



**Indira Gandhi National Open University
Staff Training and Research
Institute of Distance Education**

**MDE-417
DISTANCE
EDUCATION:
ECONOMIC
PERSEPECTIVE**

Block

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ECONOMICS OF EDUCATION

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Conceptual Foundations**

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Education as Investment**

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MDE-417: Distance Education: Economic Perspective

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

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MDE-417: Distance Education: Economic Perspective

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-

INTRODUCTION TO THE BLOCK

As you will notice, the Course on “Distance Education: Economic Perspective” comprises five Blocks, which is of six (6) Credits, and will require, on an average, 180 hours of your study time (though you may take time duration, i.e. 20 to 40 hours, to complete each Block or Module). We have redesigned this course in this form, different from the course structure that we had in its earlier version. The first four Blocks deal with various conceptual and practical aspects of economics of education, and economics of distance education, while in the last Block we have compiled eight select articles/papers in the area of distance education written by international experts in this field. We have obtained copyright permission to reproduce them with reformatting in this Block which is titled as ‘Readings in Economics of Distance Education’.

In Block 1 you will find four units that provide for conceptual foundation to enable further study of ‘economics of distance education’. These deal with the meaning of economics of education and concepts associated with it; education as consumption and investment, including earnings, wastage, and production function in education; various types of costs and cost analysis in education; and generation and utilisation of resources for education. Block 2 is devoted exclusively to the study of ‘economics of distance education’ – human resource development, funding, pricing, and cost and quality – the last two being exclusively new areas of study within this field. In Block 3, we have focused entirely on the cost aspect of distance education and technology-enabled learning. We have provided international perspectives on this field through some case studies in Block 4. Further, you will find the eight selected readings in economics of distance education given in Block 5 useful to your current comprehensive understanding of this field, as also for your future research work in this area, including the project work for MDE-320.

We have tried to make the units as presentable as possible; and hope you find them interesting to study. All the best indeed.

UNIT 1:

CONCEPTUAL FOUNDATIONS

Structure

- 1.1. Introduction
- 1.2. Learning Objectives
- 1.3. Introduction to Concepts
 - 1.3.1. What is economics of education?
 - 1.3.2. Public good and private good
 - 1.3.3. Consumption and investment goods
 - 1.3.4. Social good and merit good
- 1.4. Human Capital Theory
 - 1.4.1 Rates of return approach to education
 - 1.4.2 Education as a screening or credentialism hypothesis
- 1.5. Education and Economic Growth
 - 1.5.1 Growth accounting framework
 - 1.5.2 Endogenous growth theory
- 1.6. Contemporary Economic Reform Policies and their Effects on Education
 - 1.6.1 Privatization of education
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- 1.7. Let Us Sum Up
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- 1.9. Model Answers to Activities

1.1 INTRODUCTION

This is the first Block of the Course on “Distance Education: Economic Perspective”, and provides the foundation to the study of economics of distance education with conceptual clarifications. Besides conceptual foundations/clarifications given in Unit 1, the subsequent three deal respectively with education as consumption and investment, various educational costs and cost analysis in education, and how resources are utilized within/for education.

With the foundational clarity provided in this Block, you will be equipped better to appreciate the detailed study of economics of distance education in Block 2, costing in distance education in Block 3, and international perspectives in Block 4 on costing in distance education which are contributed by international experts in the area of economics of distance education; and the critical study of select papers given in Block 5 shall expand the horizon of your understanding of this area, as also facilitate you to take up research studies of your own in future, as also for your project work within the Masters programme.

1.2 LEARNING OBJECTIVES

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

- Define ‘Economics of Education’.
- Differentiate between public and private good; investment and consumption goods; and social good and merit good.
- Explain the human capital theory with a critique on it.
- Examine the relationship between education and economic growth.
- Explain the endogenous growth theory.
- Examine the contemporary economic reform policies and their effects on education, such as privatization and internationalization of education.

1.3 INTRODUCTION TO CONCEPTS

1.3.1 What is economics of education?

‘*Economics of Education*’ is a branch of Economics which applies various economic theories, principles and models to the issues and problems of education. Economics of Education was born as a formal area of study only about five decades ago, with ‘the human investment revolution in economic thought’ created by Theodore Schultz in his Presidential Address to the American Economic Association in 1960. It builds powerful interface with theories of growth, labour economics, international economics, public finance, welfare economics, micro economics, household economics, and simultaneously going deep into the ‘basic tenets’ of Economics of Education. To begin with, the interests of economists in the field of education have centered chiefly on four topics: (a) measurement of the economic cost and benefits of education, (b) educational planning, (c) efficiency criteria, and (d) adequacy of revenue sources.

Further, three major economic approaches to educational planning, viz. i) rate of return analysis, ii) manpower planning, and iii) social demand analysis have vastly contributed to better understanding of several economic dimensions of education. These have also influenced considerably the boundaries of the theories of growth, labour economics, and development economics. Research studies that examined private and social demand for education have made significant dents into ‘*Development Economics*’, necessitating broadening the framework of studies on poverty, inequality, household consumption, and levels of living. For its own development, Economics of Education has drawn heavily from Economics, and in turn influenced heavily the development of Economics too. It has become a specialized branch of Economics and also a separate area of Educational Studies. The other major components of human capital, viz. health and migration also branched out of it as important areas of study.

1.3.2 Public good and private good

Public good is a good which has the twin characteristics of non-rivalous and non-excludability nature. In Paul Samuelson’s words, public good is “good, which all enjoy

in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individual's consumption of that good...". Public goods are goods or services that can be consumed by several individuals simultaneously without diminishing the value of consumption to any one. This key characteristic of public goods that multiple individuals can consume the same good without diminishing its value is termed as *non-rivalry*. Non-rivalry characteristic is the one which most strongly distinguishes public goods from private goods. A pure public good also has the characteristic of *non-excludability*, that is, an individual cannot be prevented from consuming the good whether or not the individual pays for it. For example, fresh air, a public park, national defense. Education, more broadly defined as knowledge or ideas as postulated in the modern growth theories (discussed later), has the inherent nature of non-rivalness (Romer, 1994).

On the contrary, private goods are *exclusive* and *rival* in nature. Exclusiveness means once the good or service is bought, the buyer owns it and consumes. Rivalness means the competitiveness -that is once a good is sold off, it is not there for other people to consume. For example, food, clothing, toys, cars, etc. In the recent periods, education is also argued as a private good, but has immense positive externalities. *Externality* means the benefits of education that is conferred on the society, which further means the benefit the society receives as the people are educated. Examples include cleanliness, better health practices, etc. Similarly, education has the characteristics of both consumption and investment goods.

1.3.3 Consumption and investment goods

Goods in economics can be categorized as consumption and investment goods. Consumption good or service is one that is used (without using it for further transformation in production) for the direct satisfaction of individual needs or wants or the collective needs of members of the community. Investment good is a good which enables further production of goods which is also called as capital goods. Capital goods are generally human-made, and do not include natural resources such as land or minerals. For example, plant, machinery, tools, equipments, etc.

The nature of education is such that it possesses both consumption and investment characteristics of good. However, since 1960s, education has been recognized as an investment for both the individual and the society. Education is both investment as well as consumption. There is no method of estimating in what proportion these two contribute to education. In primary education, the investment component is lesser than consumption component. In secondary education both the components may more or less equal and in the case of higher education, investment benefits are much higher than consumption benefits. Moreover, whether education is a consumption or an investment good needs to be examined from both the private and social point of view.

1.3.4 Social good and merit good

Social goods are distinguished as those goods to which exclusion principle cannot be applied. In other words, it is a good or service that benefits the largest number of people in the largest possible way. Some examples of social goods are clean air, clean water and literacy. *Merit good* is a socially desirable good whose distribution of benefits is the maximum. In the case of merit goods, people do not realize the true or

actual size of benefit. For example, people underestimate the benefits of education such as the scientific innovations and the benefits of using them like the benefits of using vaccinations.

Activity 1.1

Write, in your own words, brief statements on each of the following with an example for each:

i) Public good:

ii) Investment good:

iii) Social good:

1.4 HUMAN CAPITAL THEORY

After the conceptual introduction, let us turn to a very important aspect of economics and economics of education, i.e. *human capital*.

The human capital theory postulates that education is an investment activity that increases skills, and hence labour productivity and the lifetime earnings of individuals (Schultz, 1963; Becker, 1964; Mincer, 1974). A simple description of this process is illustrated in Figure 1.1 which depicts that investment on education leads to enhanced skills which in turn lead to higher productivity which in turn causes higher earnings. The higher wages and salaries in turn lead to higher economic growth.

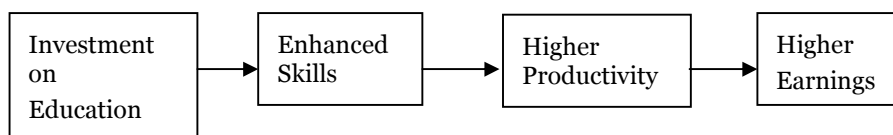


Figure 1.1: *Process of education as investment*

Human capital theory brought out that education is a major source of acquired abilities. It brought out the distinctive attributes of education as human capital distinguishable from that of from physical capital:

- i) The stock of knowledge is *embodied* in human capital unlike in physical capital.
- ii) In acquiring human capital, the individual must invest both of his/her time and resources.

Another important facet of human capital theory deals with investment in on-the-job training and the criteria for determining who will pay for such training and who will benefit there from. Based on the pioneering work of Becker (1964), a distinction is made between general and specific training. That the accumulation of human capital occurs through both formal instructional programs and through informal ways such as the cumulative experience on a job, in which one learns by doing. General training refers to training that provides valuable knowledge and skills to workers useable both within the present employment and in other employments. On the other hand, specific training has value only within the current employment and is totally irrelevant for the workers' productivity in other firms. The distinction between general skills in terms of portability and specific skills in terms of non-portability are important. The general skills defined in terms of portability have a central place in both learning and at work as parts of an integrated theory of human capital.

Applying the criteria who will pay for the cost and who will benefit from what kind of training (general or specific) can result in four alternatives as shown in Figure 1.2.

	Individual	Employer
General	Cost, spread over benefit	Additional cost, similar benefit
Specific	Additional cost, benefit specific to a firm	Cost, additional benefit

Figure 1.2: *Who pays for training*

The alternatives are the following.

- i) For general training:
 - a) The individual would be willing to bear the cost as the benefit is spread over to more than one employment opportunity.
 - b) But, for the employer, it would be an additional cost for no additional benefit.
- ii) For specific training:
 - a) For the individual, it is an additional cost and the benefit is specific to a particular firm.
 - b) For the employer it is an additional cost and would bring in additional benefit.

Among these four alternatives, one can deduce the two desirable ones as: i.a) The individual would be willing to bear the cost for general training as the benefit is spread over to more than one employment opportunity, and ii.b) For the employer it is an additional cost for a specific training but would be benefiting more from that cost of specific training.

Mincer (1974) applied empirically to separate out-the-schooling and on-the-job training components of earning streams by the interpretation of the concave shapes of earning paths over a person's life. Hence, the rates of return to education are estimated using the age-earnings profile or Mincer's earning function. We will briefly discuss these two methods of estimating rates of return to education as follows.

1.4.1 Rates of return approach to education

The economic returns to education can be measured by the internal rate of return to education, which is the interest rate that equates the present value of the costs incurred for education to the present value of additional lifetime earnings attributable to education. It is the profitability or rate of return on investment as a measure of the expected yield of investment in terms of future benefits, or income stream generated by capital compared with the cost of acquiring the capital asset. The rate of returns to education can be measured for both the individual (private) and social rates of returns. The private rate of return is used to explain the demand for education. It can also be used to assess the equity or poverty alleviation effects of public education expenditures, or the incidence of the benefits of such expenditure. The social rate of return summarizes the costs and benefits of the educational investment from the state's point of view, i.e., it includes the full resource cost of education, rather than only the portion that is paid by the recipient of education, i.e. the student or the trainee.

Private Rate of Return

The costs incurred by the individual are his/her foregone earnings (since he/she may have earned in a job if had not gone for further education) while studying, plus any education fees or incidental expenses the individual incurs during schooling. The private benefits amount to what a more educated individual earns (after taxes), above a control group of individuals with less education. The private rate of return to an investment at a given level of education in such a case can be estimated by finding the rate of discount (r) that equalizes the stream of discounted benefits to the stream of costs at a given point in time.

Social Rate of Return

The main difference between private and social rates of return is that, for a social rate of return calculation, the costs include the state's or society's at large spending on education. Gross earnings (i.e., before taxes and other deductions) is used in a social rate of return calculation, and such earnings also include income in kind where this information is available.

Since the costs are higher in a social rate of return calculation relative to the one from the private point of view, social returns are typically lower than a private rate of return. The difference between the private and the social rate of return reflects the degree of public subsidization of education.

Adjustments

Estimating the returns to investments in education, as for any other sector, involves an implicit projection of anticipated benefits over the person's or society's lifetime. Since only the past earnings are observed, or, most commonly, only a snapshot of the relative earnings of graduates of different levels of schooling is observed, adjustments have been used in the literature to provide a realistic projection of earnings of graduates. The most common adjustments refer to the anticipated real growth in earnings, mortality, unemployment, taxes and innate ability.

'Mincerian method' or earning function involves the fitting of a function of log-wages, using years of schooling, years of labor market experience and its square as independent variables (Mincer, 1974). Often weeks-worked or hours-worked are added as independent variables to this function as compensatory factors. We call the above a "basic earnings function." In this semi-log specification the coefficient on years of schooling can be interpreted as the average private rate of return to one additional year of schooling, regardless of the educational level this year of schooling refers to.

1.4.2 Education as a screening or credentialism hypothesis

Many economists particularly Arrow (1973), Spencer (1973) and Stiglitz (1975) among many others have argued that education remained as a screening or filtering device. The skepticism of human capital theories have led to development of alternative theories such as Screening theories and labeling mechanisms. This hypothesis contends that education or investment on education is not productive by imparting necessary knowledge and skills, but simply acts as a screening device, which enables employers to identify individuals who possess either superior innate ability or certain personal characteristics such as attitudes towards authority, punctuality, or motivation, etc. Rather, education screens, labels and identifies the higher credentials in people and leads to higher earnings (see Figure 1.3).



Figure 1.3: Education and earnings relationship

Arrow (1973) noted in his filter argument that higher education not really adds up to productivity but adds to some information to the extent that it identifies higher credentials in people. However, the screening hypothesis is important as it focused the attention on education and other forms of investment in human capital which influence productivity. It served as a reminder that education does far more than imparting knowledge and skills. The educational process helps to shape and develop those attributes. This restates that the concept of human capital is still valid that it must be extended to include activities which affect personal attributes as well as skills, and it must recognize that such activities increase workers' productivity in complex ways.

Activity 1.2

Distinguish between 'Rates of Return Approach to Education' and 'Education as a Screening Hypothesis'. Write within 100 words in the space given below.

1.5 EDUCATION AND ECONOMIC GROWTH

The relationship between education and economic growth has been one of the major tenants of economics of education. This relationship has been examined by economists under two theoretical frameworks: i) The growth accounting framework which Solow, Dennison and other followed; ii) The modern or endogenous growth theories, which Romer, Arrow and Lucas have contributed these two frameworks are discussed as follows.

1.5.1 Growth accounting framework

During 1950s, growth had been extraordinarily rapid and in reflecting on this experience, economists began to recognize what Tinbergen had shown in 1942 itself that conventionally specified Cobb-Douglas aggregate production functions left a large part of observed growth in national income per capita unexplained. This fact was rediscovered in 1950s in Norway, Finland and in U.S. The residual was given many designations as technical change, human factor, and measure of ignorance. However, it was generally agreed that education is a vital element in economic development. The discovery that increases in physical capital and labor did not, by themselves, explain economic growth led to an analysis of the factors determining the "residual," in particular the role of education and technical knowledge. One of the first attempts to measure the contribution of education to growth was made by Denison (1964), who argued that about 23 percent of recent increases in U.S. national income during the period 1929 to 1982 were due to the increased education of the labor force. In Denison's accounting the effects of scale economies were arbitrarily assumed and the residuals were simply supposed to reflect the effects of advance in knowledge with no explanations of how scale economies work and how human knowledge advances.

Harrod and Domar are the earliest exposition of growth models. The rate of growth in the economy is determined by the ratio of rate of savings (s) to capital output ratios

(v). The assumption made in the First Five Year Plan in India was that rate of savings is equal to investment in the economy, which is not necessarily the case. If the rate of growth is lower, it results in cumulative unemployment. It is important to recognize that the strategy to promote economic growth by forced savings was based on the assumption of a special production function. The peculiar nature of this production function is evident from the specification that only capital but not labor is included as a factor of production. It also assumes that labor and capital are not substitutable in production and hence output does not increase by applying more output for given stock of capital. The warranted rate of growth is referred as knife-edge, and it is also the unstable growth path. The dynamic question on how fast the economy should grow is not addressed in the model. This model does not concern about how the variation in growth rate occurs across space and time.

Using the neoclassical production function, Solow and Swan in 1956 advanced a very different perspective from the Harrod-Domar model on the relationship between capital accumulation and economic growth. Unlike in Harrod-Domar, the labour and capital ratios were allowed to change by Solow and Swan. It can be derived from this model that both capital input per worker and output continue to grow at the same rates as the rate of increase in the efficiency of labor resulting from technological progress. Thus, it implies that the growth of income per capita cannot be sustained without continuous technological progress. However, Solow's convergence keeps on growing at the same rate and does not allow for any difference across space or time as in Harrod-Domar. An important contribution of the neo-classical growth model of Solow-Swan was to elucidate the decisive role of technological change in economic growth. However, the problem was treating technological progress as exogenous in the growth model.

1.5.2 Endogenous growth theory

An attempt to incorporate the effects of scale economies and endogenous technological progress into the growth theory is called endogenous growth models pioneered by Paul Romer (1986, 1994), Kenneth Arrow (1973) and Robert Lucas (1988). These models try to explain the mechanism of how new knowledge is created through economic activities, giving rise to scale economies. Its basic assumption is that new knowledge to improve economic production accentuates bit by bit through the efforts of individual firms to design and construct more efficient machines and factories in their investment activities. It is assumed that certain useful knowledge created by a firm sooner or later becomes usable by other firms despite the firm's efforts to prevent other firms from using it. According to Romer, an inherent characteristic of ideas or such knowledge is that they are non-rivalrous. But they vary substantially in their degree of excludability. Excludability indicates the degree to which a good is excludable, i.e. the degree to which the owner of the good can charge a fee for its use.

As discussed earlier, non rivalrous goods that are essentially non-excludable are called *public goods*. On the contrary, a rivalrous good must be produced each time they are sold; goods that are non-rivalrous need to be produced only once. That is non-rivalrous goods such as ideas involve a fixed cost of production and zero marginal cost. An example is Thomas Edison and his lab to produce the first commercially viable electric light. Additional lights could be produced at a much lower per-unit cost. Once

the product is developed, each additional unit is produced with increasing returns to scale under imperfect competition.

This process can be viewed as production with a fixed cost and a constant marginal cost, which exhibits increasing returns to scale (see Figure 1.4). Ideas are very different from other economic goods. Ideas are non-rivalrous and also non-excludable after some time at least in the medium term. Once an idea is invented, it can be used by one person or by one thousand people, at no additional cost. That the size of the economy—its scale—plays an important role in the economics of ideas.

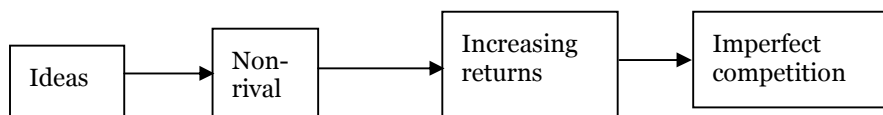


Figure 1.4: *The process in endogenous growth*

In particular, the non rivalry of ideas implies that production will be characterized by increasing returns to scale. In turn, the presences of increasing returns suggest that we must move away from models of perfect competition. It is because the inventor expects to be able to charge a price greater than marginal cost and earn profits.

It is important to understand that the technical progress in machines and equipments is embodied, whereas in labour it is *disembodied*. In the production function of goods and services, the constant returns to scale operate, whereas in the stock of knowledge function the increasing returns to scale operates. However, the rate of knowledge accumulation depends upon the initial stock of knowledge. Higher the stock of knowledge, the more one can add to it. This proposition gets accentuated under the contemporary economic policies.

Activity 1.3

Establish the relationship between education and economic growth by briefly explaining the two frameworks – growth accounting, and endogenous growth. Write in about 150 words in the space given below.

1.6 CONTEMPORARY ECONOMIC REFORM POLICIES AND THEIR EFFECTS ON EDUCATION

Knowledge is the driving force in the rapidly changing globalised economy and society. Quantity and quality of highly specialized human resources determine their competence in the global market. It is now well recognized that the growth of the global economy has increased opportunities for those countries with good levels of education and vice versa (Carnoy, 1999; Stewart, 1996). It is also widely recognized that to the extent globalization and macro economic reforms intensify competitive pressures, it correspondingly de-emphasizes the redistributive strategies and push governments away from equity-driven reforms (Bowles, 2001).

India is no exception to this global phenomenon. As a part of globalization, economic reforms initiated in India in the beginning of 1990s consisting of structural adjustment and stabilization policies. Further, the second generation of economic reform policies especially the Fiscal Responsibility and Budget Management (FRBM) Act, notified on August 2003, aims to eliminate the revenue deficit by 2008-09. With economic reforms and other pressures of the government, higher education has been listed as non-merit good. Following the structural adjustment policies and later the macro economic and fiscal policies, a fiscal squeeze is experienced in all social sector investments, which has trickled down to public expenditure on education in general, and higher education in particular.

