B.E. (Hons.) Chemical, Civil, Computer Science, Electrical & Electronics, Electronics and Instrumentation, Mechanical.	Group B M. Sc. (Hons.) Biological Science, Chemistry, Economics, Mathematics, Physics.	Group C M. Sc. (Tech.) Engineering Technology, Finance, General Studies, Information System.	B. S. Engineering & Industrial Technology, Information System, Marine Engineering, Process Engineering etc.
B.Pharm. (Hons.) M.M.S. (Master of Management Studies)			M. Sc. (Tech.) Pharmaceutical, Chemistry.

4.8 Off Campus Distance learning and collaborative Programmes

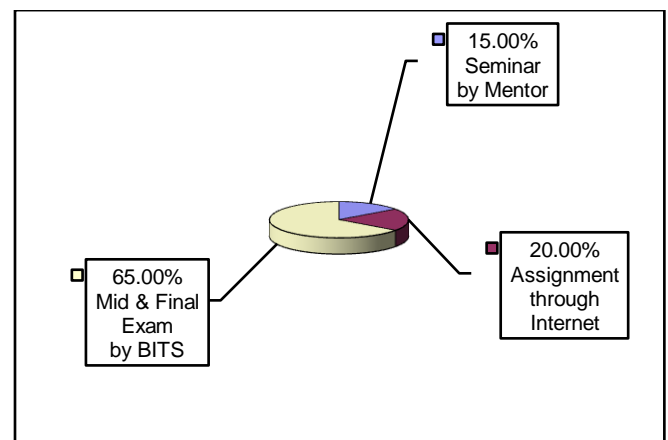
The educational activities of the institute have extended beyond the campus. This has been principally due to Institutionalized linkages established by the institute with the various industries, R&D organizations, development agencies and of course due to rapid growth of major Mass Media “Internet” etc. Since 1979, the institute has been participating in the human resource development activity of the industry. The institute has evolved several degree programmes by integrating the working environment of employee with the learning environment of required by the institute. These programmes were started as ME collaborative programmes. Later from 1988, Institute launched its Distance learning programmes like First Level Diploma in Computer Application etc. After that institute introduced BS and MS level Distance Learning Programmes. Now a days the institute is one of the few Universities in

