

# The Economics of Quality in Distance Education: An Indian Perspective

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**Abstract :** *Cost-effectiveness, cost-efficiency, productivity, effectiveness of media, and quality costs are some of the economic measures of quality. This paper tries to analyse empirically some of these economic measures of quality with special reference to Indira Gandhi National Open University (IGNOU), New Delhi. The data analysis signifies the cost-effectiveness and cost-efficiency of IGNOU programmes. The time series analysis of data of its 3-year undergraduate programmes shows that there is a significant improvement in retention rates. When compared with university norms, the faculty productivity rate was accounted for 89%. An analysis of media choice, effectiveness and costs shows that print is the most significant media followed by TV and counselling. While, selecting the media and its mix one should take into account factors like costs, access, emphasis, usefulness for learning, etc.*

## Introduction

In India, there has been a phenomenal growth of higher education since 1950. The unprecedented growth of enrolments (annual growth 5%) against the background of a progressively declining growth in expenditure (annual growth 2%) and per capita expenditure at constant prices raises several questions about the quality and standards. The increase in the teacher-student ratio and the decline in the per capita student expenditure are considered to be two main indicators of the decline in the quality of education. Since the conventional education system is inelastic (in real terms) to these two indicators, it is not possible to have achieved this without compromising on the quality of higher education. The last fifteen years have witnessed a phenomenal growth in distance education using multimedia instructional system. The origin of this growth lie in the commitment to widening access to education, characteristics of the conventional education as discussed above and new educational technologies. High investments have been made in developing the multimedia instructional materials. Most of these costs are incurred irrespective of the student numbers. Therefore, educationists and policy makers saw the significance of distance education in the substitution of technology for labour intensive teaching process of conventional education.

Increasing the quality of distance education requires not only the will to improve, but also the benefit of well-organised and concerted initiatives using recognised quality management principles. In the industry, a wide variety of quality techniques are used, with varying applicability to IS organisations. Barratt, Slater, and Morgan (1996) briefly reviewed 21 such quality techniques. However, quality plan, quality audit, quality review, and quality costs are some of the significant quality techniques widely used in distance education.

Cost-effectiveness, cost-efficiency, unit-costs in relation to the student number and graduation ratios, productivity ratios, consumer satisfaction, costs resulting from poor quality of education, investments made on continuous improvement of the quality of education are some of the economic measures of quality. Cost structure on the planning, development and production of multimedia instructional materials; student support services; and other central costs (overheads) also determine the quality of distance education. This paper outlines some of these economic measures of quality in distance education and considers quantifying and analysing them with reference to Indira Gandhi National Open University (IGNOU)

### **Cost-efficiency and Cost-effectiveness**

Cost-efficiency and cost-effectiveness are the two performance measures indicating the interrelations between the costs and quality. Cost-efficiency is concerned with the study of least costly way of achieving a defined objective. It is the level of output for an optimum level of expenditure assuming that the quality of the output maintained. Cost-effectiveness analysis on the otherhand deals not only with the output-expenditure ratio but also with the quality of the output compared. However, while comparing the cost of two or more systems of education or between two or more institutions within a system, it is often assumed that the quality of education is same. A lot of controversy has aroused from this view. Carnoy and Levin (1975) argued that 'the average University student receive not only instructions and instructional material, but he receive substantially more tutorial services, contact with fellow student, access to libraries, computers and campus lectures than does his open university counterpart'. According to Rumble (1986) academic standards can vary enormously not just between conventional and distance systems but also between institutions of the same type. On the otherhand one may argue that in order to measure the quality we should give an indication of the contribution made by the university to the students education. To gauge the contribution, it is necessary to know the ability level of the students when they entered the university. Therefore, low ability levels and average degrees/students would then indicate a major contribution, whereas high ability and slightly above average number of first class degrees/students indicates an inferior contribution. Review of a number of empirical studies on cost-effectiveness and cost-efficiency indicates that there is no convergence of opinion on the terms used. Table 1 suggests that there is little ambiguity in using these terms when costs are compared between programmes of same institution, institutions of different systems, and different systems of education. However, the perception is divided when the comparison is made between institutions of the same system, and systems of the same institution. This

signifies our argument that educationists without much probing into the facts assume that the quality of education between institutes of the same system and different systems of the same institute is equal.