Economic reforms initiated in India in the beginning of 1990s consist of structural adjustment and stabilisation policies. Following the structural adjustment policies, a fiscal squeeze is experienced in all social sector investments, which has trickled down to public expenditure on education in general, and higher education in particular. On account of the cut in the budget for higher education, there are severe pressures for the higher education system to mobilise resources from non-governmental resources. Simultaneously, the demand for higher education has been growing rapidly with comparatively faster growth in enrolment in higher educational institutions¹ than the growth in number of higher educational institutions.

On account of the cut in the budget for higher education, there are severe pressures for the higher education system to mobilize resources from non-governmental resources. As a consequence, augmentation of resources by higher educational institutions covering either a larger portion of cost of higher education or full cost recovery even in public higher education institutions has become the order of the day through introduction of self-financing courses and seats in tune with liberalisation policies². The emerging alternatives on various financial reforms/innovations

¹ It pertains to public higher educational institutions. However, there is no comprehensive information available on growth of private higher educational institutions and number of students enrolled therein.

² Certain number of students in each department pay full cost fee, while the rest of the students pay normal (subsidised) fees. It is to be noted that the normal fee itself has been increasing, besides the full cost fees.

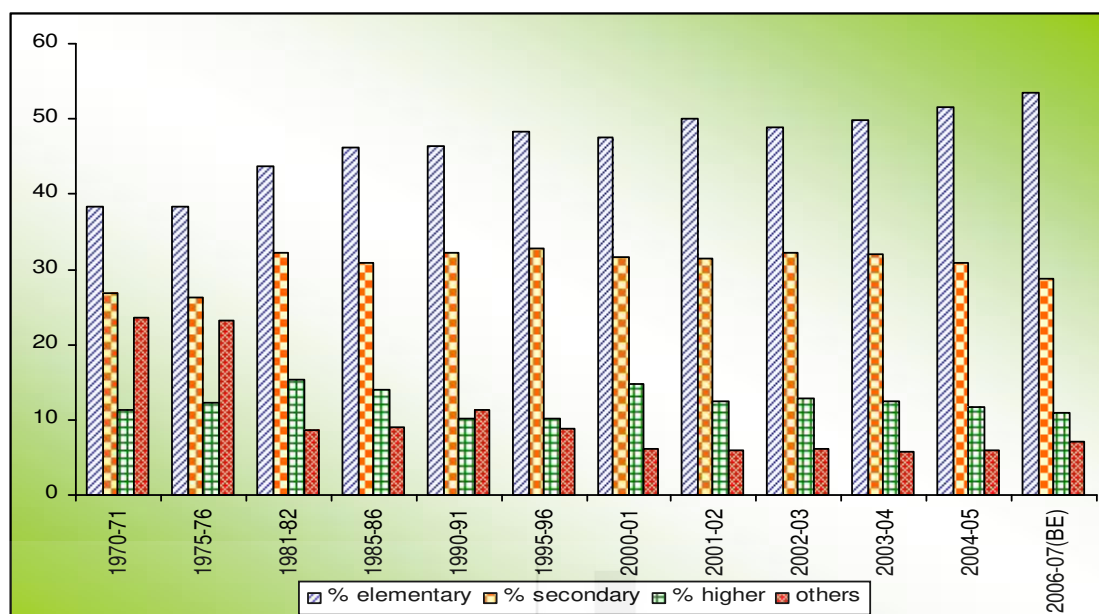
including hike in student fees, student loans and privatization in public higher education institutions along with increasing private sector participation.

1.6.1 Privatization of education

Private higher education is one of the most dynamic and the fastest-growing segments of post-secondary education at the turn of the 21st century. A combination of unprecedented demand for access to higher education and the inability or willingness of governments to provide the necessary support has brought private higher education to the forefront. Private institutions, with the long history in many countries, are expanding in scope and number, and are increasingly important in parts of the world that have relied on the public sector (Altbach, 1999.). This transition process in higher education is primarily on account of the new goals, policies, and practices of *neo-liberal market principles*. There has been a paradigm shift in the attitude towards the role and efficiency of state *per se* and financing of any public services (including education) in particular. India is no exception to this global transformation especially during 1990s.

Historically, private sector participation in education in India is not a new phenomenon. In India, over the years, there have been private initiatives in education initially for philanthropic reasons and more intensively during 1990s, in professional and even in general higher education not only to meet the growing demands but also to realize the huge and quick profit potential. Such a rapid growth of private higher education institutions is also on account of the policy changes at the macro economic level and also at the micro or sub sectoral level, i.e. higher education. This is primarily the impact of economic reforms initiated during the beginning of 1990s. The five major components of the new economic policy initiated in the beginning of 1990s include: liberalisation, globalisation, privatisation (called LGP), currency convertibility, and reduced role of state.

These reform packages imposed a heavy compression on the public budgets on education sector, more specifically so on higher education (see Figure 1.5). With macro economic reforms leading to severe cuts on the education budget resulted in several policy directions. Such policy changes have paved way to several alternatives, including student fees, student loans and privatization in higher education. The increased role of market is manifested by the expansion of private sector education industry (i.e. marketisation).



Source: Based on Analysis of Budgetary Expenditures on Education in India

Figure 1.5: Sectoral allocation of public expenditure on education by levels of education in India (in %)

1.6.2 Internationalization of education

Until late 1980s, education was thought to be essentially a non-traded service. Under General Agreement on Trade and Services (GATS) in January 1995, education has become a tradable service. Since then, internationalization of higher education gained momentum. Internationalization of higher education is seen as one of the ways the country responds to globalization, while maintaining the individuality of the nation. Knight (2002) defines internationalization of higher education as the process of integrating an international/intercultural dimension into the teaching, research and service functions of the institutions. There are several key concepts in this definition, e.g., the idea of internationalization being a dynamic process and not a set of isolated activities, integration or infusion contributes to the sustainability of the international dimension. Finally, the definition refers to the primary and universal functions of an institution of higher education, namely teaching, research and service to the nation.

Internationalization of higher education is pursued via four modes (see Table 1). The first important mode, Cross-Border Supply, corresponds to the normal form of trade in goods and service which crosses the border. Cross-border supply of educational services might grow rapidly in the future through the use of new information technologies for distance learning (cable and satellite transmissions, audio and video conferencing, PC software, CD-ROMs, and the Internet). In particular, the Internet is seen as a promising tool for distance learning. A number of private companies and universities have launched recent initiatives in this area.

Table 1.1: *Main modes of international supply of educational services*

Modes	Explanation	Examples	Size of Market
1.Cross-border supply	The provision of education of a service where the service crosses the border(does not require the physical movement of the consumer)	Distance education; on-line education; virtual universities	Currently a relatively small market Seen to have great potential through the use of ICT
2.Consumption abroad	Provision of service involving the movement of the consumer to the country of the supplier	To students who go to another country to study	Currently represents the largest share of the global market for education services
3.Commercial presence	The service provider establishes or has presence of commercial facilities in another country in order to render service	Local branch or satellite campuses Twinning Partnerships Franchising arrangements with local institutions	Growing interest and strong potential for future growth Most controversial as it appears to set international rules on foreign investment
4.Presence of natural persons	Persons travelling to another country on a temporary basis to provide service	Professionals, Teachers, researchers working abroad	Potentially a strong market given the emphasis on mobility of professionals

Note: The different modes of services trade according to the GATS classification
Source: Knight (2002)

The second mode of Consumption Abroad refers to a situation where a service consumer moves to another country to obtain the service in question (e.g. a student who travels abroad to study). International flows of students in higher education constitute at present by far the largest share of the global market for education services. The third mode of Commercial Presence of educational services refers to the commercial establishment of facilities abroad by education providers, e.g. "local branch campuses" or partnerships with domestic educational institutions. There is a growing interest through this mode and has a strong potential for growth. The last mode of Presence of Natural Persons consists of a natural person (e.g. professor, researcher, teacher etc.) travelling to another country on a temporary basis to provide an educational service (see Table 1.1).

Under GATS, there are both conditional and unconditional obligations (see Knight, 2002). These obligations in a broader sense favor the developed nations than the developing nations. In brief, we can say that it makes a similar platform for unequal partners and hence poses many challenges for the developing nations. For instance in India, many foreign universities and institutions have been allowed to come into the country and establish franchise centers in the country, offering degrees or diplomas, which are not necessarily recognized by the parent universities in their own countries. The regulatory framework in developing countries is yet to be developed or even if exists, is yet to be strengthened.

Activity 1.4

Is privatisation of education any way related to internationalization of education? In what different ways economic reforms have affected education in recent times? Write in about 150 words in the space given below.

1.7 LET US SUM UP

You have learnt what is meant by Economics of Education, that it is a branch of economics evolved during 1960s, but an area growing tremendously. You also understood some key and basic concepts of the subject such as investment and consumption goods; human capital verses physical capital, and public good, merit good, etc. Further you learnt how education contributes to the economic growth under two streams of studies – one focusing on human capital theory and the recently developed endogenous growth theories. With this basic foundation knowledge, you would have appreciated the contemporary economic reform policies and their effects on education especially on privatization of education and internationalization of education.

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1.9 MODEL ANSWERS TO ACTIVITIES

Activity 1.1:

- i) Public good is the consumption of any good provided by any public representative for consumption by each member of the society, where such consumption by any one does not reduce the value of consumption of the same good by another. Educational facilities provided by public authorities free to all are enjoyed by each member of the society equally.
- ii) Investment good is one which facilitates further production of goods, and is considered as investment. Education is generally considered as investment good, i.e. higher the education higher shall be the benefits accrued to that individual.
- iii) Social good is such that it provides equal opportunity for each one to benefit from. Generally, social goods are merit goods which provide maximum benefits to citizens over the non-merit goods.

Activity 1.2:

Both the approaches find out the economic rates of return to education. The 'Rates of Return Approach' finds out to what extent the present value of expenditure of education per student/graduate (i.e. per unit) is equal to (or more or less than) the present value of additional learning in the whole lifetime that one will accrue due to more education – both individual rate of return, and the social rate of return. Perception of higher rate of return leads to more demand for education, and vice versa.

On the other hand, unlike the human capital theory which postulates that higher the education higher is the earnings, others do believe that higher education leads to screening the best – i.e. those who get higher knowledge and skills are better or more skilled than those with lower education, and therefore are to earn higher earnings than the latter.

Activity 1.3:

Education is directly related to economic growth. There are two frameworks which account for this – i) growth accounting framework, and ii) endogenous growth framework.

The growth accounting framework explains that over a period time, one may find out through analysis of data over that period that higher the education and training higher is the average earning per capita. In the Harrod–Domar model, given the knowledge and skill of a labour, higher capital (input) shall lead to higher output (though this model did not take into account the increase in skills during process of production). Alternatively, the Solow–Swan model suggests that due to technological progress, during the process of production, the efficiency of labour increases leading to increase in both capital input and output per worker.

On the other hand, the endogenous growth framework suggests that due to technological growth, one can also innovate in the process of production. Once a novel idea or new innovation is conceived by one, other only scale it up by using that idea, thereby resulting in increasing returns to scale.

Activity 1.4:

Privatization of education refers to private participation in education induced largely by neo-liberal market principles. Though in early stages, private participation in education was mainly due to philanthropic reasons, of late this has been considered as an investment in education for expansion as also to meet the growing demand for good schooling and especially professional higher education.

Once GATS was promulgated in 1995, education was treated as a tradable service, and so greater internationalization, including cross border delivery of education, started. Internationalization is done through four modes or mechanisms: cross border supply of education, students studying overseas, overseas students studying in a host country, and brain drain in professions, teaching and research.

Due to liberalization and opening up of economy, demand for especially private education has increased; there are changes in access and equity; demand for education abroad has increased; private and international participation in education has also increased; employment opportunities in both in-country and overseas have increased; and there is increase in salary and standard of living too.

Conceptual Foundations



UNIT 2:

EDUCATION AS INVESTMENT

Structure

- 2.1 Introduction
- 2.2 Learning Objectives
- 2.3 Decision Making
 - 2.3.1 Individual decisions
 - 2.3.2 Institutional decisions
 - 2.3.3 Collective decisions
- 2.4 Development of Human Resources
 - 2.4.1 Human capital vs. physical capital
 - 2.4.2 Human capital: dimensions and determinants
 - 2.4.3 Education and human capital
 - 2.4.4 Formation of human capital
 - 2.4.5 Human capital formation: quantitative indicators
- 2.5 Education and Earning
 - 2.5.1 Earning profiles
 - 2.5.2 Earning differentials
 - 2.5.3 Earning and productivity
- 2.6 Production Function in Education
 - 2.6.1 The production function
 - 2.6.2 Human capital and agricultural/industrial productivity
 - 2.6.3 Level of education and output return
 - 2.6.4 On-the-job training
- 2.7 Wastage in Education
 - 2.7.1 Educational wastage
 - 2.7.2 Measurement of wastage in education
 - 2.7.3 Repetition and dropout
- 2.8 Effective Utilisation of Resources
- 2.9 Let Us Sum Up
- 2.10 Model Answers to Activities

2.1 INTRODUCTION

In the last Unit, we dealt with the fundamental concepts in the study of economics of education, including the concept of investment. We defined investment as the deployment of physical and financial resources that have alternative productive uses in any activity. The benefits of such activities will accrue to the individual and to society over a period of time. The benefits of investment take the form of production of goods and services which, in effect, are treated as incomes. The use of resources for the development of education is essentially an investment, the benefits of which accrue to society for a relatively longer period of time. Therefore, education, in all countries, is regarded to a large extent as a social responsibility. The task of making provision for adequate and relevant education to suit different types and levels of learners is, therefore, largely assumed by the Government everywhere. Obviously, a great deal of caution has to be exercised in respect of planning and management of physical and financial resources devoted to education.

The present Unit, broadly speaking, deals with issues related to educational investment. We talk of issues concerning the decision making for development of human resources and increase in earning, the production function in education and educational wastage, effect of the latter on the investment function of education, and productive utilisation of resources for education.

2.2 LEARNING OBJECTIVES

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

- Describe the decision making processes in education.
- Outline the theory of human capital and its relationship with economic development.
- Identify and describe the ways and means of promoting the formation of human capital.
- Explain the external efficiency of investments in education and training, especially its impact on productivity and earnings of educated people.
- Describe the production function in education;
- Describe such aspects of education system as wastage which impinge upon internal efficiency of investments in education.
- Describe proper utilisation of resources for educational purposes.

2.3 DECISION MAKING

Let us start with the process of making decisions for educational investment. In order to play a justifiable role in expediting the process of educational development, the Government and its constituent bodies have to take a number of sound decisions, of course, taking into account the human resources requirements of different economic and social sectors of the country. A wide spectrum of issues which always receive the attention of educational planners and decision makers encompass such areas as:

- public and private uses of current resources;
- public expenditure on social welfare programmes including those relating to the promotion of economic growth and the necessary provision for such services as education, health, housing and national defence;
- estimation of budgetary requirements of different sectors of education, like primary, secondary, vocational, higher, general and technical education, etc.; and
- determination of the combination of a set of inputs like teachers, laboratory, library, size of the classroom and other necessary equipment, keeping in view of course the desired quality of educational output.

The decisions in respect of all these, however, require detailed information pertaining to:

- i) the identification of factors which have a significant bearing on the process of educational development, and the extent to which each factor exerts its influence in determining the course of the above process; and
- ii) the alternative costs or losses which a society will have to incur if the appropriate decision is not taken to initiate action for the promotion of education.

Obviously, such information, as noted above, which is gathered through different means from individuals as well as institutions, forms the basis for taking decisions in respect of planning, managing and financing of the education system. As you have

seen in Unit 1, education has both consumption and investment aspects, the benefits of which accrue both to individuals and to society. Therefore, investment decisions with regard to the nature, types and levels of education as well as the extent of sharing the costs of the related educational provisions are accordingly taken by both the individual and society. Broadly, the process of decision making can be classified under three categories:

- i) decisions made by individuals with regard to buying or obtaining education of different kinds and levels;
- ii) decisions made by institutions regarding the sale or supply of education; and
- iii) collective decisions taken in the case of conflict of interests or objectives between individuals and institutions or society.

In the following sub-sections we have discussed the different perceptions which influence and guide the decision making processes with regard to acquisition of knowledge, training and technical know-how.

2.3.1 Individual decisions

The investment decisions taken by individuals for buying their dependants' education constitute individual decisions. Individual decision making varies from person to person and from situation to situation, because the decisions are based on the individual's perception of the social and economic gains. These gains are expected to accrue to the family as a whole, after the dependant(s) receive a particular type and level of education. For instance, if a family faces a situation in which it can either finance all the children up to an identical level of schooling or provide financial sustenance to some children for higher levels of schooling, the investment decision of the head of the family in either of the above situations would be influenced by expected gains from the alternative investment. Likewise, individual decisions in education may pertain to the type and level of education, choice of institution and other related aspects which are expected to yield somewhat higher returns from the various alternative investment choices available to individuals, especially in areas characterising purely economic activities. Obviously, for making individual decisions, it is imperative to explore all the alternative opportunities so that sound decisions can be taken for achieving the best possible results. It can thus be said that the individual investors in education seek to maximise the economic returns so that the life time earnings could be increased.

2.3.2 Institutional decisions

All investment decisions taken by either individuals, private enterprises, public institutions or the State, with respect to the creation of necessary facilities for providing education to all those who are eligible and seek it, are termed as institutional decisions. Such decisions are generally subject to societal judgement and even control in one form or another.

The distinction between institutional and individual decisions about investment in education is that the former pertain to those decisions for which there are private or public agents to provide education, and the latter denote those made by or for individuals for procuring their own or their dependents' education. There is, thus, a

difference in the main categories of investments made by the institutions and individuals.

Education as Investment

- A large chunk of investment by an institution is accounted for by such items as payments of salaries to teaching and non-teaching staff, and infrastructure facilities like buildings, equipment, library, etc.
- Investments by individuals are made in the form of payment of fees, maintenance expenditure, and the opportunity costs or foregone earnings.

Such a distinction in the pattern of investment arises because individual decisions are influenced by considerations of private benefit whereas institutional decisions have to take into consideration the total impact of the decision on society and economy as a whole.

2.3.3 Collective decisions

Unlike the individual and institutional decisions that you studied in the two subsections above, the social approaches to investment in education are dominated by considerations like the social and economic welfare of society. Societal judgement on investment decisions in education takes into consideration the entire investment made by individuals and private and public institutions. These societal decisions are, therefore, reflected in the policies and programmes of the Government for educational development. At times, situations do arise in which the choices made by individuals and/or institutions come into direct conflict with each other and, therefore, indicate divergent trends in human activities. These trends may satisfy the wants of the individuals and institutions concerned but the overall expected gains for the society may be somewhat lower. In such a situation, it becomes imperative to rectify the diverse and heterogeneous nature of choices of investments by way of a strong societal intervention so that the overall social gains of investments in education are maximised without unduly affecting the individual and/or institutional options for purchasing education.

In this context, collective choice refers to societal investment decisions which are aimed at optimising the social rate of returns derived from investments in education. Such an objective of optimisation is realised by way of aggregating individual as well as institutional preferences, and reconciling the two different dimensions of individual and societal interests and judgements through a sound method is the process of decision making about investment in education.

Activity 2.1

Distinguish between individual and institutional decision making with regard to investment in education.

Answer in about 100 words.

- Notes:** a) Space is giving below for writing your answer.
b) Compare your answer with the one given at the end of the Unit.

2.4 DEVELOPMENT OF HUMAN RESOURCES

The major aim of educational investment is the development of human resources or human capital. Almost every society makes a vigorous effort for human resource development which constitutes the ultimate basis for generating the wealth of nations. Capital and natural resources are the passive factors of production, whereas human beings are the active agents who accumulate capital, exploit natural resources, and build social, economic and political organisations with a view to promoting national development. Obviously, if a country is unable to develop the skills and knowledge of its people and to utilise them effectively in various socio-economic activities, it would be unable to develop anything else. It is the development of the human resources of a nation, not its capital nor even its material resources alone, that ultimately determines the character and pace of economic and social development vitally necessary for enhancing the quality of the life of the people.

Let us first distinguish human capital from physical capital.

2.4.1 Human capital vs. physical capital

As you have seen in Unit 1, the term 'investment' refers to the expenditure on creation of capital assets which enable a country to produce a stream of goods and services (or income) in the future. On the other hand, the assets which generate income in the future are called capital. Traditionally, economic analyses of investments have tended to concentrate on physical capital, namely machinery, equipment or buildings which have productive capacity. Until the early sixties, there was, however, no worthwhile attempt to examine the economic aspect of education and training which is conducive for increasing the productive capacity of the manpower resources which has a direct relationship with that of the physical capital. Today, there is consensus among the economists and the educationists that the effective use of physical capital in itself is dependent upon the quality of human capital. If there is under-investment in human capital, especially in the form of educational and health services, the rate at which additional physical capital can be productively utilised will be limited.

The market value of human capital, unlike that of physical capital, cannot be observed, largely owing to the lack of homogeneity in the human force. However, knowledge and skills embedded in human capital depreciate after a certain age. 'Depreciation' is defined as the negative change in capital value especially due to wear and tear. In the case of human capital, it depends upon the age of a person while in the case of physical capital it is the chronology of time that causes it. In other words, depreciation of human capital occurs as a result of increased probabilities of death and gradual

deterioration of mental and physical capacities with increase in age. However, in certain other cases like white collar jobs (i.e., office jobs), there may be 'appreciation' of human capital with age. Further, human capital, like physical capital, also has 'obsolescence', i.e., it becomes out of date over a period of time. This is so because the usefulness of the stock of knowledge and skills changes from time to time.