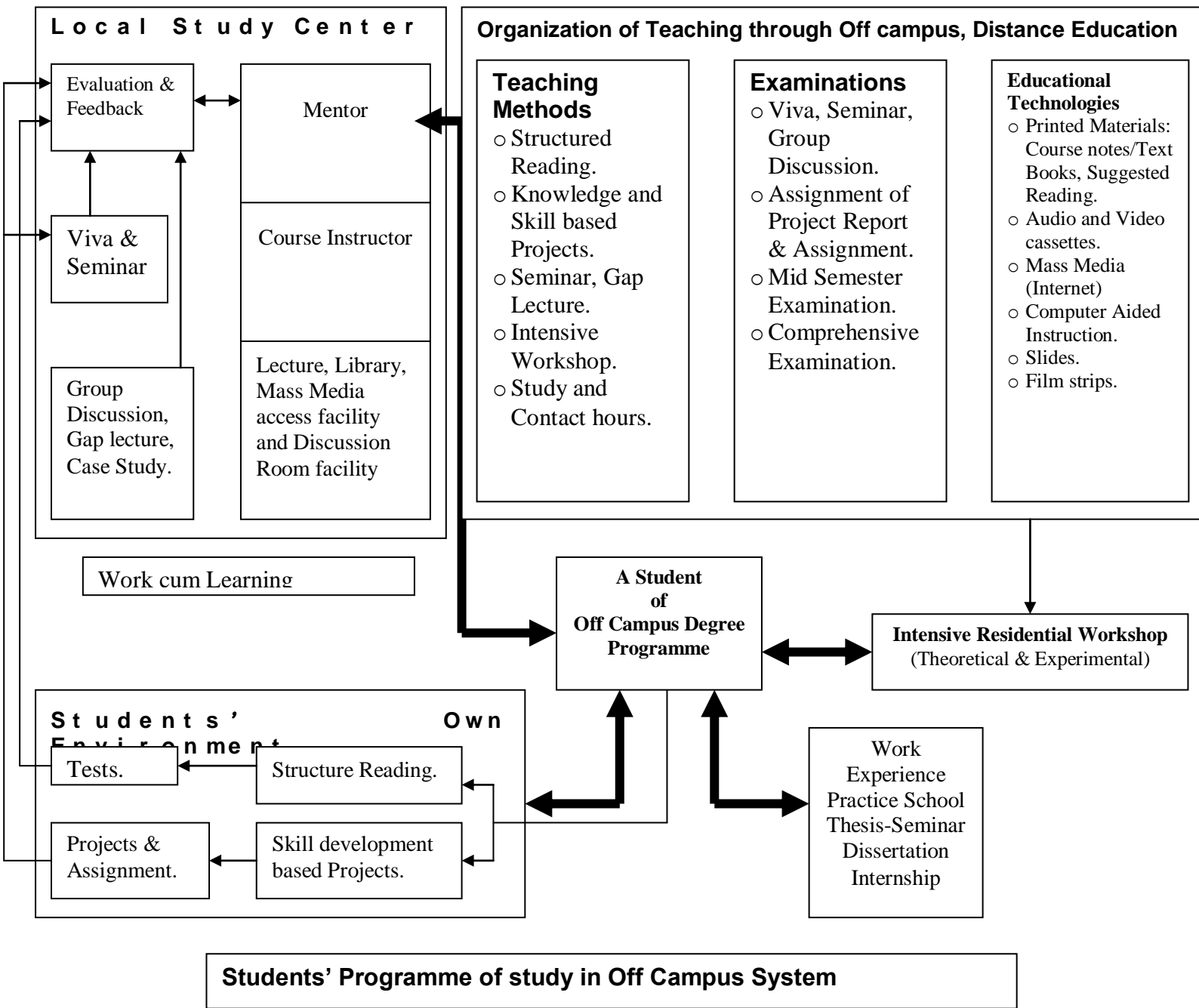
India, which has ventured into off campus distance learning programmes in Science and Technology at Higher level. The admission are given normally to the candidates who are already employed and whose organization sponsor them in their academic pursuit subject to the candidates having the required academic qualifications. **The Institute looks for candidates who have the necessary Computer, laboratory and physical facilities including access to e-mail and Internet** as well as certain intellectual input in terms of guidance by Superior or expert preferable from the work place of the student who will be termed as mentor.

Educational Process

The work-learning environment of Off Campus Distance Learning Programme consist of two broad based facets:

1. Academic Environment is created by Pilani based and Off Campus Center based Instructor (who are institute faculty).
2. Students own work environment from which assignments, projects, seminars etc., may emerge to integrate theory and theory and practice. A (locally based) mentor imparts guidance and conducts certain (approx. 15% in each semester in the form of seminar etc.) evaluation components, remaining (approx. 85% in the form of Assignment, Mid term Examination, Final Examination, Project etc.) components evaluated by the institute. The major communication between students and institute takes place through Internet for on line Assignment submission (approx. 20%).





4.9 Planning For Information Systems And Technology

Certainly the World Wide Web, the **Internet**, and ubiquitous personal computing and communication devices have already changed the way people throughout the world gain access to information and interact with one another. These technologies are changing how we learn, do research, manage our activities, reach out to others, and even have fun. We can speculate about the revolutionary effects these advances will spawn during the next decade, but we will probably underestimate their actual impacts.

