Economics of Adult Education, Community Development and Social Welfare

ADE 302

University of Ibadan Distance Learning Centre
Open and Distance Learning Course Series Development
Vice-Chancellor’s Message

The Distance Learning Centre is building on a solid tradition of over two decades of service in the provision of External Studies Programme and now Distance Learning Education in Nigeria and beyond. The Distance Learning mode to which we are committed is providing access to many deserving Nigerians in having access to higher education especially those who by the nature of their engagement do not have the luxury of full time education. Recently, it is contributing in no small measure to providing places for teeming Nigerian youths who for one reason or the other could not get admission into the conventional universities.

These course materials have been written by writers specially trained in ODL course delivery. The writers have made great efforts to provide up to date information, knowledge and skills in the different disciplines and ensure that the materials are user-friendly.

In addition to provision of course materials in print and e-format, a lot of Information Technology input has also gone into the deployment of course materials. Most of them can be downloaded from the DLC website and are available in audio format which you can also download into your mobile phones, IPod, MP3 among other devices to allow you listen to the audio study sessions. Some of the study session materials have been scripted and are being broadcast on the university’s Diamond Radio FM 101.1, while others have been delivered and captured in audio-visual format in a classroom environment for use by our students. Detailed information on availability and access is available on the website. We will continue in our efforts to provide and review course materials for our courses.

However, for you to take advantage of these formats, you will need to improve on your I.T. skills and develop requisite distance learning Culture. It is well known that, for efficient and effective provision of Distance learning education, availability of appropriate and relevant course materials is a *sine qua non*. So also, is the availability of multiple platform for the convenience of our students. It is in fulfilment of this, that series of course materials are being written to enable our students study at their own pace and convenience.

It is our hope that you will put these course materials to the best use.

Prof. Abel Idowu Olayinka
Vice-Chancellor
Foreword

As part of its vision of providing education for “Liberty and Development” for Nigerians and the International Community, the University of Ibadan, Distance Learning Centre has recently embarked on a vigorous repositioning agenda which aimed at embracing a holistic and all encompassing approach to the delivery of its Open Distance Learning (ODL) programmes. Thus we are committed to global best practices in distance learning provision. Apart from providing an efficient administrative and academic support for our students, we are committed to providing educational resource materials for the use of our students. We are convinced that, without an up-to-date, learner-friendly and distance learning compliant course materials, there cannot be any basis to lay claim to being a provider of distance learning education. Indeed, availability of appropriate course materials in multiple formats is the hub of any distance learning provision worldwide.

In view of the above, we are vigorously pursuing as a matter of priority, the provision of credible, learner-friendly and interactive course materials for all our courses. We commissioned the authoring of, and review of course materials to teams of experts and their outputs were subjected to rigorous peer review to ensure standard. The approach not only emphasizes cognitive knowledge, but also skills and humane values which are at the core of education, even in an ICT age.

The development of the materials which is on-going also had input from experienced editors and illustrators who have ensured that they are accurate, current and learner-friendly. They are specially written with distance learners in mind. This is very important because, distance learning involves non-residential students who can often feel isolated from the community of learners.

It is important to note that, for a distance learner to excel there is the need to source and read relevant materials apart from this course material. Therefore, adequate supplementary reading materials as well as other information sources are suggested in the course materials.

Apart from the responsibility for you to read this course material with others, you are also advised to seek assistance from your course facilitators especially academic advisors during your study even before the interactive session which is by design for revision. Your academic advisors will assist you using convenient technology including Google Hang Out, You Tube, Talk Fusion, etc. but you have to take advantage of these. It is also going to be of immense advantage if you complete assignments as at when due so as to have necessary feedbacks as a guide.

The implication of the above is that, a distance learner has a responsibility to develop requisite distance learning culture which includes diligent and disciplined self-study, seeking available administrative and academic support and acquisition of basic information technology skills. This is why you are encouraged to develop your computer skills by availing yourself the opportunity of training that the Centre’s provide and put these into use.
In conclusion, it is envisaged that the course materials would also be useful for the regular students of tertiary institutions in Nigeria who are faced with a dearth of high quality textbooks. We are therefore, delighted to present these titles to both our distance learning students and the university’s regular students. We are confident that the materials will be an invaluable resource to all.

We would like to thank all our authors, reviewers and production staff for the high quality of work.

Best wishes.

Professor BayoOkunade
Director
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<thead>
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<th>Name</th>
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### References
About this

Economics of Adult Education, Community Development and Social Welfare ADE 302 has been produced by University of Ibadan Distance Learning Centre. All s produced by University of Ibadan Distance Learning Centre are structured in the same way, as outlined below.

How this is structured
The course overview

The course overview gives you a general introduction to the course. Information contained in the course overview will help you determine:

- If the course is suitable for you.
- What you will already need to know.
- What you can expect from the course.
- How much time you will need to invest to complete the course.

The overview also provides guidance on:

- Study skills.
- Where to get help.
- Course assignments and assessments.
- Margin icons.

We strongly recommend that you read the overview carefully before starting your study.
The course content

The course is broken down into Study Sessions. Each Study Session comprises:

- An introduction to the Study Session content.
- Study Session outcomes.
- Core content of the Study Session with a variety of learning activities.
- A Study Session summary.
- Assignments and/or assessments, as applicable.
- Bibliography

Your comments

After completing Economics of Adult Education, Community Development and Social Welfare we would appreciate it if you would take a few moments to give us your feedback on any aspect of this course. Your feedback might include comments on:

- Course content and structure.
- Course reading materials and resources.
- Course assignments.
- Course assessments.
- Course duration.
- Course support (assigned tutors, technical help, etc.)

Your constructive feedback will help us to improve and enhance this course.
Welcome to Economics of Adult Education, Community Development and Social Welfare ADE 302

Education as a way of increasing human capital is considered to be a basic factor in the growth process of any community. The returns to investment into human capital are thus an important issue to understand. This course – ADE302 - provides an indispensable framework for analyzing the relationship between education and economy. In our course of study, we will develop a range of skills for constructively analysing the effectiveness and outcomes of adult educational programmes and policies.

Course Outcomes

Upon completion of Economics of Adult Education, Community Development and Social Welfare ADE 302, you will be able to:

- *apply* economic theories to explain how individuals, societies and government make education choices;
- *analyse* the linkages of the education system with the labour market;
- *apply* economic theories to explain and predict adult education markets and their inefficiencies;
- *discuss* the contribution of education and training to economic and social development;
- *evaluate* the outcomes of adult educational programmes.
Getting around this

**Margin icons**

While working through this you will notice the frequent use of margin icons. These icons serve to “signpost” a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this.

A complete icon set is shown below. We suggest that you familiarize yourself with the icons and their meaning before starting your study.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Assessment</th>
<th>Assignment</th>
<th>Case study</th>
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Study Session 1

Conceptualization of Economics of Education

Introduction

Having an understanding of the meaning of “economics of education” begins with comprehending the key concepts that constitute the term. Therefore, in this Study Session, we shall be looking at the terms: economics and education. We will also capture the nexus between these two terms. We will cap this session by exploring the scope and provide justifications for studying economics of education.

Learning Outcomes

When you have studied this session, you should be able to:

1.1 define and use correctly the following terms in bold:

- economics
- education
- economics of education

1.2 Highlight the scope of economics of education

1.3 Provide reasons for studying economics of education.

Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>The process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits.</td>
</tr>
<tr>
<td>Economics</td>
<td>The study of individuals and societies use scarce resources to satisfy infinite human needs.</td>
</tr>
<tr>
<td>Economics of Education</td>
<td>The study of how stakeholders in education make choices within scarce resources in a bid to achieve best educational</td>
</tr>
</tbody>
</table>
1.1 Conceptualization of Economics of Education

1.1.1 Meaning of Education

You must have been wondering by now what economics of education is. To get a firm grip on this subject matter, let us attempt to separate these two concepts. Let us start with education. Education is the aggregate of all the processes by which a child or young adult develops the abilities, attitudes and other forms of behaviour which are of positive value to the society in which he lives (Fafunwa, 1974). Ogbonnaya (2000) defined education as the process through which the physical, intellectual, social, emotional and moral abilities of an individual are developed to enable him contribute positively to the development of his society.

From these definitions of education, you will discover that education is supposed to develop in the recipients, the skills and abilities that will enable them to make a successful living within a particular society.

That is why many countries are reforming their education systems to provide their citizens with knowledge and skills. This will enable them to engage actively in democratic societies and dynamic knowledge-based economies (OECD, 2000; Riley, 2004).

The fundamental criteria for the society is that, everyone has to get sufficient knowledge and skills in literacy, numeracy and information and communication technologies (ICTs) for growth and development of our society even to be self-directed and competence.

From the points that everybody must be knowledgeable and skilful, adult education programmes will be helpful to reduce the rate of illiteracy in the country.

1.1.2 Meaning of Economics

Now let us consider the meaning of economics. Economics is concerned with how individuals and societies use scarce resources to satisfy infinite
Economics
The study of individuals and societies use scarce resources to satisfy infinite human needs. It is interested with the wealth of Nations, a phrase which gave the title to the classic work of Smith (1776). It looks for the causes of economics growth and tries to design policies that promote prosperity, increase efficiency and reduce unwanted fluctuations in economics activities. According to Blaug (2007), he explained that economics as a branch of social science that deals with the production, distribution and consumption of goods and services and their management. The nature of economics is such a herculean task such that no one solution fit-all exist anywhere. Now that you have understood the terms Education and Economics, let see the concept of economic of education. Eneasator (1996) has recognized that rather preponderance nature in the definition of the term, economics, has summarized it as essentially dealing with the following areas such as:

i. Production of wealth, goods and services.
ii. Income distribution, involving devising equitable means to ensure fairness and equity in then distribution.
iii. Allocation of scarce resources, using appropriate criteria.
iv. Human capital utilization, to take care of the problems of unemployment, under-employment and productivity.
v. Economic growth and development.
vi. Planning, financing and costing of plans to ensure effective and efficient use of resources.

1.1.3 Concept of Economics of Education
Let us attempt to marry these two concepts; education and economics. Despite the enormous interest in the relationship between Education and Economics, the evidence is fragile in conceptualize the two words. It is through the economics of education that the quest for development is related to the level of literacy in any nation. The underdeveloped countries are in a state of revolt against ignorance, poverty, disease and dominance by stronger nations. The advanced countries too are committed to development, and their aspirations are no longer limited to this planet, but are extended as well to the exploration of outer space and other planets (Harbison, 1965). There exist varying viewpoints aimed at
explaining the concept of Economics of Education. Now let us consider some of these viewpoints:

i. A state's education investments are non-random, that is, the level of education is vary from state to state. States that are richer, faster growing, or with better institutions probably find it easier to increase their education spending in order to develop their economy of the country. Thus, there is a distinct possibility that correlations between education investments and economics are due to reverse causality (Bils & Klenow, 2000).

ii. Also, owing to the poor availability of direct on education investments, researchers are often forced to use crude proxies, such as average years of educational attainment in a state. Average years of education are outcome that people chose, given their state's investments in education. It depends on returns to education and is, thus, far more prone to endogeneity than is the investment policy. Furthermore, because the average year of education counts an extra year of primary school, just the same as a year in a doctoral program, average years of education cannot inform us much about the mechanisms that link education investments to growth. If we do not know where the education investment is taking place, we cannot rule in or rule out mechanisms.

iii. Thirdly, the role of education in the process of economic development is usually assessed by relating the resource cost of inputs invested in human capital formation and the corresponding increments in the economic productivity.
In a more specific sense, Nwadiani (2000) has defined it as “the study and practice of resources generation, allocation and utilization”, and their relationship with education and the general economy of the society. With this definition, one would be able to recognize three critical factors, namely, the concern for the generation, allocation and utilization of available resources in education, the symbiotic relationship between education and the economy and the influence of the economy on education.

Figure 1.1 Economics of Education

Having listened and read some definitions about the word ‘education’, what do you expect to see in the life of an educated fellow?

Feedback

I can hear you say so many things. Yea, you right. But let me say here that, the level of education one received always reflects in his/her culture, countenance, disposition, manner, value system, experience and his/her relationship with other to mention but few.
1.2 The Scope of Economics of Education

Now, we are going to consider the scope of economics of education. The scope of economics of education has been generally accepted to include the generation, allocation and utilization of resources for education through the creation of human capital resource. According Blaug (1972) who pointed out that economics of education is only part of the story of any educational issue, implying that its contents should be drawn from various related areas, including other branches of education and economics. Furthermore, Nwadiani (2000) specified the following areas as a scope of economics of education:

i. Demand and supply of education;
ii. Educational demography;
iii. Educational finance: their sources and distribution;
iv. Taxation for Education;
v. Costing;
vi. Cost-Benefit of investments in education;
vii. Cost-qualify relation;
viii. Wastage in education;
ix. Productivity in education;
x. Educational manpower development;
xii. Migration of school leavers and labour market;

xii. National economic growth and development;

xiii. Rural and urban economics and the consequences of schooling on the economy.

Concisely, you will understand that the scope of economics of education embraces all aspect of economics that describe, explain and justify investments in education. It therefore contains all the various economic considerations, which bear on education setting.
1.2.1 Critical Issues in Economics of Education

In treating economics of education, we must discuss some issues. Many of these issues are attributable to learning of economics of education from the students, society, government, organisations and the facilitators. Some of these critical issues are discussed below using questions raised by the meaning of economics of education, particularly towards growth and development of nation economy. These include:

i. In an economy, what should be the size of the investment in education, vis-à-vis the investment in other sectors?

ii. Is education an investment good or a consumer good or both?

iii. If education is an investment good, how much should be the returns from education, as compared to the returns from investment in other forms of human capital formation and different type of physical projects?

iv. If education is a consumer good, how much should be the choice of consumer to purchase education?

v. What is the optimal investment pattern between formal education and different types of informal learning such as on-the-job training, off-the job training, learning by doing and literacy programmes?

vi. How can the government make a choice between improvement in the quality of enrolment and expansion in the educational facilities to meet the demand of the less privileged social classes and the children coming from backward areas?

vii. In the context of national economy, what is the role of the central, state and local governments, voluntary organisations, philanthropic trusts, etc. in the financing of education?
viii. What should be the criteria of central assistance of state governments and for grants given by the state governments to different types of educational institutions?

ix. How can the “surplus and shortage” existing in the labour market for educated manpower be corrected?

**Internal efficiency**

The ratio of output to input

Some of these aforementioned issues are the challenges confronting the study economics of education and adequate solution or answers should be provided by due authorities. Furthermore, how can the internal efficiency of the educational system be increased by minimising the economic wastage of resources on account of drop-out and repeater in the educational process, the quality of teachers, and the functional illiteracy of primary school leavers, low attendance rates, outdates teaching techniques, irrelevant curricula, poor supervision and administration (UNESCO, 1965). While other issues, which fall within the purview of economics of education, include the problems of unsatisfied demand or education at all levels, the imbalances and maladjustments within the educational system, the relevance of adult education to national development and the problem of equal access to education at all levels.

**ITQ**

**Question**

What makes up the scope of economics of education?

**Feedback**

Yes, I expect that your response pointed out that the scope of economics of education includes the generation, allocation and utilization of resources for education, and also utilization of education products.
1.3 Justification of Economics of Education

Have you been wondering why economics of education is necessary? Why are you engaging with this material? The answer is simple. The imbalance in the output of education, which result to the unstable economy growth of the Nation yielding some factors on individuals. Such as factors includes:

1. increment in the cost of education and the unstable pressure in available resources, make it necessary to introduce economics into education, so that individual can be able to acquire specific knowledge and skill to be creative and innovative in nature.

2. high level of unemployment among graduate in the face of selective manpower shortages in some other sectors of the economy. It therefore appears that, there is a mismatch between the type of education provided and the type needed by the economy, therefore, economics techniques needed.

3. the problem of quality of education provided in schools. The overall performance of students in school effect on the economic productivity of the country calls for some economic intervention.

4. education is one of the sectors of the economy growth, since, each sector partly depends on others for survival, economics of education will ensure that education is properly linked to other sectorsthe increasing politicization of education has resulted in uncoordinated expansion of the educational system.

The determinants of the direction of education, allocation of resources, control, content and learning environment have become purely political, and therefore calls for serious economic concern…(Nwadiani, 1992)
**ITQ**

**Question**

True/false? The application of economic theory into the field of education has little or no significant effect.

**Feedback**

If you have considered the above statement as true, then you are wrong. Application of economic theory into the field of education helps to provide facts (about the education system) that inform decision-making that tend to affect the generality of the economy as a whole.

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**Study Session Summary**

In this Study Session, you have learnt the the meaning of education, economics and to the concept of economics of education. It also identified scope, critical issues and justification within the education industry and the rest of the country that necessitate the study of economics of education.

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**Assessment**

**SAQ 1.1 (tests Learning Outcome 1.1)**

Carefully study the table below and fill the empty columns appropriately from the options below:

A) Education  B) Economics of Education  C) Economics

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td></td>
<td></td>
<td>Asocial science that deals with the production, distribution, and consumption of goods and services and their management.</td>
</tr>
<tr>
<td>II</td>
<td></td>
<td></td>
<td>The transfer of skill, knowledge, attitude</td>
</tr>
</tbody>
</table>
and societal values from one generation to another.

III

Application of economic theory, principles and laws to the field of education.

SAQ 1.2 (tests Learning Outcome 1.2)
Highlight any ten scope of economics of education

SAQ 1.3 (tests Learning Outcome 1.3)
What is the relevance of the study of economics of education to an adult educator, community development, change agent and the social worker? Justify

Bibliography

Fafunwa, A. B. History of Education in Nigeria London: George Allen and Unwin


Study Session 2

Education, Economic Growth, and National Development

Introduction

In this Study Session, we shall be looking at the issue of education, economic growth and national development. We will look at the two concepts; education and economic growth, contribution of economic growth to education and education and national development.