Human capital, like physical capital, requires regular efforts to keep up the required level of knowledge and maintenance of physical vigour and mental calibre. For instance, medical care and health services are concerned with the repair and maintenance of human capital. Unlike physical capital, it deteriorates during the periods of idleness and unemployment which impair the skills and knowledge already acquired. Acquisition of knowledge, like possession of physical property, requires adequate investment of physical and financial resources, time and effort. The expenditure on education, health and other welfare programmes help not only in improving the quality of human resource but also in enhancing productivity.

Human capital has many peculiarities which distinguish it from physical capital. Some of the important distinguishing features are as follows:

- i) No two units of human capital are homogeneous.
- ii) Human capital (the factor) and the individual (the agent) who employs it are not repairable; in the case of physical capital it is always so.
- iii) Human capital requires a longer gestation period as compared to physical capital. The term gestation period refers to the time gap between the start and the completion of training for a person. In the case of physical capital, it refers to the start of investment in the building or installation of a production unit and the period taken to complete the work of installation so that production can be started.
- iv) With the lapse of time and on-the-job experience, human capital adds to the built-in potential of human stock.
- v) Depreciation of human capital is difficult to determine as it rests on many factors including the factor of heredity.
- vi) Occupational and spatial mobility of human capital is influenced by socio-economic factors, besides purely commercial considerations.
- vii) Productivity of human capital is the function of the efficiency of the individual as well as the resourcefulness of the firm and the country where he/she is employed.
- viii) Development of human capital is the pre-condition of the optimal utilisation of improved technological and physical inputs, and their relationship is of a complementary nature.
- ix) Expenditure on human beings is non-transferable, its consumption and investment components are inseparable, and it changes the economic as well as the non-economic attributes of the individual concerned (Patel, 1969).

It is obvious from the foregoing distinguishing features of human capital that it has many social advantages over physical capital. However, there are difficulties in quantifying the social indicators of change and measuring the qualitative aspects of social development in which the role of the human factor is so crucial. Therefore, it is

not easy to formulate a model approach whereby human capital could be expected to discharge its assigned role like its counterpart, i.e., physical capital. This constitutes a major weakness in the theory of human capital vis-à-vis the physical capital theory, especially in the context of its role in stimulating economic and social development.

2.4.2 Human capital: dimensions and determinants

(i) Dimensions of human capital

Human beings invest in themselves to acquire more education and training, and better health conditions which, in essence, form human capital, which has both quantitative and qualitative dimensions.

- a) By **quantitative dimension** we mean the number of people performing a particular task, the proportion of people who enter into the labour force or into gainful employment, and the number of hours devoted to completing a particular task.
- b) On the other hand, the **qualitative dimension** of human capital involves the acquisition of a variety of skills, extent of knowledge, abilities and other desirable attributes that affect human capabilities of undertaking productive work as well as handling it efficiently with a view to maximising the outputs.

(ii) Determinants of human capital

Of the various factors that determine the human capital, the following are the most important:

a) *Education*

Imparting knowledge of various types and levels like elementary, secondary and higher knowledge – which are, by and large, formally organised – is one of the most significant determinants of human capital. Upgrading of standards by way of ensuring the effectiveness of the teaching and learning process and modernisation of curricula at all stages of education, and maintaining positive links between education and the world of work, have a significant bearing on the quality of human capital. This, however, requires that due emphasis be laid on science, environment and value-oriented education, which are the basic elements of the quality of human capital.

b) *Health service*

The nature and the extent of availability of health services have both quantity and quality implications for human capital. Improvement in the standard of health of people has a direct link with population growth. Modernised health services improve life expectancy, reduce infant mortality and the incidence of diseases. All these factors improve the possibility of sustaining physical vigour and longevity of the labour force, and they are positively related to high life long earnings. Moreover, health services enhance the quality of human resources by enabling them to acquire better knowledge and benefits from the new know-how which, in turn, enhances not only the prospects of earnings but also the quality of life enjoyed by them.

c) *On-the-job training*

Almost every employer makes necessary arrangements to provide in-service training to employees as it helps the trainees to become acquainted with the efficient methods of production based on new knowledge. For instance, in-service teacher training oriented towards innovative programmes in the thrust areas, such as education of the

first generation learners – specially learners from the poor and deprived sections of the community – helps in expediting the process of educational development. Likewise, vocational and environmental education, and group specific non-formal education oriented towards skill formation, etc. contribute to the productivity of human capital. The costs of on-the-job training are recovered or neutralised by improved productivity gains due to the techniques of production newly acquired by the work force.

d) Non-formal education

Non-formal education, which is normally aimed at school dropouts, who cannot attend full-time schools, also contributes to the formation of human capital. Industrial workers, farm labourers and other self-employed artisans and craft persons are generally the target groups under non-formal education programmes.

e) Extension programmes

Study programmes are organised by various institutions, firms and organisations. They include extension programmes in agriculture and allied sectors. Such programmes are intended to improve the performance of the labour force, who are already on the job in different sectors of the economy, by way of transmitting new knowledge and skills to them.

f) Housing, urban development, water supply and sanitation

In fulfilling the pre-requisite condition for sound human capital, housing ranks next only to food and clothing in importance. A minimum standard of housing is obviously essential for a healthy and civilised existence. Moreover, factors like urban development, water supply and sanitation also affect the development of human capital and the quality of the life of people.

g) Modernisation of technical education

Modernisation of and removal of obsolescence in technical education programmes and timely facilities help in developing infrastructure for manpower training in emerging areas which, in turn, improve the quality of the human capital.

h) Migration of workers

Migration of individuals and families to other geographical areas help them exploit the new opportunities and equip themselves to adjust to the new environment which, in effect, enhances the ability of human beings to gainfully exploit the economic opportunities available.

Activity 2.2

List and describe in about 150 words the dimensions of human capital. Summarise briefly in what way they all put together affect human capital.

- Notes:**
- a) Space is given below for writing your answer.
 - b) Compare your answer with the one given at the end of the Unit.



2.4.3 Education as human capital

Of all natural creatures, it is only human beings who have the ability and capacity to generate, disseminate and preserve knowledge and technical expertise. The acquisition and possession of knowledge by them through the educational processes turns them into human capital, which has a strong and positive correlation with the ability of human beings to use knowledge as effective means to satisfy their varied needs and wants.

Let us examine how education itself may be considered human capital that further contributes to improved productivity.

- i) First, education and training influence the ability of the labour force to perform their jobs in a better way owing to improvement in manual skills and rational methods of handling different types of jobs.
- ii) Second inculcation of scientific temper and values improves the allocative ability which, in essence, refers to the worker's ability to choose the most appropriate among the possible alternatives to reach the set objective. Such an ability presupposes judgement, cognitive ability as well as technical know-how.
- iii) Third the educational process alone can enhance the innovative ability of human beings, which is crucial for raising productivity and increasing the level of earnings. Though it is difficult to establish a relationship between the level of schooling and innovative ability, it is certain that for innovations a great deal of cognitive ability and knowledge is essential, which is acquired mainly through the process of formal and non-formal education.

The above-mentioned three points suggest that an educated person embodies better human capital than an uneducated one. Can you, at this stage, think of the attributes of human capital? Some of the distinctive attributes of this capital are given below.

- i) An individual's stock of human capital cannot be sold, nor can it be given to someone else. It goes with the individual wherever he or she may go. If an individual were to migrate to another country, the government cannot confiscate that person's human capital.
- ii) To take advantage of the human capital, an individual must employ it in person.
- iii) The duration of the value of an individual's human capital cannot exceed his or her life span.

- iv) In acquiring human capital the individual must invest some of his or her time along with other resources.
- v) It is productive to invest in human capital at a young age, because the value of time is less than it is when the individual grows older.

Human capital depreciates over time as does physical capital. Some aspects of human capital become obsolete in a short time because of changing circumstances, while others have a long life even if the circumstances change (Schultz, 1963). Therefore, human capital must be updated and upgraded from time to time. With the advancement of knowledge, an individual must renovate his/her human capital. For example, new technologies have to be studied and new advances in medicine have to be studied by doctors.

Obviously, education and training of people affect positively most of these attributes of human capital. This fact leads us to know more about how human capital is formed—education is human capital!

2.4.4 Formation of human capital

The term 'human capital formation' refers to the level and extent of acquisition of new knowledge, technical know-how, skills and experience by the work force. Such human capital formation is important because the productive capacity of a country depends not only on its endowment of industrial plants, machine tools and natural resources, but also on the level and types of education and training embodied in its labour force. The human capital formation is, therefore, an essential but not a sufficient condition for accelerating the pace of development as skilled labour force, entrepreneurs, managers and administrators are needed for the development of institutions as well as for directing critically the needed manpower into productive channels. For instance, a machine by itself can do nothing, but when handled by a technician it becomes productive, and when handled by a better technician, it becomes more productive. Thus, without the formation of better and still better human capital, it is not possible to promote and sustain a high rate of economic growth.

Human capital formation is a time consuming and continuous process. To train a person, for instance, as an engineer, doctor or teacher, requires a period of one and a half to two decades. And this process is influenced by various important factors ranging from the availability of adequate food and health facilities to on-the-job training, through formally organised education at the elementary, secondary and higher levels, study programmes for adults, extension programmes, etc.

There are certain factors which slow down the process of human capital formation. Poverty, defined as deprivation of basic material needs for survival, is the major bottleneck which hampers this process. Although all people have a creative spark that is inborn in them, poverty and the consequent poor health, tension, anxiety, worry, etc., can sap that creativity and, thus, impinge upon the learning abilities. Poverty does not permit people to get nutritious food, education, recreation, etc., and therefore, imposes restrictions on the human capital formation. Also added to this limitation are wide-spread illiteracy, low education, status of workers, etc., that dampen the level of the human capital formation. And if the investments in human capital are lop-sided, unscientific notions and social factors like superstition, social taboos, caste system, unchecked population, etc., continue to hamper this process further. Every country, therefore, plans its educational, health and other social

services in such a way that they become conducive to expediting the process of human capital formation.

2.4.5 Human capital formation: quantitative indicators

Human capital constitutes the most important of all the resources, and with skilful management and scientific planning, it can go a long way in taking a country from a lower to a higher stage of development or from poverty to prosperity. In order to realise the socio-economic objectives, a number of quantitative indicators are evolved which assist in the task of assessing and evaluating the nature and degree of human capital development. These indicators generally fall into two broad categories (Harbison and Myers, 1964):

- i) those which measure a country's **stock** of human capital; and
- ii) those which measure the gross or net additions to the stock or, more precisely, the **rate** of growth in human capital over a specified period.

The **stock** of human capital indicates the level of the human resource development which has been achieved by a country; and the **rate** of the human capital formation indicates the extent of periodic improvements in such capital. Let us discuss these two indicators in some detail.

Some of the important indicators of **the stock of human capital** are as follows.

- a) The first indicator is the level of educational attainment, i.e. the gross number of persons in the total population who have completed successive levels of education, like primary, secondary and higher education. Of these levels of education, the last two are important in indicating the stock of high-level human resources.
- b) The second indicator is the number of persons in relation to the population or labour force, who are in high level occupations. These refer especially to the numbers in selected strategic occupational groups such as scientists, engineers, managers, teachers, doctors, technicians, nurses, etc.

Some of the important indicators for measuring the **additions to or improvements in the human capital stock** are as follows.

- a) The first indicator is the number of pupils enrolled at the primary level education as a percentage of the estimated population, say between the age of 5 to 14, who are supposed to attend school.
- b) The second indicator includes the pupils enrolled at the secondary level of education as a percentage of the estimated population aged 15 to 19 inclusive, adjusted for the required length of schooling.
- c) The third is the enrolment in higher levels of education for the age group 20 years and above.
- d) The fourth is the proportion of students enrolled in scientific and technical faculties in a given year.
- e) The fifth indicator is the proportion of students enrolled in faculties of humanities, fine arts and law in the same year.

Activity 2.3

Describe in about 150 words how education contributes to human capital.

- Notes:**
- a) Space is given below for the writing your answer.
 - b) Compare your answer with the one given at the end of the Unit.

2.5 EDUCATION AND EARNING

Earning, which is an indicator justifying investment, is closely related to education due to the fact that educated workers earn higher wages or salaries than those who are illiterate or unskilled or have lower educational qualifications. The relationship between education and earnings is important from the point of view of distribution of income and wealth among a cross-section of people. In countries with feudal characteristics, where inequality in income is generally very high, it is very difficult to ensure the even distribution of income by way of transferring resources from the haves to the have-nots due to the policy constraints arising from socio-political considerations. In such situations, equalisation of educational opportunities helps the poor and deprived sections of society to improve the levels of their educational standards, skill and training, thereby increasing the prospects of employability, higher earnings, etc. Education is thus used as a major instrument to ensure the even distribution of the benefits of development among different socio-economic groups, without taking recourse to direct transfer of income and wealth, which if attempted might arouse the resentment of the high income groups of people.

Moreover, an idea of the nature and extent of the relationship between different types and levels of education and the earning from different professional categories is of crucial importance in the decision making processes, especially with regard to the optimum and efficient allocation of resources. This is mainly because the higher level earning reflects the higher degree of productivity of educated persons. It is, however, important to note that apart from the education of the workers, the patterns of wages and salaries reflect the influence of many other factors. The individual's natural ability, family background and other personal characteristics also determine the pattern of the earning differentials.

2.5.1 Earning profiles

As discussed above, the level of education that an individual possesses, in one form or the other, is positively correlated with the amount of personal earning. Age, sex, race, native ability, social class background, place of residence, branch of employment, occupation, and on-the-job training are all important factors which have a significant bearing on the earning profiles. Of these, however, the influence of the number of years of schooling completed successfully is the most significant, which implies that additional years spent on education raise the life-time earnings of people. We have evidences on the earning functions and path analyses of the effects of an individual's background and characteristics on occupational attainment and earnings, that indicate that a large part of the variance is explained by the index of education. The number of years of successful education is the best predictor of the eventual occupational status and earning of an entrant into the labour force market. Entry for a person, who successfully completes the necessary schooling, into the sector of the modern labour market has a higher probability of getting well-paid urban jobs than one who does not have access to an adequate level of education.

The earning profiles of workers with different levels of education or length of schooling share three general characteristics as given below.

- i) The average earnings of all workers, both highly educated and illiterate, increase with age up to a maximum in mid-career, and the curve then either flattens or begins to decline.
- ii) The higher the level of educational attainment, the steeper the rate of increase of earnings and, in most cases, the higher the initial earning of workers at the start of their working life, the higher their emoluments towards the end of their service.
- iii) The workers with higher levels of education reach their maximum earning capacity faster, and their level of earnings at retirement is also higher, as compared to those who are less educated.

These three characteristics suggest that, over a life-time, the total earnings of educated workers remain considerably higher than the life-time earnings of those with very little or no education. By and large, it has been established that the average earnings of workers rise as they grow older until they reach their peak level of earnings between the ages of about 40 and 55. Thereafter, the average level of earnings decline, even though the earnings of the individuals may continue to increase till their retirement. The average earnings of all workers decline steeply after retirement, around the age of 60 to 65.

From the foregoing discussion, it is clear that the levels of education, or the educational qualifications of workers, influence their relative average earnings. For instance, university graduates have consistently higher average earnings than workers with only secondary schooling, and likewise, the latter earn more than those with only primary, middle or elementary schooling, or the illiterate with no schooling at all.

2.5.2 Earning differentials

The income derived from the sale of the labour services is determined by a variety of factors such as social, economic, political, geographical or personal traits. As it is a

psychological fact that each individual is different from another, the economic fact is that the earning capacity also differs from individual to individual.

As discussed in sub-section 2.4.1 above, the differences in **educational attainments** and **age** directly affect the earning capacity of an individual, but they are not the only factors that influence the relative earnings.

Sometimes **race** and **sex** also play an equally important part in determining an individual's earning potential. In many countries, and in many industries or occupations within countries, discrimination may exist for different reasons, which may distort earning patterns. Research studies have shown that women generally earn less than men, irrespective of discrimination on account of personal characteristics or lower productivity in certain jobs. People of high castes or socio-economic backgrounds usually have higher average earnings than others. Nevertheless, the more educated earn more than the less educated, when race, sex and other similar factors are constant.

Apart from race and sex, **hours of work** and **occupational differences** also affect the average earnings of different workers. Therefore, it might be concluded that the earning differentials are caused due to the superior natural ability, family background, motivation, social class, access to well-paid jobs, etc. However, education and experience with age are the major determinants of earnings.

The relevant theories that have been evolved to explain as to why differences in earnings exist may be summarised as given below.

- i) The earning differentials exist because of the differences in the nature of jobs. Since some jobs are more dangerous in nature and involve more dissatisfaction, the employee expects a compensating premium. Similarly, some occupations require additional training as compared to certain others, and as a result, some expenditure is incurred during the training period in which people generally seek to recover in the form of higher earnings.
- ii) Wage differences also exist because of the differences in individuals. If more able people are scarce, the extra earning of the more-able is due to the limitations in the supply of able labour.
- iii) In the absence of perfect consumption, institutional factors which are susceptible to discrimination also explain wage differentials.

2.5.3 Earning and productivity

Education has usually been considered an investment in human capital. The basic assumption behind this is that education raises the productivity of workers, and that the higher earnings of the educated reflect the value of their product. The most obvious way in which education raises productivity is by imparting knowledge and skills which make a worker more efficient, and hence more valuable in the labour market than the less educated workers.

If earnings reflect differences in marginal productivity, then the extra earnings of the educated measure their higher contribution to the output. The marginal productivity of a worker is the addition to the total output which is achieved by employing one additional (marginal) worker. In this context, the economic theory suggests that the relative prices of goods and services and the relative wages and salaries of workers reflect their relative scarcity, and, hence, the productivity of the workers, provided, of

course, that the market, including the labour market, is competitive. If markets are perfectly competitive, then earnings provide a completely satisfactory measure of productivity. However, if there exist some imperfections in the degree of competition, the earnings will still reflect differences in productivity, provided the forces of demand and supply ensure that scarce factors command a higher price than the plentiful factors of production. Since highly educated workers are more scarce than the unskilled and uneducated workers, they become costlier, and are paid more in terms of average wages and salaries.

Activity 2.4

Answer in about 100 words in what way earning and productivity are related to each other.

- Notes:**
- a) Space is given below for writing your answer.
 - b) Compare your answer with the one given at the end of the Unit.

2.6 PRODUCTION FUNCTION IN EDUCATION

Having talked about the relationship between education and productivity, let us now look into the production function of education, i.e. the input-output relationship in an educational system.

2.6.1 The production function

The concept of the production function is the theoretical construct employed by economists for analysing the effectiveness of resources allocation decisions of firms or industrial enterprises. A firm's production possibilities are assumed to be governed by certain technical relationships between inputs and outputs, which indicate the maximum feasible output that can be obtained from a given set of inputs. In other words, production function defines the boundary in the input-output relationships, specifying the maximum output from employing the best combination of inputs.

An important concept associated with the production function is the notion of productivity. Can you recall how we described this notion earlier in this Unit? (See sub-section 2.5.3 above.) We defined productivity as the output obtained for the resources expended, i.e. the ratio of output to input at a particular time or place. The

relationship between the total output and the total input in a particular period is called **average productivity**, whereas the relation between incremental output resulting from the addition of one unit of a factor of production is known as **marginal productivity**. Productivity may be measured either in physical terms, i.e., physical units of output resulting from the use of a combination of a factor or addition of a factor to existing ones, or in terms of **value productivity** expressed through money value of the products.

The production function in education is described as the process which explains the relationship between the variety of inputs to the outputs. The list of inputs include the size of the institution, number of staff, class size, classroom atmosphere, student-teacher ratio, per unit instructional expenditure, number of instructional assignments per teachers, teachers' qualifications and experience, teachers' salaries, verbal ability and job satisfaction, administrative expenditure, library and science laboratory facilities, specific vocational courses, etc. The outputs are measured by the number of students passing a particular grade and their ability to absorb and apply knowledge in their day-to-day activities. (The earning profile described in sub-section 2.5.1 also indicates the quality and quantity of the output). Thus, the production function in education can be defined as a process which transforms the fixed quantities of inputs i.e., individuals into individuals with different qualitative attributes which are conducive for the socio-cultural transformation and economic development.

2.6.2 Human capital and agricultural/industrial productivity

As discussed in section 2.4, the concepts of human and physical capital are closely interrelated. The availability of natural resources, physical capital and abundant unskilled labour alone are not sufficient for developing a modern and highly productive economy. A wide range of human skills and a high level of specialised human resources are essential for the dynamics of development. In the absence of a relatively high level of human skills, it is not possible to make the optimum use of physical and financial resources. In order to benefit fully from the new productive techniques that emerge from the advances in science and technology, every country plans for competent scientists/ technicians and administrative and managerial personnel for raising productivity in every sector of development, as the contribution of human resources in promoting economic growth is very close to that of natural resources. This is more so because in all the developmental matters where scientific know-how and technology are increasingly made use of, organisational capacity, motivation, creativity and application of knowledge play a vital role in accelerating the pace of development. The development of human capital, therefore, is crucial for improving efficiency and thereby raising productivity which, in turn, promotes economic growth.

Let us discuss productivity in both agricultural and industrial sectors.

i) *Agricultural sector*

As far as productivity and growth in the agricultural sector are concerned, regional variations in agricultural fields and crop responses are explained by the differences in the quality of the individual behind the plough. It is the well trained and skilled individual who is the central catalyst in the process of agricultural production as, compared to other economic activities, the agricultural sector is highly labour

intensive, especially in the developing countries. It is the human being who manipulates plants and animals to produce the food and fibers which we require; who also take decisions in the production process especially with regard to what and when to plant, how to plant, in what kind of soil to plant, how to cultivate the growing plant and how to protect it against pests and diseases, when to harvest, etc.