**Table 1: How cost-efficiency/cost-effectiveness terms are used**

Comparison between :	Frequency of usage	
	Cost- efficiency	Cost- effectiveness
1. Programmes of an institution	Most	—
2. Institutions of the same system	Some times	Some times
3. Systems of the same institution	—	Most
4. Institutions of different systems	—	Most
5. Systems	—	Most

IGNOU is a young institution with objectives of quality education and exclusivity of access. There is no evidence to show that the quality of education offered by IGNOU in any way different from conventional education in India. In 1992, the University Grants Commission (UGC) commended the IGNOU's programmes as equivalent to those of other universities. In fact, in recent years, the quality of the material developed and produced by IGNOU has received recognition not only within the country but also by governments and universities in other developing and developed countries. For example, two post-graduate programmes in distance education discipline are offered to students from 14 developing countries in the commonwealth under the Rajiv Gandhi Fellowship Scheme, sponsored by Commonwealth of Learning. The cost structure of a university also indicates the quality of programmes and their delivery to the students. In IGNOU when looking at the cost structure one-third of cost each is accounted for development and production of courses (print, audio, video), support services, and central costs respectively (Table 2).

**Table 2 : IGNOU cost structure : 1993-94**

Sl. No. Structure	Total Cost (Rs. in lakhs)	Cost per Student (Rs.)	Percentage to total
1. Development, production and maintenance of courses	517.01	724.20	30.64
2. Student Support Services	600.22	840.75	35.58
3. Central Csots	569.95	798.35	33.78
Total	1687.18	2363.30	100.00

Source : Pillai, C.R. and C.G.Naidu, *Economics of Distance Education: The IGNOU Experience*, IGNOU, New Delhi, 1997.

Distance education, in comparison with conventional education is characterised by high fixed and low marginal costs. Therefore, the combination of these two factors accounts for the economies of scale and cost-efficiency, which is a distinctive feature of a typical

distance education system. The analysis presented in Table 3 suggests that the university has achieved economics of scale with significant increases in enrolment with relatively small increases in its per capita cost. The evidence (see Perraton, 1994, pp. 21) shows that the distance teaching is more cost-effective than the conventional university. The relative cost of distance education system in different countries ranges from 17% in Sri Lanka to 97.5% in Australia when compared with conventional education. A similar attempt in IGNOU shows that the per capita unit cost of IGNOU's three-year undergraduate programmes (B.A./B.Com./B.Sc.) is 42.8% of that of conventional colleges offering similar programmes.

**Table 3 : Cost efficiency/effectiveness rates**

Sl.No.	Parameter	Reference Year	Rate (%)
1.	Per student cost to conventional education (3 year undergraduate programmes)	1993-94	42.8
2.	Fee income to cost	1993-94	40.7
3.	Growth in per capita cost	1989-90 to 1993-94	38.0
4.	Growth in total cost	1989-90 to 1993-94	140.0
5.	Growth in enrolment	1998-90 to 1993-94	74.0

Source: Pillai, C.R. and C.G.Naidu, *Economics of Distance Education: The IGNOU Experience*, IGNOU, New Delhi, 1997.

### Productivity Analysis

Productivity, performance, and the quality are the buzz words often used in higher education in general and distance education in particular in the recent years. The productivity is the output in relation to the resources employed or simply output-input ratio. It is significant to make a comprehensive analysis of various input factors so that the efficiency factors of output are known. Such a step will help the planners and decisions makers in distance education to review their policies and make appropriate corrective measures. The measurement of the output-input ratio in a comprehensive manner tantamount to measuring the performance of the university.

In conventional education, the analysis of productivity includes the parameters such as 'average class size', 'teacher student ratio' and /or 'the ratio between teaching and non-teaching staff'. However, in distance education these productivity measures may not be relevant because of significant differences in its structure. Snowden and Daniel (1980) applied the ratio of weighted course enrolments to course credits in delivery, explained that this relationship is not so much a productivity ratio as it is an indicator of the relative balance between the two primary functions of the institution, and called it as the 'enrolment ratio'. Retention rates and dropout/ graduation ratios are also widely applied to measure the performance of education institutions. Some of the input and output factors that could be used for the analysis of productivity in distance education are:

***Input Factors***

- Enrolments
- Faculty
- Students taking examination

***Output Factors***

- Course credits on offer
- Retention of students
- Dropouts
- Graduates
- Time taken to complete a course

The above factors could be considered as fair and gross indicators of the input and output. Thus the formulae for measuring productivity is as under:

$$\text{Productivity (\%)} = \frac{\text{Output factor}}{\text{Relevant input factor}} \times 100$$

Since productivity indicators are useful in the review of quality of an education institution, an attempt was made to indicate some productivity factors in the case of IGNOU. Table 4 explains some of these productivity rates applied to IGNOU.