Learning Outcomes

When you have studied this session, you should be able to:

2.1 Establish the interrelationship that exist between education and economy.

Terminology

<table>
<thead>
<tr>
<th>Education</th>
<th>Impartation or acquisition of knowledge, skills and attitudes, which enables one to contribute to the environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>An increase in the amount of goods and services produced per head of the population over a period of time.</td>
</tr>
<tr>
<td>Economic Development</td>
<td>A sustained increase in the national output of a country over a considerable period of time.</td>
</tr>
</tbody>
</table>
2.1 Interrelationship of Economy and Education

In the last study session, we discussed the relationship between education and economics. In this session, however, we shall focus on the impact of education on the economy as a whole. There exist a symbiotic relationship between education and the economy. This means that education and economy are mutually dependent. One of such dependence leads to economic growth.

2.1.1 Education and Economic Growth

Have you really asked yourself if education actually influence economic growth? What do you think? There is empirical, observation, ample anecdotal and correlational evidence suggesting that education and economic growth are related, but the evidence points in a variety of directions. Blaug (1972), in his early works on economics of education pointed out that the relationship between education and the economy lies on the effect of literacy on the development of the economy. Encastrator (1996), pointed out that literacy may contribute to the development of the economy by:

- Raising the productivity of literates;
- Raising the general productivity of individuals; through working in association with the literates. This is demonstrated in the so-called spill-over effects of literacy;
- Reducing the cost of disseminating information to individuals (for example about health and nutrition);
- Stimulating the demand for a particular type of education (for example, vocational and technical education), which may be more relevant to the economy;
- Strengthening economic incentive that is the tendency of people to respond positively to a rise in the rate of reward of their efforts.

It is in realization of the above effects and relationships of education with the economy, that many national governments have launched
programmes on mass literacy in aiming for nation growth most especially for economics’ growth. In Nigeria, for example, the government had launched in 1976, the Universal Primary Education Programme, as a way of promoting mass literacy. It had also supported this programme with adult literacy and nomadic education programmes. Of recent, the Universal Basic Education (UBE) has been launched as a means of universalizing access to education. It is hoped that with these programmes, the entire populace will acquire basic literacy, which will help them to contribute meaningfully to the overall economy of the country.

Complete the following activity below

A) As you have discussed above, can you list at least three areas where education affects the economy of your nation.

B) Name any three national programmes of education in Nigeria.

Feedback

A. Irrespective of the areas you might have identified, a nation cannot grow beyond it level of educational progress. This implies that education is the nucleus of a country’s economic growth and development.

B. The recently launched national educational programmes in Nigeria include:

- Universal Free Primary Education (UPE)
- State Primary Education Board (SPEB)
- Universal Basic Education (UBE)

2.1.2 Contributions of Economic Growth to Education

Do you think economic growth can contribute to education advancement? Clearly, the education to economic growth relationship is not so simple that one can compute average years of education in a state and confidently predict economy growth of such state.
Education is a capital-intensive business that is; money is needed to finance it.

In order to achieve this, a number of models for financing education have been proposed. Some of them include:

- Complete private sector involvement, incorporating individuals, corporate bodies and organizations;
- Joint partnership financing, involving both the government and private sector;
- Sole-government financing.

In Nigeria, a variety of these models has been tried. The early education enterprise, for example, was dominated by private sector involvement. But at the moment, the joint-partnership model is being adopted, because there is the practical realization that no single economic sector can finance education alone. The Federal Government, in its National Policy on Education, recognizes education as an expensive social service, requiring adequate financial provision from the Federal, State and Local Governments, as well as the Local Communities, individuals and organizations (FRN1998). Other economic-related models have been developed and used in other areas of education. For example, the Parnes-Tinbergen model of manpower planning is based on how education is related to the rest of the economy. This model project future manpower demands, given certain levels of national income. On the other hand, the Schultz-Dennison model, inspired by the investment theory of economics, used the concept of human capital formation to justify investment in education.

| Economic-related models of education include; the Parnes-Tinbergen model of manpower planning, which is based on how education is related to the rest of the economy and the Schultz-Dennison model, which use the concept of human capital formation to justify investment in education. |

In all the various educational models, whether they relate to financing of education, manpower development, teacher demand and supply, rate of returns to education, and so on, it should be noted that these models have their roots in economics, and therefore have their influence on the economy (OECD 1973).
Another area of inter-dependence between economy and education is in the area of employment. The system of education and nature of economy determines the profitability of employment. Thus, where the educational system produces the right manpower for the economy, the profitability of employment will be relatively high, because there will be no cases of unemployment or under-employment. Indeed, the educational system and the level of economy combine to determine employment prospects.

2.1.3 Education contribution to National Development

Have you asked yourself if education can contribute to National development? From the point of view, education play a significant roles towards the national development, hence there are nine major components of a satisfactory index levels of living that have been identified by the United nations Statistical Commission which are directly related to education and its effect on National Development.

These components include:

i. Health;
ii. Food consumption and nutrition;
iii. Formal and informal education
iv. Employment and working conditions
v. Housing
vi. Social security
vii. Clothing
viii. Recreation and
viii. Human factors

The diagram below shows that the economy will make available resources i.e. human, financial and material to the education sector. These resources will be utilized by the education sector to provide training to the students who will
after their training be released to the economy to work in the various ministries, factories, schools and other establishments. Diagrammatically, the flow of education to the national development i.e. linkage between the two;


**ITQ**

**Question**

How will you explain the meaning of this expression:

“the criterion for investment in education is basically economic”?

**Feedback**

Of course, this statement implies that people invest in education because of economic and material gains.

**Study Session Summary**

In this Study Session, you have learnt the relationship between education, economic growth, and economic development. In addition, we have been able to establish how education contribute to the economic growth and national development generally. The relationship between education and developments are established through education and national economy linkage. This linkage was demonstrated diagrammatically in the Study Session.
Assessment

SAQ 2.1 (tests Learning Outcome 2.1)
Identify at least three areas where education affects the Nigerian economy.

Bibliography


Study Session 3

Education and Human Capital Development

Introduction

The importance of human resources as an aspect of economics of education cannot be overemphasized in adult education, community development and social welfare. Thus, this Study Session is designed to examine the concept of human capital (resource), problems of human capital development and how to provide adequate solution to the problems of human capital development.

Learning Outcomes

When you have studied this session, you should be able to:

3.1 Explain the term 'human Capital'.

3.2 Mention problems of Human Capital Development.

3.3 Discuss solution to the Problems of human capital development.

Terminology

<table>
<thead>
<tr>
<th>Factors of production</th>
<th>This represents land, labor, capital, and entrepreneurship.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human capital</td>
<td>The skills, knowledge, and experience possessed by an individual or population, viewed in terms of their value or cost to an organization or country.</td>
</tr>
</tbody>
</table>
3.1 Meaning of Human Capital

When you hear human capital, what comes to your mind? You must have thought about money but then humans. Maybe you might be right but let us discuss it. The term, human capital has come to be generally accepted by economists and educational scholars and researchers as a component of the labour force that influence education, learning and training. It is a significant change from the classical theory concept of labour as a static factor of production. Indeed, for a long time, economists discussed economic progress or stagnation in terms of money, capital goods and natural resources, to the exclusion of the human factor (Okonkwo, 1996). There was the misconception that economic development was a factor of capital inputs only, and that man was only a consumer of economic products. The beginnings of the relatively new interest in the role of human capital dates back to the early 1960's, when Schultz (1961) first put forward the argument that increases in the value of observed total output in relation to increases in existing factors of production could be attributed to investment in human capital. All humans possess some abilities needed in production. According to Ndu (1991), he explained that the stock of abilities can collectively yield a whole stream of services that are needed for yielding income for both the nation and the individual.

Human beings constitute what in economic terms, is seen as capital and in the parlance of the social scientists as a resource.

From the above, you can then now understand that human capital or human resource can be regarded as the human being who is endowed with knowledge, skills, ability and expertise to be used in various ways, to operate the social and economic systems in a given society. It should be recognized that, all the various sectors of the economy require varied human skills and abilities. Thus,
human capital, in the form of educated and skilled personnel is a pre-requisite for the viability of capital projects.

Human capital, in the form of educated and skilled personnel is a pre-requisite for the viability of capital projects. It is not primarily what individuals know or do not know, but more of what are their skills in acquiring, utilizing, diffusing and creating knowledge that are important for economic progress and social change.

Human capital can be understood as a stock of educated and skilled citizens. Knowledge plays a key role in increasing human capital through education process i.e. input to output. Human capital is one of the main drivers of economic competitiveness. Formal education, especially at pre-tertiary levels, has been criticized for outdated conceptions of knowledge. Traditionally the foundation of knowledge has been based on positivist scientific method.

Based on your own understanding, how will you describe the word ‘human capital’?

Feedback
Did I hear you mentioning the skills, knowledge, and experience possessed by an individual or population, viewed in terms of their value or cost to an organization or country? If yes then you are right.

3.2 Problems of Human Capital Development

From experience, you would have discovered that human capital development in Nigeria is faced with many obstacles. Such problems reduces the growth and development of productivity, distribution and manpower. These problems include:

1. The increasing in the rapid rate of population: i.e. when there is increase in the birth rate, increase in immigration,
all these attributed to the problem of human capital development.

2. Rate of unemployment: this is the critical issues that caused problems of human capital development. A country where there is increase in rate of unemployment certainly there would be problems of growth and development to the economy of such country being under developing, developing and developed. According to Harbinson (1974) has even noted that the rate of increase in the labour force, the rate of increase in population growth caused high rate of unemployment. This situation creates problems for the human resource development planner, who should be concerned with what to do with the surplus labour i.e. educational output.

3. Political ideology: the political system of a country will determine how growth and development of such country will be. In some cases, the knowledge, skills and training put in place by the government assist in developing human capital by empower youth and adult.

4. Level of education: education is best tools in measuring and assessing growth and development of a country. It is assumed that education is a major component of human capital. Thus, education status of an individual may not determine the progress of that person, at times; occupation does not necessarily depend on education and qualification of someone, but on such other factors such as: parental status, maturity, natural ability, peer group associate, initiative, social background and the policy of the organization in which he may be employed. Indeed many people with a low level of education do succeed, where ability and skill are not directly acquired through formal education.
5. Inadequate of socio-amenities: in order to develop human capital in a country, there must be appropriate amenities to facilitate one needs mostly electricity, transportation, skill acquisition among others.

6. Lack of incentives: learning, teaching, development requires motivation. For country to reach a peak stage of developed adequate incentives most be provided for an individual in different fields of work.

**ITQ**

**Question**

Why do people with low level of education are sometimes found to be more productive than their counterparts with higher level of education?

**Feedback**

We may not know your thought on this, but we all know that productivity is a reflection of skills and knowledge one had acquired overtime. However, acquisition of these skills and knowledge is not restricted to formal education alone, but including informal education.

### 3.3 Solution to the Problems of Human Capital Development

The following possible suggestions are provide in handling outlined problems of human capital development.

From the issue of rapidly increasing in population, control in birth rate and adequate measurement in the control of migration should take place. Thus, human capital development planners must give closer attention to population problems and make suggestions on strategies for population control. The case of high rate of unemployment may be contained by considering ways and means
of absorbing surplus manpower and directing them into productive activities. This may be acquired by diversifying consumption or investments to another means for instance, investing in rural-community development, creating skill acquisition centers, both in urban and rural area, and building modern industries. Following the problem experienced in measuring the actual contribution of human capital to national development, government should by all means providing adequate socio-amenities for useful of manpower. Also, the method involving the estimation of production costs of the labour force, in terms of the returns on the original investment incurred in educating the relevant proportion of the labour force. However, the problem associated with lack of incentives can be better addressed, when human capital development organizers consider and review their plans on how to motivate or influence the allocation of manpower into high-priority activities and occupations so that individual will be able utilize their potential to the contribution of development. Such incentives may include scholarship support for particular kinds of education, removal of barriers inhibiting people to progress in the occupation, and in some cases outright compulsion.

Activity

What do you think are the remedies to the problems of human capital development in Nigeria? Can you suggest any five solutions? Then, list them below

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
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Study Session Summary

In this Study Session, explained the concept of human capital development in relation to educational output. Also, explicit analysis of the problems and solutions to the problems of human capital (resources) development was carried out.

Assessment

SAQ 3.1 (tests Learning Outcome 3.1)
What do you understand by the word ‘human capital’.

SAQ 3.2 (tests Learning Outcome 3.2)
What are the problems confronting human capital development in Nigeria?

SAQ 3.3 (tests Learning Outcome 3.3)
Proffer solutions to the problems of human capital development in Nigeria.

Bibliography


Study Session 4

Manpower Forecasting

Introduction

This Study Session is aimed at introducing you to the concept of manpower forecasting, where our major focus shall be on the procedures/steps in forecasting process, techniques to be adopted in predicting trends pattern of manpower behaviour, and how to calculate using selected techniques the future availability of manpower in education system.

Learning Outcomes

When you have studied this session, you should be able to:

4.1 Define Manpower Forecasting and identify the steps involved in forecasting process
4.2 Identify the various techniques used in forecasting

Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasting</td>
<td>A planning tool that helps management in its attempts to cope with the uncertainty of the future, relying mainly on data from the past and present and analysis of trends.</td>
</tr>
<tr>
<td>Regression</td>
<td>A statistical measure that is used to determine the strength of the relationship between one dependent variable (usually denoted by Y) and a series of other changing variables (known as independent variables).</td>
</tr>
<tr>
<td>Correlation</td>
<td>A measure of linear association or relationship between two or more variables.</td>
</tr>
</tbody>
</table>
4.1 Concept of Manpower Forecasting

You must have watched either NTA network news or CNN where an astrologist will give weather forecast. However, have you ever asked yourself the question, what is forecasting? Forecasting is a process of estimating a future event by casting forward past data. The past data are systematically combined in a predetermined way to obtain the estimate of the future. Prediction is a process of estimating a future event based on subjective considerations other than just past data; these subjective considerations need not be combined in a predetermined way.

In some situations forecast regarding single indicator is sufficient, whereas, in some other situations forecast regarding several indicators is necessary. The number of indicators and the degree of detail required in the forecast depends on the intended use of the forecast.

**Forecast is an estimate of future values of certain specified indicators relating to a decisional/planning situation.**

This is a way of predicting the future by using different strategies or techniques. Adult education, rural development, community development and social welfare programmes are continually expanding for national development in aiming to reduce level of illiteracy in our nation through forecasting. Therefore, to avoid distortion on the part of policy makers and curriculum planners of any programmes in adult education, community development, and social welfare, hence interest should be in what the future of these programmes will look like in terms of human and physical resources, which will be involved. However, if the expansion of these programmes is not well monitored, the available resources that will be used may be difficult to meet the organisers’ needs and aspirations. In other point of view, forecasting is the predictions about a future of adult education, community development and social welfare programmes which have transformed from a mere...
guess work to a more systematic method. This systematic method is referred to as forecasting.

Indeed, forecasting in adult education, community development and social welfare programmes serves as a pointer to the path ways and manner decision making can improve the quality of any programs embarked upon after due consideration of the available resources and what the nation intends to achieve at in the future. However, you aware that decision on what may be done depends on our knowledge of the future programmes under consideration. Though prediction about the future is full of uncertainties, efforts are made to introduce mathematical or sophisticated forecasting techniques into planning of the programmes to be undertaken in order to reduce uncertainties.

There are two basic reasons for the need for forecast in any field of study most especially in Adult Education namely:

1. **Purpose:** Any action devised in the present to take care of some contingency accruing out of a situation or set of conditions in future. These future conditions offer a purpose / target to be achieved, so as to take advantage of or to minimize the impact of (if the foreseen conditions are adverse in nature) for future conditions.

2. **Time:** To prepare, plan, organize and implement resources all requires for its implementation, to implement; and complete the plan; all these need time as a resource. Some situations need very little time, some other situations need several years of time. Therefore, if future forecast is available in advance, appropriate actions can be planned and implemented in time.
4.1.1 Steps in Forecasting Process

The most general steps or procedures in the forecasting process are as follows:

**Identify the need:** this is the first step to take into consideration when one wants to predict the future event or enrolment of adult student. Here, the availability of resources like human capital, infrastructure, facilitators, etc. is very essential.

**Period (Time Horizon) of Forecast:** the time or period of forecasting must be determined

**Forecast Model/techniques:** For this, knowledge of various forecasting models or techniques is required. However, to carry out this, one must consider, how applicable, reliable and what type of data is required before selecting any model.

**Data Collection:** With reference to various indicators identified, data are to be collected from various appropriate sources, which are compatible with the model(s) selected in step(3).

**Prepare forecast:** Apply the model using the data collected and calculate the value of the forecast.

**Evaluate:** The results obtained here must be subjected to evaluation in terms of ‘confidence interval’ – usually all good forecast models have methods of calculating upper value and the lower value within which the given forecast is expected to remain with 146 certain specified level of probability. It can also be evaluated from logical point of view whether the value obtained is logically feasible. It can also be evaluated against some related variable or phenomenon. Thus, it is sometimes advisable that one should try and modify the statistically forecasted’ value based on evaluation.
4.2 Forecasting Models/Techniques

Under this sub-section, you will discuss the models/techniques of forecasting. There are many techniques or models in forecasting depending on the categories of future events to be predicted. The techniques used in Adult Education, Community Development and Social Welfare are:

1. Productivity Measurement Method
2. The employers’ Opinion Techniques
3. Rules of Thumb Techniques
4. The Incremental Labour Output Ratio Techniques
5. The density ratio techniques
6. The international comparison techniques
7. The Parnes-Mediterranean Regional Project techniques
4.2.1 Productivity Measurement Method

The first of this method, which you will discuss, is the productivity method. This approach is closely related to work study method of manpower forecasting. Both seek to determine the amount and effectiveness of the human content of the work involved in any activity. Work-study involves a thorough analysis of the work process and seeks to establish the man-hours needed per unit of output. On the other hand, productivity measurement is generally more concerned with the inverse of this ratio i.e. output per hour. The use of measures of productivity in manpower forecasting seems straightforward enough. Output (measured say by gross tonnage or sales) divided by labour productivity (output per man hour) gives the number of man-hours required to complete the task. In practice, this method is a different and hazardous one. Accurate measures of productivity in the individual organisation are notoriously difficult to obtain even for the current situation, then to the prediction of future.

4.2.2 The Employers’ Opinion Techniques

This method involves asking the employers/facilitators with psychological instrument i.e. questionnaire, to determine how much and what kind of labour (skilled, semi-skilled and unskilled) they expect to employ during the next few years. The employers to be covered may be stipulated by the government or the education authority to cover either the public sector or both sectors of the
economy. In actual sense, this method addresses itself only to those who receive wages or salaries.