In short, the human being is the main functionary in the process as he/she is responsible for taking and carrying out decisions pertaining to tilling the soil, planting, weeding, etc. Hence, an individual and his/her abilities and skills (that we have earlier referred to as human capital) are of crucial importance for expediting the process of agricultural development. The performance of the farm worker is reflected by the indicators of agricultural productivity such as production per acre and per worker.

As in the case of agricultural production, the role of human capital is also crucial for industrial productivity.

ii) Industrial sector

Productivity and growth in the industrial sector are dependent on the availability of material resources as well as the upgrading of human resources. The latter require the imparting of scientific knowledge and technical know-how on a continuous basis, because improvements in the quality of human resources help in realising the objective of increasing the level of outputs which constitute the means for alleviating poverty and raising the quality of the life of people. In modern times, for effective industrial growth, what is essentially required is highly qualified human resources, such as engineers, technicians, designers, managers and administrators so as to ensure efficient and effective management of industrial and commercial enterprises.

In brief, human capital is positively and significantly associated with productivity in both the sectors of agriculture and industry. It is so in all the sectors of human enterprise.

2.6.3 Level of education and output return

You have read about the contribution of education to marginal productivity in sub-section 2.5.3 above. There are research studies (Psacharopoulos, 1973 and 1981) that have shown that rates of return to education and the levels of education acquired by the human resources are positively related, though there are differences in the social and private rates of return to education of different types and levels. While the social rates of return are generally estimated to be higher at the lower levels of education like the primary and elementary stage, the accrual of private benefits are relatively more from the successively higher levels of education. It is on the basis of such evidence and reasoning that most governments everywhere on the globe have adopted a deliberate policy of providing free education for certain age groups of the population; for example, up to 14 years of age in India, while the extent of subsidy (as a proportion of total cost of education per student) is somewhat less at the higher levels of education as compared to the lower levels. However, the rates of return to education – social and private – differ considerably, not merely at different levels and types of education, but also across various regions.

2.6.4 On-the-job training

On-the-job training, which has different connotations, commonly refers to organised instruction at the work place. In a narrower sense, it implies job related training programmes sponsored by the employer or required by an employee as a pre-condition for promotion, even when conducted on other premises. On-the-job training, therefore, is a process that raises future productivity and differs from institutional training in that in the former case an investment is made on-the-job rather than in an institution that specialises in teaching. Hence, in a broader sense the term implies formal as well as informal training programmes in a job situation (the latter is also experiential learning or learning by doing) which result in improvement of the worker's productivity.

On-the-job training is of two types: general and specific. Let us briefly discuss these two types.

i) General training

General training is useful in many firms. For example, a mechanic trained in the army finds his/her skills useful in steel and aircraft firms; or a doctor trained at one hospital finds his/her skills useful in other hospitals. Most of the on-the-job training programmes presumably increase the future additional product of workers in the firm providing it. General training also increases the additional product in many other firms or organisations as well. This implies that general training is also equally useful in many firms, and there is rise in additional product more or less in the same order in all of them. Consequently, wage rates rise in accordance with the productivity gains. Persons receiving general training pay the cost of training as it can raise their future wages as well as their productivity.

ii) Specific training

In contrast to general training, specific training is a kind of training which increases productivity in a particular line of production. Obviously, it increases productivity more in the firms that provide it. For example, some forms of training provided to military officers like the astronauts, fighter pilots, etc. are useful to the defence sector only. Such training schemes fall under the scope of specific training because productivity is raised in the relevant sectors but not elsewhere. In such a case, the cost of training is usually made available by the firms concerned.

In short, it may be said that on-the-job training – no matter whether general or specific, whether received virtually as a part of the job at the work-place or elsewhere – is basically a training of the active members of the labour force with the purpose of improving productivity and career prospects at one and the same time. On-the-job training entails investments in the human capital of men and women who have already entered in the labour force, and these investments are oriented towards their future in paid or self-employment.

Activity 2.5

Given below are two questions. Space is given after each question for you to write your answer. Compare your answers with those given at the end of the Unit.

- i) What is meant by productivity when applied to education?

ii) Differentiate between average productivity and marginal productivity in about six lines.

2.7 WASTAGE IN EDUCATION

Planners of education have always expressed concern about educational wastage caused by repetitions and dropouts. Such wastage is one of the difficulties in fulfilling the social demand for formal education. For effective management of an educational system, it is required that the retention rate should be improved by reducing educational wastage while maintaining the quality of the system at reasonable input costs. In the following sub-sections, an attempt is made to define the concept of educational wastage, discuss the issues concerning its measurement and examine the relationship between dropouts and repetition. Though the examples given in the sub-sections pertain to school, where the magnitude of wastage is high, they are equally applicable to colleges and universities where the magnitude of repetition and dropout is comparatively lower than that at the earlier stages of education.

2.7.1 Educational wastage

Educational wastage is an economic term defined as the total number of student-years spent by the repeaters and dropouts. A repeater is a student who, in a given school year, remains in the same grade as in the previous year, while dropouts are those who leave the school before the end of the final year of, or somewhere during, an educational cycle in which they are enrolled. Wastage refers to the benefits provided to the repeater for his/her spending extra time in school, and the benefits accruing to the dropouts before their leaving the school. Total wastage, then, merely reflects the total size of repetition and dropout in the flow of promotion within an educational system. Of the two, repetition is thought to be more wasteful because repeaters:

- stay in school longer than normal duration thereby reducing the intake capacity; and
- cause the loss of investment in educational services and increase the amount of expenditure per student.

Besides, it raises inequalities as failure to get promoted at a normal pace is larger among learners of rural low socio-economic background.

2.7.2 Measurement of wastage in education

While some attempts have already been made by researchers to evolve formulae for measuring wastage, there is no foolproof method to measure it. This is so because within school systems repetition may be due to various reasons. For instance, a student's migration from a rural school to an urban school before completing a particular grade (due to the migration of parents to the urban area), and taking admission in the same grade again in the next year in the urban school causes repetition for the student. Sometimes, students pass a year-end examination but repeat a grade to improve the overall score. For example, in some multi-lingual societies repeating the first grade (Grade I) may be a prerequisite for the students to master the language of instruction which is different from their local dialect. Moreover, high rates of repetition in the final grade (Grade X) of secondary education may be due to the desire on the part of the students to obtain favourable results needed to qualify for admission to the senior secondary grade. In spite of these problems, certain methods have been in use for measuring wastage at any given level. One such method which has been extensively used for this purpose includes counting the number of failures during different years from the same cohort of the students. The formula used in India for computing the indicator of wastage at school level is as follows:

$$\text{Index of wastage} = 1 - \frac{\text{Total optimum years}}{\text{Total actual used years}}$$

where, 'optimum years' stands for the number of years required to complete the prescribed course on the assumption that every student will make normal and regular progress from year to year. The 'actually used years' are, however, calculated by counting the total number of years spent in school by every student in the age-cohort (NCERT, 1968).

The procedure described above, however, cannot be applied for quantifying the wastage at international levels. When comparing educational wastage across nations, a great deal of caution needs to be exercised because educational systems are not alike structurally; and promotion policies and achievement norms differ to a great extent.

For measuring wastage across nations, a different approach has been used with reasonable convenience and success. It consists of measuring school output by the number of pupil years attributable to all primary schoolers (where a student who spends one year at school is said to have spent one pupil year). We have considered educational wastage as the total number of pupil years spent by repeaters and dropouts, and can be converted into a percentage of the total number of pupil years accruing to a student cohort. For example, if a student drops out after grade three having repeated grades two and three once each, calculations would show that the student has spent five pupil years – two as a repeater and three as a dropout.

2.7.3 Repetition and dropout

Let us specifically distinguish between dropout and repetition. Dropout is generally understood to note the premature withdrawal of a student from an institution before completing the last grade of the stage of education at which he/she is studying. Thus, every student who is withdrawn from the institution before completing, for example, grade VII or VIII is a dropout. Whereas repetition is defined as the retention of a student in a grade for more than one year on account of unsatisfactory progress. Thus, if a student passes a grade in two or more years, he/she constitutes a case of stagnation or repetition.

The tendency of students to repeat and dropout is greatly influenced by socio-economic and educational factors. We have evidence that point out the fact that social and economic backwardness of the family has been one of the most important causes contributing to the phenomena of repetition and dropout. Moreover, factors like excessive involvement of learners in domestic work, parental opposition to or indifference towards education, and the educational status of the parents have a direct impact on the education of learners and their performance at school. As far as educational factors are concerned, stagnation, absence of relationship between educational system and economic needs of the community, faulty admission policy, lack of physical facilities, poor institutional environment, etc., are some of the significant causes of repetition and dropout. Besides, certain miscellaneous factors like the death of parents, poor physical standard of learners, etc., also lead to dropping out or repetition of grades.

Activity 2.6

Describe in about 100 words how wastage in education is measured.

- Notes:**
- a) Write your answer in the space given below.
 - b) Compare your answer with the one given at the end of the Unit.

2.8 EFFECTIVE UTILISATION OF RESOURCES

The allocation of resources for education must be effectively utilised to derive the maximum benefit from those resources. Such resources are of three types:

- i) *Human resources*: teaching, administration, technical and professional staff.
- ii) *Physical infrastructure/resources*: classroom, laboratory, library, instrumentation centre, hostel, office accommodation, etc.
- iii) *Financial resources*: fees from students, donations, endowments, government grants, etc.

Though effective utilisation of financial resources is usually taken into consideration, the human and physical resources acquired through financial resources are also equally important. Resources are deployed with the intention of achieving certain objectives and systems to study the capacity of resources for goal achievement. Factors like the organisation of a system, size of its operation, mechanism of finding, timeliness of resource allocation, flexibility in deployment, and adequacy of resources affect the efficiency of resource utilisation. An analytical framework of utilisation of resources in education is given by Qamar (1992) while studying higher education institutions. The framework takes into account the working of *indicators* of efficient resource utilisation, ascertaining of the *status* of utilisation of resources and exploring the causes of their under-utilisation. We shall discuss the indicators of the three types of resource utilisation. It may be noted that while these indicators are broad and suggestive, one may select indicators at micro-level depending on the objective of analysis and the components involved in the organisation of the system under study.

Utilisation of human resources

The indicators for a study of the utilisation of human resources take into account what different kinds of employees are expected to do, and what responsibilities are assigned to them by the organisation. In a situation involving face-to-face classroom teaching, the index of utilisation of teaching resources, for instance, can be studied with the following formula:

$$I_T = \left(\frac{t_1}{t_o} \right) \left(\frac{h_1}{h_o} \right) \left(\frac{d_1}{d_o} \right)$$

where: I_T = the index of utilisation of teachers as resource

t_1 = the actual number of teachers reported taking their classes

t_o = the total number of teachers working with an institution

h_1 = the actual number of hours teachers are generally available in the campus

h_o = the standard number of hours teachers are expected to be available in the campus

d_1 = the actual number of days an institution conducts teaching

d_o = the standard numbers of days the institution must conduct teaching as per the rules

While data relating t_1 and h_1 need to be collected from students, teachers and heads of departments through structured questionnaires, the performance of students in annual (and term-end) examinations expresses the effectiveness of teaching. The effectiveness of non-teaching (library, laboratory, administration, secretarial) resources may be studied through the following formula:

$$I_s = \left(\frac{s_1}{s_o} \right) \left(\frac{d_1}{d_o} \right) \left(\frac{h_1}{h_o} \right)$$

where: I_s = the index of utilisation of a particular category of non-teaching staff
 s_1 = the actual number of staff reported efficient
 s_0 = the actual number of staff in the category of s_1
 (d_1, d_0, h_1, h_0 as above)

The indices of utilisation may be calculated separately for various categories of such staff; and a final weightage may be calculated for all the indicators to suggest the effective utilisation of human resources.

Utilisation of physical facilities and infrastructure

The optimum of utilisation of physical facilities and infrastructure like classroom, library, laboratory, etc. may be studied by using the following formula:

$$I_{PH} = \left(\frac{ph_1}{ph_0} \right) \left(\frac{h_1}{h_0} \right) \left(\frac{e_1}{e_0} \right)$$

where: I_{PH} = the index of utilisation of a particular type of physical facility or infrastructure
 ph_1 = the actual number or portion of the facility being in active use
 ph_0 = the total number of facility available in the educational institution
 e_1 = the actual number of persons making use of the facility in a given time frame
 e_0 = the standard number of persons which may use the facility in a given time frame.

(h_1, h_0, d_1, d_0 as above)

The I_{PH} has to be calculated separately for each type of physical facility and infrastructure available in the institution.

Utilisation of financial resources

Financial resources have no meaning unless these are utilised to procure human and physical resources for further utilisation. Their efficiency to procure human and physical resources determines their effective utilisation. Three important indicators of effective utilisation of financial resources are discussed below:

- i) *Allocative Efficiency*: The efficiency of financial resources vis-a-vis achievement of goals of an institution depends on how resources are allocated. The ratio or proportion of expenditure, administrative expenditure, teachers, teaching aids, procurement of facilities, maintenance of facilities, and the like indicates the allocative efficiency of financial resources.
- ii) *Administrative Efficiency*: The efficiency shown by the administration in spending money determines the effective utilisation of financial resources. Administrative efficiency or inefficiency is reflected through various indicators including: over-spending, budgetary deficit, diversion, refund of funds from one activity to the other, procedural delays, refund of funds due to inability to spend in the stipulated time or financial year, delay in completion of tasks or projects, and the like.
- iii) *Efficiency of Funding Mechanism*: Every institution has its own mechanism of generation, allocation and utilisation of financial resources. Factors such as

adequacy, timeliness, objectivity and flexibility in funding mechanism determine the effectiveness of utilisation of financial resources.

While the above analysis was based on the consideration of effective utilisation of resources at the institutional level, some issues need to be addressed to and resolved at the system or state/government level so that resources are effectively utilised for education. Three important issues are discussed as follows (Singhal, 1992):

i) Policy Issues

The policies of the national or provincial governments largely affect the allocation and utilisation of resources for education. Some of the policies include the following: Whether the system of large scale public support for education should continue or there shall be greater privatisation of educational provision (at school or college or university level)? Whether there should be indiscriminate expansion of regular colleges and universities (leading to at times substandard educational provision) or education should be restricted to the selected meritorious students? Whether there should be expansion of non-formal and distance education provisions so as to economise educational resources? Whether the norms and regulations for educational institutions should be framed and strictly followed so that quality is ensured and resources are efficiently utilised? Keeping in view the analytical findings on the rate of return, whether there should be readjustments in inter-sectoral allocation of resources? Whether there should be regular national academic and financial audit of institutions or should each of the educational institutions be left free to decide for itself? Whether grants should be linked to performance of educational institutions? These and allied issues at the policy level affect the allocation and utilisation of resources at both national and institutional levels.

ii) Management Issues

- The organisational climate affects considerably the utilisation of resources in educational institutions. At the central and provincial levels, decisions have to be made with regard to, for instance, the activities of teachers and non-teaching staff associations which largely affect the efficient utilisation of human, infrastructure and financial resources.
- Mechanisms of institutional evaluation affect their performance. The question arises as to whether there should be external evaluators or self-evaluation, or both? What reward (or even punishment) systems are adopted, based on institutional and individual evaluations?
- The system of budget management affects the extent of utilisation of resources. Modern techniques, viz. expenditure analysis, unit costing, and the like have been useful in determining the cost-effectiveness of each of the items of expenditure.
- The measures undertaken in minimising and checking wastage contribute towards the efficiency in resource utilisation. The decision as to whether institutions need to consider further utilisation of physical and human resources during the period when students are not on-campus. This would not only meet deficits if any, but also facilitate institutional goals of innovation and quality enhancement.

Some decisions taken at the state level, other than those concerned with policy and management issues as discussed above, have implications for the functioning of the educational institutions at the system and institutional level. For instance, the staffing pattern in institutions and actual work (load) allocated to various categories of functionaries influence institutional efficiency. Frequent transfers of teachers adversely affect teaching. At school level, for instance, policy shift from an emphasis on enrolments to the development of mechanisms leading to higher retention and lower attrition contributes to an increase in efficiency in the system.

It may be emphasized that effective and efficient utilisation of physical, human and financial resources is the most important indicator of success of educational systems and institutions. Efficiency in utilisation of resources is directly related to an increase in academic standards and productivity of the educational system.

Activity 2.7

How can an educational institution effectively utilise different resources?

Notes: a) Write your answer in about 150 words in the space given below.
b) Compare your answer with the one given at the end of the Unit.

2.9 LET US SUM UP

In this Unit, you studied about decision making in education – individual and institutional decision making as well as collective choice. Individual decisions are made for private benefits, while institutional decisions are undertaken to provide educational facilities to all. Collective choice is dominated purely by societal considerations. Decisions for investment in education and training are made to develop human resources, both quantitative and qualitative. Various factors like education, on-the-job training, health services, non-formal education, better living conditions, modernisation of technical education, etc. determine the quantity and quality of human capital.

We have also noted that education is seen as human capital. A more educated person is empowered with better human capital than a less educated one. Human capital formation refers to acquisition of knowledge, skill, technical know-how, experience, etc. by human beings to contribute more to the output. Therefore, a more educated person has higher earnings than a less educated person; an additional education increases the lifetime earnings of individuals. You also studied that, besides education, age, sex, race, hours of work, etc. contribute to the differences in earnings.

Another important aspect of educational investment that you studied is the production function in education. Like any production process in an industry, in education inputs in terms of teachers, institutions, class size, teacher-student ratio, expenditure on infrastructural facilities, etc. are invested to achieve the outputs measured in terms of the number of students passing a particular grade and their ability to apply whatever is learnt in day-to-day-life situations. Investment in education and human capital formation increase both industrial and agricultural productivity. Thus, human capital formation and productivity get curtailed by wastage in education measured in terms of the number of years wasted by repeaters and dropouts. Further, for deriving the maximum benefit from educational resources, such infrastructural human and financial resources should be effectively and efficiently utilised.

2.10 MODEL ANSWERS TO ACTIVITIES

Activity 2.1:

Both individuals and institutions make decisions with regard to investment in education. Individual investment decisions are made to buy education for oneself or for dependents where private benefits are the main concern. Investment in this case includes tuition fees, maintenance expenditure and forgone earnings. On the other hand, institutional investment decisions are mainly concerned with providing education to all for socio-economic change benefiting all the members of society. Usual investment heads include salary to staff (teaching and non-teaching) and expenditure on infrastructural facilities.

Activity 2.2:

Human capital has two dimensions: quantitative and qualitative. Quantitative dimension refers to percentage of people getting employed, number of people and hours invested in doing a particular task. Qualitative dimension refers to the qualitative aspect of human capital, viz., extent of knowledge, skills and other attributes affecting human ability to do work efficiently and at relevant levels of specialisation.

Activity 2.3:

The contribution of education to human capital can be seen in the difference in the quantity and quality of output made by a less educated person and a comparatively more educated one. Education directly contributes to the development of human capital by increasing one's ability to perform faster and with a qualitatively better result; inculcating scientific temper and values in the workers so that they choose the best possible alternative to accomplishing a task, and increasing the innovative ability of the individual and thereby raising productivity.

Activity 2.4:

Education increases the productivity of workers, and usually a more educated person receives higher salary/earning than a less educated one. Difference in earnings reflects difference in marginal productivity. Extra earnings of a person, therefore, reflect his/her contribution to extra output. It should be noted in this context that earning differentials bring in difference in productivity, provided the market is competitive in nature.

Activity 2.5:

- i) Productivity refers to the ratio of output to input at a given time and place. When applied to education, it refers to the ratio of output of the system (i.e., number of student passing a particular grade with the ability to apply whatever they learnt on the course) to inputs (which consist of the teacher and his/her abilities, class/school size, teacher salary, student-teacher ratio, academic and non-academic facilities, etc.).
- ii) Average productivity is the ratio of total outputs to given inputs in a particular period of time, whereas marginal productivity refers to the relation of increase in output to a given increment in one unit of input/factor of production.

Activity 2.6:

An extensively used method for measuring wastage in education is to count the number of failure from the same cohort of pupils during different years and to apply the formula

$$(1 - \frac{\text{total optimum years}}{\text{actually used years}})$$

Because this method poses problems for international comparison, the method of counting the number of pupil years spent by repeaters and dropouts is used to measure educational wastage.

Activity 2.7:

Various teaching, administrative and technical staff comprising human resources can be effectively utilised if these functionaries devote themselves to tasks by utilising fully the time allocated to them, and by optimally utilising the potentiality of each functionary. Utilisation of physical facilities and infrastructure can be enhanced if there is economy in utilisation of space and if these facilities are put to use by a large number of clients. Efficiency in utilisation of financial resources can be enhanced by ensuring efficient generation, allocation and disbursement (and actual spending) of resources.

UNIT 3:

COST ANALYSIS IN EDUCATION

Structure

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- 3.2 Learning Objectives
- 3.3 Different Types of Cost Analysis
 - 3.3.1 Basic cost analysis
 - 3.3.2 Cost-feasibility analysis
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- 3.4 What Constitutes Cost in Education?
 - 3.4.1 Individual or private cost
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- 3.8 Cost in Education: Current and Constant Prices
- 3.9 Let Us Sum up
- 3.10 Further Readings
- 3.11 Model Answers to Activities

3.1 INTRODUCTION

Cost analysis as an important tool for making decisions to improve the educational systems. A competent cost analysis can contribute significantly to improved policymaking in education, given genuine interest of the decision maker. Many important decisions on education concern its costs. These decisions may be related to the allocation of national resources (including the government budget) across the levels of education, the estimation of the total cost and evaluation of financial feasibility of education programs (such as teacher training programs, special education programs, and alternative curricula for skill training), or the cost effectiveness of alternative methods for promoting learning in the classroom. Hence, a cost analysis in education encompasses a variety of needs.