It is true that high enrolments put an Open University on the threshold of mega open universities. But high retention rates increase the reputation of the system. Similar to that of other open and distance education institutions, in India, it is widely believed that the low retention rates in three-year undergraduate programmes are causing concerns. As Rao (1997) explains 'the initial impression of an average student in open university is that somehow the academic requirements are less demanding and equates the flexibility of the system with lowering of academic standards. As the student experiences the learning process he gets frustrated about the academic standard made by the programme which the student did not anticipate at the beginning'. This perception is true in the short run. However, in the long run the new entrant will know the standards of the programmes offered and may not randomly try out for a cheap degree. This can be clear from Table 4 that although the retention rates are low in the first batch (1990-91) of B.A./B.Com programmes, there is a significant improvement in the retention rates over time. On the otherhand, the proportion of qualified students for awards in relation to appearance in the examination was higher when compared with enrolments. There could be several reasons for this trend. One of the arguments for this trend was that many of the students enrol for Open University programmes particularly for the professional courses to improve their professional competence and/or acquiring new skills and may not be interested in improving qualifications (in terms of degrees etc.).

**Table 4 : Productivity rates**

Sl. No.	Parameter	Reference Year	Rate (%)
1.	Faculty Productivity to University norms (Development and maintenance of Courses)	1995	88.7
2.	<b>Retention rates (3 year B.A./B.Com. Programmes)</b>		
2.1	First year to second year	1990-91 batch	30.0
		1994-95 batch	50.6
2.2	Second year to third year	1990-91 batch	35.7
		1994-95 batch	69.6
2.3	First year to third year	1990-91 batch	16.1
		1994-95 batch	28.7
3.	<b>Graduation rates (*)</b>		
3.1	Qualified for the award as proportion to enrolment	1994	27.5
3.2	Successfully completed some courses as proportion to enrolment	1994	37.6
3.3	Unsuccessful as proportion to enrolment	1994	34.9
3.4	Qualified for the award as proportion to appearance in the examination	1993	48.3

Note: \* Average of 4 Programmes, where the cycle of the maximum allowed duration has been completed.

Source: 1. Pillai, C.R. and C.G. Naidu, *Economics of Distance Education: The IGNOU Experience*, IGNOU Pub., New Delhi, 1997.

2. IGNOU evaluation Division (1994) Evaluation division report, New Delhi, IGNOU

3. Computer Division, IGNOU

The university has evolved some indicative norms of workload for its faculty for development, translation, maintenance, and revision of courses. The feedback on the expected output and the actual output will form a basis for a continuous assessment of performance and review of norms. Pillai and Naidu (1997) developed a model for faculty productivity on the basis of university norms and actual data. At the aggregate level the productivity rate was 89%, when compared with norms. However, the differences among the individual programmes are significant. It varies from 50% to 207%. The higher productivity rates are positively associated with those programmes for which contribution from external course writers was high. On the otherhand the programmes that depend heavily on in-house development have registered lower productivity rates.

### **Media Choice, Effectiveness and Cost Implications**

Effectiveness is concerned with the outputs of an organisation that are relevant to the needs and demands of its clients. In this section we try to analyse the effectiveness of media in terms of its access and usefulness to the learners for learning. A significant contribution to the effectiveness of the distance education system comes from a range of technology options available to it. The recent advances in mass communication technology have provided more efficient tools for the dissemination of knowledge than the conventional system. The choice of a range of media and its mix that an institution employs in terms of learning packages will have a decisive influence on costs. As

explained earlier the important decisive factor in selecting a media is the difference between fixed and variable costs. For example, audio cassettes and radio programmes have low fixed and variable costs whereas face-to-face teaching have low fixed but high variable costs. On the otherhand, video and TV programmes have high fixed and high variable costs. In addition, factors like enrolment size, access to media, usefulness of media for learning also play vital role in selection of media and richness in media-mix. Like other open universities around the world, IGNOU follows a multimedia teaching strategy. The media include Printed material, Audio, Video, Counselling, TV, Radio and Tele-conferencing. Table 5 explains the unit costs and media-mix of some of these media in IGNOU.