For example, Information Systems and Technology (IST) did not include the word "Web." Mature browsers did not exist then, and we did not foresee the transforming potential of millions of websites accessible to people around the globe. We know that today we cannot predict the full impact of high-performance networks or pervasive personal digital assistants on either UC Berkeley or the higher education community in the next five years. If we plan intelligently, however, and have a modest amount of luck, BITS will accomplish its goals and develop the physical, organizational, and fiscal electronic information infrastructure needed to lead the campus into the next century.

Technical Institutions are responsible for transmitting humanity's accumulated wisdom and knowledge to the next generation expanding the knowledge base, teaching about it, distributing it as widely as possible, and preserving it. The ever-expanding roles for information technologies in these endeavors dictate the development of an integrated technological environment and a rich set of computing and communication services. Without them, BITS Pilani will not be able to sustain its drive for excellence, preserve its preeminence among other Technical Universities, and, in Chancellor Berdahl's words, "**Build a community of learners that transforms the lives of all who come in contact with it.**"

IST's role is to provide information technology leadership, to build the campus information infrastructure, and to expand technology support to create the information technology environment that institute needs in order to reach its goals in the coming decades. To be successful in this role, we must develop broadly based partnerships throughout the campus community and beyond. In short, institute's *mission is to be the technology partner for all members of the community of learners.*

The Present

Between 1995 and 1999, there was a remarkable explosion in demand for electronic information resources from every corner of the campus. Institute implemented many programs to develop and improve both the campus electronic infrastructure and the support staff required to provide these remarkable resources. A brief review of several highlights from these three years provides a backdrop for the 1999 planning initiative. These accomplishments provide the foundation upon which institute is planning for the future.

- Individuals in every part of the campus now connect electronically to colleagues on campus and around the world
- People from all over the world can visit institute's electronic resources, including tens of innovative web pages, on a daily basis.
- All of the campus's computer lab terminals now connected to the campus network; only a few were connected before 1999. Institute provides a wide assortment of educational technology support services to help faculty utilize this infrastructure, including the recent implementation of a basic web page course for all category of students.
- Several new student service applications have been developed since 1995. For example, all students register via computerized GC Cell, they use the online catalog and schedule of classes to decide what courses to take, and they receive up-to-date grade information
- Institute coordinates the campus's electronic outreach to neighboring communities through the Internet, which did not exist before 1999.
- The campus is currently implementing the new Financial System and Human Resources Management System to replace obsolete administrative applications.
- All students, faculty, and staff have access to free electronic mail services; the campus did not have this capability before 1999.

Information Technology Challenges

At institute, as at many other institutions, there is a great deal of ambiguity about the appropriate roles for the central information technology organization and its counterparts in departments, colleges, and divisions. For example, the tendency to distribute responsibilities for planning, budgeting, and architectural decisions to

autonomous local units is often in tension with the desire for coordinated budgeting and planning, common databases and procedures, and overall system compatibility and security. Questions such as "What resources should be provided at no cost to all members of our campus community?" and "What services should individuals and departments pay for?" remain unanswered. Since these ambiguities are significant impediments to the progress to which we are all committed, institute resolving them and foster more creative collaborations among its diverse information technology units.

Additional factors that need campus wide attention were emphasized in several of the focus group meetings during the planning process. Several of these factors are beyond IST's area of direct authority, but it is important that campus leaders recognize these issues and work together to resolve them. The most significant campus wide challenges are described below.

1: Campus budgets are essentially fixed, but demands for technology are exploding. All campus departments need significantly more support than they now have. In order to attract and retain the best students, and staff, the institute must offer a modern computing environment. Institute has a need to make strategies to invest in new technologies either by reallocating existing resources or by developing additional resources.

2: Faculty, students, and staff are increasingly integrating educational technology resources into all aspects of teaching and learning. However, campus responsibilities for educational technology and academic computing are unclear; existing services are not well coordinated and are often difficult to locate and access; and resources are unevenly distributed among disciplines. Working closely with the Library, the Office, and other departments, IST will take a leading role in meeting this challenge.