**Advantages**

i. It is good for short-term prediction of employment

ii. It helps to determine the percentage of workers in wage or salaries employment

iii. It enables the employers of labour to plan for the manpower needs of different categories of workers

iv. It enables the nation to know how to expand and facilitate education sector as to produce the needed manpower in the future.

v. It helps to determine the quality and quantity of labour force of the nation at a particular time.

**Disadvantages**

i. Instrument administered to the workers, if filled could be guess responses and devalidate the items.

ii. Bureaucracy in the government sector could mar the forecast by lack of information required at the time if available at all

iii. The quality of workers is often difficult to determine or measure as the employers in the private sectors may or may not employ the most qualified workers but those less qualified for profit making

iv. The poor state of economy in the developing nations prevents some employers of labour to under-employ workers.

v. Most employers do not have adequate information or proper records to guide them to forecast their future manpower needs.
4.2.3 Rules of Thumb Techniques

This method developed by Professor F. Harbison. The technique was used in Nigeria in 1960 for the Ashby Commission, which looked into the future of the post-secondary education system in Nigeria. This technique states that ‘the amount of intermediate and senior level of manpower to be required by a country should be related to the expected income growth rate of that country’. He propounded a mathematical formula in forecast future which reads

\[ M = (L_i - R_i - D_i - G_i) \]

Where \( i \) = number of retiring, dying, or migration of workers
\( L_i \) = quality and quantity of educated labour demanded by employer \( i \) in target year \( t \).
\( R_i \) = retirements in employer \( i \)’s establishment in target year \( t \).
\( D_i \) = deaths in employer \( i \)’s establishment in target year \( t \).
\( G_i \) = migration of employees from employer \( i \)’s establishment in target

\( M \) = manpower demanded in target year \( t \).

Advantages

i. It can be used in developed and developing countries
ii. It is good for short-term employment forecasts.
iii. It assist in determine the quality of the labour force at any given time.

Disadvantages

i. It may not be applicable where there is no adequate records or information of the number of people employed
ii. It can lead to underestimation or over-estimation of manpower of a nation
iii. Its applicability could be affected by government decisions on conditions for retirement for workers which may not be consistent
iv. It may be very difficult to determine the rate of the migrant labour in the developing country.

**4.2.4 The Incremental Labour Output Ratio Technique**

This method is based on the labour and output relationship with the belief that an increase in the output will determine the likely increase in labour; however, labour in this technique refers to a particular type of manpower in an occupational category. Also, output on its own refers to the industrial output or the nation income. This technique requires the time series data per man classified by sector, occupation and educational qualifications in determine the increasing the organisation productivity.

**4.2.5 Density Ratio Techniques**

This is also called the ratio of saturation and it is categorised into two forms; namely;

**Sable fractions:** this involve qualified manpower in the labour force of an economic sector of the developing country

**The population forecast:** the total number of labour force distributed amongst the various economic sectors in the country.

**Advantages**

i. It helps to identify different types of manpower required within the organisation

ii. It helps to determine the percentage of the working population of a nation.

iii. It is very good where there is availability of workers’ data.

iv. It is very important for centralized economy.

**Disadvantages**

i. It is yet to be successfully applied in the non-socialist countries

ii. It cannot be used where there is no correct population census
iii. Problems of employment in many countries will lead to poor and incorrect manpower forecast.
iv. It may be difficult to determine a stable fraction of employment for scientific and technological manpower.

4.2.6 The International Comparison Technique
This technique's discovery came from the view that countries without adequate manpower data and information but had similar characteristics with other countries that had such data could use the country's economy characteristics to plan her manpower development. The relevant characteristics include productivity level, where robots are substitutes for human beings, level of motivation of her workers, nature of the economy etc. The countries, whose characteristics are similar usually, will not be at the same level of development and also their different level of development must be determined. This technique involves identification of the lag in productivity levels between the two countries for instance, countries A and B, the situation required in country B, in year X can be likened to that which existed in year Y in country A.

4.2.7 The Parnes-Mediterranean Regional Projects Technique
This technique was formulated by the Organisation for Economic Community and Development (OECD) to produce educational plans for countries in the Mediterranean Region. The director of the project was H.S Parnes, therefore, the method was called by his name, Parnes-MRP method. This method relates to the target Gross National Product (GNP) or Gross Domestic Product (GDP) in some future years of a country with the economic development plan and the supply of educated manpower required to achieve the target GNP or GDP.
This method is broken into four stages
i. The target GNP or GDP in the future year is broken down into major Economic sectors.

ii. The average output co-efficient (ALOC) are applied to the sectoral GNP or GDP targets to drive the estimates of future sectoral employment.

iii. The projected sectoral employment is distributed among a number of mutually exclusive occupational categories

iv. The occupational structure of the labour force is converted into an educational structure by applying a standard measure of the level of education required to perform in each occupation

Using Blaug (1970) formula, this method can be summed up by an occupation-education matrix mathematically stated thus:

\[
(X) \left( \frac{L_j}{L_{jk}} \right) \left( \frac{L_k}{L_{kj}} \right) ;
\]

The matrix of required workers of education in occupation k in industry j.

Where;

\( = \) GNP or GDP of a country
\( X_i = \) GNP or GDP originating in each industry (\( j=1,2,3,4,\ldots,n \))
\( L_j = \) the labour force in each industry
\( L_k = \) the labour force in each occupation (\( k=1,2,3,4,\ldots,m \))
\( L_i = \) the labour force with each level of education (\( i=1,2,3,4,\ldots,t \))

Therefore, \( n,m,t, L_{jki} \leq j=1, k=1, i=1 \)

Allowances are usually made for deaths, retirements and emigration for replacements as well as additions to the stock of educated manpower.

**4.2.8 Eye-Balling Forecasting Techniques**

This method relies solely on the sense of judgment of the adult educational planner or the policy makers. It is sometimes called judgement techniques. This method is adopted under conditions of the failure of any known planning model to project with sufficient
accuracy. However, it is the simplest forecasting techniques in adult education, community development and social welfare programmes.

Let use this techniques as application to adult literacy class enrolment at some centres in Ibadan, Oyo State from 2008/2009 to 2013/2014 as it is shown in table below. This technique involves plotting the enrolment against the stream years.

**Table 4.1: Projection of Adult Literacy Class in Ibadan between 2008/2009 to 2014/2014 academic sessions**

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>645</td>
</tr>
<tr>
<td>2009/2010</td>
<td>509</td>
</tr>
<tr>
<td>2010/2011</td>
<td>465</td>
</tr>
<tr>
<td>2011/2012</td>
<td>411</td>
</tr>
<tr>
<td>2012/2013</td>
<td>370</td>
</tr>
<tr>
<td>2013/2014</td>
<td>323</td>
</tr>
</tbody>
</table>

This is to present in graph before projected

**Fig 4.2: Projection of Adult Literacy Class in Ibadan between 2008/2009 to 2014/2014 academic sessions**
From the graph above, we can project the future of enrolment of literacy class by using compound progression techniques. Though, the enrolment is decreasing from year to year due to the fact that students are now securing regular programmes both adult and young one.

Table 4.2: Adult Literacy Class enrolment projection at Ibadan between 2008/2009 to 2014/2014 using compound progression technique.

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>905</td>
</tr>
<tr>
<td>2009/2010</td>
<td>1120</td>
</tr>
<tr>
<td>2010/2011</td>
<td>1209</td>
</tr>
<tr>
<td>2011/2012</td>
<td>1890</td>
</tr>
<tr>
<td>2012/2013</td>
<td>2397</td>
</tr>
<tr>
<td>2013/2014</td>
<td>2612</td>
</tr>
</tbody>
</table>

Note: this method assumes a constant progression rate.

4.2.9 Trend Exploration Technique

Believe This method provides the opportunities of determining the functional relationship that exist between past growth values and the years. These relate to the long-term persistent movements/tendencies/changes in data like price increases, population growth, and decline in market shares. The existing relationship is then projected to predict the future, however, the relationship in the values for the different years may be expressed in ratios, percentages, proportion and averages. According to Pandt(1980), he concluded that trend exploration techniques can be fitted to mathematical equation from which the future conditions of system can be derived. The trend is based on historical information that is assumed to influence the future. Moreover, this technique is applicable to short and long terms projections, the techniques cannot be used to find the turning points of prediction. There must
be large accurate information and data, the costs of implementation, which are likely to be fairly high (Wheelright, 1973).

Table 4.3: shows the application of projection of Adult Literacy Class at Ibadan between 2008/2009 to 2014/2014 academic sessions

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolment</th>
<th>Annual growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>645</td>
<td></td>
</tr>
<tr>
<td>2009/2010</td>
<td>509</td>
<td>-4.99</td>
</tr>
<tr>
<td>2010/2011</td>
<td>465</td>
<td>-1.62</td>
</tr>
<tr>
<td>2011/2012</td>
<td>411</td>
<td>-1.98</td>
</tr>
<tr>
<td>2012/2013</td>
<td>370</td>
<td>-1.51</td>
</tr>
<tr>
<td>2013/2014</td>
<td>323</td>
<td>-1.73</td>
</tr>
<tr>
<td>Averages</td>
<td>454</td>
<td>-2.37</td>
</tr>
</tbody>
</table>

In a hypothetical case by using the average annual growth rate, it is possible to predict the future adult literacy class enrolment for the 2014/2015 to further years.

**ITQ**

**Question**
The forecasting technique that is based on the judgment of the researcher, planner or policy maker is known as ________________?

**Feedback**
The forecasting technique that is based on the judgment of the researcher, planner or policy maker is known as Eye-Balling Forecasting Techniques

**4.2.10 Moving Average Techniques**
This involved trend analysis, which tends to reflect seasonal fluctuations that may make future predictions to be less reliable.
This technique consists of finding the average of certain number of terms of a time series and taking their average as the trend value for the middle of the period covered. When demand for a product is neither growing nor declining rapidly, and if it does not have seasonal characteristics, a moving average can be useful in removing the random fluctuations for forecasting. Although moving averages are frequently galloped, it is more convenient to use past data to predict the following period directly. Although it is important to select the best period for the moving average, there are several conflicting effects of different period lengths. The longer the moving average period, the more the random elements are smoothed (which may be desirable in many cases). However, if there is a trend in the data—either increasing or decreasing—the moving average has the adverse characteristic of lagging the trend. Therefore, while a shorter time span produces more oscillation, there is a closer following of the trend. Conversely, a longer time span gives a smoother response but lags the trend.

The formula for a simple moving average is

$$F_t = \frac{X_t + X_{t-1} + X_{t-2} + X_{t-3} + X_{t-4} + \cdots + X_{t-n}}{n}$$

where, $F_t$ = Forecast for the coming period, $n$ = Number of period to be averaged $X_t$ is the latest value and $X_{t-1}$, $X_{t-2}$, $X_{t-3}$, $X_{t-4}$ and so on are the actual occurrences in the past period, two periods ago, three periods ago and so on respectively. A case study on moving average is presented below.
The data in the first two columns of the table below depict the output of an institution. The first two columns show the years and the graduate. The prediction based on 2, 4, 8, 11 and 12 years on moving average and shown in the next three columns. The 2 years moving average of a year is the average of output of the preceding three year.

<table>
<thead>
<tr>
<th>Years</th>
<th>Actual graduate</th>
<th>Two years moving average</th>
<th>Four years moving average</th>
<th>Eight years moving average</th>
<th>Eleven years moving average</th>
<th>Twelve years moving average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>96</td>
<td>(80+100)/2=90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>105</td>
<td>(100+96)/2=98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>120</td>
<td>(96+105)/2=101</td>
<td>95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>99</td>
<td>(105+120)/2=113</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>109</td>
<td>(120+99)/2=110</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>79</td>
<td>(99+109)/2=104</td>
<td>108</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>110</td>
<td>(109+79)/2=94</td>
<td>102</td>
<td>99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>89</td>
<td>(79+110)/2=95</td>
<td>99</td>
<td>102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>100</td>
<td>(110+89)/2=100</td>
<td>97</td>
<td>101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>92</td>
<td>(89+100)/2=95</td>
<td>95</td>
<td>101</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>101</td>
<td>(100+92)/2=96</td>
<td>98</td>
<td>100</td>
<td>107</td>
<td>98</td>
</tr>
</tbody>
</table>

The four years moving average is given by the average of the preceding four years actual graduate. This was done just like two years moving average to
Characteristics of moving averages
i. Different moving averages produce different forecasts.
ii. The greater the number of periods in the moving average, the greater the smoothing effect.
iii. If the underlying trend of the past data is thought to be fairly constant with substantial randomness, then a greater number of periods should be chosen.
iv. Alternatively, if there is change in the underlying state of the data, and more responsiveness is needed, therefore fewer periods should be included in the moving average.

Limitations of Moving Averages
i. Equal weighting is given to each of the values used in the moving average calculation, whereas it is reasonable to suppose that the most recent data is more relevant to current conditions.
ii. An n period moving average requires the storage of n – 1 values to which is added to the latest observation. This may not seem much of a limitation when only a few items are considered, but it becomes a significant factor when, for example, a company carries 25,000 stock items each of which requires a moving average calculation involving say 6 months usage data to be recorded.
iii. The moving average calculation takes no account of data outside the period of average, so full use is not made of all the data available.
iv. The use of the unadjusted moving average as a forecast can cause misleading results when there is an underlying seasonal variation
Regression and correlation technique

Regression analysis
A statistical measure that is used to determine the strength of the relationship between one dependent variable (usually denoted by Y) and a series of other changing variables (known as independent variables).

Correlation
A measure of linear association or relationship between two or more variables.

Regression can be defined as a functional relationship between two or more correlated variables. It is used to predict one variable given the other. The relationship is usually developed from observed data. This method tries to find out cause and effect relationship between factors cost, enrolment and other inputs in education (pandit, 1980). The value to be predicted is said to be dependent variable while the predictor is commonly described as independent variable. In regression, both dependent and independent may be more than one i.e. dependents and independents. This method seek to provide a measure of the extent to which movements in the values of two or more variables - as for example labour input and sales are related (or correlated) with each other. The aim is to predict changes in one variable by reference to changes in the other or others, where the future value of these other (or explanatory) variables is already postulated. Thus, if a company finds that the number of hours put in by a group of workers bears a strong relationship to the amount of output from the department, or sales, knowledge of future output or sales levels should make possible a forecast of future manpower requirements. Where only two variables are concerned, the analysis is known as simple regression or correlation. Where more than two variables are considered together, the analysis is known as multiple regression.

Linear regression refers to the special class of regression where the relationship between variables forms a straight line. The major restriction in using linear regression forecasting is, as the name implies, that past data and future projections are assumed to fall about a straight line. Although this does limit its application, sometimes, if we use a shorter period of time, linear regression analysis can still be used. For example, there may be short segments of the longer period that are approximately linear.

The linear regression line is of the form $Y = a + bx$,

where

$Y$ is the value of the dependent variable that we are solving for represent (enrolment)

$a$ is the $Y$ intercept
b is the slope or regression coefficient and
X is the independent variable represent (year). (In time series analysis, X is units of time).

In applying the above to adult literacy class enrolment, the two constants a and b may be determined by these equations:
\[ a = \bar{y} + b\bar{x} \]
\[ b = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2} \]

A case study using the above stated formula is presented below

Using the above given formulas to predict the students’ enrolment of Adult Literacy Class at Ibadan between 2008/2009 to 2012/2013 academic sessions by regression computation

<table>
<thead>
<tr>
<th>t</th>
<th>X = t − 2010/2011</th>
<th>y</th>
<th>x^2</th>
<th>xy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>-2</td>
<td>645</td>
<td>4</td>
<td>-1290</td>
</tr>
<tr>
<td>2009/2010</td>
<td>-1</td>
<td>509</td>
<td>1</td>
<td>-509</td>
</tr>
<tr>
<td>2010/2011</td>
<td>0</td>
<td>465</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2011/2012</td>
<td>1</td>
<td>411</td>
<td>1</td>
<td>411</td>
</tr>
<tr>
<td>2012/2013</td>
<td>2</td>
<td>370</td>
<td>4</td>
<td>740</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>2,400</td>
<td>10</td>
<td>-648</td>
</tr>
</tbody>
</table>

Let input these figures into derived regression equation to project the future enrolment of adult Literacy class in Ibadan centre.

\[ n = 5, \sum x = 0, \sum y = 2,400, \sum x^2 = 10, \sum xy = -648 \]
\[ \bar{x} = \frac{\sum x}{n} = \frac{0}{5} = 0 \]
\[ \bar{y} = \frac{\sum y}{n} = \frac{2,400}{5} = 480 \]
\[ a = \bar{y} - b\bar{x}; \]
\[ a = 480 - b(0) \]

Then what is b
\[ b = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2} \]
Therefore,

\[
b = \frac{-648 - (0)(2,400)}{5(10) - (0)^2}
\]

\[
b = \frac{-648 - 0}{50 - 0}
\]

\[
b = \frac{-648}{50}
\]

\[
b = -12.96
\]

Since, \(b=-12.96\),

\[
a = 480 - 12.96(0)
\]

\[
a = 480
\]

From the analysis, the mathematical function that describes the enrolment trend can be written as:

\[
y = 480 - 12.96x
\]

**Table projected adult literacy class enrolment using regression technique from 2008/2009 to 2013/2014 academic sessions.**

<table>
<thead>
<tr>
<th>Year</th>
<th>X</th>
<th>(y = 480 - 12.96x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/2009</td>
<td>5</td>
<td>415.20</td>
</tr>
<tr>
<td>2009/2010</td>
<td>6</td>
<td>402.24</td>
</tr>
<tr>
<td>2010/2011</td>
<td>7</td>
<td>389.28</td>
</tr>
<tr>
<td>2011/2012</td>
<td>8</td>
<td>376.32</td>
</tr>
<tr>
<td>2012/2013</td>
<td>9</td>
<td>363.36</td>
</tr>
<tr>
<td>2013/2014</td>
<td>10</td>
<td>350.40</td>
</tr>
</tbody>
</table>

### 4.2.12 Exponential Smoothing

Exponential Smoothing is the major drawback due to the need to continually carry a large amount of historical data. (This is also true for regression analysis techniques, which was covered before) As each new piece of data is added in these methods, the oldest observation is dropped, and the new forecast is calculated. In many applications (perhaps in most), the most recent occurrences are
more indicative of the future than those in the more distant past. If this premise is valid – “that the importance of data diminishes as the past becomes more distant” - then exponential smoothing may be the most logical and easiest method to use. The reason this is called exponential smoothing is that each increment in the past is decreased by \((1-\alpha)\). If \(\alpha\) is 0.05 for example, weights for various periods would be as follows (\(\alpha\) is defined below):

**Weighting at \(\alpha = 0.05\)**

<table>
<thead>
<tr>
<th>Most recent weighting</th>
<th>(\alpha (1- \alpha))</th>
<th>0.0500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data one time period older</td>
<td>(\alpha (1- \alpha))</td>
<td>0.0475</td>
</tr>
<tr>
<td>Data two time periods older</td>
<td>(\alpha (1- \alpha))</td>
<td>0.0451</td>
</tr>
<tr>
<td>Data three time periods older</td>
<td>(\alpha (1- \alpha))</td>
<td>0.0429</td>
</tr>
</tbody>
</table>

Therefore, the exponents 0, 1, 2, 3 and so on give it its name.