In an era of increasing demand for educational resources, cost analysis in education is useful for a number of purposes.

- To estimate the resource requirements for education such as the amount of resources required to establish a school. The various resource requirements such as amount required for constructing a building, other educational infrastructure such as furniture, blackboards and number of teachers required to be employed in relation to the expected enrolment, etc are to be worked out. Hence, the basic cost analysis needs to come out with the norms, parameters, unit costs and the underlying assumptions in working out the resource requirements.

- To facilitate decision making to allocate resources at macro and sub-sectoral level of education. The macro level allocation for education or inter-sectoral allocation indicates the allocation of resources for education in the total income of an economy (GDP) or in the total government's expenditures (total budget) of a country. Sub-sectoral or intra sectoral allocation implies allocation of resources to sub-sectors of education, that is allocation of resources to elementary, secondary, higher and other levels of education.
- Not only for allocation but also for monitoring and improving the utilization of resources, cost analysis is very useful. The unit cost estimates can identify the extent of wastage of resources in the system through which utilization of resources can be monitored and improved. This also indicates the internal efficiency of the educational system.
- Using the cost function or the relationship between the average and marginal cost principles along with enrolment, optimum allocation of resources can be identified in an institutional set up.
- It helps to understand inequalities in the cost of education across regions (rural-urban or by states and within states by districts), gender, social class, ethnicity and income groups.

In sum, analyses of the costs of education can reveal the cost implications of an educational policy, provide diagnosis of past cost patterns (such as the determinants of costs and sources of variation in costs) and prognosis of future cost requirements, and assess the relative cost-efficiency of alternative educational policies or interventions. Cost studies in education can thus contribute to improved policymaking in education.

In this unit, while you will be exposed to the importance of cost analysis in education as outlined above, you will also have a comprehensive idea about various dimensions of cost analysis including determinants of educational costs, and cost analysis and enrolment.

3.2 LEARNING OBJECTIVES

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

- Define cost of education.
- List and describe the purposes of using different types of cost analysis in education.
- Explain the types of cost of education.
- Identify the determinants of private and public cost of education.
- Calculate different types of unit costs.
- Explain the cost functions.
- Calculate costs in current and constant prices.

3.3 DIFFERENT TYPES OF COST ANALYSIS

3.3.1 Need for cost analysis in education

Different types of cost analysis answer different kinds of questions and use different analytical techniques. *Basic cost analysis* is used to know how much a particular

educational program or intervention will cost. In achieving the goal of universal basic education, many such estimates are worked out using the basic cost analysis. A step ahead of basic cost analysis is to know whether the required cost could be implemented within existing budgetary constraints. Such an analysis is known as *cost-feasibility analysis*. On the other hand, if the purpose is to know about the relative effectiveness or utility of a range of programs or interventions, *cost-effectiveness*, or *cost-utility analysis* are desirable. The *benefit-cost analysis* is more appropriate for evaluating the economic profitability of alternative investment projects. However, each of this involves a different method for analyzing economic information, and each has evolved from historically distinct economic traditions. For example, benefit-cost analysis grew out of welfare intervention outcome. Cost-effectiveness analysis was developed to help decide among various options in the provision of limited resources. Each method of analysis makes different assumptions regarding the data (e.g., qualitative or quantitative) and provides very different outcome analyses (e.g., comparison of alternatives or the overall value of a program). Each one of them is discussed below.

3.3.2 Basic cost analysis

It is concerned with costing several inputs that are used in education. The major tasks here are to identify, classify, and measure the costs of various inputs to education. Analytically, they are concerned with identifying the various inputs to educational production and measuring the costs of these inputs. It is the most limited form of cost analysis. This form of analysis answers questions regarding the overall cost (or distribution of costs) of implementing a given intervention or program. Although this form of analysis can be very helpful during the financial planning for education, it may not be appropriate for making within- or cross-country comparisons.

3.3.3 Cost-feasibility analysis

This is a technique for costing and testing the economic feasibility of an educational plan, measuring the start-up costs and operating costs of a major educational intervention, and estimating the short-term and long-term cost budget feasibility of a project. Cost-feasibility analysis is a situation-specific form of analysis that addresses whether a given program can be successfully implemented within predefined budgetary constraints. Although this form of analysis can be very helpful during the financial planning phase of a project, it is not appropriate for making cross-site comparisons. In both basic-cost analysis and cost-feasibility analysis, program or intervention benefits are not considered.

3.3.4 Benefit-cost analysis

Benefit-cost analysis is used to determine which program or intervention provides the greatest benefits at the lowest cost. Founded in the principles of welfare economics, benefit-cost analysis is typically used to compare programs that may (but need not necessarily) have different goals and program structures. All costs must be translated into monetary terms (e.g., a dollar amount must be placed on the cost of time). Although this form of analysis can be very helpful for making decisions regarding the distribution of resources between two categorically different projects (e.g., road construction vs. educational investment), it requires that all benefits and costs be converted to monetary units. The advantage of the monetary approach to inputs is

that there can be many different types of input involved (labor, capital, rent, etc.), yet they all can be made commensurate and aggregated using the common denominator of money. It is best suited to address the question, which among many programs or interventions provides the most benefits at the least monetary cost?

3.3.5 Cost-effectiveness analysis

Effectiveness is defined as performance on a single criterion variable (e.g., reading test scores). The essential problem to be solved here is how to relate the inputs, which are measured in dollar terms (i.e. the costs), to the outputs, which are measured in physical units called effects. Unlike the benefit-cost analysis, outputs are specified in physical units and hence measured in different units. Cost-effectiveness analysis is able to determine which program or intervention provides the most effectiveness at the least possible cost. Costs are monetary (e.g., cost of materials), but benefits can be monetary (e.g., supplies) or non monetary (e.g., time) in nature. Although this form of analysis can be helpful in deciding which of the two programs with similar objectives (e.g., reading improvement) is most effective at the least cost, it generally is not used to compare programs with multiple program objective. It is most appropriate when comparisons are made according to a single criterion measure, such as gains in reading achievement or mathematics scores. Because programs must be compared according to this single criterion measure of effectiveness, cost-effectiveness technique requires that programs being compared have similar outcome goals (Lewin, 1995).

Cost-effectiveness analysis refers to the consideration of decision alternatives in which both their costs and consequences are taken into account in a systematic way. It is a decision oriented tool, in that it is designed to ascertain which means of attaining particular educational goals are most efficient. For example, there are many alternative approaches for pursuing such goals as raising reading or mathematics achievement. These include the adoption of new materials or curriculum, teacher training, educational television, computer-assisted instruction, smaller class sizes, and so on. The cost effective solution to this challenge is to ascertain the costs and effects on reading or mathematics achievement of each alternative and to choose that alternative which has the greatest impact on raising achievement scores for any given resource outlay. The underlying assumption is that different alternatives are associated with different costs and different educational results. By choosing those with the least cost for a given outcome, a society can use its resources more effectively (Woodhall, 2004).

3.3.6 Cost-utility analysis

In cost-utility analysis, the costs of a program are related to stakeholder perceptions of its value. Cost-utility analysis appears rarely in educational cost studies. Cost-utility analysis uses the concept of program utility to compare programs with different outcome measures. Like cost-effectiveness analyses, cost-utility analyses do not limit the definition of costs to items that can be assigned a monetary value. However, in cost-utility analysis, unlike cost-effectiveness analysis, evaluators use the criterion of utility to compare programs. To define operationally the criterion of utility, program evaluators typically consult stakeholders to determine which outcome measures are most relevant to them. Once utility is operationalised in this fashion, program evaluators can then collect the data necessary to compare programs according to their

utility ratings. Although this method of estimating program “worth” is appealing because it defines social validity locally, it is inherently more subjective than other methods of cost analysis. As such, cost-utility analysis can only ask: Which program or intervention provides the most utility at the lowest cost? Hence, cost-utility analyses need not be cost-effective. Unlike the basic cost or cost feasibility analyses, benefit-cost or cost-effectiveness or cost-utility analyses relate inputs to educational outcomes, by comparing both the costs and benefits or effects of alternative educational outcomes.

Table 3.1 illustrates the different forms of cost analysis, their purpose and outcomes. Basic-cost and cost-feasibility analyses are best suited to answer questions about the financial viability of a given program. While basic-cost analysis is used to describe economic data, cost-feasibility analysis is used to make decisions about the economic data described. For example, cost-feasibility analysis is frequently used to determine the extent to which a program can be successfully implemented, given the existing budgetary position in educational decision making. In contrast, basic cost analyses seek only to describe the distributions of cost, both real and current, that are necessary to successfully implement a given program; whereas conclusions about the feasibility, its worth, or relative benefits of the program are determined through other forms of cost analysis. In sum, basic cost analysis asks: How much will implementing this program or intervention cost, and what is the distribution of those costs? And, cost-feasibility analysis asks: Can we implement this program or intervention, given our budgetary constraints? (See Table 3.1).

Table 3.1: *Form of cost analysis, their purpose and outcomes*

Form of cost analysis	Purpose	Outcome
Basic-cost analysis	How much will implementing this program or intervention cost, and what is the distribution of those costs?	Estimates total costs required to implement a program
Cost-feasibility analysis	Can we implement this program or intervention, given our budgetary constraints?	Assess the total costs and financing of the required costs
Benefit-cost analysis	Which among many programs or interventions provides the most benefits at the lowest monetary cost?	To estimate the external efficiency of the investment made
Cost-effectiveness analysis	Which program or intervention provides the most effectiveness (on a single criterion measure) at the lowest cost?	To know the internal efficiency of the resources invested
Cost-utility analysis	Which program or intervention provides the most utility at the lowest cost?	To know the internal efficiency

To summarise Table 3.1, you may note that benefit-cost analysis identifies among many programs the one which would give the highest monetary benefit with the least cost. Hence, it indicates the external efficiency of the education system in the labour market. Cost-effectiveness analysis seeks to answer effectiveness of a program or intervention at the least cost. As noted earlier, benefit-cost analysis looks at both cost and benefit in monetary terms, but in cost-effectiveness analysis, the effectiveness is measured in terms of educational outcomes – achievement scores, passed out percentages, etc. This brings out the extent of internal efficiency within the educational systems. Cost-utility analysis estimates which program or intervention provides the highest utility given the least cost. It also brings out the internal efficiency of the system.

Different techniques of cost analysis are used for a given purpose. In order to use any of these cost analysis techniques, we should be clear about what do we mean by costs in education and what are the different types of costs of education. This you will study in the next section.

Activity 3.1

Give examples in education where each of the five types of cost analyses in education is applied or used.

Notes: a) Space is given below for writing your answer.

b) Compare your answer with the one given at the end of the unit.

- i) Basic cost-analysis:
- ii) Cost-feasibility analysis:
- iii) Benefit-cost analysis:
- iv) Cost-effective analysis:
- v) Cost-utility analysis:

3.4 WHAT CONSTITUTES COST IN EDUCATION?

Costs of education are defined as value of all inputs that go into the process of education (Schultz, 1963). From the viewpoint of economic analysis, the costs incurred include both the costs incurred by the families or households and the institutions or government. In other words, the cost of education includes not only public costs on education but also private costs. The summation of public and private costs is the social cost of education. Social cost represents the cost to the economy as a whole. Each of these *private* and *social* costs can further be distinguished between *direct* and *indirect* costs. Each one of them is explained further.

3.4.1 Private or individual cost

Private cost represents the cost to an individual. Private costs of education include both direct monetary expenses for tuition, textbooks, and other maintenance items and the indirect cost of students' time measured by the foregone earnings if employed in the labour market. The expenditure incurred by the individual is of two types—

direct and indirect cost. The direct cost includes expenditure on admission fee, tuition fees, books, stationery, examination fee, boarding and lodging for hostel students, etc. This is the household expenditure on education or out-of-pocket expenditure on education or direct cost. Indirect cost is incurred by the student and his/her family implicitly. The indirect cost or invisible cost or the foregone earnings is the opportunity cost of the child attending a school. The sum of direct and indirect costs is referred to as individual cost of education. It consists of the following items:

- Fees consisting of tuition fee, examination fee and other fee and payments
- Other household or out-of-pocket expenditure such as books, stationery, uniforms, transport, private coaching, boarding and lodging, etc. It is also known as maintenance cost or living expenses.
- Opportunity cost, that is foregone earning which is hidden cost when the child goes to school forgoing its earning in the labour market. It is also referred to as indirect cost. Opportunity cost of a child in the age group 14-17 is the wage of the child in the same age group in the labour market (see Box 3.1).

Box 3.1: Opportunity Costs or Foregone Earnings

Opportunity cost in education refers to the earnings foregone by a student to the output foregone that would have been produced by the present inputs in the next best use. In Economics, the distinction between real and money cost is important. **Real cost** in Economics is said to correspond to the sacrifice of resources or inputs needed to produce goods and services. Therefore, real cost corresponds to opportunity cost; because, opportunity cost refers to the foregone output that could have been produced had the input been utilized in the next best way.

3.4.2 Institutional or public cost

Costs incurred at the institutional level (government, private or mixed) are called institutional costs or public costs of education. Public costs are those that include financing by the government on the basis of taxes, loans and other public revenues. The public cost on education also consists of both direct and indirect costs. The direct public costs include non-recurring or capital or fixed cost and recurring or current or variable cost. The non-recurring or capital cost is incurred on educational infrastructure, such as school and college buildings, teaching-learning materials, etc. The inherent features of fixed cost are such that:

- o Fixed or non-recurring or capital cost is incurred at a point of time (e.g. purchase of land, building, durable equipment, furniture, etc.).
- o Fixed costs do not vary with a change in the enrolment.
- o Fixed cost changes when scale or size of operation changes.
- o For a small increase in enrolment, there is no change in fixed cost.
- o Yet, fixed cost changes when the scale or size of enrolment changes.

Recurring or current or variable cost is incurred on teachers' salaries, maintenance of the buildings, etc. Variable or recurring or current costs are incurred every year, every month. Variable costs vary with every change in the number of enrolment, e.g. costs on teachers, laboratory materials, and stationary items. However, one cannot argue

that certain costs are fixed, and others are variable for all time. The scale of operation or size of school and size of incremental changes determine whether the cost is variable or fixed cost. For example, if the number of enrolments increases to a great extent, not only the number of teachers has to be increased, but an additional number of classrooms may also have to be constructed. Hence, fixed cost changes when the scale or size of operation changes. The indirect public costs are the sums of the value of taxes not collected on income foregone during education. The total public cost is the sum of the direct and indirect costs.

3.4.3 Social cost

The sum of individual costs and institutional costs is the total or social costs of education. While estimating the social costs of education, it is necessary to see that no double counting of any item is made. If there are transfers, e.g. in terms of fees (a transfer from the institution to the individual), it is important that social costs of education takes into account only the net of transfers. From both the social and private perspectives, indirect costs are the value of the student's time, typically measured as earnings foregone. The student's time is a cost because a student could be earning an income or performing other activities if he or she were not spending time studying. As explained earlier, in economic terms, the value of the student's time is called an opportunity cost.

Even though indirect, the opportunity cost of time is a very important cost to be considered. If, for example, a student studying full-time in a university course could have been earning a salary of \$6,000 per year, then the \$6,000 must be counted as part of the total cost of the student's investment. From society's perspective, the opportunity cost is the *before-tax* foregone income. From the individual's perspective (or that of the individual's family), it is the *after-tax* income foregone, because if the individual had instead been working, he or she would have received only an *after-tax* income, as the tax is collected by the government. This is nothing but the disposable income. Table 3.2 summarizes the various components under private, public and social costs of education.

Table 3.2: *The private, public and social costs of education*

	Private Costs	Public Costs	Social Costs
	Student	Institution	Society
Direct Costs	Fees paid; transportation costs; books, private coaching, etc. Out-of-pocket expenses borne by the student or student's family.	Cost of capital goods, e.g., buildings and equipment; salaries of teachers and other staff; cost of recurrent inputs, e.g., books, materials, etc; other recurrent costs such as transportation, uniforms, meals, etc.	All resources directly used in the production of education, including private and public costs.
Indirect Costs	After-tax income foregone by the family, i.e., earnings foregone.	Taxes on income foregone during schooling or before tax income foregone.	Before-tax income foregone ¹ .

* These are the same as private indirect costs except for taxes that would have been levied on the student's higher income; in other words, social indirect costs are higher than the private indirect costs by the amount of taxes foregone.

Give a practical example on each of the following:

- ### 3.5 DETERMINANTS OF COSTS OF EDUCATION

The major tasks are to identify the various factors determining costs of education—both public and private costs of education. First, the determinants of public cost, which can be grouped under two heads: that factors which determine the public cost within the education systems, and outside the education systems. Within the education system, the public cost depends on the level and structure of the teachers' salaries; the average pupil-teacher ratio at each level; the non-salary costs of education; and the capital cost for buildings and other equipments. Of course, each of these factors is themselves determined by a number of other factors like availability of funds, teachers, student enrollment, etc. It is because of the variation in these factors that countries or states and districts within the country differ with regard to their educational priorities and the corresponding expenditure. Outside the education system, the public costs gets influenced by the macro economic factors like general income and prices, government revenue and fiscal position and more importantly the political commitment towards prioritizing educational spending. The demographic demand pressure is also an equally important factor. Further, the institutional factors (such as the share of public and private educational institutions) also influence the public cost.

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economic factors. Cost factors include private costs of education especially fees and other direct costs besides the opportunity costs. Opportunity cost is important as the child has to work for wage/salary. Further the child has to participate in other economic activities, has to look after siblings, and to attend other domestic activities. Economic factors include the expected private benefits in the form of increased life time earnings, the level of personal disposable income and unemployment rates.

The determinants of private cost from the demand side or direct household demand factors are particularly dependent on a number of household characteristics such as household size, social groups the children belong to, gender, the educational levels of the parents, income of the household, occupation of the parents, geographic location, etc. Supply-side factors can be discussed at three levels at the public policy or macro level, system level and at the institutional level. Macro level factors would include shortage of places and poor and inadequate provision of physical infrastructure (viz. school places, the remoteness of rural schools and poor physical infrastructure). System level factors include the governance dimension such as, incentives and penalty to influence the performance of the schools, school governance, management mechanism and structures including supervision and inspection, ineffective or no teacher accountability, etc.

Within institutional level, the academic factors on the one hand and leadership and cordial environment on the other hand influence the performance. It includes academic oriented approach and also good institutional leadership, good interpersonal relationship among headmaster, staff and students and team-work, etc. All of these factors need to operate together for better performance, which indirectly influence the private costs of education. The non-economic factors include the social, cultural and political influences on the private demand for education and hence determine the private cost of education.

3.6 UNIT COSTS

Unit cost in education refers to the cost per student. It is a sum of *unit recurring cost* and *unit capital cost*. Information on unit costs are an important guide to policymakers. Particularly important are unit costs by level of education (i.e., preschool, primary, secondary, tertiary), though sometimes information are also needed for particular subjects (e.g., science or languages), for different streams (e.g., arts, science, commerce, etc).

3.6.1 Unit recurring cost

Unit recurring cost is the recurring cost per student or the average recurring cost. Depending upon the purpose, a number of concepts on unit costs can be developed. Most often, the term unit cost refers to the cost of a school place occupied by a single student for one year. However, this definition says nothing about attendance (i.e., whether pupils actually occupy the spaces allocated to them). For this purpose, it is the number of students actually attending the classes should be taken for the purpose of calculation of unit costs and not the total number of learners on roll. Even this definition says nothing about the quality of teaching or learning. Alternatively, unit costs can also refer to the unit of output, i.e. successful student or graduate. This is called effective unit costs of education. This type of cost calculation takes care of

wastage in education. The difference between the effective and the normal costs of education reveals the internal efficiency of the given level of educational system due to both drop-out and failure. Thus, we can calculate alternative forms of unit costs of education. These are given as follows.

i) Normal unit cost = Total cost/Enrolment

It is the cost per pupil enrolled and widely used in planning at all levels of education. This can be calculated by grades and levels of education and by school wise; and also be estimated at district, state and national level. It can be estimated across space and over time. Hence, one can compare the unit costs across countries (after converting into comparable terms for instance in terms of purchasing power parity), states, district or schools. One can also compare the unit costs over a period of time as well.

ii) Cost per pupil attending school = Total cost/Number of students attending school

If there is a large gap between enrolment and attendance as found in many developing countries including India, this cost is calculated. The difference between normal unit cost and cost per pupil attending school indicates the wastage of resources due to drop-outs in a grade and hence in the system. It reflects partly internal efficiency of the system.

iii) Effective unit cost = Total cost/Number of passed out students

It is cost per successful student. It is useful for manpower planning and it relates cost with performance. Difference between normal and effective unit cost brings out wastage in education due to drop-outs and failure. It reveals internal efficiency of the education system. Larger the gap, higher is the inefficiency in the system. This indicates the extent of effective utilization of resources.

Example:

Normal and effective unit cost at elementary levels of education for the state of Tamil Nadu is estimated and reported in Table 3.3. The normal unit cost in 2003-04 at elementary levels of education was Rs.2387. This has increased to Rs.5512 by 2007-08. It is important to note that the unit cost has more than doubled in these five years. Further, the divergence between the normal and effective unit cost brings out the extent of wastage of resources on account of drop out and failure in the education system. In the example given here wastage per student range from Rs 780 during 2007-08 to a maximum of Rs.1230 in the year 2003-04.

Table 3.3: Normal and effective unit cost in elementary education in Tamil Nadu (in Rs.)