3: The campus, the Sister Educational concerns (BET Schools) face the enormous challenge of how to integrate the classic paper- and artifact-based systems of Office, libraries and other Department with emerging electronic systems for authoring, ownership, publication, storage, delivery, and retrieval

4: Most campus departments want improved systems for managing their operations, but campus responsibilities for developing and maintaining new systems are not clear. As a result there are often gaps or overlaps in development and

services. The growing complexity of many of these systems makes the cost of campus wide implementations very large.

Strategies

Three overarching strategies emerged from the 1999 planning process --

**Provide leadership,
Build the information technology (IT)
infrastructure, and
Expand IT technical support.**

A. Provide Information Technology Leadership

Institute have developed leadership in information technology to move forward with the many bold ideas generated by Board of Governor for improving and transforming its teaching, learning, research, administrative, and outreach environments. Its plans to take a leadership role in each of these areas, not simply as a large department with a vested interest in technology, but as a major focal point for campus wide discussions, decisions, and actions. Institute, in cooperation with other campus units, will lead the effort to develop comprehensive guides to IT programs, services, and resources, in order to help the campus community locate and access the resources they need, and make effective use of what is already available. Whenever possible, institute will represent the broad interests of the campus information technology community at the highest levels of the University administration.

B. Build the IT Infrastructure

Another primary responsibility is to ensure that the campus information infrastructure will support the needs of this great Technical Institution. Institute continuously plans to address these challenges by rebuilding the campus networking infrastructure, developing an upgraded network, constructing a new Labs (when necessary), and serving as the Main technical Institution in west India. Of-course the scalable funding models need to be developed to support the ongoing development, replacement, and renovation of these systems.

Based on what the campus has learned during the past several years, the Director generally recommends to the Administrative Council Board about how to plan, implement, and operate large-scale enterprise solutions. Illustrative problems in this area are campus wide Year 2000 preparations, network and departmental security enhancements, and the implementation of Initiatives.

C. Expand IT Technical Support

Institute's most valuable resource is its pool of Skilled and Economic staff members who collectively

represent the broadest and deepest set of operational information technology skills. The broad dissemination of technology into almost every workspace on campus brings with it the need to develop collaborative technical support programs for all of its sister concern schools' Computer Education and their Management since 1999.

4.70 Impact of Information System and Technology

After 1999, institute got an energetic effect solely due to IST adaptation. The INTERNET proved itself as an effective mass media tool in the teaching technology. The various Off Campus Distance Learning courses now reach to large number of masses (students). This media dramatically reduce the unit cost of education even though the staff salaries and other expenses of the institute increase.

In the following section, the Unit Cost Analysis of the Institute has been worked out by taking the data from 1998 (Pre internet era) to 2002 (Post Internet era).

4.71 Unit Cost Analysis

The Unit cost can be calculated in the following way

1. **Total Expenses** - This is the sum of Recurring and Total Annualized Non Recurring Expenses for this year. This is given in table 4.1

TE (in Rs.) = Recurring Expenses + Annualized Non Recurring Expenses

Here Annualized Non Recurring Expenses are calculated by the following formula –

Jamison, Klees and Wells (1978)[1] had suggested a method for amortization of fixed costs into annual costs by using the following formula:

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

$a(r, n)$ = Annualisation factor

r = Interest Rate

n = Life time of the Material

According to this formula, fixed cost can be converted into annual cost, by multiplying the former with the annualisation factor $a(r, n)$. Studies on economics of education have generally assumed a rate of interest of 7.5 to 15% and six years as the life of Course materials. To calculate the annualized costs at the three interest

rates, viz., 0%, 7.5% and 15% and different life expectancies, we have given different coefficients in Annexure. The coefficient for a capital item with a life expectancy of 6 year and 7.5% interest rate is 0.213. The annualized cost of a given item costing Rs.10,000, will work out to Rs. 2130 (0.213 * Rs.10,000). We have made an attempt to amortise the fixed cost on development of print material and the audio video programmes on the assumption that the life expectancy of Course materials is 6 years and the interest rate 7.5%.