The method involves the automatic weighting of past data with weights that decrease exponentially with time, i.e. the most current values receive a decreasing weighting. The exponential smoothing technique is a weighted moving average system and the underlying principle is that the:

\[ \text{New Forecast} = \text{Old Forecast} + \text{a proportion of the forecast error}. \]

The simplest formula is

\[ \text{New forecast} = \text{Old forecast} + \alpha (\text{Latest Observation} - \text{Old Forecast}) \]

where \(\alpha\) (alpha) is the smoothing constant. Or more mathematically,

\[ F_t = F_{t-1} + \alpha (A_{t-1} - F_{t-1}) \]

\[ F_t = \alpha A_{t-1} + (1- \alpha) F_{t-1} \]

Where

\(F_t\) = The exponentially smoothed forecast for period \(t\)

\(F_{t-1}\) = The exponentially smoothed forecast made for the prior period

\(A_{t-1}\) = The actual demand in the prior period

\(\alpha\) = The desired response rate, or smoothing constant
**Smoothing Constant**

The value of $\alpha$ can be between 0 and 1. The higher value of $\alpha$ (i.e. the nearer to 1), the more sensitive the forecast becomes to current conditions, whereas the lower the value, the more stable the forecast will be, i.e. it will react less sensitively to current conditions.

Exponential smoothing is the most used of all forecasting techniques. It is an integral part of virtually all computerized forecasting programs, and it is widely used in ordering inventory in retail firms, wholesale companies, and service agencies.

**Reasons for Exponential smoothing techniques**

There are six major reasons for using exponential smoothing techniques:

i. Exponential models are surprisingly accurate

ii. Formulating an exponential model is relatively easy

iii. The user can understand how the model works

iv. Little computation is required to use the model

v. Computer storage requirement are small because of the limited use of historical data

vi. Tests for accuracy as to how well the model is performing are easy to compute.

In the exponential smoothing method, only three pieces of data are needed to forecast the future: the most recent forecast, the actual demand that occurred for that forecast period and a smoothing constant alpha ($\alpha$). This smoothing constant determines the level of smoothing and the speed of reaction to differences between forecasts and actual occurrences. The value for the constant is determined both by the nature of the product and by the manager’s sense of what constitutes a good response rate. For example, if a firm produced a standard item with relatively stable demand, the reaction rate to difference between actual and forecast demand would tend to be 157 small, perhaps just 5 or 10 percentage points.
However, if the firm were experiencing growth, it would be desirable to have a higher reaction rate, perhaps 15 to 30 percentage points, to give greater importance to recent growth experience. The more rapid the growth, the higher the reaction rate should be.

Sometimes users of the simple moving average switch to exponential smoothing but like to keep the forecasts about the same as the simple moving average. In this case, $\alpha$ is approximated by $2 \div (n+1)$, where $n$ is the number of time periods. To demonstrate the method once again, assume that the long-run demand for the product under study is relatively stable and a smoothing constant ($\alpha$) of 0.05 is considered appropriate. If the exponential method were used as a continuing policy, forecast would have been made for last month. Consider the case study below.

The data are given in the first two columns and the forecasts have been prepared using the values of $\alpha$ as 0.1 and 0.4.

<table>
<thead>
<tr>
<th>Years</th>
<th>Actual unit of graduate</th>
<th>Exponential $\alpha = 0.1$</th>
<th>Exponential $\alpha = 0.4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>80</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2002</td>
<td>100</td>
<td>80*</td>
<td>80*</td>
</tr>
<tr>
<td>2003</td>
<td>96</td>
<td>80+0.1(100-80)=82</td>
<td>80+0.4(100-80)=88</td>
</tr>
<tr>
<td>2004</td>
<td>105</td>
<td>82+0.1(82-96)=81</td>
<td>88+0.4(88-96)=85</td>
</tr>
<tr>
<td>2005</td>
<td>120</td>
<td>81+0.1(81-105)=79</td>
<td>85+0.4(85-105)=77</td>
</tr>
<tr>
<td>2006</td>
<td>99</td>
<td>79+0.1(79-120)=75</td>
<td>77+0.4(77-120)=59</td>
</tr>
<tr>
<td>2007</td>
<td>109</td>
<td>75+0.1(75-99)=73</td>
<td>59+0.4(59-99)=41</td>
</tr>
<tr>
<td>2008</td>
<td>79</td>
<td>73+0.1(73-109)=69</td>
<td>41+0.4(41-109)=68</td>
</tr>
<tr>
<td>2009</td>
<td>110</td>
<td>69+0.1(69-79)=68</td>
<td>68+0.4(68-79)=72</td>
</tr>
<tr>
<td>2010</td>
<td>89</td>
<td>68+0.1(68-110)=64</td>
<td>72+0.4(72-110)=87</td>
</tr>
<tr>
<td>2011</td>
<td>100</td>
<td>64+0.1(64-89)=61</td>
<td>87+0.4(87-89)=86</td>
</tr>
<tr>
<td>2012</td>
<td>92</td>
<td>61+0.1(61-100)=57</td>
<td>86+0.4(86-100)=80</td>
</tr>
<tr>
<td>2013</td>
<td>101</td>
<td>57+0.1(57-92)=53</td>
<td>80+0.4(80-92)=75</td>
</tr>
</tbody>
</table>

* In the above example, no previous forecast was available. So,
year 2001 graduates were used as year 2002 forecast.

4.2.13 Time Series Methods

This time-series forecasting method fits a trend line to a series of historical data points and then projects the line into the future for medium- to long range forecasts. There are several mathematical trend equations that can be developed viz. linear, exponential, quadratic etc. Here we will concentrate only on the linear trends. Of the components of a time series, secular trend represents the long-term direction of the series. One way to describe the trend component is to fit a line visually to a set of points on a graph. Any given graph, however, is subject to slightly different interpretations by different individuals. We can also fit a trend line by the method of least squares. In our discussion, we will concentrate on the method of least squares because visually fitting a line to a time series is not a completely dependable process.

Decomposition of the time series

We have seen earlier that observations taken over time (i.e. time series) often contain the four following characteristics:
(a) A long-term trend (denoted by T)
(b) Seasonal variations (denoted by S)
(c) Cyclical variations (denoted by C)
(d) Random or residual variations (denoted by R).

The methods covered so far do not make any attempt to isolate the individual factors, namely, seasonally, trend, cyclical and random variations, in the time series. But there are many situations where such a breaking down of the time series is possible and necessary. The decomposition methods basically operate on the principle that a time series is composed of the four factors stated earlier. The decomposition methods assume the time series value at time t to be a function of the different components, i.e.,
\[ D_t = f(T_t, S_t, C_t, R_t) \]

where

\( T_t \) = trend value at period \( t \)
\( S_t \) = seasonal component at period \( t \)
\( C_t \) = cyclical component at period \( t \), and
\( R_t \) = random variation at period \( t \).

To make reasonably accurate forecasts, it is often necessary to separate out the above characteristics (i.e. \( T, S, C \) and \( R \)) from the raw data. This is known as time series decomposition or often just time series analysis. The separated elements are then combined to produce a forecast. The functional form for the series used may either be additive or multiplicative. The multiplicative form (most commonly used) is written as follows:

\[ D_t = T_t \times S_t \times C_t \times R_t \]

The components are expressed as percentages or proportions. Also, the additive model takes the form symbol addition. In the additive components which are expressed as absolute values. The multiplicative model is commonly used in practice and is more appropriate if the characteristics interact, e.g. where a higher trend value increases the seasonal variation. The additive model is more suitable if the component factors are independent, e.g. where the amount of seasonal variation is not affected by the value of the trend. Of the four elements the most important are the first two; the trend and seasonal variation, so this book concentrates on these two.

**ITQ**

**Question**

Which of the forecasting techniques emphasized that the amount of manpower required or needed in an economy must be related to the expected income growth rate of that country?

**Feedback**

It is the Rule of thumb technique.
Study Session Summary

Summary

In this Study Session, you have learnt the various techniques adopted in forecasting. We also stated and discussed exclusively on their functions limitations, advantages and disadvantages in using each of the techniques. The various techniques were applied in one form or the other on how students’ enrolment can be predicted to serve as guides to the policy makers on what and how to use the available resources in education judiciously.

Assessment

SAQ 4.1 (tests Learning Outcome 4.1)
What do you understand by manpower forecasting?

SAQ 4.2 (tests Learning Outcome 4.2)
List any ten techniques in forecasting

SAQ 4.3 (tests Learning Outcome 4.3)
Bibliography


Ravi MahendraGor (2015). Industrial Statistics and Operational Management: Forecasting Techniques
Study Session 5

Cost Analysis in Education

Introduction

This Study Session is designed to acquaint you with the methods of cost analysis in education. Thus, we shall be examining the different conceptualisations of 'cost' to both the economist and the accountant. The Session will also examine how the various components of cost of education are arrived at in order to determine how individuals, the government or the society in general, can reduce the burden of educational costs directly or indirectly. Finally, we shall examine the factors influencing cost education.

Learning Outcomes

When you have studied this session, you should be able to:

5.1 Explain the concept of Cost in Education
5.2 Identify and determine the various costs incurred in education
5.3 Explain the factors influencing cost of education.

Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>An amount that has to be paid or given up (both cash and in kind) in order to get something.</td>
</tr>
<tr>
<td>Short-run</td>
<td>A period that is too short for all factors of production to be varied. Thus, some are variable while others are variable in nature.</td>
</tr>
<tr>
<td>Long-run</td>
<td>A period where all factors of production are variable.</td>
</tr>
</tbody>
</table>
5.1 Concept of Cost in Education

Before discussing cost in education, let us briefly see how cost is conceptualised in economics term. The concept of cost comes into play in the production of goods and services. Cost may be expressed in terms of money or in non-monetary terms use in running education system. It should be noted also that cost affects a specific economic transaction, producer, seller, buyer, consumer, etc. Thus, when the owner of a factor of production offers that factor to a producer, the cost to the owner is represented by his 'consumption forgone', while the producer incurs a precise and measurable money cost, made up of wages, interest, charges, etc. (Hallak, 1969).

In economic terms, the real cost corresponds to the opportunity cost. There is always a choice of alternatives, and that the cost of any choice must be expressed in terms of the 'opportunity forgone' to achieve the alternatives.

Cost in education can be conceptualized from two-related perspectives i.e. direct and indirect cost of education. The direct costs include the cost of all items purchased or used for the educational system. From this point of view, you should have realized that a lot of resources (human and materials) are used in the educational system or output for the production of an educated person. The total value of these resources constitutes the direct cost of education. According to Nwadiani (2000) noted that the cost in education reflect the real resources (material, human and time) used up in the production of educated students, as estimated in monetary terms. The direct costs are sometimes referred to as real costs in education. Also, the other cost of education i.e. indirect cost to education is sometimes called opportunity cost. Perhaps, the cost of education could be defined in terms of real cost (money cost) and opportunity cost. It can be expressed in the mathematical equation as:
Cost of Education = Expenditure + Opportunity Costs

Cost in education can be conceptualized into direct and indirect cost. Direct cost of education covers both the human and material resources spent or expended in the course of education, while the indirect cost represents the opportunity cost of education i.e. the alternative forgone.

5.1.1 Types of Cost in Education

As we have described what cost is, let us now consider the different types of cost in education. There are three types of costs in education. These are:

i. Private cost;
ii. Institution cost and
iii. Society cost

Private Cost: Private costs of education are the expenses incurred by the students in the process of acquiring education. These private costs of education could be direct costs like the cost of books, transport costs, feeding, accommodation and other incidental expenses. This is sometimes referred to as household cost. This cost component comprises the money, which the family, household or any private body expends on education, as well as the opportunity cost. It should be noted that many households are generally responsible for such things as students tuition fees, students’ clothing, feeding, books and stationery, transport fares to school, as well as the income the students forgo in the course of their education. The income forgone to the student is in terms of student’s time and other earnings he had forgone by being in school. The student should have been gainfully employed in the production of goods, and services, instead of being in school.
As a 300 level student of this department (Adult Education), several costs have been expended on your education up to this level. Itemize the private cost of your education thus far and classify them under direct and indirect costs.

**Institution Cost:** this refers to the cost incurred by the institution in the process of carrying out their activities. It is also sub-divided into two types namely:

i. Capital cost

ii. Recurrent cost

**Capital cost:** this is the cost incurred on fixed items such as building, furniture, electricity, water installation, land, tools and equipment and other specified cost.

**Recurrent cost:** this refers to cost of personal services and materials, which are consume by school within one academic year. It was called recurrent because it is day to day running cost and that occur regularly and to cover expenditure on goods and services that bring immediate and short live benefit. It includes teacher and non-teacher salary, allowances, cost of stationery, cost of repair and maintenance and other running in the school.

**Society Cost:** this is the totality of the cost borne by the government in the course of educating within citizens (Ajayi & Ayodele, 2002). The social costs include the institutional costs. These are the costs in which the society through the government provides. For example, in Nigeria, cost of education is borne by the Federal, State or Local governments from the first level of education to the highest level.

Each of these types of cost in education has sub-types and is diagrammatical illustrate below:
What do you understand by social cost of education?

We do not know what is your thought, but social cost of education covers both the institutional cost and societal cost of education.

5.2 Education Cost Production Function

You must have learnt about production function in your economics lectures. Let us now try to relate that to education cost production
function. The process of teaching, learning, examining and graduating students in all the educational levels is called production. However, in the process of production in the education industries, there are some standard components of production cost that are in use in the analysis of cost behaviour such as fixed cost, and variable cost.

5.2.1 Fixed, Average, Total and Marginal Cost in Education Cost

**Long-run**
A period where all factors of production are variable.

**Short-run**
A period that is too short for all factors of production to be varied.

**Fixed cost (Q):** this is refers to the cost of all fixed factor inputs. It does not change with the level of output. The cost must be incurred whether or not. The educational system produces in any quantity of any output. For example, at the construction stage of a school, the level of activities or output is still zero but expense have to be incurred on building and fitting which represent the fixed cost. They are fixed at all level of production at least in short-run but not in the long run. for instance; cost of building houses e.g. hostel accommodation, classroom, administrative building, health centre etc.; cost of constructing road with the school linking one department to the another; cost of purchasing big and sophisticated equipment.

**Total cost (TC):** Total cost, will of course, increase as N increases. In analysing the costs of education, it is important to be explicit about the units in which N is measured. N will usually be measured in terms of the number of students reached per year.

\[ \text{Total Cost} = \text{TC} = \text{TC (N)} \]

where

TC (N) is the total cost required to provide service to N Students.

**Average cost (AC):** this is refers to the cost of educating student. It can be measured in two ways, that is, if the total expenditure or cost is divided by total number of the students enrol in a school or in the level of education. This is the average cost per students. Moreover, if the total expenditure is divided the number of graduate, it gives an average cost per graduate. This is done in mathematical forms;
Marginal Cost (MC): this is the addition to total cost, because of an extra increase in student enrolment. The marginal cost of output is the extra expenditure incurred when one additional unit is produced as the result of marginal increase in output. The marginal cost at any given number of students, N, is equal to the total cost for N + 1 student minus the total cost for N students. It is often reasonable to assume that the marginal cost of adding one more student to a system is constant, that is, independent of the number of students already served.

This formula is used to calculate marginal cost

\[ MC = \frac{\Delta TC}{\Delta Q} \text{ or } \frac{TC_{n+1}}{Q_{n+1}} + \frac{TC_n}{Q_n} \]

To understand the concepts of total cost, average cost and marginal cost, let us examine the table presented in the case study below

<table>
<thead>
<tr>
<th>Unit (Students)=N</th>
<th>Total cost</th>
<th>Average cost</th>
<th>Marginal cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>40</td>
<td>37</td>
</tr>
<tr>
<td>3</td>
<td>117</td>
<td>39</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>144</td>
<td>36</td>
<td>51</td>
</tr>
<tr>
<td>5</td>
<td>165</td>
<td>33</td>
<td>21</td>
</tr>
<tr>
<td>6</td>
<td>186</td>
<td>31</td>
<td>03</td>
</tr>
<tr>
<td>7</td>
<td>189</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>8</td>
<td>208</td>
<td>26</td>
<td>44</td>
</tr>
<tr>
<td>9</td>
<td>252</td>
<td>28</td>
<td>0</td>
</tr>
</tbody>
</table>

From the table, the first column shows the number of students
served by an institution, while the second column indicates the total cost of serving the number of students. The total cost revealed that there are increases as the number of students’ increases. The average cost is calculated from the total cost divided by the numbers of students, while the marginal cost is the changes occur between each total cost then divide by the changes in Unit (students).

**ITQ**

**Question**
The addition of fixed cost of education and variable cost of education gives _______________

**Feedback**
The addition of fixed cost and variable cost gives the total cost of education.

### 5.2.2 Functions of Cost Analysis in Education

Cost analysis serves various purposes in education, according to IIEP (1972), cost analysis serve a variety of purposes in educational planning such as;

i. Testing the economic feasibility of expansion plans proposal or targets;

ii. Projecting future levels of education costs;

iii. Estimating the cost of alternative policies and of educational reforms or innovations;

iv. Comparing alternative ways of achieving the same objective in order to select the most efficient or economical;
5.3 Factors Influencing Cost of Education

Several factors bring about variation in cost of education. This can be classified into two such as internal and external factors.