	Nominal Unit Cost	Effective Unit Cost	Difference between Effective and Normal unit cost
2003-04	2387	3617	1230
2004-05	2741	3834	1093
2005-06	3022	3925	903
2006-07	4481	5601	1120
2007-08	5512	6292	780

Source: Based on Analysis of Budgeted Expenditure on Education, Information on enrolment from SSA office

iv) Besides these unit costs, crude methods of working out unit cost also prevail. It is estimated in the absence of relevant information on enrolment. Cost per child of the relevant age group for general education is given as:

$$= \text{Total cost on general education} / \text{Population of the relevant age group}$$

v) Similarly cost per child of the relevant age group population by levels of education can also be estimated. It is given as:

$$= \text{Total cost of given level of education} / \text{Population of relevant age group.}$$

vi) Depending upon the purpose of coverage, cost per capita is estimated as:

$$\text{Cost of education per capita} = \text{Total cost} / \text{Total population}$$

A variety of other types of unit cost measures exist that are valuable for certain purposes. For example, the average cost per teacher, the average cost per classroom, the average cost per school, the average cost per course can also be calculated. As mentioned earlier, the suitable unit to use for costing depends upon the particular item with which we are concerned. If we are costing the number of notebooks and textbooks needed, then the individual student is the most suitable unit because, in these cases, cost varies in direct proportion to the number of students. Generally, unit costs of education are calculated per year. Unit costs can be worked out as those related to the students; those related to the teachers; and those related to various items, such textbooks, uniforms, etc.

3.6.2 Unit capital cost

Unlike the unit recurring costs, there are problems involved in calculating capital cost, because capital investment is made at a point of time but the benefit flows over its lifetime. Hence, one has to be very cautious in amortizing the capital cost by considering its net present value by depreciating or discounting the capital value of the asset. The annualized capital cost can be worked out using the formula as

$$= [r(1+r)^n / (1+r)^n - 1] * I / E$$

Where r = discount rate

n = life span of the asset

I = Initial investment

E = enrolment

The value of the annualization factor can be derived from the following Table 3.4, which can be used to estimate the annual fixed cost.

Table 3.4: Annualisation factors for determining annual fixed cost for different periods of depreciation and interest rates

Lifetime of Assets	Interest Rates (r)		
	5%	10%	15%
n			
1	1.050	1.100	1.150
2	0.538	0.576	0.615
3	0.367	0.402	0.438
4	0.282	0.315	0.350
5	0.231	0.264	0.298

6	0.197	0.230	0.264
7	0.173	0.205	0.240
8	0.155	1.187	0.223
9	0.141	0.174	0.210
10	0.130	0.163	0.199
15	0.096	0.131	0.171
20	0.080	0.117	0.160
30	0.065	0.106	0.152
40	0.058	0.102	0.151
50	0.055	0.101	0.150

Source: Lewin and McEwan (2001)

Example:

Suppose the rate of discount is 10 percent, the life span of the building is 20 years, then we get the value as 0.117. If the value of the building is Rs.2,00,000, then the annualised fixed cost is Rs. 23,400.

Activity 3.3

Explain what do you mean by 'unit cost'; and distinguish between unit recurring cost and unit capital cost with suitable example.

Note: a) Write in about 150 words in the space given below.

b) Compare your answer with the one given at the end of the unit.

3.7 COST FUNCTIONS

The concept of cost functions can be used to investigate the relationship between average and marginal costs. This analysis is useful to know whether the investment decisions are involved a choice between different types of institutions – whether expanding or keeping the existing system or consolidation. It may be noted that here, we are discussing the relationship between different costs pertaining to institutional or public costs.

Total cost (TC) is an increasing function of enrolment. This indicates that when the enrolment increases, total cost also increases. A cost function expresses the

relationship between 'cost' and its determinants. As discussed earlier, several factors influence cost. Such relationship to cost is expressed in a functional or mathematical form. It is called cost function. Symbolically,

$$TC = f(E) \quad \dots\dots\dots (1)$$

where, TC = total public costs of education and E = enrolment

We already know that, total cost (TC) is the sum of total fixed cost (TFC) and total variable cost (TVC). This we can write as:

$$TC = TFC + TVC \quad \dots\dots\dots (2)$$

Where, TC = total cost; TFC = total fixed cost; TVC = total variable cost.

This relationship can be illustrated in a diagram (Figure 3.1). The fixed cost remains fixed as enrolment increases hence it is parallel to the x axis. The variable cost is an upward sloping line starting from the origin. This indicates that when no student is enrolled, no cost is incurred. As enrolment increases, the variable cost also increases indicating a direct positive relation between variable cost and enrolment. The total cost and enrolment also exhibit a positive relationship and hence an upward sloping line. But, total cost (TC) starts from fixed cost (FC) on the y axis and not from the origin; it is because total cost is the sum of variable and fixed costs.

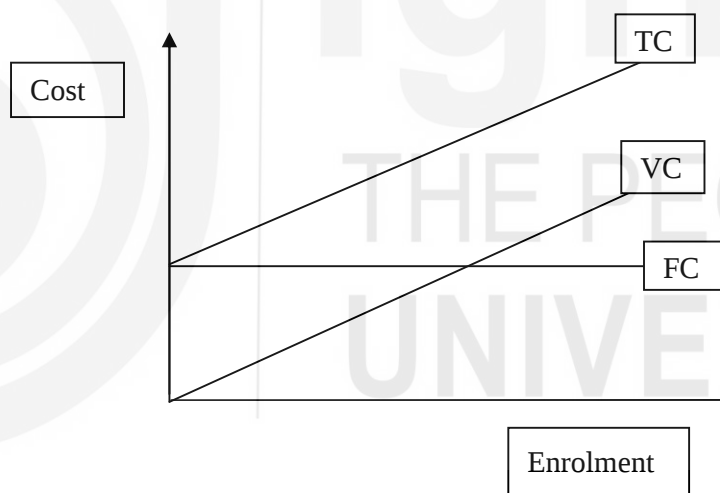


Figure 3.1: Relationship between fixed cost, variable cost and total cost

We already know that average cost (AC) is nothing but the unit costs or cost per student. The AC is derived by dividing the total cost by the number of enrolments as given in equation (3)

$$AC = TC / N \quad \dots\dots\dots (3)$$

Where, AC= average costs, N = number of students enrolled.

Marginal Cost (MC) refers to the cost incurred on an additional student or the additional cost attributable to an additional student. We can express it in notational form as:

$$MC_n = TC_n - TC_{n-1} \quad \dots\dots\dots (4)$$

Where, MC = marginal cost, TC_n = the total cost when enrolment is n , TC_{n-1} = the total cost when enrolment is $n-1$. **Cost Analysis in Education**

In other words, it is an incremental cost. It may be emphasized that in cost analysis in education, total cost and average cost are used extensively. On the other hand, the use of marginal cost in education is limited. There exists a functional relationship between total cost (TC), average cost (AC) and marginal cost (MC). The average cost per student falls as student number increases as presented in Figure 3.2 and Table 3.5.

Table 3.5: Total, Average and Marginal Cost (Hypothetical Cost Function)

Number of students	Total Cost(TC)	Average Cost (AC)	Marginal Cost (MC)
0	0	0	0
1	300	300	--
2	410	205	110
3	528	176	118
4	660	165	132
5	795	159	135
6	950	158	155
7	1108	158	158
8	1320	165	212
9	1620	180	300
10	1950	195	330
11	2220	202	270

Whereas the rate of decline in average costs is relatively large to begin with, it quickly falls off. Later, it rises. Average cost declines as enrolment increases up to a point and then starts increasing, resulting in a 'U' shaped curve. Marginal cost (MC) is additional cost incurred on an additional student. MC also declines as enrolment increases (but less than AC) up to a point (where $AC=MC$) and then starts increasing (but higher than AC) giving a 'U' shaped curve. The same is depicted through a hypothetical example in Table 3.5 and plotted in Figure 3.2.

There are three possible relationships between average and marginal costs, which provide valuable information to the educational planner, particularly regarding the economies of scale and optimum size of the institution. Using this, the educational administrator identifies whether he is using the resources at an optimal level or not. Further it facilitates him to identify the best size of the school in order to achieve efficiency of the resources utilized.

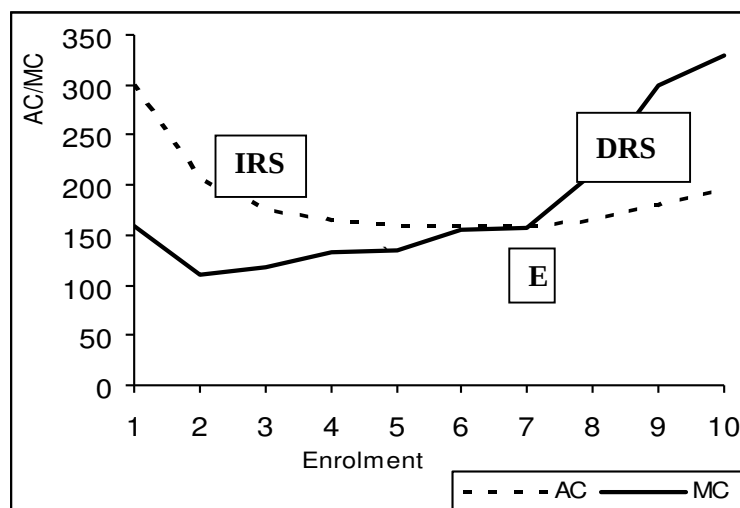


Figure 3.2: Relationship between Average and Marginal Cost and Enrolment

Analysis of the behaviour of AC and MC provides three valuable tips to educational planners:

- Constant Returns to Scale, where AC equals MC and $MC=AC$ remains the same regardless of enrolments. E is the point of constant return to scale in Figure 3.2.
- Economies of Scale (Increasing Return to Scale - IRS), where AC falls due to increase in the enrolments. It is because marginal costs are lower than average costs as shown in the IRS portion.
- Diseconomies of scale (Decreasing Return to Scale - DRS), where AC increases with increase in enrolment and MC is higher than AC, and therefore AC increases as the enrolment increases as shown in Figure 3.2 as DRS.

Whether the marginal cost equals to average cost or not depends on the degree of utilization of resources in the existing system. If there is spare or unutilized capacity, then it would be possible to increase enrolments without incurring substantial costs. There would be economies of scale and marginal costs would be below average costs. If existing facilities are over crowded, however, there are diseconomies of scale, and marginal costs may exceed average costs.

The most obvious application of cost functions involve school reorganization or consolidation based upon scale effects. Other uses of cost functions would be in identifying the impact of input utilisation on school costs and in funding methods by which costs could be minimised.

3.8 COST IN EDUCATION: CURRENT AND CONSTANT PRICES

In cost analysis of education, when examined over a period of time or in a time-series data, it is important to convert the data in current or nominal prices to constant prices. It is because the time series data inherently includes the inflationary changes in an economy. Costs at constant prices take care of price-inflation and represent real costs of education. We calculate the costs of education at constant prices so that the

changes in the value of money are taken into account. It is important to estimate the cost in constant prices which has serious policy implications for the future cost allocations in education. By converting the current costs into constant prices, the influence or effect of change in the rate of change in prices or inflation is attempted to be removed. Only when expressed in constant prices, the inter-temporal comparison becomes meaningful.

In practice, costs at current prices can be converted into costs at constant prices, with the help of either price or income deflators. It can be converted by deflating the values through deflators. The widely used deflators include the following:

- Education Price Index is the most suitable deflator. But in many developing countries including India, there is no such index constructed.
- Consumer Price Index (CPI) would be appropriate as the education budget predominates with salary of the teachers. But there are capital goods as well involved in the education budget. Hence, this CPI is generally not preferred.
- Wholesale Price Index (WPI) could also be used but only as the second best as that of income deflator. However, in WPI, the education sector as such may not be represented. Hence, we use the income deflators in the education sector.
- Use of National Income/State income deflator is the second best alternative when there is no information available such as on Education Price Index. This is being widely used in the education sector.

The method of converting the current expenditure into constant expenditure involves the following two steps (see Table 3.6 for an exercise):

Step 1: Calculate income deflator as:

Income Deflator = current income/constant income

Step 2: Divide the current expenditure by income deflator. The resulting quotient is expenditure in constant prices:

Expenditure in constant prices = Expenditure in current prices/income deflator

Example:

How to converting cost in education from current to constant prices?

Table 3.6: *Converting Cost in Education from Current to Constant Prices*

(Rs. In 100 millions.)

	SDP in Current Prices	SDP in 80-81 prices	Income Deflator =(2)/(3)	Expr. on Elem. Edn. in current prices	Expr. on Elem. Edn. in 80-81 Prices
(1)	(2)	(3)	(4)	(5)	=(5)/(4)
1980-81	7218	7218	1.0	281	281
1981-82	8677	8011	1.1	323	298
1982-83	8821	7578	1.2	411	353
1983-84	10222	7988	1.3	441	345
1984-85	12028	9033	1.3	522	392
1985-86	13682	9391	1.5	646	443

Source: Analysis of Budgeted Expenditure on Education, Ministry of Human Resource Development, New Delhi.

Note: The data on SDP (State Domestic Product) in current and constant prices are available from Department of Economics and Statistics or economic survey of countries; expenditure on education is available from the state education budget document. Hence data on column 2, 3, and 5 are secondary data which are used to convert the current costs into constant costs of education.

Activity 3.4

Establish the relation between total cost, fixed cost, and variable cost with the help of an example.

Note: a) Space is given below for writing your answer.

b) Compare your answer with the one given at the end of the unit.

3.9 LET US SUM UP

Cost analysis in education is an important technique essential for the educational administrator for planning and utilizing the resources efficiently. In this unit, we studied the need or usefulness of cost analysis in education. We also studied the different types of cost analysis of education, such as basic cost analysis, cost-feasibility analysis, cost-benefit analysis and cost effectiveness analysis and their purpose and outcomes. We further understood what constitutes costs in education and also the different types of costs such as private, public and social costs within which the direct and indirect cost concepts. We identified what are the factors which determine the private and public cost of education. Yet another important concept and method of calculating unit costs of both unit recurring and unit capital costs are explained. We studied the cost functions in detail using the relationship between average and marginal cost. Finally, we also learnt to calculate costs in current and constant prices.

3.10 FURTHER READINGS

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3.11 MODEL ANSWERS TO ACTIVITIES

Activity 3.1:

- i) Basic cost analysis: This is utilized in developing the overall budget of a country or an institution or a project/programme. All cost centres are put together to calculate the total cost.
- ii) Cost feasibility analysis: Given that there are budgetary constraints of an organization, analysis is done to find out what short and long term costs will be involved, and what short and long term benefits be accrued at what cost. For example, opening up a sports ground, and expanding to include swimming pools, indoor games, gyms, etc.
- iii) Benefit-cost analysis: This suggests which alternative should be followed so that it becomes most beneficial. For example, to construct a huge library building with large number of study rooms, or to subscribe to online resources and provide access to students and teachers from department or home.
- iv) Cost-effectiveness analysis: This helps in deciding the best-alternative and the most effective way to achieve the stipulated goals.
- v) Cost-utility analysis: Instead of effectiveness, utility is the main consideration here, as perceived by the end users or various stakeholders.

Activity 3.2:

- a) Students paying for their transportation, purchase of books, private tuition.
- b) The loss to the government due to foregone tax on income of the student since he/she goes for further study instead of doing a job.
- c) All costs involved in educating the citizen of a country.

Activity 3.3:

Unit cost is the cost of educating one student or one graduate. Unit recurring cost is cost incurred (like teacher salary, computer lab cost, library cost) while teaching-learning goes on till one completes education. Unit capital cost is expenditure incurred once which shall benefit more than one cohort of students. For instance, money spent on sports complex shall benefit a large number of students for coming many years.

Activity 3.4:

Total cost is the sum total of fixed cost and variable cost. For example, the total cost for one academic session shall comprise of the total investment made/expenditure incurred on fixed costs like central facilities, library, teachers' salary, etc. (apportioned for that year), and total investment on variable items like chemicals in science lab, student laptop as part of course work, etc.

UNIT 4:

GENERATION AND UTILIZATION OF RESOURCES

Structure

- 4.0 Introduction
- 4.1 Objectives
- 4.2 Resource Generation and Mobilisation
 - 4.2.1 Generating human resources
 - 4.2.2 Generating non-human resources
 - 4.2.3 Generating financial resources
- 4.3 Problems of Educational Finance
- 4.4 The Process of Financing Education in the Context of Centre-State Relations
 - 4.4.1 Role of the government in education
 - 4.4.2 Role of the central government in financing education
 - 4.4.3 Role of the state governments in financing education
 - 4.4.4 Transfer of resources through the Finance Commission
 - 4.4.5 Transfer of resources through the erstwhile Planning Commission
 - 4.4.6 Financing mechanisms: adequacy and efficiency
 - 4.4.7 Equity in financing
- 4.5 Mobilisation and Optimum Use of Resources
 - 4.5.1 Measures to raise additional resources
 - 4.5.2 Measures to reduce government spending on education
 - 4.5.3 Measures for optimising the use of non-monetary resources
- 4.6 Let Us Sum Up
- 4.7 Model Answers to Activities

4.0 INTRODUCTION

In the previous three Units, we discussed the very foundations to economics of education— concepts of economics of education, education as investment, and cost analysis in education. These should provide the back-drop to what you are going to study in this unit. In this fourth Unit, we shall discuss the generation and utilisation of resources, both human and non-human. In our discussion, resource generation and utilisation has been considered in respect of only the government supported institutions, which were administered and financed directly by the government or are being controlled indirectly through grants-in-aid. Educational institutions such as public schools, which were administered by private bodies, meet their entire expenses from fees and do not receive any financial grant from the government. They fall outside the purview of the unit. The four sections deal with generation and mobilisation of different types of resources, problems of educational finance, the mechanism of financing education in India with reference to centre-state relations, and mobilisation and optimum use of resources for education respectively. For describing the generation and utilisation of resources in education, we need to rely on any specific national context – in this case, we give the example of educational structure as it exists in India. You may relate the aspects of resources in education (as discussed in this unit) to the situation as it obtains in your country (if you do not belong to India).

4.1 OBJECTIVES

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

- Describe the nature of human resources needed by education, and their generation and mobilisation.
- Describe the nature of the process involved in the generation and mobilisation of non-human resources (physical and financial).
- Describe the problems involved in educational finance (in India).
- Explain the sources and the status of income to and expenditure on education (in India).
- Describe the role of the Central and the State governments in educational finance (in India).
- State and describe the process involved in the transfer of resources from the Centre to the State government.
- List and explain the measures involved raising additional resources for education, and reducing government spending on education.

4.2 RESOURCE GENERATION AND MOBILISATION

Resources for education can be categorised into two broad types: human and non-human. In this section, let us start with describing the human resources.

4.2.1 Generating human resources

Education in a country is provided at different levels: primary through university; and it is of several types: general, liberal vocational, technical and professional. For providing education, different modes are available, viz. formal, non-formal, and distance mode. For providing different types of education at different levels, a variety of human resources are needed. These may be classified into two categories: teaching, and non-teaching. Human resources for teaching comprise all categories of teachers, librarians, demonstrators, laboratory/workshop assistants, etc. Human resources in the non-teaching category consist of office superintendents, accounts officers, secretarial staff, attendants, etc. Whereas human resources for teaching are directly concerned with teaching-learning activities, those for non-teaching provide essential support services. Thus, both the types of resources are important for education and make their respective contribution to the effectiveness of any educational system.

The most important determinant of the quality of human resources is the quality of education that one has received, which in turn depends upon the quality of the teachers. Both the quantity and quality of teachers for teaching at different levels and for teaching various types of courses are a function of the level of development of the education system (especially at higher and professional stages) and of professional training. This also depends upon the proportion of academics who are willing to adopt teaching as a career. Their willingness is determined by a number of factors that influence vocational choices, chief among which are the pay scales, opportunities for career advancement, working conditions, social prestige, aptitude for teaching, etc.

The process of generating human resources is lengthy, requiring a number of years for them to become functional. Developing countries like India which are facing the problems of providing universal, free and compulsory education up to elementary level, and expansion of secondary and higher education for meeting human resource needs of the economy, cannot afford a long process of human resource development. The problem that these countries face may be articulated as 'how to meet the requirements of the ever expanding education system'.

The supply of teachers can be increased by improving the efficiency of existing stock of teachers and by raising their number. The measures to bring about these desired changes are discussed below.

- The efficiency of teachers can be increased by training them in the methods of teaching large classes. It can also be increased if they are trained on how to use print and audio visual media, as substitute teachers. Examples of such media-packages are correspondence lessons, radio lessons, educational television, educational films, computer assisted instructions, etc. Through these media a teacher can reach out to a large number of students who otherwise cannot receive formal education as, for example, they live in remote areas or due to other factors like educational backwardness.
- The supply of teachers can be increased through mobilisation and use of community resources. In every community there are retired government servants, army personnel, teachers, doctor, unemployed youth, and educated housewives etc., who may be prepared to take up teaching assignments voluntarily. Their energies can be channelised for providing education through voluntary and non-government organisations. Community resources play a very important role in supplementing the efforts of school teachers in providing elementary vocational and adult education through formal and non-formal modes.
- Shortage of teachers in certain subjects such as sciences and mathematics (specify if it is so) can be countered by recruiting persons who do not hold professional qualifications (like B.Ed.) but possess requisite academic qualifications (like B.Sc., M.Sc. etc.). The appointment could, however, be made subject to the condition that they would acquire professional qualifications through part-time/full-time/distance learning courses, within a stipulated period. Besides this provision, the shortage of teachers can be taken care of by appointing qualified persons to work as guest teachers on hourly basis.
- In the case of higher education, the shortage of teachers in certain subjects is met by appointing qualified persons as part-time teachers or guest lecturers/teachers who are paid on hourly basis, or as ad-hoc teachers for a specific period. Some institutions persuade their own teachers to attend classes of guest teachers for acquiring competence in new subjects, and thereby contribute to the development of the internal resources of the institution. However, such teachers need to be regularized after a period of time.