2. **Total Students (TS)**- This is the total no of students enrolled in this session, this is given in table 4.2

3. **Unit Cost** - This is calculated by dividing the Total Expenses (TE) by Total number of students (TS) in the same year. Hence -

$$\text{Unit cost (in Rs/Student)} = \text{TE/TS}$$

Table 4.1 shows Non-Recurring expenses of DLPD as well as of On Campus Programmes from the period 1998 to 2003. There is rising trend in Non Recurring cost upto the period 2001-2002 and after that it starts decreasing. The Recurring expenditures of On Campus is continuously increase from 1998 to 2003. This table also indicates the total students of DLPD and On Campus. There is an increasing trend of number of Students in both type of courses but the ratio of increase in DLPD is at greater rate than On Campus programmes.

S. No.	Detail of non Recurring Expenses	1998-99 (NR)	1999-2000 (NR)	2000-2001 (NR)	1999-99 (NR)	2001-2002 (NR)
1.	Building	102.00	102.00	200.00	200.00	275.00
2.	Furniture	73.00	73.00	73.00	100.00	125.00
3.	Equipment	70.50	8.87	370.08	226.97	60.49
4.	Books	30.00	10.00	75.00	80.00	82.00

Table 4.1 Non-recurring and Recurring cost of Institute

Table 4.2 Details of Non-Recurring Expenses
(Source: Year Book for 2002)

Table 4.2 shows the Non-Recurring expenditure, which is considered under broad categories of expenditures namely Building, Furniture, Equipment and Books etc. On the basis of the analysis of the *Jamison, Klees and Wells'* formula, a consolidated statement of the Non-Recurring expenditure is annualized from 1998 to 2002, which are shown in table 4.3. The course wise details of the students registered in On campus programmes and Off campus programmes are given in table 4.4, 4.5 & 4.6.

S. No.	Heads	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
1	Non recurring (In Lakh) DLPD On Campus <i>Total</i>	55.10 220.40 275.50	38.774 155.097 193.871	149.016 596.064 745.080	121.394 485.576 606.970	108.498 433.992 542.490
2	Recurring a. Salary b. Miscellaneous c. Others Total Recurring (In Lakh) DLPD On Campus	548.01 150.09 374.89 1072.99 214.598 858.392	645.45 201.73 383.44 1230.62 246.124 984.496	1061.90 217.93 466.03 1745.86 349.172 1396.688	1227.64 235.34 790.65 2253.63 450.726 1802.904	1368.68 254.30 821.52 2444.50 488.90 1955.60
3	Total Students DLPD <i>On Campus</i>	769 639	1793 791	2316 1070	2290 1036	Not available

Table 4.3 Annualized Non Recurring Expenses of DLPD and On Campus programmes

S. No.	Detail of non Recurring Expenses	Lif e in ye a rs	Inte rest rate	Annua lizing Factor	Annualize d Non Recurring Expenses for 1998-1999 (a X NR)	Annuali zed Non Recurrin g Expense s for 1999-2000 (a X NR)	Annuali zed Non Recurrin g Expense s for 2000-2001 (a X NR)	Annuali zed Non Recurrin g Expense s for 2001-2002 (a X NR)
1	Buildi ng	50	15 %	0.15	15.30	15.30	30.00	30.00
2	Furnit ure	20	12 %	0.13	9.49	9.49	13.00	13.00
3	Equip ment	10	10 %	0.16	11.28	9.03	59.21	36.31
4	Books	10	10 %	0.16	4.80	1.60	12.00	12.80
	Total Annualized Expenses DLPD On Campus				8.174 32.696 40.870	7.084 28.336 35.420	22.842 91.368 114.210	18.422 73.688 92.110
	Gross Annualized Expenses (in Lakhs)							