5.3.1 Internal factors

These factors are those within the control of the educational institutions. These are factors or variables, which can be manipulated by decision makers in education. A decision maker may design the values of the internal factors all to suit their own purposes. These factors as identified by Longe (1981) include

i. Capital cost of education
ii. Recurrent salary cost
iii. Recurrent non salary cost
iv. Student-teacher ratio
v. The size of institution
vi. Teacher quality
vii. School age

Capital cost of education: A capital cost is one that is incurred to acquire goods or services that will have a useful lifetime that extends beyond the time of purchase, this include; the style of designed of
building, nature of the location of the institution, nature of school curriculum, information of capital goods. In order to construct a useful cost function, it is necessary to annualise the expenditure on capital equipment. Such annualisation is what we called amortisation.

In annualising a capital cost, one must take into account both how long the capital equipment will last and how much interest one could receive on the capital if it were invested in bonds, say, instead of in the printing machine and the primes to produce. The resulting annualisation can reasonably be thought of as the annual rent one would have to pay if the equipment were leased rather than purchased. The standard formula for expressing the annualised cost of capital cost \( C \), its lifetime in years, \( n \); and the discount rate or prevailing rate of interest.

The annualised cost is then given by an annualisation factor,

\[
A(r,n) \text{ multiplied by } c
\]

Where

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

Cost calculate for some instructional-technology projects are sensitive to the interest rate chosen; hence the need to use the current banks interest rate on fixed deposit. Let us see how intelligent you are using the above formula to determine the annual cost of capital, by performing the task in the activity below.

If ₦220,000.00 worth of equipment had an expected lifetime of ten years, and if the rate of interest were 7.5 per cent a year, what would be the annualised cost (rental value) of the equipment?

**Feedback**

If truly, you take your time to follow and adopt the formula above, the annualised cost (rental value) of the equipment would be ₦32,051 a year. Did I hear you saying no? Try to rework it.

**Recurrent salary cost:** It must be emphasised that any meaningful definition of adult education, community development and social welfare must contain construction functions, as well as the goal of
educational cost with determination. Recurrent salary as internal factor influencing cost of education are the factors that are examine under; number of personnel employee, qualification needs of personnel employed, utilization of personnel employed.

**Recurrent non-salary cost:** The non-salary cost of education includes expenditure on maintenance of electricity bill, repair of tools and equipment, and other consumables uses in the process of teaching and learning.

### 5.3.2 External factors

These are the factors outside the control of the educational institutions. These factors as identified by Coombs and Hallak (1972) includes; inflation, social demand for education, market forces, constraints on educational spending, external aid and government policy on salary structure., price of goods and services.

**Inflation:** this constitutes the major source of variation in educational cost in developing countries like Nigeria. Inflation as the persistence rise in price of goods and services will in variably influence the cost of educational programmes in the country as well as affect educational development and growth in such a nation. The prevailing prices of goods and services also influence the cost of education i.e. prices of inputs for classroom construction, prices of chalk and industries materials use for teaching, changes in prices of vehicles for transportation etc.

**Government policies:** the significant changes in the cost of education may involve as a result of government policies on salary structure, enrolment and the school curriculum.

**External aid:** overseas countries give grants in aid to developing countries in form of loan, gift.
Take a moment to reflect on the following

| \textbf{1. What are the internal factors causing variations in the cost of education in Nigeria?} |
| \textbf{2. Are there external factors causing the same problem?} |

Yea, there exist both internal and external factors causing a variation in the cost of education in the country. Try to read this again, we have just explained this on sub-section 5.3.1 and 5.3.2 respectively.

\textbf{5.3.3 Control of Cost of Education}

For ensuring efficiency in resource utilization in the educational system, proper attention must be put in place on how to control or manage the running cost in the education for both government and school authorities. According to (Eicher 1984, durosaro, 1985, Oni, 1992), they both stressed the need for reduction in unit cost of education consume in school system. They concluded that in order to control the rising cost of education, each of the internal factors influencing the cost has to be manipulated in a way that can lead to constant or lower unit cost.

The cost of education can be controlled using the internal factors namely;

\textbf{Student-teacher ratio}: student-teacher ratio influences educational cost through the number of teacher that have to be employed in the facilitating teaching and learning processing. When the student-teacher ratio is low, more teachers would be employed and more recurrent cost would be incurred unlike when the students – teachers’ ratio is high.

\textbf{Average teachers’ salaries and allowance}: it usually constitutes the bulk of recurrent cost of education. Salaries and allowances of teachers are determined by the qualification and experience of the teachers employed in the schools. Therefore, a school with less
qualified and experience teachers would incur lower cost than the one with more qualified and experienced teachers

**Size of educational institutions**: educational cost is influenced by students’ enrolment. Studies have shown that the average cost curve of education is U-shaped. Educational planners have to find out the enrolment at the point where the unit cost or average cost is lower and recommend this as the optimum size.

**ITQ**

**Question**
Which of the external factors do you consider as the major cause of variation in the cost of education across boards and why?

**Feedback**
We do not know what you think about this, however, inflation is the most important external factor causing variation in the cost of education across boards. This is because the prevailing prices of goods and services in the economy determine the extent to which the needed educational resources can be provided.

**Study Session Summary**

In this Study Session, you were exposed to the concept of cost analysis in education and types of cost analysis in education. Also discussed were the production function and the conceptions of costs to the economist and the accountant are recognized. All the component parts of costs of education were fully discussed and analyzed covering the total, average and marginal costs respectively.
Lastly, we explained some factors influencing cost of education and suggested control measures aimed at reducing the cost of education.

**Assessment**

**SAQ 5.1 (tests Learning Outcome 5.1)**
What do you understand by cost of education?

**SAQ 5.2 (tests Learning Outcome 5.2)**
Calculate the average and marginal cost in the following tables and explain the procedures/steps

<table>
<thead>
<tr>
<th>Students</th>
<th>Total cost</th>
<th>Average cost</th>
<th>Marginal cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>1800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>2100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>2695</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>3200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>3510</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>3660</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>4575</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SAQ 5.3 (tests Learning Outcome 5.3)**
What are the factors influencing cost of education in Nigeria?

Study Session 6

Economic Perspectives on Education

Introduction

In this Study Session, we want to take an economic view on education. In doing so, we ask some questions:

- Is education an investment? or
- Is education consumption?

Thus, we shall analyse the specific differences between the two concepts for better understanding and explore some benefits inherent in investing on education.

Learning Outcomes

When you have studied this session, you should be able to:

6.1 justify whether education is a consumption or an investment.
6.2 identify the problems militating against the educational system in Nigeria.
6.3 Explain the benefits of investment in education.

Terminology

<table>
<thead>
<tr>
<th>Consumption</th>
<th>Utilization of economic goods to satisfy needs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>Commitment of resources in order to produce a product.</td>
</tr>
<tr>
<td>Luxury Goods</td>
<td>Goods whose demand increase more than proportionally as income rises.</td>
</tr>
</tbody>
</table>
6.1 Education - Consumption or Investment

6.1.1 Education as Consumption

Do you see education as something we can consume? The concept of education as consumption can best be explained from the four major concepts of production, consumption, saving and investment, where do you think education should be classified? Therefore, education can be classified as consumption. This is because an individual uses education in a variety number of personal ways, which include:

i. he could use it to widen his knowledge,
ii. achieve personal satisfaction or life ambition,
iii. maintain a certain level of enjoyment and
iv. attain a societal status or just acquire education for the fun of it.

In all these, economic benefits of education are not considered. When education is classified as consumption, the main focus is on enabling an individual to enjoy a better life, without expecting any direct or indirect financial benefits form acquired education. Thus, an individual, who, after qualifying as a graduate, still enrolls on a diplomas programme in social works, may be doing so just for the knowledge in social works and not for any monetary attachment. Similarly, a Nigerian Certificate in Education holder who has already attained a Grade-Level 14 job, but who enrolls for an undergraduate programme, may be doing so merely for the knowledge, and probably for status-symbol, and not for any monetary attachment. Thus, type of education, which do not contribute to either better employment or higher financial remunerations, could be described as consumption. However, It may be noted that education as consumption is not popular in developing economies, where the conditions for basic existence are generally lacking.

That form of type of education, which do not contribute to either better employment or higher financial remunerations, could be described as consumption, implying that it (education) is not being considered for its financial/pecuniary benefits.
Where the consumption aspects of education are predominant are in the developed economies, most of the populace have already achieved high standard of living, and merely look on to education as a social service, and hence a consumption good. The inherent advantages of the consumption type of education make it imperative for any country to aspire for it. Some of these advantages are summarized below:

i. Enhancement of quality of life;
ii. Realisation of one’s potentialities;
iii. Rapid economic and national development due to the presence of highly knowledgeable populace.

The above advantages notwithstanding, education for its own sake, as a consumption good only, is a luxury, which no developing country can easily afford in the face of the competition for scarce and limited resources.

<table>
<thead>
<tr>
<th>Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>While perceiving education as consumption is most predominant in the developed economies, the reverse is the case in developing economies, particularly, the sub-sahara Africa. This is because, the interior motives of being educated in the developing economies revolves round the material/economics gains therein, and not for the actualization of one self-fulfillment.</td>
</tr>
</tbody>
</table>

### 6.1.2 Education as Investment Criteria

As we have discussed education as consumption above, we can also see it as an investment. Investment in adult education at a macro-level tends to generate forces of change, which are likely to influence the life styles and value systems within a given society. Investment in education at the aggregate level in Nigeria before independence had been based on different approaches depending on the level of education involved and the type of government that took the decision. There was no military government in Nigeria before independence. The criteria of investing the scarce resources in education require some appraisal to determine the best approach that will give optimal utilization of the scarce resources. Investment is what a rational individual does, that is, putting
money in a business with the aim of making profits. In education, investment, according to Eneasator (1996) refers to the act of putting money or resources into education with the aim of making profits or returns. Investment is therefore characterized by economic motives. This type of education contrasts with the consumption type of education, where non-economic objectives predominate. An individual who sees education as an investment embarks on it with the aim of enhancing his economic status through increased salary or better job prospects. Similarly, a government that sees education as an investment, commits its resources into it with the aim of improving its national economy through educated labour force.

There are three major criteria or approaches to investment in educational enterprise which includes:

- The manpower approach;
- The social demand approach and
- The rate of return approach

6.1.2.1 The Manpower Approach

The basic rationale of this approach is to forecast the manpower ‘needs’ of the economy. That is, the number and distribution of trained people in the labour force that would be required to promote and produce a given output in a certain year, and then to match the educational system with the manpower needs of the economy. This has immediate relevance to developing countries because of shortage of trained manpower which represents one of the main constraints to economic growth. If the educational system can be planned so as to produce just the right kind and number of
workers, obviously, this can be regarded as an optimum or efficient allocation of resources. However, it will be optimum allocation of resources only in one sense because, it will ignore the other aims of education such as the role of education in the social and political development of the country (Okedara, 1981).

With respect to Nigeria, the Ashby Commission (1960) used the Manpower Approach in working out the higher education expansion in Nigeria during 1960 and 1980. This forecasting is a necessary technique to operationalize the concept of education as an investment, but by no means solves the problems of how to efficiently allocate resources to and within education. In Nigeria, this approach has never worked for the following reasons:

i. Imbalance between the levels of and within the educational system.

ii. Shortage or paucity of data on the type and number of manpower required at a particular time.

iii. Over concentration of production of manpower needs in some disciplines as against other disciplines.

iv. Lack of effective guideline from the government on how to invest in all the manpower needs of the country.

v. Lack of adequate and current census to guide the policy makers on the quantity and quality of manpower needed to service the nation.

vi. Political instability which spills over to instability of government decisions on how to train manpower for the nation.

vii. Shortage or lack of infrastructure for training some areas of manpower needs.

viii. High cost of training some manpower needs outside the country.
ix. The demographic nature of the country and different cultural backgrounds of those to be trained.

x. The politics of education.

6.1.2.2 The Social Demand Approach

This approach rests heavily on forecasting of private demand for education. It is more concerned with the consumption than the investment aspects of education. The approach connotes the sum total of individual demands for education at a given place and time under prevailing cultural, political and economic circumstance.

The emphasis on this approach is placed on educational inputs. The approach gives weight to the private rates of return to education and for equity considerations. In this case, government tends to spend more on educational facilities in order to reduce the gap in educational achievements in different states, rural and urban areas and between men and women. This approach has been applied to investing in primary education in Nigeria since September 1976 for the Universal Primary Education (UPE) programmes.

The approach has also been applied to various types of education in recent times in Nigeria through which many people have benefited. The mass literacy campaign on functional literacy, the political education programmes and the nomadic education are all part of using the social demand approach to investing in education.

Criticisms of the Approach

i. It ignores the larger national problem of resource allocation. It implicitly assumes that, no matter how much resource go to education, this is their best use for national development as a whole.

ii. It ignores the character and pattern needed by the economy and can readily result in producing too many of some types and not enough of others.
iii. It tends to overestimate popular demand, to underestimate costs and to a thin spreading of resources over too many students thereby reducing quality and effectiveness.

iv. It over assumes that job will be readily available for the educated ones in an environment of technical unemployment.

v. It assumes a political dimension to the educational enterprise.

**The Rate-of-Return Approach**

This method has four techniques in its application. It involves the use of

i. present net values,

ii. cost-benefit-ratio,

iii. the internal rate of return and

iv. the break-even points.

The approach has been the best, though; most policy makers because of its technicalities avoid it. The approach helps to examine alternatives, weigh costs and benefits as much as possible before reaching a decision. It looks at education as an instrument for the whole economy by means of social rates of return and as an investment for the individual by using the private rates of return.

This rate-of-return approach primarily views education as investment in human resources development and then asks the question: How do relative’s benefits from educational investment compare with returns from other uses of the resources? Within education itself, this approach aims at understanding where the investment should be focused in view of the benefits.
6.2 Educational System in Nigeria

Let us now discuss the Nigerian educational system. Nigeria still operates three major types of educational classification. This is pyramidal in shape as shown below:

Figure 6.2 Levels of Education in Nigeria
The pyramidal shape of the education system may confuse you as to what is now called the 6-3-3-4 educational system, and now the system has changed to 9-3-4. The explanation is that within this new system, we have nine years of basic school, three years of senior secondary school and four years from the university education. Within this new system, the university still serves as the apex of the educational systems, while basic education level serves as the floor. But, despite the evident growing commitment of the government and individuals to education, certain problems still beset the education system. The first concerns the astonishing imbalance in the distribution of students at different educational level- an imbalance that reflects the emphasis on growth without development and a lack of coordination and control of the educational system.

While no universally accepted distribution ratios exist, the experience of the advanced countries should be a guide to the nation. 60 per cent of total population should be at the primary school level while the remaining 40% of the school population should be in other levels. But that has not been the ideal in Nigeria. For example, between 1960 and 1971, the primary schools controlled no less than 90 per cent of total student population. With awareness, this 90 per cent has been projected to be 70 percent in 1995 (Adesina, 1981).

The second major problem is the low level of enrolment ratios for the first two levels of education. Added to this is the rate of increase in the unsatisfied demand for university education in the country. The third major problem is that of shortage of teaching staff and the concomitant question of the quality of those in service. The recent directive that unqualified primary school teachers should qualify by 1992 is a good step at the right time. But, while some states have implemented this directive, because of the diverse
nature of the nation, some have not. In order to improve the quality of instruction to pupils, massive training programmes should be conducted to upgrade the teaching skills of the teacher.

6.2.1 The Rate-of-Return

In attempting to analyse the rates of return to schooling in Nigeria, we should be concerned with four major sectors of the formal system: basic education (primary & vocational and technical), secondary education (academic), post-secondary (intermediate) and University. These four levels supply the bulk of the educated labour force for work outside the educational system of Nigeria.

In previous session, we identified the rate-of –return approach as one of the investment criteria in Nigeria.

The rate-of-return has four components. These are the cost-benefits ratio, the net discounted present value, the breakeven point and the external rate of return (IRR)

The Net Present Value or Worth Method

This is one or the approaches in the rate-of –return technique using this method, both the present value of the stream of returns and the time the investment of education is made will be determine. This value is the present worth of the net benefits (benefit-cost) discounted at the opportunity cost of the capital invested. Both the cost and the benefits are usually discounted so that account can be taken of the effect of time preference on the value of future earnings.

There is always a slight difference in opportunity cost of capital for private enterprises and the society as a whole. For private enterprises, it is weighted average of the borrowing rate for funds and acceptable price earnings ratio for equity shares. On the other hand, for the society as a whole, it is the return on the marginal
investment, which could be obtained if all the available capital were fully invested on the most remunerative project. (Adesina & Johnson, 1980)

Six major criticisms have been identified in the application of the rate-of return to education.

i. That education is not the only factor that affects earning since there is a significant correlation between earnings on the one hand, and the other factors like endowed ability, social class and individual motivation on the other.

ii. The assumption that only the financial benefits motivate people to take additional schooling, thus ignoring the psychological attractions of some occupation and the consumption benefits of education.

iii. The use of earnings differentials as the benefit of additional schooling disregards the impact of unemployment.

iv. That the approach assumes that earnings differentials are measures of the difference in the productive ability of the various people concerned.

v. The estimate of benefits and costs used is based on cross-sectional data, which relate to the time that the data were collected.

vi. The approach can only measure the direct economic returns to education.

6.2.2 Methods of Calculating Rates of Returns

We have given brief explanation on the use of rate of return as one of the criteria for investing in education. We shall now provide information that could be used in calculating rates of return to education investments.