**Table 5 : Unit costs of some media : 1993-94**

Media	Unit	Unit cost (Rs.)	Media-mix of one standard 8 credit course
Printed material Development, production (upto camera ready copy) and maintenance	Credit	60000	
Printing	65 pages block	10.75	8 blocks
Production of video programme	25 mts. programme	90000	4 programmes
Production of Audio programme	15 mts. programme	90000	5 programmes
Teaching (counselling)	2-1/2 hrs Session	100-200	10 Sessions

Source: Pillai, C.R. and C.G. Naidu, *Economics of Distance Education: The IGNOU Experience*, IGNOU, New Delhi, 1997.

Although many distance education systems use a variety of media, not much feedback is available about the relative effectiveness of the different media. Costs, access, emphasis and usefulness for learning could be used as indicators for selection of media. For example, if the student access to some media is not significant one could do away with that media without compromising the quality. Rumble (1981) looked at the number of hours of study time which students spent by media and compared this to the proportion of expenditure on the media and suggested that 'there is a need to consider very carefully any policy which might result in the allocation of over 60% of resources of a course on an activity that takes about 4% of a student's time'. Table 6 sets out the media emphasis from institution point view and Table 7 explains the media effectiveness from student usefulness point of view.

**Table 6 : Media emphasis**

Media	Who bears the cost	Emphasis
Printed material	IGNOU	Highest
Video programmes	IGNOU	Limited
Audio programmes	IGNOU	Limited
Teaching (Counselling)	IGNOU	Limited
Radio	All India Radio - IGNOU	Limited but likely to be intensified
TV	Doordarshan - IGNOU	Limited but likely to be intensified
Tele-conferencing	Indian Space Research Organisation and IGNOU	Limited but likely to be intensified

**Table 7 : Media effectiveness**

Media	Access (%)	Effectiveness (Learners perspectives %)*		
		Most	Somewhat	Les
Printed material	100.0	88.0	12.0	
Video programmes	25.0	45.9	0.7	53.4
Audio programmes	18	**	**	**
Teaching (Counselling)	73	36.6	59.9	3.5
Radio	53	***	***	***
TV	93	43.4	56.0	0.6
Tele-conferencing	***	***	***	***

Note : \* Source : Naidu, C.G. (1995) Learners perspectives on student support services: IGNOU, New Delhi,