NUMBER OF STUDENTS REGISTERED IN FIRST SEMESTER 2001-2002

Programme	Year of Admission						Total
	1996 and earlier	1997	1998	1999	2000	2001	
On Campus Programmes							
<i>A. Integrated First Degree Programmes</i>							
B.E.(Hons.)							
Chemical	0(0)	5(1)	46(15)	47(15)	61(33)	64(26)	223(90)
Civil	0(0)	3(1)	30(5)	32(9)	37(8)	48(16)	150(39)
E.E.E.	0(0)	4(2)	89(19)	116(42)	106(23)	114(46)	423(132)
Mechanical	0(0)	6(0)	58(4)	71(8)	77(5)	81(18)	293(35)
Computer Science	0(0)	7(0)	57(17)	78(31)	100(41)	95(36)	337(125)
Electronics & Instrumentation	1(0)	2(2)	35(13)	50(17)	56(18)	56(19)	200(69)
B.Pharm.(Hons.)	1(0)	2(1)	26(4)	27(8)	31(14)	29(7)	116(34)
M.M.S.	0(0)	13(6)	41(20)	48(23)	48(20)	36(19)	186(88)
M.Sc.(Hons.)							
Bio. Sciences	2(1)	26(12)	31(18)	39(17)	38(18)	42(20)	178(86)
Chemistry	4(1)	29(7)	29(7)	41(14)	38(11)	42(12)	183(52)
Economics	5(0)	38(6)	44(14)	51(10)	41(9)	53(19)	232(58)
Mathematics	3(0)	35(11)	36(7)	45(16)	48(16)	53(26)	220(76)
Physics	2(1)	24(4)	34(5)	37(15)	37(12)	63(13)	197(50)
M.Sc.(Tech.)							
Engineering Tech.	0(0)	3(0)	16(6)	9(2)	10(2)	8(5)	46(15)
Information Systems	0(0)	7(2)	32(21)	46(22)	52(26)	58(18)	195(89)
Gen. Studies	5(0)	3(1)	13(5)	10(2)	16(6)	18(5)	65(19)
Finance	0(0)	0(0)	7(3)	9(2)	7(2)	4(1)	27(8)
Sub Total	23(3)	207(56)	624(183)	756(253)	797(264)	864(306)	3271(1065)

Note: The numbers in brackets indicate number of female students

Table 4.4(Source: Year Book for 2002)[6]

Programme	Year of Admission						Total
	1996 and earlier	1997	1998	1999	2000	2001	
B. Higher Degree Programmes							
M.E.							
Chemical	0(0)	0(0)	0(0)	0(0)	15(0)	11(3)	26(3)
Civil	0(0)	- 1(0)	0(0)	0(0)	10(1)	7(0)	18(1)
Computer Science	0(0)	0(0)	1(0)	0(0)	19(4)	15(3)	35(7)
Electronics & Control	0(0)	0(0)	0(0)	2(1)	0(0)	0(0)	2(1)
Mechanical	0(0)	0(0)	0(0)	0(0)	20(1)	9(0)	29(1)
Software Systems	0(0)	0(0)	2(0)	6(3)	55(1)	33(5)	96(9)
Microelectronics	0(0)	1(0)	0(0)	0(0)	14(0)	14(1)	29(1)
Communication Engineering	0(0)	0(0)	0(0)	0(0)	19(2)	11(0)	30(2)
Internet Tech. & e-Business	0(0)	0(0)	0(0)	0(0)	2(2)	0(0)	2(2)
Biotechnology	2(1)	1(1)	2(2)	0(0)	16(5)	9(2)	30(11)
Design Engineering	0(0)	0(0)	0(0)	0(0)	25(0)	10(0)	35(0)
Manufacturing Sys.	0(0)	0(0)	0(0)	0(0)	15(0)	10(1)	25(1)
M.Pharm.	0(0)	0(0)	0(0)	2(1)	21(3)	13(3)	23(7)
M.Phil.	0(0)	0(0)	0(0)	0(0)	1(1)	0(0)	1(1)
Sub Total	2(1)	3(1)	5(2)	10(5)	232(18)	142(18)	394(45)
C Ph.D.	18(3)	6(0)	10(0)	25(0)	41(0)	30(0)	130(3)
Total (On Campus)	43(7)	216(57)	639(185)	791(258)	1070(284)	1036(324)	3785(1115)