There are four major methods in calculating rates of returns in cost benefits analysis, these are:

i. Benefit cost ratio
ii. Break-even point

iii. Net-present value and

iv. The internal rate of return (IRR)

**Benefit-Cost Ratio**

In economic discussion, cost benefit ratio and benefit cost ratio are used interchangeably. However, their computation still remains the same. This method involves the discounting of both the benefit stream and cost stream by an interest rate considered to be close to the opportunity cost of capital and the ratio between the present worth of benefits and the present worth of the costs is determined by using this formula

\[ \frac{\sum_{t=i}^{43} (W_u - W_s) t}{\sum_{t=i}^{43} (W_s + C) t (1 + r)^t} \]

Where \( W \) = benefits for the two educational levels

\( u \) = university

\( W_s \) = secondary

\( C \) = annual cost

\( T \) = time given

Another formula could be used to calculate the benefit cost ratio, the formula looks thus;

\[ \frac{x_1}{1+i} + \frac{x_2}{1+i^2} + \cdots + \frac{x_n}{1+i^n} \]

\[ \frac{y_1}{1+i} + \frac{y_2}{1+i^2} + \cdots + \frac{y_n}{1+i^n} \]

Where

\( X_1, X_2, \ldots, X_n \) and \( Y_1, Y_2, \ldots, Y_n \) are series of benefit and costs in successive years respectively,

\( i \) = interest rate

\( s \) = scrap value in terms of physical facilities.

**Break-Even Point**

This is the time at which the present value of cost equates the present value of benefit. Implicitly, it is multiplied by the number
of years say in “t” years when the net present worth of a capital project equals zero. But in real life, this technique is usually adopted to appraise a physical capital investment whether such investment will break-even before a time stipulated by creditors usually commercial banks. In other words, such information can be presented by an enterprise to a creditor in an attempt to attract bank loan. This technique is rarely used in education enterprise unless it is for commercial purpose.

**Net-Present Value Method**

The net present value (NPV) of the investment is found by subtracting the benefits from the costs that have been discounted at a given discount rate. This represents the present worth of the net benefits of any educational project or an investment discounted as an interest rate earlier considered feasible by the investor. If the net discounted present value (NDPV) is positive, then the project is profitable. This formula can be used to calculate (NPV) thus:

\[
\sum_{t=i}^{43} \frac{(W_u - W_c)t}{(1 + r)^t} - \sum_{t=i}^{4} (W_s + C_u)(1 + r)^t
\]

Another method that could be used is

\[
\frac{B_1 - C_1}{(1 + i)} + \frac{B_2 - C_2}{(1 + i)^2} + \cdots + \frac{B_n - C_n}{(1 + i)^n}
\]

Where

- **B** = benefits from education
- **C** = costs of education and
- **i** = the assumed discount rate

**The Internal Rate of Return**

This method involves a derivation of an internal rate of return that equates the stream of benefits to the stream of costs. The internal rate is usually determined by trial and error. To an educational economist with access to computer, the use of discounted cash flow programme is used to obtain the internal rate. By trial and error, one discount rate is found which is low and which leaves a positive
present value and another which leaves a negative present value of benefits. This, then brackets the true internal rate of return, which may then be estimated by interpolation using any of the following formulae;

$$\frac{B_1 - C_1}{(1 + r)} + \frac{B_2 - C_2}{(1 + r)^2} + \cdots + \frac{B_n - C_n}{(1 + r)^n} = 0$$

Where

B= streams of benefit from education  
C= streams of cost education  
\( r \)= internal rate of return

or

$$\sum_{t=i}^{43} \frac{(W_u - W_s)t}{(1 + r)^t} = \sum_{t=i}^{4} (W_s + Cu)_t (1 + r)^t$$

Given the costs of investment in education occur within a time span of 4 years and the benefits last over 40 years, the rate of return to such investment could be estimated by the so-called short-cut formula,

$$r = \frac{W_u - W_s}{4(W_u)}$$

where a bar over variables denotes mean annual values of earnings and cost. This method assumes that age-earnings profiles are flat.

**ITQ**

**Question**

Name the four major sector of the formal educational system in Nigeria.

**Feedback**

We do not know your thought about this, however, the four major sector of the formal educational system in Nigeria are:

- basic education (primary & vocational and technical),
- secondary education (academic),
- post-secondary (intermediate) and
- University
6.3 The Economic Benefits of Investment in Education

What do you consider as the benefits of investment in education? Investment in education is a shared enterprise that includes private investment by families and students. Families normally bear over 50 per cent of the total investment costs since forgone earnings must be included as part of the investment. An objective of estimating education externalities is to get some idea of how these costs should be shared between private support by families and employers, and public support by government and by donors if efficiency is to be achieved. Since private decision makers take these external benefits for granted, and they will not be provided without external intervention to correct this source of market failure.

The direct benefit of education to society is the higher productivity of educated workers and the additional contributions to national income over their entire working lives (Psarcharopoulos in Nwadiani, 2000). He further stated that economic benefits lend themselves to easy measurement. According to him, what is usually done is to use the earnings of workers. Actually, the use of earnings to measure the direct benefits of education is based on the assumption that the productivity of workers is reflected in their earnings/incomes. There is also an extended assumption as noted by Nwadiani (2000) that additional earnings, measure in a proxy manner higher output. One needs to point that earnings are determined not only by educational attainment. The experiences of many people have shown that there are other important variables that also determine earnings. These include age, experience, on-the-job training, natural ability, attitudes, motivation, social class, sex, type and place of work, socio-economic background of workers and family connection.
Earnings of workers is not only determined by educational attainment. There are several other factors that determine workers earnings, which include; age, experience, on-the-job training, natural ability, attitudes, motivation, social class, sex, type and place of work, socio-economic background of workers and family connection.

The easiest way to measure the direct benefits of education according to Nwadiani (2000) is to construct an age-earnings profile. This should be done for educated and uneducated workers of the same age group. Age-earnings profile is important because it shows the trend in workers earnings throughout their working life-span.

**6.3.1 Method of Collecting Data on the Earnings of People**

Collection of data on the earnings of people in developing country may be little difficult because proper records of workers in the developing countries are not well put in place for future purposes. If one wants to collect data on the earnings of people from the time they enter the labour force to when they entire, two approaches are usually adopted.

These are
- longitudinal
- cross-section methods.

**The longitudinal method**

This is the one in which data are collected right from the time a person starts work until when he/she retires. For example, the income of a worker who joins the academic staff in Adult education department at the age of 40 years till when he/she retires at the age of 70year are collected. That is, data on his income would be collected for a period of 30 years.
**The cross-section method**

The cross-sectional approach appears to be very favoured that is why this approach has been described as very tedious because it takes a long time to study the changes in income. Researches may not have all the time to embark on such a study. Nwadiani (2000) points out that in this approach, data on earnings are collected from a sample of workers of different age groups. The collected data, according to him, are used to construct an age-earning profile with the aid of the calculated age-earning streams by plotting a graph taking into consideration their educational levels.

**ITQ**

**Question**

What differentiates longitudinal study from cross-sectional study?

**Feedback**

In a longitudinal study, researchers conduct several observations of the same subjects over a period of time while such observation is done once in a cross-sectional study.

### 6.3.2 Non-Economic Benefits of Investment in Education

Investment in education has some non-economic benefits not only to education but relative to individuals, family, neighbours, community and to the entire society. These are the categories of other members who, in one way or the other benefit from education. The individual gets internal physiological satisfaction for receiving a particular type or level of education to identify their potential for development of the nation and for them to understand the changes occurred within their environment and around the world through the education received. The individual gets widened employment possibilities, decreased unemployment, improved fringe benefits and working conditions, improved health and longer life, improved
use of leisure time, efficient consumer behaviour and improved ability to manage personal assets; Families also benefit from education. For instance, there are improved childcare services, which schools provide while mothers are at work. There are improvement of the health of wives/mothers and their children. There is effective control of family size with planned fertility behaviour. Neighbours and communities also benefit from the education of an individual or individual’s children of neighbours acquire information from the educated. They benefit from counselling services. The educated teach and spread new farming techniques to their communities. They participate actively in community development efforts. Some of the educated people who find themselves in good positions use their education to better their communities. The non-economic benefits which society derive from education include very high citizen participation in democratic political process, social cohesion, reduction in crime rate as a result of the social norms and values inculcated in the educated, appreciation of citizens of the assets and liabilities of society.

As an undergraduate student, have you ever give a deep thought on the following?

<table>
<thead>
<tr>
<th>Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. is this the kind of society I aspire to live in?</td>
</tr>
<tr>
<td>2. If yes, is there any way I can use my educational experience to better the lots of the community.</td>
</tr>
<tr>
<td>3. If not, what do I do with my educational prowess to address some of the challenges confronting this society?</td>
</tr>
</tbody>
</table>

Pondering on how to use your educational attainment right wrong, some of the inherent inefficiency in your community constitute the non-economic benefits of education.
Study Session Summary

In this Study Session, you have learnt the investment criterion in education with a detailed analysis of the applicability of the criterion. We have also discussed extensively, the approaches of educational investment such as manpower approach, social demand approach and rate of return approach. Finally we examined the benefits of investing in education.

Assessment

SAQ 6.1 (tests Learning Outcome 6.1)
What are the parameters that make education an investment?

SAQ 6.2 (tests Learning Outcome 6.2)
Itemize some the fundamental challenges confronting the educational system in Nigeria.

SAQ 6.3 (tests Learning Outcome 6.3)
What do you consider as the benefits of investing in education?

Bibliography


Study Session 7

Cost Benefit Analysis

Introduction

This Study Session is designed to make you understand the concept of cost benefit analysis as a way of assessing ability of desired project to the development of education system. You will also be made to understand the types of cost benefit to match your projection and make you understand the advantages of cost benefit to education setting.

Learning Outcomes

When you have studied this session, you should be able to:

7.1 Define cost benefit analysis based on your own understanding

7.2 Discuss the advantages of cost-benefit analysis

Terminology

<table>
<thead>
<tr>
<th>Cost Benefit Analysis (CBA)</th>
<th>An analysis explaining that the pros and cons of a project must be considered, studied, and examined before engaging in it.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Externalities</td>
<td>A consequence of an economic activity that is experienced by unrelated third parties.</td>
</tr>
<tr>
<td>Income-Stream Differential</td>
<td>The analysis of reasons for income variation among the group of people.</td>
</tr>
</tbody>
</table>
7.1 Meaning of Cost Benefit Analysis

If asked to define both cost and benefit, I believe you will be able to do so. However, can you explain the meaning of cost-benefit analysis? A practical way of assessing the desirability of projects, where it is important to take broader views by looking at repercussions as to the effects of embarking on such projects on persons, education, industries, regions, etc. This implies the enumeration and evaluation of all the relevant costs and benefits. By extension, as part of the developing interest in the economics of education, cost benefit analysis (CBA) was applied to investment in education, where it increasingly became known as "rate-of-return analysis". Applying the cost benefit concept to education entails an evaluation of the cost of education to the benefit derivable from expenditure on education. This in itself is a more complex problem than applying the theory to ordinary investment. Expenditure as indirect productive ventures or even in utilities such as electricity, railways, dams among others. Expenditure on education is both a social and a productive investment and so the direct cost benefit is more complex and diffused. To determine the benefits from education is much more difficult and involves philosophical issues relating to the purposes of education and how to assess whether these are being achieved. Economists have tended to concentrate on the relatively hard evidence that exists in most countries that those people with higher levels of education on average receive higher incomes throughout their working lives than people with lower levels of education. These differences, as measured by data known as age-earnings profiles, appear to be relatively stable and consistent over time. It has therefore seemed reasonable to regard the income-stream differentials, or some proportion of them, as attributable to the education received and it has become conventional to use them to measure the benefits from education. Clearly, to do so is not without problems and leaves a number of questions unanswered, but efforts to find alternatives have met with difficulties. One of the most interesting alternatives was the attempt to measure the contribution of education directly by comparing the
physical output of educated and less educated workers (Jamison and Lau, 1982).

<table>
<thead>
<tr>
<th>Reflection</th>
</tr>
</thead>
</table>
What do you want to benefit from this undergraduate programme? Is it to be able to secure good job, live in a good home and acquire for yourself the good things of life?

| Externalities |
A consequence of an economic activity that is experienced by unrelated third parties.

7.1.1 Types of Cost Benefits to Education

There are two types of benefits of education

i. **The direct benefits:** This can lead to an increase in the future earnings or output of the educated individuals through improved productivity of labour. Also, this can lead to psychological satisfaction in the individuals that have acquired that particular level of education.

ii. **The indirect benefits:** these are those called externalities that are benefits accruing to others as a result of one’s education.

| Tip |
.In both the direct and indirect benefits, the elements of social and private benefits are incorporated. The social benefits accrue to the society while private benefits accrue to the individual beneficiary of education.

For the purpose of computation of the cost benefits analysis, we are concerned with the direct economic benefits. These are benefits that can be measured in monetary terms through the earnings received by the educated persons as proxy measure.

For us to get the correct earnings for our computation, earning differential of the educated and the uneducated are always considered. This can be derived from the earning profile of workers within a relevant geographical boundary

**Age- Earning Profile**

It is obvious and recognized that education contributes to the productive capacity of labour which is reflected in increased
output. As a result, it is expressed in form of additional earnings. Age-earnings profiles should be based on time-series statistical data, i.e. data collected over the whole of the working life, a period of forty years or more. For obvious reasons, these rarely exist and it is necessary instead to rely on cross-section data, i.e. snapshot evidence of cross-sections of society at one moment in time. Such cross-section data may be unduly affected by short-run cyclical changes in the economy, they ignore future changes in the demand and supply of educated manpower and they fail to capture the effects of trends over time, the major one of which in most countries is the incidence of economic growth.

The summation of the additional earnings received by the educated worker(s) is used in calculating the stream of benefits that have accrued to such workers. In practice, these data should be collected by comparing the earnings of the educated and uneducated workers over their whole working life. The total lifetime earnings differential would then provide an estimate of their higher productivity levels of educated. Since, it is not that always easy to determine the time series data for the previous earnings of the educated and the uneducated, an alternative standard is used to determine the earning differential by use of cross-section data. This is used to estimate the average age-education earnings profile for workers with different levels of education.

The differences between private and social rates-of-return, i.e. the extent of public subsidization of education, are greatest in the poorest countries and at the higher levels of education. To compare the results of rate-of-return studies in this way across countries and across levels of education is not an easy matter. Some of the studies, especially the older ones, use the traditional method, some, especially more recent ones, the Mincer method. Psacharopoulos comments that researchers do not always state explicitly the nature of the sample used (for example, urban, rural, and national) or the
methodology according to which the estimates are made (especially what adjustments have been made on the benefits side). The table below presents an illustration of income-earnings differentials between the Bachelors Degree holder and an A-Level Certificate Holder.

Table 7.1: Earning Differentials between a Bachelors Degree holder and an A-Level Certificate Holder

<table>
<thead>
<tr>
<th>Age Different Group</th>
<th>Earnings P.A Payment Degree</th>
<th>Earnings P.A Payment A-Level</th>
<th>Post-Tax Payment Degree</th>
<th>Post-Tax Payment A-Level</th>
<th>Earnings Diff. Pre-tax</th>
<th>Earnings Post tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-21</td>
<td>1,800</td>
<td>1,700</td>
<td>3,600</td>
<td>2,102</td>
<td>3,360</td>
<td>1,922</td>
</tr>
<tr>
<td>22-25</td>
<td>1,588</td>
<td>1,438</td>
<td>4,200</td>
<td>2,400</td>
<td>3,960</td>
<td>2,280</td>
</tr>
<tr>
<td>26-30</td>
<td>1,800</td>
<td>1,680</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-35</td>
<td>2,280</td>
<td>2,076</td>
<td>4,800</td>
<td>2,520</td>
<td>4,476</td>
<td>2,400</td>
</tr>
<tr>
<td>36-40</td>
<td>2,812</td>
<td>4,920</td>
<td>2,700</td>
<td>4,632</td>
<td>2,566</td>
<td>2,220</td>
</tr>
<tr>
<td>41-45</td>
<td>2,240</td>
<td>4,248</td>
<td>6,000</td>
<td>2,760</td>
<td>5,412</td>
<td>2,600</td>
</tr>
<tr>
<td>46-50</td>
<td>4,756</td>
<td>4,220</td>
<td>7,656</td>
<td>2,900</td>
<td>6,948</td>
<td>2,700</td>
</tr>
<tr>
<td>51-55</td>
<td>4,560</td>
<td>4,220</td>
<td>7,800</td>
<td>3,240</td>
<td>7,200</td>
<td>2,980</td>
</tr>
<tr>
<td>56-60</td>
<td>5,040</td>
<td>4,634</td>
<td>8,400</td>
<td>3,360</td>
<td>7,704</td>
<td>3,070</td>
</tr>
</tbody>
</table>

Certain adjustments have to be made in the overall computation of rates of return. Adjustments are made with tuition fees, scholarship and bursaries to avoid the error of double counting when computing social costs. Adjustment is also made for educational wastages and unemployment. Usually, only a proportion of trained people are employed. If all were to be employed, the returns of training, (education) would be higher.

This method has a serious limitation in that it does not consider change in the value of money over-time it cannot be true that ₦200,000 invested in a child’s education 6 years ago carries the same value with amount of today. Put in another way, the value of
the ₦1,000,000 you may be earning by the time you retire will not be worth the ₦600,000 you are receiving now. This method merely introduced you to the logic of benefits-cost-analysis. It is an easy way of understanding the processes involved. The method is, however, not recommended for use in real-life situations.

<table>
<thead>
<tr>
<th>ITQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question</strong></td>
</tr>
<tr>
<td>How does individual gains from education transformed to social gain?</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
</tr>
<tr>
<td>This occurs through the spillover effect. There are “spillover” effects from education that transforms individual gains into social gains. Spillover effects are otherwise known as externalities.</td>
</tr>
</tbody>
</table>

### 7.2 Importance of Cost Benefit Analysis

Since we have been able to explain what cost-benefit analysis is, let us consider some of its importance. Cost benefits analysis has some desirable significant, particularly into the field of education. Some of these significant include:

i. It is a tool for estimation of the rates of return to different levels and types of education.

ii. It has an advantage of considering other options and alternatives before making a decision on where to invest any money in education. It therefore provides a rational basis for decision-making.

iii. It provides educational planners with solid guidance whenever they are planning education.
Question

Based on your own assessment, how relevant is cost benefit analysis toward solving some of the fundamental challenges confronting Nigerian education and the overall economy today?

Feedback

With CBA, we have been able to realize that the social benefits of education is more than its social cost. Thus, this makes education a positive externality that can never be over-produced, the more conscious-driven an economy is concerning education, the higher the social benefits.