4.2.2 Generating non-human resources

Non-human resources include both physical and financial resources. We shall first consider generation of physical resources needed for providing education and then

take up financial resources in sub-section 4.2.3. The physical resources consist of the following:

- i) Fixed capital items like land and building consisting of administrative blocks, halls, class/lecture rooms, laboratories, library, subject specific rooms computer room, sports room, lavatories, sports ground, hostel buildings, etc.
- ii) Moveable capital items like mobile laboratory and other equipment, furniture, books, implements and tools, teaching aids like globe, models etc., technological educational gadgets like radio, television, telephone, overhead projector, film projector, tape recorder, slide projector, personal computer, laptop, tablet, etc.
- iii) Permanent capital installations like fittings and fixtures, fans, etc.
- iv) Consumable items like power, water, writing-chalk, duster, stationary, newspapers, magazines, etc.

Whether an item is of capital or of consumable nature depends upon the life span over which it provides services. Those items which provide services for a short period (say for one or less than one year) are regarded as consumable items while those which provide services for a long period are considered to be of capital nature.

Mobilisation of physical resources

In the developing countries, physical resources of capital nature for education are generally provided by the community. Land required for building educational institutions is often donated by individual, religious bodies, trusts, industrialists, village *panchayats* and/or government. The community, at times, contributes labour in the form of “*shramdan*” (donation of free labour) to put up schools and colleges. Some members of the community, who are financially well off, make liberal donations towards the construction of buildings and provision of other infrastructural facilities. Given the capacity, the extent of mobilisation of physical resources depends on the ability of the management of the institution and the community leaders to exploit these sources.

It may be pointed out that when education expands at a rapid pace, the community cannot meet all the requirements out of its own sources. The Government has to provide for them from its own revenues. In case of non-formal education, physical resources are often provided by the community. The classes are held at homes, work places, farms, etc. Apart from space, other physical resources, both of capital and consumable nature, are also provided by the community.

Activity 4.1

Describe, in about 15 lines, how the supply as well as efficiency of school teachers can be increased in a country like India or any developing country.

- Notes:**
- a) Space is given below for writing your answer.
 - b) Compare your answer with the one given at the end of the Unit.

4.2.3 Generating financial resources

Financial resources, by themselves, do not make the provision of education possible until a country has acquired both the human and physical resources. The major role of financial resources is to mobilise human and physical resources and bring them together for providing education. Lack of financial resources adversely affects not only the maintenance of the existing system of education but also its development in the country. The financial resources for education may be examined both from the point of view of expenditure and income. Let us first consider financial resources from the point of view of expenditure.

i) Expenditure on education

Expenditure on education can be categorised into two groups — recurring and non-recurring, and plan and non-plan expenditure. These are discussed below.

Recurring and non-recurring expenditure

An educational institute incurs recurring and non-recurring expenditure for providing education. Recurring expenditure is that which is incurred every year for running an educational institution. Broadly speaking, it includes expenditure on salaries of staff, contingencies, maintenance and repair of equipment, buildings and furniture; expenditure on stipends, scholarships and other fee concessions, provision of mid-day meals and school uniforms, games and sports, inspection, public examinations, hostel charges (except mess charges) etc.; and expenditure on consumable articles used in the teaching learning transaction.

Non-recurring expenditure is that part of educational expenditure which is other than recurring expenditure. Broadly, it covers expenditure on purchase of land, capital items like equipment and furniture, expenditure incurred on buildings, hostel, staff quarters, and the purchase of books, dictionaries, encyclopaedias, etc. An idea of the relative size of the recurring and non-recurring expenditure on the educational institutions in India during 1983-84 is provided in Table 4.1.

Table 4.1: *Expenditure by objects on all Indian educational institutions during 1983-84 (Rupees in thousands)*

	Amount	Percentage within the category (recurring/non-recurring) of expenditure	Percentage of total expenditure on education
<i>Recurring</i>			
Salaries and allowances of teaching and other academic Staff	39,62,30,14	75.20	71.70

Salaries of non-teaching staff	5,73,93,30	10.90	10.40
Maintenance of buildings	68,97,54	1.30	1.20
Maintenance of equipment and furniture	38,00,55	0.70	0.70
Apparatus (chemical-consumable stores)	65,62,66	1.20	1.20
Library	30,62,21	0.60	0.60
Stipends, scholarships and other financial concessions	1,43,84,19	2.70	2.60
Games and sports	17,15,80	0.30	0.30
Hostels	24,96,67	0.50	0.50
Other items	3,44,47,95	6.60	6.20
Total (recurring)	52,69,91,11	100.00	95.40
<i>Not-recurring</i>			
Libraries	18,43,97	7.30	0.30
Buildings	1,09,26,98	43.00	2.00
Equipment	39,78,01	15.70	0.70
Furniture	17,96,92	7.00	0.30
Other items	68,45,29	27.00	1.30
Total (non-recurring)	2,53,91,17	100.00	4.60
Grand Total	55,23,82,28		100.00

Source: *Education in India, Vol.11, 1983-84.*

Table 4.1 reveals that in 1983-84, 75.20 % and 10.90 % of the total recurring expenditure was made on salaries of the teaching and the non-teaching staff respectively, together making a total of 86.10%. Compared to recurring expenditure on salaries, only 13.90% of the total recurring expenditure was incurred on other items. This expenditure pattern shows the labour intensive nature of education. Table 4.1 also shows that the highest percentage of total non-recurring expenditure (i.e., 43%) was spent on buildings, 15.70% on equipment and 27% on other items. These data indicate that due attention was paid to the creation of infrastructural facilities for education during that period.

Further a low percentage of recurring and non-recurring expenditure on libraries and low recurring expenditure on games and sports reflect lack of concern for the provision of quality education and the co-curricular activities during that period. It may be pointed out that expenditure incurred on the creation of capital assets, though usually very huge, forms a small percentage of the total cost of providing education.

Plan and non-plan expenditure

Financial resources of the Central and the State governments are classified into plan resources, and non-plan resources. Plan resources refer to the expenditure incurred

on the development of educational facilities such as construction of new buildings, recruitment of new teachers, expenditure on innovations during the period of Five Year Plans and Annual Plans. The non-plan resources refer to expenditure incurred on the maintenance of educational facilities and the infrastructure already created during the Five Year Plans. Plan outlays get translated into non-plan outlays at the end of each Five Year Plan. Thus, where the plan expenditure ends, non-plan expenditure begins. The outlay and expenditure on education under various Five Year Plans are given in Table 4.2.

Table 4.2: Educational outlay in the various plans
(at current prices)

Five Year Plans	Expenditure on education (Rs. in millions)	Total Plan outlay (Rs. in millions)	Expenditure on education as % of total plan outlay
1	2	3	4
First Plan	1530	1,9600	7.80
Second Plan	2730	4,6000	5.90
Third Plan	5890	8,5800	6.90
Fourth Plan	7860	15,9020	4.90
Fifth Plan	9110	39,3220	2.31
Sixth Plan	25300	97,5000	2.59
Seventh Plan	76330	1,80,0000	4.24
Eight Plan (Approved)	196000*	7,98,0000	2.46

Source: Compiled from various Five Year Plans
*Plan allocation.

Table 4.2 shows that the plan outlay on education at current prices has been rising at a rapid rate since the First Year Plan. In the Eighth Five Year Plan, the plan expenditure is expected to be 138 times that of the First Plan. However, when we consider expenditure on education as a percentage of the total plan outlay, a different picture emerges. As is evident from column 4 of Table 4.2, expenditure on education as a percentage of the total plan outlay was the highest in the First Plan (7.80%) and the lowest in the Fifth Plan (2.31%). It started rising marginally in the Sixth Plan (2.59%) and is likely to be 4.60% (estimated) in the Eighth Plan. This decrease in expenditure shows that low priority is being accorded to education generally in India.

Table 4.3 reveals that since 1950-51 the non-plan expenditure has been much higher than the plan expenditure, and with the passage of time the difference goes on widening. Whereas at the beginning of the First Plan (1950-51) non-plan expenditure was 2.5 times that of the plan expenditure, by 1994-95 the former was five times the latter.

It may be pointed out here that in a federal country like India, there exists a complex mechanism for providing financial resources for meeting plan and non-plan expenditure. This you will study in section 4.4 below. Before that let us look into the sources of income for meeting the expenses incurred on education.

Table 4.3: Plan and non-plan expenditure in India
(Rs. in millions at current prices)

Year	Plan expenditure	Non-plan expenditure	Total
1950-51	200 (28)	510 (72)	710 (100)
1960-61	900 (38)	1440 (62)	2340 (100)
1965-66	1780 (41)	2590 (59)	4370 (100)

1970-71	1150 (14)	7310 (86)	8460 (100)
1973-74	2250 (17)	10860 (83)	1,3110 (100)
1977-78	3240 (14)	19910 (86)	2,3150 (100)
1978-79	4130 (16)	22450 (84)	2,6580 (100)
1980-81	5200 (14)	32260 (86)	3,7460 (100)
1994-95	45347 (17)	226425 (83)	271772 (100)

Sources: *Trends of Expenditure 1968-69 to 1978-79*, New Delhi: Ministry of Education 1980, 1995
Ministry of Education, Annual Reports of various years.

Note: Figure in brackets represent percentages.

ii) Source of income for financing education

So far, we have examined financial resources for education in terms of expenditure; let us now examine them in term of income.

A developing country like India has several sources of income for financing education, viz., government, local bodies, university funds, fees, endowments, etc. The government sector comprises both the Central Government and the State Governments. The term 'local bodies' refers to the corporations, municipalities and town area committees in urban areas and the *zila parishad*, *panchayat samities* and *panchyats* in rural areas.

You will find from Table 4.4 that in absolute terms the contribution has been increasing over the years. However, in relative terms the share of the Central and the State Governments has been consistently increasing, and that from other sources has been declining. Whereas the contribution of the government sector in 1950-51 was 57.06, it rose to 81.51% in 1983-84. On the other hand, the contribution from local bodies, fees, endowments and other sources declined from 10.93%, 7.50% and 11.62% to 5.61%, 7.50% and 3.80% respectively during the same period. The decline in the contribution from these sources has placed considerable burden on the government for financing education.

Table 4.4: *Income (recurring and non-recurring of all types of educational institutions by sources (all India 1950-51 to 1983-84) (figures in thousands of rupees)*

Year	Government funds	Local body funds	University funds	Fees	Endowments and other sources	Total
1950-51	65,2678 (57.06)	124,987 (10.93)	N.A	233,272 (20.39)	132,885 (11.62)	1143,822 (100)
1960-61	2340,914 (67.97)	224,914 (6.53)	N.A	590,258 (17.15)	287,714 (8.35)	344,801 (100)
1970-71	8459,499 (75.65)	484,925 (4.34)	152,162 (1.35)	1432,370 (12.81)	65,3905 (5.85)	11182,862 (100)
1975-76	16523,063 (78.51)	N.A	N.A	N.A	N.A	21047,030 (100)
1980-81	30772,393 (81.70)	1773,291 (4.71)	514,312 (1.36)	3090,208 (8.20)	1516,928 (4.03)	37667,132 (100)
1983-84	46443,305 (81.50)	3195,042 (5.60)	916,285 (1.60)	4273,312 (7.50)	2153,312 (3.80)	56981,243 (100)

Source: Education in India volume II, 1983-84; figures in brackets show contributions as percentages.
N.A = not available

The rise in the share of the government in financing education is accounted for mainly by three factors as given below.

- a) The first is the phenomenal rise in the social demand for education after independence, which required greater government participation in expanding educational facilities to meet the demand.
- b) The second is the adoption of developmental planning. This increased the demand for human resources with varied skills and in turn it called for greater government involvement in expansion of secondary, vocational, technical, general and professional education.
- c) The third is the policy of the government to bring about equality in educational opportunity requiring heavy subsidies in education, particularly for students belonging to S.C and S.T., weaker sections and those belonging to socially and economically backward regions.

Local bodies play an important role in the development of primary education. The decline in the relative contribution of local bodies, as you have seen in Table 4.4, is the result of the inability of the State Governments to strengthen them by devolution of the more powers to them. In comparison to municipalities in towns and municipal corporations in metropolitan cities, the State Governments have discriminated against *Panchayati Raj institutions*. Besides, where local bodies have been given powers to administer, control and develop primary education, they have failed to mobilise required community and fiscal resources for financing education and have been relying mostly upon grants-in-aid from the respective State Governments.

As regards fees, the proportionate decline in this income for education is attributed to the following factors.

- a) First, according to Article 45 of the Indian Constitution, the State is required to provide free and compulsory education to all children until they complete the age of fourteen. Obviously, the government cannot charge fees from children upto the elementary level.
- b) Secondly, the State Governments have been following populist policies which have resulted in providing free education upto the graduation level in many of them.
- c) Thirdly, wherever fees are charged, the policy of the government has been to keep their level very low in view of the consideration of equity.
- d) Last, though the cost of providing education has been rising because of inflation and other factors, the fee structure has not been revised for many years now.

It may be emphasised that while providing grants-in-aid to an educational institution, the governments deduct the income that the educational institution concerned receives from fees from the total grant. Low income from fees has, therefore, increased the burden on the governments progressively over the years.

Endowments and donations constituted an important source of income in the past. In the beginning of the twentieth century, 25% of the total expenditure on education was met through this source. The fall in income from this source is attributed partly to

increased expenditures involvement in education, partly to the increased expenditure involvement in education and partly to the failure of the educational institutions to tap this traditional source.

Activity 4.2

Notes: a) Space is given below each question to write your answers.
b) Compare your answers with those given at the end of the Unit.

- i) How may the non-human resources for education be considered? Illustrate your answer with examples in about 100 words.
- ii) Compare the recurring and non-recurring expenditure given in Table 4.1 and the plan and non-plan expenditure given in Table 4.3. Use about 150 words to write your answer.

4.3 PROBLEMS OF EDUCATIONAL FINANCE

There are several problems pertaining to educational finance that a federal country like India faces.

- i) The first and foremost is the inadequacy of resources in comparison to the magnitude of the task faced at various levels of education. For example, even after 65 years of independence, India has not been able to fulfil the constitutional obligation of providing universal elementary education to all the children of the relevant age group. Whereas for achieving this goal, 5 crore (50 million) additional children had to be enrolled in the Seventh Five Year Plan, only about

2.53 crore (25.3 million) were actively enrolled. According to 1991 census, the number of illiterates in all the age groups is 33.60 crores (336 million) and the overall literacy rate is only 52.11%.

As per the *Fifth All-India Educational Survey* (1992), among the primary schools 27.96% were single teacher schools and 32.36% were two-teacher schools. In the States of Arunachal Pradesh, Karnataka, Jammu and Kashmir, Meghalaya and Rajasthan, the single teacher schools constituted more than 50% of the primary schools. As regards physical facilities, among the primary schools 7.69%, 37.79% and 25.42% had zero one and two instructional rooms respectively. Among the upper primary schools, 2.30% schools had no institutional room and 18% had one or two instructional rooms.

The data presented above show the extent of the lack of various types of resources in the educational institutions. To solve this problem it is necessary to find alternative ways for raising additional resources.

- ii) The second important problem is the inability to use the existing resources economically/optimally. When the resources are not optimally utilised, it leads to their wastage which in turn raises the cost of providing education per student. The economic use of resources makes it possible to release resources for developmental tasks and thereby brings down the demand for additional resources for developmental purposes.

4.4 THE PROCESS OF FINANCING EDUCATION IN THE CONTEXT OF CENTRE-STATE RELATIONS

Before we discuss the process of financing education in the context of centre-state relations, it would be worth-while to describe the roles of the Central Government and the State Governments in the field of education, as envisaged in the Indian Constitution.

4.4.1 Role of the government in education

The Seventh Schedule of the Indian Constitution has divided all the subjects under three heads: Union list, State list, and Concurrent list. List I contains subjects falling under the Union list; List II has subjects under the State list; and List III indicates subjects under the Concurrent list. List II had vested the responsibility for providing education mainly to the State Governments, subject to the provisions of entries 63, 64, 65 and 66 of List I and entry 25 of List II. The said provisions in List I mention the functions of the Central Government in respect of education: central universities, union agencies and institutions of national importance, institutions for professional, vocational and technical training, and co-ordination and determination of standards in institutions of higher education. Entry 25 of List III makes vocational and technical education a concurrent function of both the Central and the State Governments. The above mentioned arrangements lasted till 1975. With the 42nd Amendment of the Constitution, education was transferred to the Concurrent list in 1976. It is worth mentioning that the 'concurrent' status accorded to education has in no way reduced

the responsibility of the State Governments. It has, however, increased the participation of the Central Government in the development of education by providing more central funds. Besides, the Centre can legislate on educational matters of national importance.

4.4.2 Role of the central government in financing education

As compared to the State Governments, the Central Government has more varied sources of income. It, therefore, plays a major role in financing education which it does in three ways.

- i) First, it meets non-plan and plan expenditure of all the educational institutions, organisations, etc. under its control. The central sector comprises, besides the Union List I, the central schools, the regional colleges of education, national scholarships and the programmes of the UGC.
- ii) Secondly, it provides grants-in-aid for centrally sponsored schemes. These schemes are formulated by the Central Government and are included in the Centre's Five Year Plans. The State Governments as such do not accept responsibility for their implementation. The Centre, however, persuades the States to implement these schemes through financial incentives in the form of grants-in-aid which meet a larger proportion of the total expenditure of the States on those schemes. Some examples of centrally sponsored schemes are Mass Orientation of School Teachers (MOST) strengthening of Secondary Teacher Education Institutions (STEl)s State Councils of Educational Research and Training (SCERTs) setting up of District Institutes of Education and Training (DIETs), etc.
- iii) Thirdly, the Central Government provides assistance for centrally-assisted schemes. Though these schemes are included in the State plans, the Centre is interested in their speedy implementation. It, therefore, provides central assistance to the States for this purpose.

An example of centrally-assisted scheme is the enrolment of handicapped students in the integrated schools. Though these schools are run by the State Governments, a special grant is sanctioned to them by the Central Government (though the Rehabilitation Council of India) as a priority educational sector for implementing the strategies required to bring the handicapped children upto the level of the normal children studying in the same classroom. It is to be noted that besides the Ministry of Human Resources Development (MHRD), other Central Ministries like Health, Defence, Labour, etc. also finance education; for instance, the Ministry of Agriculture for agricultural education and extension, the Ministry of Health for medical education, etc.

4.4.3 Role of the state governments in financing education

As already stated in the sub-section 4.4.1 above, the Indian Constitution has vested the responsibility for providing education in the State Governments. The States meet the non-plan and plan expenditure on education at all levels. The non-plan expenditure is

met from a State's own revenue supplemented by the financial resources passed on from the Centre to the State through the Finance Commission. Generally, the States incur non-plan expenditure on education to the tune of one fifth of their revenue in a financial year. They meet plan expenditure for educational development from the grants-in-aid received by them through the Planning Commission and from their own resources. Figure 4.1 illustrates the process of transfer of financial resources from the Central Government to the State Governments.

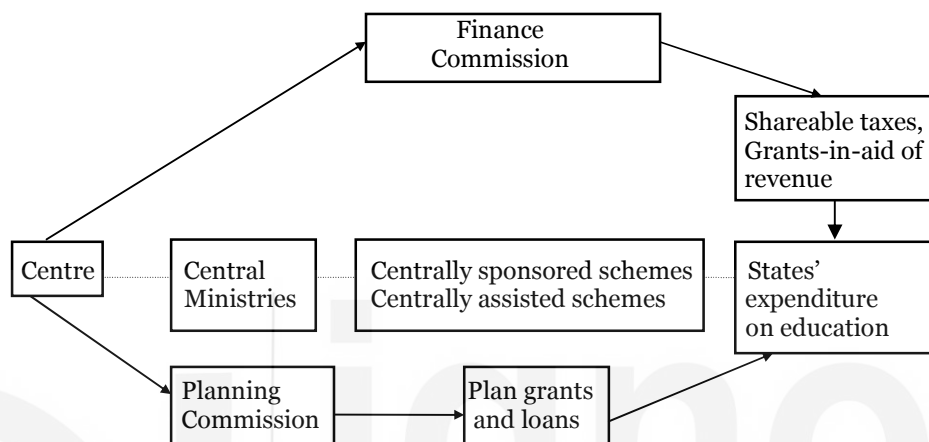


Figure 4.1: Mechanisms for the transfer of resources from centre to states to finance education

Let us examine, in same detail, the transfer of resources, noted in Figure 4.1 above, through the Finance Commission and the Planning Commission to the States.

4.4.4 Transfer of resources through the Finance Commission

The role of the Finance Commission is very important in the Indian federal set up, comprising of 28 States and 6 Union Territories. Article 280 of the Constitution provides for appointment of the 'Finance Commission as a statutory body, every five years or earlier if necessary. So far, nine Finance Commissions have given their awards. The tenth Finance Commission was set up in 1992 under the Chairmanship of Sh. K.C. Pant.

Article 275 of the Constitution lays down the mechanism which the Finance Commission follows for assessing the requirements and distribution of resources. This is given as follows.

On the basis of the trends of the financial resources of the Central and State Governments the Finance Commission prepares estimates of revenue and expenditure for a specified period and decides the total amount of transfers from the Centre to the States. This is followed by determination of separate principles/criteria of distribution of shares of taxes and grants -in-aid among the States. These two aspects are further discussed as under.