II. Off-campus Programmes**A. First Level Diploma**

Nautical Sciences		220	242	169	327	958
Sub. Total		220	242	169	327	958

B. Integrated First Degree Programmes

B.S.						
Engineering Technology	3	19	133(4)	247(1)	376(5)	1072(10)
Industrial Engineering & Technology)					47	47
Information	3	9(1)	73(7)	131(10)	201(15)	589(41)

Table 4.5(Source: Year Book for 2002)[6]

Programme	Year of Admission						Total
	1996 and earlier	1997	1998	1999	2000	2001	
Systems							
Manufacturing Engineering					19		19
Marine Engineering		115	121	140		190(3)	566(3)
Ophthalmic Assistant					6	5(2)	11(2)
Optometry		1	20(11)	22(20)	33(24)	38(30)	114(85)
Physician Assistant			9(6)	5(5)	21(15)	21(11)	56(37)
Power Engineering				643			643
Process Engineering				16	8	34	58
M.Sc. Tech.							
Pharmaceutical Chemistry					46	53(1)	99(1)
Sub. Total	6	29(1)	350(28)	1185(36)	397(59)	807(55)	3274(179)
<i>C. Higher Degree Programmes</i>							
M.E. (Collab.)						10	10
Project Engineering							
M.S.							
Chemical Technology					9(1)		9(1)
Consciousness Studies					6(1)		6(1)
Consultancy Management					11(1)		11(1)
E-Business					37(2)	36(6)	73(8)
Engineering Management				49			49
Industrial Production & Management					9	7	16
Management Systems			6	19(1)			25(1)
Manufacturing Management				11	86(2)	63(1)	160(3)
Manufacturing Management (DJAME)					15		15

Programme	Year of Admission						Total
	1996 and earlier	1997	1998	1999	2000	2001	
Medical Laboratory Technology				8(5)	8(8)	8	24(13)
Microelectronics		8			30(3)	26	64(3)
Pharmaceutical Operations and Management					21		21
Quality Management				3(1)		90(2)	93(3)
Software Engineering		65(28)	156(86)	94(49)	253(42)	136(15)	704(220)
Software Systems M.Phil.	1	3	21	182(30)	716(107)	741(5)	1666(142)
Hospital & Health Systems Management	1	2	8(2)		46(13)	37(12)	94(27)
Optometry					1(1)	2(1)	3(2)
Sub. Total	2	70(28)	199(88)	366(86)	1250(181)	1156(42)	3043(425)
Total off-campus	8	99(29)	769(116)	1793(122)	2316(240)	2290(97)	7275(604)

SUMMARY

	On-Campus				Off-campus	Grand Total
	Engg.	Sc.	Hum.	Total		
First Level Diploma					958	958
First Degree	1959(621)	894(298)	418(146)	3271(1065)	3274(179)	6545(1244)
Higher Degree	357(39)	36(7)	1(1)	394(47)	3043(425)	3437(472)
Total	2316(658)	930(305)	419(147)	3665(1112)	7275(604)	10940(1716)
Ph.D.				130(3)		130(3)
Grand Total				3795(1115)	7275(604)	11070(1719)

Table 4.6(Source: Year Book for 2002)[6]

In the following section I have workout unit cost analysis for DLPD as well as On Campus courses –

Table 4.7 Unit Cost of DLPD and On Campus programmes.