Study Session Summary

In this Study Session, you were exposed to meaning of cost benefit analysis in education, types and advantages of cost benefit analysis in education. Also discussed was the use of age-earning profile to capture income differential between the educated and uneducated labour force within the same economy so as to be able to measure the rate of return.

Assessment

SAQ 7.1 (tests Learning Outcome 7.1)

What do you understand by cost-benefit analysis?

SAQ7.2 (tests Learning Outcome 7.2)

How beneficial is cost benefit analysis to Nigerian educational system?
Bibliography


Study Session 8

Educational Efficiency and Effectiveness

Introduction

Many at times, the terms efficiency and effectiveness are being confused together. It is on this premise that this Study Session seeks to expose you to the concept of educational efficiency and effectiveness. We will also discuss the concept of wastages in education by highlighting the causes, and suggest solution to the problem of wastages in education.

Learning Outcomes

When you have studied this session, you should be able to:

8.1 Establish the difference between efficiency and effectiveness in education.

8.2 Describe the term ‘wastage in education’ and explain its causes.

Terminology

<table>
<thead>
<tr>
<th>Efficiency</th>
<th>The ratio between the output of an organization and inputs used in producing the output or the optimal relationship between inputs and outputs in an enterprise.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>The degree to which the stated or expected objective is achieved.</td>
</tr>
<tr>
<td>Formal Education</td>
<td>A classroom-based educational activities provided by trained teachers.</td>
</tr>
<tr>
<td>Non-formal Education</td>
<td>An organized educational activity that takes place outside the formal educational system.</td>
</tr>
</tbody>
</table>
8.1 Educational Efficiency

The word “efficiency” cannot be a new word to you. However, do you know what it means? Efficiency refers to the ratio between the output of an organisation, establishments or department and the inputs used in producing the output. In educational efficiency, the attempt is to see how outputs produced from a given quantity of inputs, which can be increased or how outputs produced can be kept at the same level even when input level is reduced. Efficiency, according Arinze in Bosah and Eneasator (1996: 1974) is defined in terms of the optimal relationship between inputs and outputs in an enterprise. We usually say that an activity is performed efficiently if a given quantity of outputs is obtained with a minimum number of inputs. Educational efficiency can also be seen to be relationship between the outputs of the education system and the inputs into the education production process, the outputs produced (students) with such educational inputs and the ratio between the educational outputs and inputs.

In education industry, there are two categories of efficiency such as the internal efficiency and the external efficiency. The internal efficiency is the ability of the inputs into the educational system to be judiciously managed to produce a required output. It is based on effective management and utilization of the resources invested into the school system. The external efficiency is the quality and quantity of end products of an educational process.

Arinze in Bosah and Eneasator (1996) stated that depending on the type of organisation and its objectives, that efficiency is measured by the number of deaths per doctor, the number of supervisees per supervisor. Kilometres covered by a car per litre of petrol.

However in education, some efficiency measures include:

i. Cost per full time equivalent student
ii. Student – faculty ratio
iii. Student – teacher ratio
iv. Percentage of classroom time utilized.
Education and economics are all concerned with production. The concept of efficiency is used to analyse production whereby one kind of goods or services is transformed into another. Education, as we mentioned, is also concerned with production. A number of inputs (teachers, students, content, buildings, books instructional materials, etc) are combined in different ways in order to achieve educational ends. In other words, various inputs are transformed in order to achieve outputs. It is therefore obvious from all this that when people talk about improvement in the efficiency of the educational system, they are generally referring to change in the way different inputs are combined to yield outputs.

Generally, efficiency in education has two dimensions. These are according to Arinze (1996)

i. the flow of students through the system with a minimum of wastage and

ii. the quality of learning achieved in the system at given levels or periods.

Mathematically, efficiency can be defined as

$$ E = \frac{Q}{X_{it}} $$

Where Q= educational output in time t

X_{it}=input in time t,i=123….n

E=efficiency of education system

In some situations, policy makers and curriculum developers in education may be more interested in assessing the efficiency level of some inputs utilized in the education process. For instance, it is possible to assess the contribution of labour i.e. teachers or capital e.g. buildings to the output produced. When that is the case, we have the following formulae:

$$ PE_{it} = \frac{Q_t}{X_{it}} $$
Where:

- PEit = Partial Efficiency of the education system
- Qi = output(s) in time (t)
- Xit = input(s) in question

Two categories of efficiency exist in education, internal efficiency and external efficiency. The internal efficiency is the ability of the inputs into the educational system to be judiciously managed so as to produce a required output. The external efficiency is the quality and quantity of end products of an educational process.

### 8.1.1 Nigeria Educational Experience on Efficiency

During the past four development plans, education in Nigeria has witnessed reasonable phases of expansion, improvement, technological changes, physical and structural changes for adequate learning process. The impact of the progressive educational policies followed by various Federal, state government and Local level council have been that Nigeria operates an extensive network of primary schools, secondary schools and higher educational institutions throughout the country. In term of resource allocation to education settings from social point of view, total expenditures currently constitute over 4.5 per cent of the Gross domestic Product (GDP). Again, formal education in Nigeria tends to depend heavily on federal, state and local governments for finance. The share of education expenditure in relation to all government budgets has risen to over 17 per cent.

It is clear that the country has been allocating, every year, a significant proportion of its scarce national resources to education, to help bring about desired changes in the country economy. However, it reveals that spectacular growth in the provision of education facilities and enrolment had generated many imbalances
and maladjustments within and between the educational system and the rest of the economy and society at all levels of education.

**ITQ**

**Question**
Mention any five educational inputs known to you.

**Feedback**
We do not know what you think about this, However, educational inputs include:

- teachers,
- students,
- content,
- buildings,
- books,
- instructional materials etc

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**Non-formal education**
An organized educational activities that takes place outside the formal educational system.

**Formal education**
A classroom-based educational activities provided by trained teachers.

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The Non-Formal Education
The international council for educational development has defined non formal education (NFE) as any organized educational activity outside the established formal education system, where operating separately or as an important feature for some broader activity, that is intended to serve identifiable learning clienteles and learning objectives (UNICEF, 1973). Formal education is only a part of human resource development as NFE is also an important aspect of human capital information for instance, NFE are on the job training apprenticeship, adult education, extension services and youth programmes. Therefore, NFE provides;

i. It provides a wide range of learning activities, which lie beyond the scope of formal education (Ojo, 1986). For example, unskilled and semi-skill workers in various areas of employment have to be trained on the job while new skills and knowledge of farmers are best generated through extension services

ii. It may be an alternative or substitute for formal education as electricians, carpenters, automobile mechanics, fitters, among other, may be trained on the job through apprenticeship or in
formal education institutions such as trade centres and vocational schools;

iii. It is a means of extending skills and knowledge gained in formal education. This underlines the fact that human resource development is a continuous lifetime process. Skills and knowledge acquired in pre-career formal education may atrophy without the stimulation, extension and enrichment provided by out-of-school learning activities;

iv. It may be the only available learning opportunities for large proportions of the population in many countries;

v. It may be one means of counter-balancing some of the distortions created by formal education.

8.1.2 Effectiveness in Education

Effectiveness

The degree to which the stated or expected objective is achieved.

Effectiveness is conceptualized in terms of the achievement of objectives of education output and input. Effectiveness in education is the process whereby the output is functioning to the expectation of the organisation. For instance, a graduate student is said to have achieved its objectives if the students perform well in the school examination from first year to last year of the programmes. We usually say that an activity is performed effectively if the objective set out is achieved. On the other hand, we usually say that an activity is performed efficiently if a given quantity of outputs is obtained with minimum inputs.

Tip

Efficiency explains optimality, while effectiveness explains achievement

8.2 Wastage in Education System

What do we mean by wastages in educational system? Wastage in education cannot be overemphasized from educational effectiveness and efficiency. Educational wastage means the inefficient or lack of useful teaching and learning materials or use of educational resources. Obviously, educational wastage includes drop-outs, repeaters, non-
employment of school leavers, brain drain and even inadequate utilization of educational resources including teacher, school library, computer, instructional aids and buildings i.e. classroom, staff-rooms etc. Inadequate utilization of educational resources implies that in a school system, for instance, a senior lecturer was appointed in the department of Adult Education and the duties and responsibilities assigned was not discharged the way it supposed to be discharged, then the lecturer is said to be a wastage to the development of the department.

8.2.1 Causes of Educational Wastage

Causes of wastage in education was classified into three grouped from Bosah and Eneasator (1996)

i. the nature of educational inputs

ii. the nature of educational processing

iii. the nature of educational outputs

These three grouped classification of wastage in education are explained below

The nature of educational input

The causes of educational wastage are largely due to the nature of educational inputs. This includes the nature and ability of students, the nature and types of educational resources, the goals of the educational system, and the nature of the content (curriculum). One aspect of manifestation is drop-outs within our educational system. We find cases of drop-outs in primary schools, secondary schools and tertiary institutions. The main reasons for students drop-outs are ill-health and death, truancy, burnout, psychological problems, financial difficulty or poverty, learning difficulties among students, and at times, parents wish, some pupils or students fell sick during their academic career and the ill-health is so serious that they cannot continue with their education. Some even die in the process. Some students also enrol into a programme but habitually absent themselves from lessons or lectures.
The nature of educational Processing

Another cause of educational wastage is the nature and types of educational resources, including teachers and facilities available for education. The nature of the goals of the educational system is also another cause of wastage in education. We find out that where the goals of the educational system are practical-oriented, then the products would be gainfully employed on graduation. But where the goals emphasize merely literacy and general education, then the products would be wastage and could be useful for the development of the nation. The nature of the content of the curriculum could also be a cause of wastage. The cause of educational wastage could be process-based; say administration or management, the examination or certificate system. The nature of administration or management of the school system could be faulty in the sense of the administrator being autocratic or high-handed. It could also be a lazy-faire administrator – who allows everything to go its own way without making effort to put things right. It could be that the nature of the examination system where emphasis is laid on one-shot examination instead of continuous assessment is the cause of the wastage in Educational system.

Tip
Where the goals of the educational system are practical-oriented, then the products would be gainfully employed on graduation. But where the goals emphasize merely literacy and general education, then the products would be wastage. This alone explains why much Nigerian graduates cannot fit in well into the labour market.

The nature of educational outputs

It could be that the graduates from the educational system do not conform to the initial objectives or even that the graduates find it difficult to fit into the society. Somebody who studied literacy subjects, for example, may not fit in very well in a computer-literate society. The graduates may not be fully employed, or it could be that they have not acquired the changes and thoughts desired by the larger society.
ITQ

Question
From the aforementioned causes of wastages in education, which one do you consider most germane and why?

Feedback
I may not know what is your thought on this, however, I think the bulk of wastages in Nigerian educational system stems from the nature of its output. This is because most of the graduates that endure to wither the storm of inefficient inputs and processes inherent in the educational system are still not rightly fixed into the areas where they can be useful not only for themselves, but for the generality of the whole nation.

8.2.2 Reduction of Educational Wastage
There are many quality things that must put in place, such as the quality of the teacher, which must be improved upon for better performance during the course of teaching. Educational institutions should organize conferences, seminars and workshops for serving teachers on the improvement of teaching methods and techniques. There should be more emphasis on science and technology, computer science and allied courses to aid teaching and learning to suit modern teaching activities in the world of knowledge. The contents of school curriculum should be in line with science, technical and computer areas. The management, school authority or administration in educational institutions should be re-examined with a view to improving its quality. There should be adequate provisions for various institutions like Federal and State Ministries of Education and their agencies, as a matter of necessity appoint qualified and competent educational administrators to head various institutions. Politics should not participate in the appointment of educational managers or administrators of our institutions.
Administrator of our educational institutions is the Primary school Headmasters, Secondary school Principals, Provosts of our Colleges of Education, Rectors of Polytechnics and Vice-chancellors of our Universities should be democratic in the management of affairs of their institutions. Educational institutions should continue to lay emphasis on continuous assessment.

**Study Session Summary**

In this Study Session, you were exposed to the concept of educational efficiency and effectiveness in relation to adult education, community development and social welfare. We also acquaint you with the analysis of what constitute wastages in education and how this problem can be resolved.

**Assessment**

- **SAQ 8.1 (tests Learning Outcome 8.1)**
  Differentiate between efficiency and effectiveness in education

- **SAQ 8.2 (tests Learning Outcome 8.2)**
  What are the causes of wastages in education?


Study Session 9

Education Demand and Supply

Introduction

Similar to Economic parlance, where it not everybody who wants a commodity that is readily available, ended up getting it, education is also subject to the economic concept of demand and supply. Thus, this Study Session will take you through education demand and supply with exclusive analysis of factors determining them.

Learning Outcomes

When you have studied this session, you should be able to:

9.1 Define the term 'demand for education' and highlight its determinants.
9.2 Describe the nature of relationship between social demand and supply of education.

Terminology

<table>
<thead>
<tr>
<th>Terminus</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pareto Efficiency</td>
<td>A state of allocation of resources in which it is impossible to make any one individual better off without making at least one individual worse off.</td>
</tr>
<tr>
<td>Demand</td>
<td>The amount or quantity of goods and services a consumer is willing, ready and able to pay for at a given price and at a particular period of time.</td>
</tr>
<tr>
<td>Exceptional Demand</td>
<td>This describes demand curve in a direct relationship between price and quantity, which against or violates the normal demand curve.</td>
</tr>
</tbody>
</table>
# 9.1 Meaning of Demand

Let me ask you at this juncture, what is demand? In economic terms, demand means the desire of would-be purchasers or users of a commodity. Nwadiani (2000) defines demand more critically as the amount of a commodity, like education, that would be bought at a price over a period of time. Many people would expect more of a commodity, like exercise books, will be bought at a lower price. This means that if the exercise books were less or smaller in number, it would cost more, Nwadiani (2000) reported that the application of this law is dependent on whether the commodity being demanded has a substitute. In a situation where there is no substitute, exceptional demand becomes the rule. It must be pointed out that where there is a further rise in the price of a commodity more of such a commodity would be bought, even if the price has risen. Education is a product of very many inputs (teacher, teaching aids, buildings, administration, funds, etc. It shares the same qualities of ostentatious goods – goods with very high prices. The price which people pay for education rises every day. A lot of wealthy individuals in the society demand for schools or educational institutions that are very costly. Thus, we normally talk of elasticity of demand.

**Note**

Demand for education represents the willingness, readiness and ability of an individual to pay the price of education at a particular period of time.

## 9.1.1 Determinants of Education

Consider the market for adult education in the country. In this fictional country, there is no variation in the quality of primary schools, secondary and tertiary institutions nor are any schools more conveniently located than others. Families send their children to school only if they can pay the bill and if they view it as worthwhile. Cost is one of the major determinants of the demand for education. It is the responsibility of the Nigerian government to provide education for her citizens. But we know that this is not
usually the case. In fact, much of the cost of education is borne by private individuals and at times, local communities. Usually parents bear the direct costs of education by paying tuition fees, buying stationeries, school uniform, paying the cost of transportation to and from the school and providing pocket money. Obviously many pupils or students would not be in school if the cost of education were very high. If the cost of secondary education for instance were to be N5000 per term, most parents may not afford to pay such amount for their children. Today many people cannot afford to train their children overseas because of cost implications.

Family disposable income is another major determinant of the demand for education. Most families are very poor in Nigeria. Only a few are rich. Those families who are very poor have little or no income to dispose towards the education of their children. Nwadiani (2000) had argued that poor families will certainly find it difficult to pay fees and that even when free education is offered, it imposes a substantial financial burden through earnings forgone and out of pocket expenses for clothes, travel, books or materials. Parents whose main occupation is farming find it difficult to release their children for school. This is especially the case in the rural areas of the country. Nwadiani (2000) had argued rightly too, that effective demand for education is usually very low among Africans and lower for uneducated, poor and rural families. Many Africans (Nigeria as one of them) have large families. In most cases, the families are beyond the level they can cope with.

Take time to ponder on this:

**Tip**

The demand for education is derived demand. Meaning that most people demand for education is not for the sake of it (that is to be educated or knowledgeable) but for the sake of what they will become in future.

In these families, the demand for education is very selective what happens is that only the very intelligent ones are sponsored. The
situation is worse in polygamous families. In such families, the mothers bear the burden of the education of their children. Of course, in this type of situation, girls are not considered for education. In Nigeria, education is seen as a profitable investment, which will yield much dividends later. This is one of the reasons why parent invest in education. They usually sacrifice their hard earned income and at times even borrow to make sure they educate their children. They make these sacrifices because they are sure that when their children graduate they will earn a fat income. Of course, people invest in education to earn a higher income over time. Also, people want to increase or improve their social status and also to contribute to the development of education demand. Another determinant of education demand is the availability of non-educational alternatives. Writing on this Akangbou (1998) and Nwadiani (2000) pointed out the decision to invest or not to invest in education would depend on the availability or non-educational alternatives. Education, as we know, is very essential for individual and societal progress. Many people have different attitudes towards education. Some see it merely as preparation for adulthood. Others see it as a means of livelihood. So, the way education is demanded depends on attitude towards education and what those demanding it feel education can do for them. There are parents who will do anything to make sure their children are in school.

**ITQ**

**Question**

Is demand for education a normal demand or an exceptional demand, why?

**Feedback**

Hmmm, a straightforward answer seems not to exist because the question is relative to both the rich and the poor in the society. To the rich, education tends towards exceptional demand, and to the poor, it a normal demand.
9.2 Meaning of Social Demand

We have been able to define demand as the amount or quantity of goods and services a consumer is willing and able to buy at a given price. Social demand for education is the total number of individual demand for education places over time. Nwadiani (2000) pointed out that social demand for education is dictated by the social, political and economic situations of the time. On other words, the total number of individual demand for education places over time is dictated by the social, political and economic situations of the people at a particular time. (Coombs, 1985) stated that “the social demand for education at times exceeds learning needs as when young people vie for entry into the University not primarily to satisfy their yearning to learn but to obtain a diploma that has special prestige and market value”. Did you take your time to ponder on the following happenings as regard securing admission into higher institutions in Nigeria?

<table>
<thead>
<tr>
<th>Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is it that most people who had the required scores in their matriculations examinations were not considered for admission?</td>
</tr>
</tbody>
</table>

This best explains the imbalance between social demand and supply of education; our next consideration.