Tax sharing

Tax revenue received by the Central Government is classified into five types:

- i) Taxes levied and collected by the Union Government, the receipts of which “are not” shared by the States (e.g., custom duties).
- ii) Taxes levied and collected by the Union Government, the proceeds of which “are mandated” to be shared with the States (e.g., income tax under Article 270).
- iii) Taxes levied and collected by the Union Government, the receipts of which “may be” shared with the States (e.g., Union excise duties under Article 272).
- iv) Taxes levied and collected by the Union Government, the receipts of which “are wholly transferable” to the states (e.g., estate duty, succession duties under Article 267).
- v) Taxes levied by the Union Government but “collected and used” by the States (e.g., excise duties on medicine, toiletries, etc.).

It is clear from the above classification that proceeds from certain taxes listed at serial nos. ii), iii), and iv), levied and collected by the Centre, are shared by the States through the Finance Commission.

Grants-in-aid of revenue

Article 275 (1) of the Constitution provides for transfer of resources to the State Governments through grants-in-aid of revenue. These grants are given to those States which generally need financial assistance. The Finance Commission identifies the States that would be requiring assistance for the period of the award and also the amount of such assistance in each case.

Thus there are two channels through which the Finance Commission makes statutory transfer of funds to the states — the tax receipts and grants-in-aid revenue.

4.4.5 Transfer of resources through the erstwhile Planning Commission

Under Article 262 of the Constitution, the Central Government set up Planning Commission in 1950 for making grants to the States for plan purposes. The grants made by the erstwhile Planning Commission are non-statutory.

The Planning Commission used to set objectives for development of various fields, makes an assessment of existing resource of individual States and the country as a whole, and formulates plan. Each State submits the plans for development to the Planning Commission in the light of these objectives and the availability of financial resources. Those project/plans of a State Government which are approved by the Planning Commission are included in the relevant Five Year Plan. The Planning Commission provides grants-in-aid for their implementation during the period of the Plan concerned. During the first three Five Year Plans (1951-1966) and three Annual Plans (1966-1969), there were no clear cut principles for allocation of Central assistance for State plans. This gave the Planning Commission considerable discretion in allocating assistance. To overcome this lacuna, the quantum of Central assistance for State plans including those for education have been determined on the basis of Gadgil formula which was modified for the Sixth and Seventh Five Year Plans. A revised formula has been devised for the Eighth Five Year Plan as well.

Table 4.5 shows the original, modified and revised Gadgil formula for Central Plan assistance to States. The provision of revised Gadgil Formula (formulated by D.R. Gadgil, the then Deputy Chairman of the Planning Commission in 1969) applicable to the Eighth Five Year Plan is as follows.

Table 4.5: Original, modified and revised Gadgil formula for Central Plan assistance to states

Criteria	Weightage (%)		
	Original formula (Forth and Fifth Plans)	Modified formula (Sixth and Seventh Plans)	Revised formula (Eighth Plan)
Population	60	60	60
Per capita income below the national average (deviation)	10	20	25*
Per capita tax efforts	10	10	—
Outlay on continuing irrigation and power projects	10	—	—
Performance	10	—	7.50
Specific problems	10	10	7.50
Total	100	100	100

*5% be allocated to all the States on the basis of "distance"

Source: Report of the Commission on Centre-State Relations Part 1, 1988, para 10.07.04 and decisions of the National Development Council reported in the Press.

The requirements of special category States (viz., Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura) are at first met from the total Central assistance. It is about 30% of the total Central assistance for the State Plans. The remaining resources are allocated amongst the rest of the states on the basis to the following criteria:

- i) 60% on like the basis of the total population (1971 census);
- ii) 20% on the basis of per capita State income to those States in which the per capita income is below the national level;
- iii) 5% on the basis of 'Distance Method' covering all the States. The distance is calculated on the basis of the following method. First, the average per capita income of all the States is calculated. Next, those are ranked in ascending order. Lower the per capital income, higher is the distance of that State from the State having the highest per capita income, and higher is the assistance received from the Centre; and
- iv) 7.50% on the basis of performance. The performance indicators are: (a) tax-efforts, (b) fiscal management, and (c) progress in respect of national objectives. Under the criterion of progress in respect of national objectives, the approved formula covers four objectives, viz., (a) population control and maternal and child health, (b) universalisation of primary and adult education, (c) on/time completion of externally aided projects, and (d) land reforms. (The rest 7.50% could be considered as miscellaneous.)

It is to be noted that though plan assistance to States is formula-based, yet the total amount of such assistance to be transferred to the States each year is determined by the Central Government.

Apart from Central assistance for the State plans, the Centre under Article 293(2) gives loans to the States. These loans have largely been used for implementing Five Year Plans. Thus, resources are transferred through the Planning Commission to the States through two channels — grants-in-aid and loans.

Activity 4.3

Describe, in about 150 words, the process of transfer of resources from the Centre to the States through the Planning Commission. Also state the revised Gadgil formula for the same.

Notes: a) Space is given below for writing your answer.
b) Compare your answer with the one given at the end of the Unit.

4.4.6 Financing mechanisms: adequacy and efficiency

The financing mechanisms have to be looked at from the point of view of their adequacy and also efficiency. Is the system of financing such that it enables every sector and type of education to have adequate resources in relation to the requirement? The generally held notion that there is scarcity of finances for education has to be examined specifically with reference to local situation because at the local or regional level there may or may not be scarcity. Very often in a big country like India or big States like Uttar Pradesh it may be the case of imperfect financial management or a case of defective financial mechanism unable to supply adequate finance. Besides, the financing mechanism should be able to ensure efficiency in the use of resources. All the State Governments have grants-in-aid codes, which are to be modernised. Such modernised grants-in-aid codes will have to contain provisions to ensure that there is efficient utilisation of available resources like teachers, equipment, etc.

Adequacy and efficiency are inter-related. At present, due to inadequate and irrational allocation of resource, there is a great deal of inefficiency arising out of the high rate of drop-outs from the educational institutions. A policy of allocating adequate resources, on the basis of well thought out norms for every level and type of education is urgently needed. This has to be preceded by an appropriate survey in as many schools and colleges as possible in all parts of the country so that appropriate norms could be evolved.

4.4.7 Equity in financing

There are different meanings given to equity and there are different aspects of equity. One could speak of equity in enrolment, or equity in achievement. The present method of achieving equity through financing is by providing a large number of scholarships, however, have both been sufficient in number or amount. Educational disparities can be regarded as evidence of inequities. There are such disparities between rural-urban, male-female, scheduled castes and others, as well as scheduled tribes and others. You can notice such differences with regard to the following four aspects.

- i) The first is the availability of facilities. According to the *Fifth All India Educational Survey, 1992* the position regarding the availability of schools in 1986 is given in Tables 4.6 and 4.7.
- ii) The second is the utilisation of facilities. Utilisation varies from one place to the other.
- iii) The third is the efficiency in utilisation of facilities which is indicated by varying wastage rates.
- iv) And the fourth is the form of the use of facilities.

Table 4.6: Number of various types of schools in 1986

School type	Number of schools
1. Total number of Schools	
(i) Total	735785
(ii) Rural areas	634719
2. Primary Schools	
(i) Total	529392
(ii) Rural areas	475938
3. Upper Primary Schools	
(i) Total	138687
(ii) Rural areas	112836
4. Secondary Schools	
(i) Total	52208
(ii) rural areas	38720
5. Higher Secondary Schools	
(i) Total	15458
(ii) Rural areas	7225

One can say that this situation suits Indian education due to the present system of financing particularly the process of allocation of funds. There are large variations in per student expenditure by districts, blocks and institutions. Such regional variations arise because allocation of resources is done by the State Departments of Education without adequately taking into account the varying regional requirements. The answer to this appears to lie in regionalisation and decentralisation of financial policies. Some States like Gujarat have adopted the policy of financial decentralisation even up to the “taluka” (block) level, and it appears to help in making the system of financing education equitable and efficient.

Table 4.7: Percentage of habitations having schooling facilities in 1986

Habitations	Percentage of the Total
1. Percentage of habitations having a Primary School/Section	
(i) Within the habitation	51.36
(ii) Within 1 km. of the habitation	84.45
2. Percentage of habitations having an Upper Primary School/Section	
(i) Within the habitation	13.25

(ii) Within 3 km. of the habitation	75.80
3. Percentage of habitations with population 300 or more served by a Primary Schools/Section	
(i) Within the habitation	76.98
(ii) Within 1 km. of the habitation	94.01
4. Percentage of habitations with population 500 or more served by an Upper Primary School/Section	
(i) Within the habitation	29.93
(ii) Within 3 km. of the habitation	84.45
5. Percentage of rural population served by Primary School/Section	
(i) Within the habitation	80.34
(ii) Within 1 km. of the habitation	94.60
6. Percentage of rural population served by Upper Primary School Section	
(i) Within the habitation	36.98
(ii) Within 3 km. of the habitation	85.39

For this purpose, there should be adequate delegation of financial powers from the State Governments to district authorities, from district to block and from block to institutional level. There should be delegation of financial powers and autonomy to institutional heads who will then be able to provide necessary flexibility to financing mechanisms at the actual operational levels.

Activity 4.4

What are the four factors indicative of equity/inequity in educational financing in India?

- Notes:** a) Space is given below for writing your answer.
b) Compare your answer with the one given at the end of the Unit.

4.5 MOBILISATION AND OPTIMUM USE OF RESOURCES

You have seen in sub-section 4.2.2 that about 86% of the total expenditure is being met through funds provided by the Government. Because of the financial constraints, the Government is finding it very difficult to meet the ever growing plan and non-plan expenditure on education. This calls for new workable measures for resource mobilisation and optimum use of resources. A possible set of such measures is as follows:

- i) Measures to raise additional resources for education.
- ii) Measures to reduce Government spending on education.
- iii) Measures to make optimum use of non-monetary resources.

Let us discuss these three measures one by one.

4.5.1 Measures to raise additional resources

We shall describe below three important measures for raising additional resources.

- i) First, educational economists suggest that the Government should levy tax on private firms which employ human capital who are educated and trained at public cost. The tax should be worked out on the basis of the total volume of human capital employed by a firm and the rate of interest required to be paid on that capital. This proposal is based on the theory that whereas employees are educated and trained at public cost, its benefits are reaped by private firms/institutions. This is, however, not so in the case of public sector undertakings. Based on the aforesaid logic are the proposals to levy tax on self-employment persons and professionals migrating to foreign countries on private employment. The value of the tax levied is to be calculated on the basis of the public investment made on them.
- ii) Secondly, it is suggested that additional resources for financing education, especially the higher education, may be generated by upward revision of the fee structure. Items of fee income include admission fee, tuition fee, laboratory fee, games and sports fee etc. Though the tuition fee can be raised to a limited extent, fees for other items can be raised to such a level that they meet the entire cost of services provided. While revising the fee structure, the following observation made in the Eighth five Year Plan document should be taken note of :

“.....the fees charged should not be exorbitant and should be supplemented by the provision of scholarships and other financial assistance to SCs/STs and students below the poverty line and loans to other students”.

The fee should not inhibit the students belonging to the weaker sections of the society and the meritorious students from availing themselves of education; otherwise only the rich will have access to it.

- iii) Thirdly, additional resources for education can be raised by strengthening local bodies through devolution of more powers by the State Governments. Strong local bodies can mobilise financial resources by levying taxes such as educational cess. They can also mobilise community resources—financial and non-monetary—in a much better way than the State Governments. By strengthening these bodies, quantitative targets can be met as well as qualitative improvements can be effected in respect of at least the primary education.

4.5.2 Measures to reduce government spending on education

Among the measures that we may consider to reduce Governmental spending on education are the following.

i) Privatisation of education

The Eighth Five Year Plan had mooted the proposal of involvement of voluntary agencies and private sector participation in the opening and conduct of higher education institutions with a view to make them self-financing. Though plausibly

sound, this proposal required to be examined in depth from various angles. The teachers' bodies had a general feeling that privatisation would adversely affect the teacher, and their service conditions. Moreover, they doubted the ability of private organisations to fulfil the socio-economic objectives of providing education. However, in case of primary, elementary, and adult education, the Government could involve students, voluntary organisations, co-operatives and industries for supplementing its efforts. These agencies considerably reduce the financial burden on the Government. While privatisation is a reality at all levels of education in India, the most favoured policy has been the mechanism of public-private participation (PPP).

ii) Raising institutional resources

If each educational institute raises its own resources, it will reduce its dependence on the Government for funds. The institutions can raise resources on their own in several ways.

- a) *By making efforts to revive the traditional sources of finances, i.e., endowments and donations:* The primary and upper primary schools can raise immense financial resources for meeting non-recurring expenditure through community participation. Apart from it, they can also raise human and physical resources. For the higher education, private contributions can be encouraged by giving tax rebates to the donors.
- b) *By starting such courses for which students are prepared to bear the entire cost:* Courses of vocational and technical nature, which enable the learners to acquire new skills or those which enable them to update their skills, are helpful in the generation of institutional resources. Since such sources enhance the productive capacity of the learners, they do not mind bearing the expenses incurred in the process. Educational institutions should plan for such courses and implement the plans. Incidentally, this effort will result in socially relevant courses which we require badly at this stage of our development.
- c) *By providing consultancy services at a price:* Some institutions can build their resources; for example, the technical institutes in higher education can provide consultancy services to industries on reasonable consultancy fees.
- d) *By allowing outside agencies/bodies to make use of infrastructure facilities of the institutions at a price:* Educational institutions can raise additional resources by allowing individuals or organisations to make use of their infrastructural facilities at a price during holidays and vacations. For example, an institution may charge for the use of its building for holding Personal Contact Programme of an Open University or a Correspondence Course Institute or for conducting examinations by the UPSC, Banking Services Board, etc.
- e) *By organising fetes, film show, etc.,* the educational institutes can raise funds for financing education.

iii) Adoption of cost-effective innovations/methods

Cost-effective innovations/methods can reduce the financial burden on the Government. As the open learning system comprising Open Universities, Distance Education Institutions, and Open Schools can provide education at a much lower cost

per unit than the institutions of the formal system of education, this innovative system needs to be expanded to meet the ever increasing demand for education.

There is a need to experiment with and adopt such innovations/methods that may reduce the time of learning. One such method is Improved Pace and Content of Learning (IPCL). It is capable of reducing the duration of learning from 500 hours to 200 hours. In view of the fact that such methods save resources, they should be experimented with and adopted by other systems too.

4.5.3 Measures for optimising the use of non-monetary resources

By making optimum use of non-monetary resources, it is possible to contain and even decrease the ever rising demand for additional financial resources for education. Some of the suggested ways for bringing this about are as follows.

- i) The infrastructural facilities of educational institutions may be put to multiple use through double or triple shift system. The morning and the day shifts may be devoted to the provision of formal education to students (both girls and boys), and the evening shift for providing part-time courses or non-formal education to adult learners. Similarly, the institutional library may be used for providing service not only to the regular students but also to part-time and non-formal education students. It may also provide services to the community. Through such practise, the non-recurring cost per student can be brought down.
- ii) By making use of the innovative techniques of institutional planning and management, the existing resources can be used optimally. This can considerably reduce the recurring and non-recurring expenditure per student.
- iii) By raising the student teacher ratio, it is possible to bring down the recurring expenditure on education. According to the *Fifth All India Educational Survey* (1992), the overall student-teacher ratio for the upper primary stage, the secondary stage and the higher secondary stage were 29, 21 and 15 respectively. There is thus a lot of scope for rising teacher-pupil ratio, with proper training for teacher in the techniques of handling larger classes.

Activity 4.5

State the measures that can be used for:

- i) raising additional resources for education; and
- ii) reducing the government spending on education.

Use 100 words for writing your answer for each question.

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

ii)

4.6 LET US SUM UP

In this Unit, you studied about the generation and utilisation of both human and non-human resources for education based on India as a case. Relatively we gave more space to the themes of the generation and the mobilisation of financial resources, including the process of educational finance in India. You could compare this case with the situation as obtains in any other developing country.

Within the educational system, both the teaching and non-teaching staff are required. The generation of teaching personnel depends upon the quantity and quality of teachers teaching at different levels, more specifically in the professional institutes. The increasing demand for teachers can be met through various ways: teachers can be asked to teach larger classes; print and audio-visual materials may be used to substitute teacher functions whenever possible; and the community resource may be mobilised and utilised for this purpose.

The non-human resources can be divided into two categories: physical and financial resources. In case of physical resources for education, the community can be involved in generating and mobilising such resources of capital as well as consumable nature.

The financial resources depend upon both the human and physical resources for further utilisation, and comprise both income and expenditure. In India, there are varied sources of income for meeting educational expenditure: government, local bodies, university funds, fees, endowments and other sources. While in absolute terms the financial contribution has been increasing, in relative terms there is marked increase in the contribution made by both the Central and State governments, and a decrease in contribution from the local bodies, fees, private endowments and other sources. The rise in the contribution from the governments is due to: increase in the social demand for education, policy of developmental planning, and increase subsidies for education.

So far as expenditure is concerned, salaries and allowances of the teaching and non-teaching staff consume a very high percentage of the recurring expenditure, while in case of non-recurring expenditure buildings take away a sizeable portion. You have seen that in case of expenditure on education in Five Year Plans, the expenditure in the First Plan was the highest (i.e., 7.80%), which was reduced to 2.59% in the Sixth Plan after which an increasing trend was noticed. The proposed outlay for education in the Eighth Plan stands at 2.46% of the total plan outlay. Among other things a disheartening feature of the expenditure over the years is the increase in the non-plan expenditure, i.e., from 2.5 times higher than the plan expenditure in the First Plan it increased five times in the Sixth plan.

Both the central and state governments play significant roles in financing the education sector. The Central Government meets the plan and non-plan expenditure of institutions under its control and provides grants-in-aid for centrally sponsored schemes. Each State Government finances education at all levels except those noted for the Central Government. Transfer of resources from the centre to the state governments is made through both the Finance Commission and the Planning Commission. The two mechanisms of 'tax sharing' and 'grants-in-aid of revenue' are followed to share resources through the Finance Commission. The Planning Commission, on the other hand, gives approval to the plans of the state governments and the approved plans are included in the Five Year Plan. During the implementation of the Five Year Plan, the Planning Commission provides grants-in-aid to the states for the approved plans.

You have also read that additional resources can be generated by the government levying taxes on the private firms, and increasing the fees for various courses at the higher education stage. Besides, the government spending on education can be reduced by measures, such as privatisation of education, raising institutional resources, and adoption of cost effective methods.

4.7 MODEL ANSWERS TO ACTIVITIES

Activity 4.1:

In India, there is a shortage of school teachers, especially for science subjects. With increasing student enrolment the demand for teachers would increase. In this situation, the community as a whole can be involved to undertake this task. For instance, retired government servants, educated housewives, etc. can be involved to teach students on voluntary basis. Moreover, voluntary organisations can be involved to help in this task.

So far as the efficiency of the teachers is concerned this can be increased by the use of print and non-print media (like audio, video, etc.) in the classroom. And this strategy would also partially solve the problem of the short supply of trained teachers.

Activity 4.2:

- i) Non-human resources may be classified into two types: **physical** and **financial** resources. The physical resources include “capital items” like buildings of an educational institution (i.e., classrooms, computer room, laboratories, libraries, hostel buildings, etc.); “movable capital items” like books, furniture, technological educational gadgets, etc; “permanent capital institutions,” and “consumable items”. The financial resources include both income from sources like the government, local student fees, endowments, etc., and expenditure (recurring and non-recurring, and plan and non-plan expenditure).
- ii) Table 1 suggests that for the year 1983-84 the total recurring expenditure was much higher than the total non-recurring expenditure. Within the category of recurring expenditure the head ‘salary of academic staff’ had taken away the major chunk expenses (i.e., 75.20%) followed by the salary of non-academic staff (10.90%). On the other hand, within the non-recurring head, the construction of buildings had the highest share of all i.e., 43%).

In Table 3 we notice a feature that has persisted in the expenditure from 1950-51 to 1980-81; it is that the non-plan expenditure was higher than the plan expenditure all along. Not only that, the percentage share of non-plan expenditure also showed an increasing trend, i.e., from 72 in 1950-51 to 86 in 1980-81.

Activity 4.3:

The Planning Commission, after assessing the progress made in different fields in the State and the requirement of further resources, formulates plans for each State. The States also submit their respective plans to the Planning Commission which approves them after discussions and adjustments. These Plans put together constitute the Five Years Plan(s). Till the Third Five Year Plan and the subsequent Annual Plans, the Planning Commission had considerable discretion in the allocation of financial resources to States. But after implementing the revised Gadgil formula, first the central assistance is provided to the special category State (i.e., 30% of the total assistance). From the remaining resources, 60% is allocated on the basis of total population of a State 20% to states in which per capita income is below the national level, 5% to those States which are much distant from the per capita income of the richest State, and 7.50% on the basis of the performance of the States.

Activity 4.4:

Equity/inequity in educational finance in India can be indicated based on the following four factors:

- i) The availability of educational facilities in terms of levels and types of educational institutions, rural-urban disparities, and proximity of educational institutional facilities to the students.
- ii) The availability of educational facilities, viz., school buildings, teachers, equipment, books, scholarships and stipends, etc., that vary from place to place, and from institution to institution.
- iii) The efficiency with which the facilities noted in (ii) above are utilised. Educational wastage in terms of repetition and dropout are indicative of the efficiency or otherwise in utilisation.
- iv) The outcome of the utilisation of such facilities measured in terms of the pass percentage and the ability of the students to apply gained knowledge and skills in the immediate environment.

Activity 4.5:

- i) Additional resources for education can be raised by : levying tax on private firms, upward revision of the fee structure, and giving more powers to and strengthening the local bodies.
- ii) The spending by the government (both central and state) on education can be reduced by: privatising education, raising resources within the institution, and adopting cost-effective innovations and methods of teaching students.