Off Campus Distance Learning Programmes (DLPD)					
YE A R	Annualized Non Recurring expenses	Recurring expenses	Total Expenses (T E)	Total Student (T S)	Unit Cost (Rs./student)
1998	8.174	214.598	222.772	769	28969
1999	7.084	246.124	253.200	1793	14122
2000	22.842	349.172	372.014	2316	16062
2001	18.422	450.726	469.148	2290	20486
On Campus Programmes					
YE A R	Annualized Non Recurring expenses	Recurring expenses	Total Expenses (T E)	Total Student (T S)	Unit Cost (Rs./student)
1998	32.696	858.392	891.088	639	1,39,450
1999	28.336	984.496	1012.832	791	1,28,044
2000	91.368	1396.688	1488.056	1070	1,39,070
2001	73.688	1802.904	1876.592	1036	1,81,138

(Recurring and Non Recurring expenses are given in Lakhs)

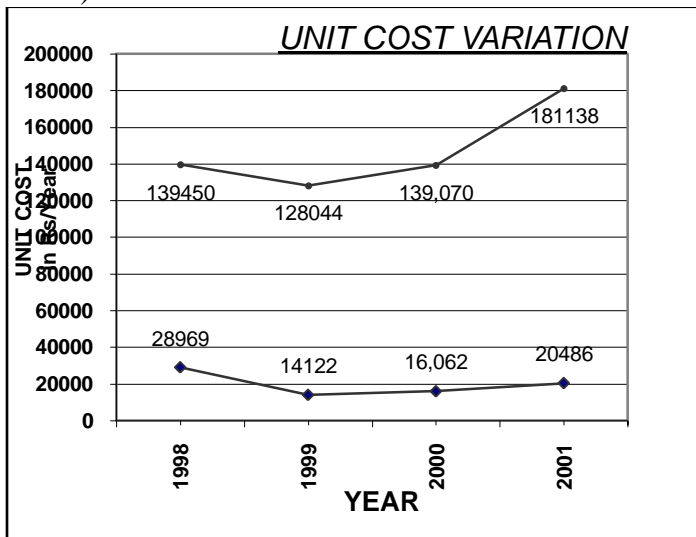


Fig 2

Table 4.7 shows Unit Cost Analysis of both DLPD and On Campus programmes. It reveals the impact of employing Internet as Mass Media in 1999 on Unit Cost. Here first, take the case of DLPD, before 1999 (Pre Internet Era), the Unit Cost was higher (Rs. 28969 per student for DLPD) but it suddenly dropped to lowest point (Rs. 14122/per student for DLPD) in 1999. After 1999 this Unit Cost increases, because the growth in Number of students reduces from 133% (in 1998-99) to 31% (in 2000-2001). In session 2000 and 2001 we observed that the number of

students registered dropped slightly, because during that time the popularity of IT related courses suddenly decreases due to slump in economy. This reduction in number of students adversely affects the Unit Cost otherwise it may prove itself as Economic. If we analyse the On campus programmes' unit cost then it has been observed that in year 1998, it was Rs. 1,39,450 per year per student, which dropped to Rs.1,28,044 per student per year, but after that, even though the mass media in the form of "Intranet" is using for on campus students, still unit cost increases in successive years.

Figure 2 shows the graphical view of the variation of Unit Cost of DLPD (Lower graph) and On Campus (Upper graph). One more important fact I have realised practically that the unit cost in conventional system (on campus) is always higher than unit cost in Distance learning system, secondly although the mass media is also using in conventional system but it fails to make the system economically viable. On the other hand distance learning system become economically viable after employing mass media.

4.12 Conclusion

Despite all adverse factors like reduction in number of students (due to unpopularity of IT related courses & slump in economy), continuous increase in Recurring expenses as well as Non-recurring Expenses etc. Mass media partially prove its Economicity specially for Distance learning courses, by suddenly rise in number of students from 1998 to 1999, and this increasing trend still continue because such courses reaches to large number of students through Mass Media – that is INTERNET. But on the other hand, for On campus courses, Mass Media couldn't help them to proved itself as economic facilitating tool for Indian Education System.

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