\*\* As indicated under video programmes

\*\*\* Data not available

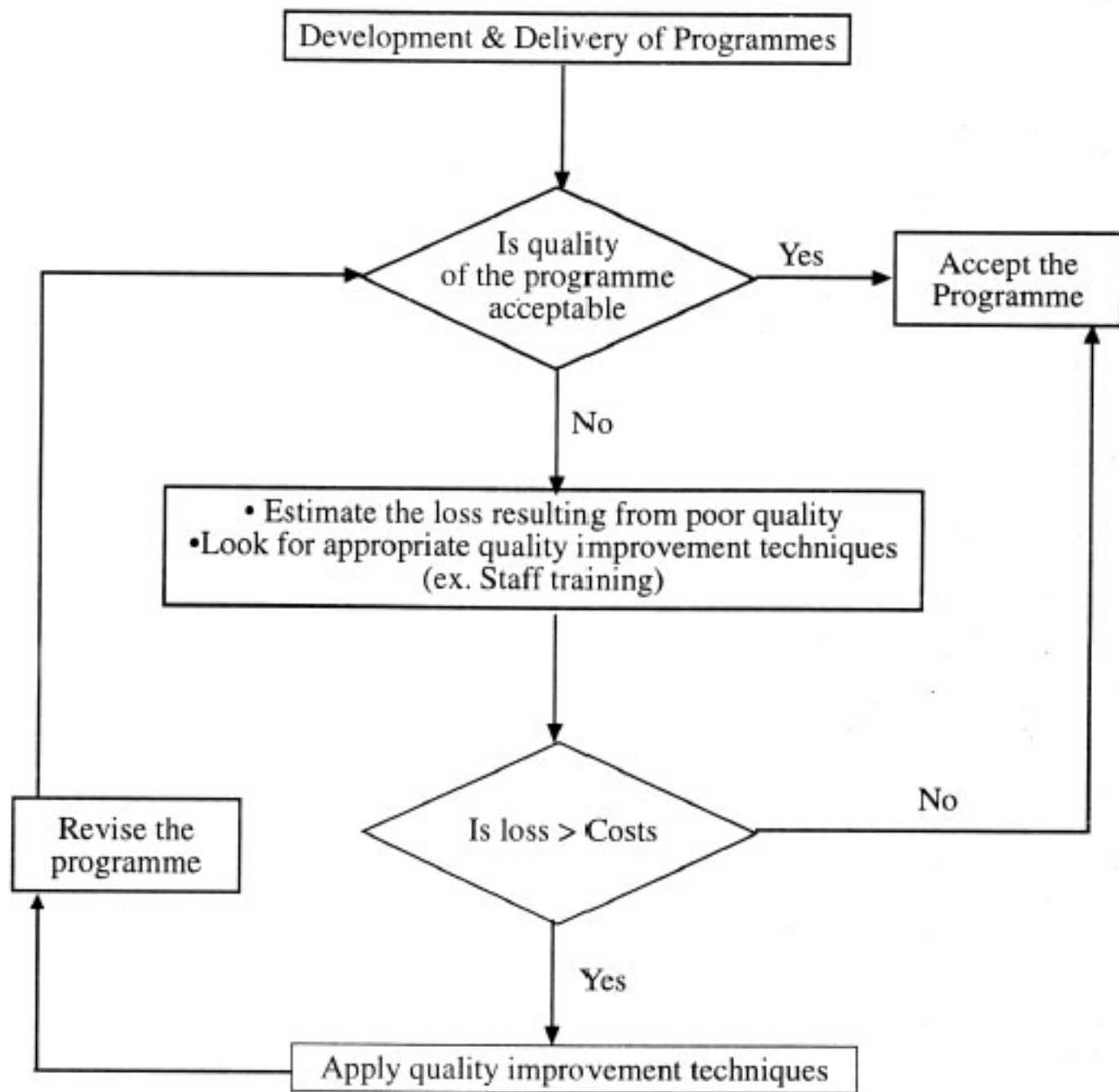
Since there could be several factors affecting the effectiveness of a media and the significance of these factors is interrelated, we cannot have the relative effectiveness of these media. However, it can be concluded that print is the most significant medium in all aspects. The TV appears to be a promising medium, if the university intensifies the frequency of telecasts. Although, not much feedback is available on the effectiveness of Tele-conferencing, it may replace some of the other media when the frequency and the access are increased because of its potentiality of becoming virtual classroom.

### Quality Costs

Quality costs are both the losses resulting from poor quality and investment costs of improving quality. Quality improvement techniques shift costs from failure to prevention. In this context the staff training is an important input in maintaining the quality of the system. Therefore, training could be expressed as an investment for the future. Figure 1 explains a schematic model of quality costs on development and delivery of programmes. Although, there may be some problems in implementing the model in real life situations, it explains the interrelationships between various aspects of quality costs.

Staff development and training programmes are important components of both conventional and distance education systems in quality enhancement of their programmes. It can be empirically verified the significance of these activities through feedback studies. In IGNOU, the Staff Training and Research Institute of Distance Education (STRIDE) develop training facilities for not only its staff but also other open universities in India and other developing countries. In addition to training, two academic programmes viz. Post Graduate Diploma in Distance Education, and Masters of Arts in Distance Education are offered by STRIDE as staff development programmes. However,





**Fig. 1 : A model of quality costs**

no study is available to measure the significance of these staff development activities in the quality enhancement of the programmes.

### Conclusions

The concepts of quality, cost-efficiency, cost-effectiveness in the context of education are not easy to define. As discussed earlier, the perceptions about these concepts vary widely. For example, the funding agencies may perceive quality in terms of optimum and efficient utilisation of financial resources. On the otherhand the learners may perceive it as an improvement in the learning skills and employability. The recent thinking signifies perceptions of education as a service provided to cost-conscious and outcome-oriented consumers.

As far as effectiveness of a media is concerned students can learn from any media, if greater quality emphasis is given to it. Students should have a greater access to that medium and easily usable in terms of time, place and cost considerations which are peculiar to distance education students.

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