9.2.1 Social Demand and Supply of Education

At a mechanical level, it can be said that the market clearing price is determined by the interaction of demand and supply. The market clearing price is that price at which the total number of units demanded equals the total number of units supplied (e.g., the level of school fees at which the supply of school places equals the demand for adult education students enrol).

To understand the importance of social demand and supply of education, there are many factors, which we must take into consideration such as:
**Human capital formation**

We derived an optimal demand for schooling under the constraint of a given technology in human capital formation. When students are inputs in the production process, it becomes crucial to consider their individual abilities and the overall ability of the group of students. Educationists have made it clear that it is much easier (and more rewarding) to teach bright students: they understand better and more quickly, raise clever questions and are typically more motivated in studying. But the converse is also true: students are brighter when teachers are better qualified and more motivated. This is only side of the coin. Since unobservable ability is positively correlated with family background (mainly with parental education). Thus, in most cases, the brightest students are the offspring of educated parents, and this creates an incentive for teachers to teach in schools where there are a greater proportion of better-endowed students. The reverse is also true: knowing that better teachers are crucial in producing more human capital; parents of abler students have a greater incentive to hunt for better schools. As a consequence, treating students are educational input is intimately related to the problem of self-sorting in schools (and classes within schools).

While individual ability may be importance when interacting with teacher quality, it could also become relevant at the aggregate level of the class (or of the school). Everyone wants to be in a class with good teachers, but everyone wants good classmates too, because it is common knowledge that the ‘speed of learning’ in a class is the average speed, which is positively correlated to the average ability. But this cannot always be the case: being in class of geniuses may have depressing effects on average students, whereas middles-to-bottom quality class may encourage the performance of average-ability students.
The overall effect of average ability in a class (peer effect), depends on the hypothesised effect of the social interaction, which can either be of the ‘complement’ variety (human capital formation improves only when there is a generalised increase in the quality of all students), or of the ‘substitute’ variety (the ability of a better-endowed student can –at least partially- compensate for the low performance of a less endowed student).

By varying student qualities (whenever schools can sort students according to their observable abilities, as in the admission to some private schools and / or to most high schools) and class size, school managers can vary the potential for human capital formation in each class. Since families choose schools according to their expectations with respect to admission and class formation policies, actual human capital formation emerges as the equilibrium result of supply and demand for school quality. Let us now discuss the issues of class formation in greater detail.

**Class formation and peer effects**

There are three main problems in defining optimal class formation: the selection of students according to their ability, the class composition (i.e. mixing students of different ability in the same class or creating ability- homogeneous classes) and the class size. The first two issues arise whenever students are differently endowed with abilities that are relevant in educational achievement (attentiveness, brightness, cooperativeness).

Otherwise, only the third issues remains relevant, the problem of screening students arises from the unobservable nature of individual ability. A large part of schooling activity is devoted to testing students in order to obtain indirect measures of these unobservable. Test score are, in turn, used as screening devices for admission to further education. On the whole, one could state that one by-product of schooling activity is information about students’
quality. This view supports the idea of educational certificates as signals for prospective employers: the longer a student remains at school the more extensive the selection that has been passed, and the greater must be his/her unobservable ability.

While testing is the only alternative in the case of imperfect symmetric information (neither the student, his/her family nor the teachers know his/her ability in advance), whenever students and families have an informational advantage on unobservable ability, charging tuition fees can be an alternative to screening students. Suppose one intends to create an elite school by admitting only the best students, in a context where families have superior information about student’s abilities (imperfect asymmetric information). All families would like to gain access to the exclusive elite school, because this will grant higher returns to education in the future, than is to the better human capital formation. There are two alternative ways to find the best students: either through submitting all applicants to specific examination, or by selecting them in accordance with their willingness to pay.

The main drawback of the allocation mechanism based on testing is that it wastes resources: students spend time to prepare for the admission tests, families spend money in order to provide extra tutoring for the same aim and schools have to pay teachers (or external examining agencies) to mark exams. In addition, student performance is very often correlated to family background, and therefore the final result does not always identify ‘pure’ ability in the students. The market mechanism (selecting students by means of admission fees that increase with perceived school quality) is in principle more efficient: by ordering people according to the maximum fees they are willing to pay, they indirectly reveal their hidden abilities. Seen from this perspective, in order to obtain the best students it is sufficient to raise fees adequately. Under the
maintained assumption that private schools provide better-quality education, the empirical counterpart is that we should observe better-ability students in private schools, because only for high-ability children is it rational to pay more for better education.

However, the market allocation mechanism works properly only when financial markets operate perfectly- that is, when families can borrow money to pay high fees on the expectation of high-ability children. Otherwise, if markets for education financing do not exist, poor parents to high-ability children will outspend the rich parents of lower-ability children. Since financial markets for education financing typically either do not exist or are heavily subsidised by the state, meritocratic selection is in general Pareto-superior as an allocative device in class formation. Better students could still be prevented from participating in higher education by high opportunity costs. For this reason, the combination of meritocratic selection and publicly financed scholarships contingent on family income can yield the most efficient matching of students to schools.

The problem of sorting students in order to obtain an appropriate match between students and schools arises not only in schools for different qualities. If learning activity in class is affected by the ability and behaviour of classmates, families are not indifferent to the class assignment of their children. Whenever other people’s features affect current behaviour we speak of the peer effect, indicating the externality created by each individual on other people. Peer effects, can take different forms: conformity, competition, envy, and so on. School classes are a typical example where peer effects reveal themselves. Consider for example, the case where (student abilities are technical complements.)

In such a case each student benefits from being in a class of bright student, because he/ she gets more insights in class discussion, feels more pressure to compete and, in general, obtain additional stimuli by being associated with intellectually rich classmates. Even
though this example may seem extreme, it makes it clear that schools themselves have incentive to attract better students. In order to analyse this aspect, let us consider a case in which a given number of identical schools exist. Each school is able to accommodate the same number of students, but the students are different in terms of ability. When peer effects matter, each school has an incentive to attract better students, because this will improve the quality of its teaching. Whenever a pre-assigned school order exists, the first school will choose the best students. Since being admitted to the best school can be priced (either directly through admission fees, or indirectly through the price of housing whenever proximity to the school is a necessary requirement for admission), the school can use either exams or markets mechanisms.

Then the second school chooses the second-best students, and so on. The final outcome is perfect segregation of students according to their abilities and of schools according to the average quality of admitted students, irrespective of whether sorting occurs either through tests or through market channels. However, a stratified educational system does not necessarily represent the most efficient allocation of students. If the peer effects linearly affect the educational production function then exchanging students between schools does not alter the overall production of human capital. In contrast, when the educational production function exhibits increasing marginal returns in terms of the peer effect, then perfect segregation is effectively the most efficient allocation of students. However, whenever we observe a decreasing marginal productivity of average ability, mixing students of different abilities may prove superior in terms of human capital.
**Class size**

A final aspect related to class formation is the problem of optimal class size. If the educational outcome of a school can be identified, and priced easily, then profit maximisation could identify the optimal class size.

It would be seen that a profit-maximising school (i.e. a private school) will optimally choose greater class size, the bigger the student pool, the higher the teacher salary and the lower the average effect of school resources (or peer effect) on individual human capital formation. Symmetrically, a private school will hire more teachers, the bigger the student pool, the lower the teacher salary and the higher the average effect of school resources (or peer effect) on individual human capital formation. Notice that a higher return to education would suggest smaller classes and/or more teachers, because families would be available to pay the monetary cost of additional resources on the expectation of greater rewards in the labour market.

In order to derive optimal size prescription, it is necessary for the educational production function to be affected in practice by class size in empirical data.

**Resource effectiveness**

The uncertain effects of class size on student performance do not constitute an exceptional case. Many other indicators of school resources (such as the student/teacher ratio, teachers’ salaries, teacher education, school size, the availability of books and/or libraries) have been found to have ambiguous effects by those trying to estimate educational production function. Eric Hanushek has repeatedly provided reviews of this literature. The general puzzle to be addressed is that ‘the constantly rising cost and “quality” of the inputs of schools appear to be unmatched by improvement in the performance of students’. Family and
neighbourhoods are generally found to exert a greater impact on school achievement than aggregate indicators of school resources.

While early studies directly tested the potential/impact of school resources on test score achievement, more recent ones have focused on the acquisition of cognitive abilities as the main output of the educational production function. While the effect of school resources is uncertain with respect to student achievement, stronger effects are found through continuation in school.

There are two main issues in measuring the effect of school resources in educational achievements:

(i). Sample selection; and
(ii). Data aggregation

**Resources efficiency**
A recurrent explanation for the finding that the effectiveness of educational resources is absent when estimating educational production functions make reference to inefficient use of the same resources. The above can be explained thus: with decreasing marginal productivity of inputs, an intensive use of one input can reduce the impact of its productivity to a negligible level (statistically indistinguishable from Zero), cost effectiveness can be said to be corresponding to the condition that achievement gains per unit of currency spent have to be equalised across inputs.

As Pritchett and Filmer (1999) convincingly demonstrate, the vast majority of studies on educational production function are inconsistent with condition. In a similar vein, using aggregate data on educational expenditure, Gundlach, Woessman and Gmelin (2001) find that the educational sector in OECD countries has exhibited a productivity decline in the order of two to four percentage points a year over the period 1970 to 1994. In terms of effectiveness of inefficiency resources variation depend on the type of schools variety of resources and the degree of utilisation of resources.
ITQ

Question

Mention those factors that enhance equilibrium between social demand of education and supply of education.

Feedback

These factors are:

- Human capital formation;
- Class formation and peer effects;
- Resource effectiveness; and
- Resources efficiency.

Study Session Summary

Summary

In this Study Session, You learnt the concept of demand in economic terms as well as educational demand in adult education, community development and social welfare. We also expose you to the main determinants of demand in education system. The concept of social demand for education was discussed alongside with discuss on the differences between education demand and supply for education and showed the factors affecting social demand and supply for education.
Assessment

SAQ 9.1 (tests Learning Outcome 9.1)
Explain the meaning of demand for education and factors influencing it.

SAQ 9.2 (tests Learning Outcome 9.2)
At what point is equilibrium attain in the educational system?

Bibliography


Notes on Self Assessment Questions

SAQ 1.1
I is C (Economics)
II is A (Education)
III is B (Economics of education)

SAQ 1.2
The scope of economics of education include:
  i. Demand and supply of education;
  ii. Educational demography;
  iii. Educational finance: their sources and distribution;
  iv. Taxation for Education;
  v. Costing;
  vi. Cost-Benefit of investments in education;
  vii. Cost-qualify relation;
  viii. Wastage in education;
  ix. Productivity in education;
  x. Educational manpower development;
  xi. Migration of school leavers and labour market;
  xii. National economic growth and development;
  xiii. Rural and urban economics and the consequences of schooling on the economy.
SAQ 1.3 ... 

First, the rising cost of education and the increasing pressure in available resources, make it necessary to introduce economics into education.

Devising the means of reducing the rising cost of education, for example, should be the concern of education economists.

Secondly, there is existing high level of unemployment among school leavers in the face of selective manpower shortages in some other sectors of the economy. It therefore appears that there is a mismatch between the type of education provided, and the type needed by the economy. There is therefore the need to synchronize the two situations with appropriate economic techniques.

Thirdly, there is the problem of quality of education provided in schools.

Today, many employers of school products are complaining about the poor performance of these school leavers. The overall effect on the economic productivity of the country calls for some economic intervention.

Fourthly, education is only one of the sectors of the economy, among several others. Since, each sector partly depends on others for survival, economics of education will ensure that education is properly linked to other sectors. For example, it could be projected and provided in the educational system through rational economic plans.

Fifthly, the increasing politicization of education has resulted in uncoordinated expansion of the educational system. Nwadiani (1992) has noted that the determinants of the direction of education, allocation of resources, control, the content and learning environment have become purely political, and therefore calls for serious economic concern.
On the whole, it should be recognized that education is no longer a “domestic animal”. As an integral part of the economy, it can no longer be excluded from the various economic influences and therefore requires serious economic attention.

**SAQ 2.1**

Education remains the nucleus of every economy, whether developed or underdeveloped. As such, it is not possible for an economy to rise above its educational level. Education has affected and will continue to affect the Nigerian economy in the following ways:

i. Education helps in raising the productivity of literates through training;

ii. It helps in raising the general productivity of individuals through working in association with the literates;

iii. It helps reducing the cost of disseminating information to individuals (for example about health);

iv. Without education, technological advancement cannot be achieved;

v. Education helps to promote peace among the people;

vi. It is also the basis of international exchange and dependence.

**SAQ 3.1**

Human capital can be defined as the skills, knowledge, and experience possessed by an individual or population, viewed in terms of their value or cost to an organization or country. Thus, it can be regarded as the human being who is endowed with knowledge, skills, ability and expertise to be used in various ways, to operate the social and economic systems in a given society.
Human capital can be understood as a stock of educated and skilled citizens. Knowledge plays a key role in increasing human capital through education process i.e. input to output.

**SAQ 3.2** …

Problems confronting human capital development in Nigeria are:

Increasing population: when there is increase in the birth rate, increase in immigration, all these attributed to the problem of human capital development.

High rate of unemployment: where there is increase in the rate of unemployment, certainly there would be problems of growth and development to the economy of such country.

Political ideology: the political system of a country will determine how growth and development of such country will be. In some cases, the knowledge, skills and training put in place by the government assist in developing human capital by empower youth and adult.

Level of education: education is best to tools in measuring and assessing growth and development of a country. With proper and standard education, Nigeria economy would improve considerably.

Inadequate social amenities: to develop human capital in a country, there must be appropriate amenities to facilitate that, most especially electricity, transportation, skill acquisition etc.

Lack of incentives: learning, teaching, development requires motivation. For country to reach a peak stage of developed adequate incentives must be provided for an individual in different fields of work.
SAQ 3.3  …

Problems of human capital development in Nigeria can be addressed through the following means:

1. By absorbing surplus manpower and directing them into productive activities.

2. By providing adequate socio-amenities needed for manpower.

3. By considering and reviewing plans on how to motivate or influence the allocation of manpower into high-priority activities and occupations so that individual will be able utilize their potential to the contribution of development.

4. By having a political system and structure that is reliable, efficient and conscious of manpower development.

5. By coming up with various forms of incentives aimed at bringing out the best in mankind.

SAQ 4.1  …

Manpower forecasting is the process of calculating how many employees will be needed in the future, and how many will actually be available. Manpower forecasting is the first step of the entire manpower planning activity. The manpower planner foresees the demand and supply of different types of manpower resources in the firm. The basic idea is to look into in which department; unit or level there is a shortage or surplus of human requirements. Forecasting is the process of making judgments about accrued events whose actual outcomes have not been seen.

However, it should be noted that although, manpower forecasting and manpower look alike, but they are not exactly the same thing. Manpower planning refers to the process of estimating or
projecting the number of personnel required for a project (with different skillsets) over a predefined period of time.

The steps involve in forecasting process are:

i. Identify the needs

ii. Choose/Determine the period (Time Horizon) of Forecast

iii. Determine the most appropriate forecast Model/techniques:

iv. Data Collection

v. Prepare forecast

vi. Evaluate

**SAQ 4.2** …

a) Models or techniques of forecasting include:

b) Productivity Measurement Method
c) The employers’ Opinion Techniques
d) Rules of Thumb Techniques
e) The Incremental Labour Output Ratio Techniques
f) The density ratio techniques
g) The international comparison techniques
h) The Parnes-Mediterranean Regional Project techniques
i) Eye-balling techniques
j) Trend exploration technique
k) Moving average techniques
l) Regression and correlation technique
m) Exponential smoothing
n) Time series methods

**SAQ 5.1** …

Cost refers to an amount that has to be paid or given up in order to get something. In business, cost is usually a monetary valuation of
effort, (2) material, (3) resources, (4) time and utilities consumed, (5) risks incurred, and (6) opportunity forgone in production and delivery of a good or service. All expenses are costs, but not all costs (such as those incurred in acquisition of an income-generating asset) are expenses.

Thus, cost of education covers all the billed costs (tuition and fees) and indirect costs (living expenses, books, and supplies). Thus, a student’s cost of education is made up of both billed costs and indirect costs. Students may receive financial aid up to (but not exceeding) their total cost of education each academic year.

**SAQ 5.2**

1. Average Cost equals total cost divided by the number of students
\[
AC = \frac{\text{Total cost}}{\text{Number of Students}}
\]
(1.) \(\frac{1000}{5} = 200\);  (2.) \(\frac{1400}{15} = 93.33\);  (3.) \(\frac{1800}{20} = 90\);  (4.) \(\frac{2100}{30} = 70\);  (5.) \(\frac{2695}{35} = 77\);  (6.) \(\frac{3200}{40} = 80\);  (7.) \(\frac{3510}{45} = 78\);  (8.) \(\frac{3660}{60} = 61\)

2. Marginal cost equals change in total cost divided by change in the number of students
\[
MC = \frac{\Delta TC}{\Delta N}
\]
(1.) \(\frac{1000 - 0}{5 - 0} = 200\)
(2.) \(\frac{1400 - 1000}{15 - 5} = 40\)
(3.) \(\frac{1800 - 1400}{20 - 15} = 80\)
(4.) \(\frac{2100 - 1800}{30 - 20} = 30\)
(5.) \(\frac{2695 - 2100}{35 - 30} = 119\)
(6.) \(\frac{3200 - 2695}{40 - 35} = 101\)
(7.) \(\frac{3510 - 3200}{45 - 40} = 62\)
(8.) \(\frac{3660 - 3510}{60 - 45} = 10\)
SAQ 5.3 ... 

Your answer should be able to explain this:

Factors influencing education can be categorized into two, these are:

- Internal factors, and
- External factors

Internal factors are:

i. Capital cost of education  
ii. Recurrent salary cost  
iii. Recurrent non salary cost  
iv. Student-teacher ratio  
v. The size of institution  
vi. Teacher quality  
vii. School age

External factors include:

i. Inflation,  
ii. Government policies, and  
iii. External aids

SAQ 6.1 ... 

Answer

Your response should show that education can serve as an investment because:

- it entails costs in the present; and
- it increases productive capacity and income (of the educated individual in particular and the society in general) in the future.

Also, education is an investment from the national point of view, because the increase of productivity and the supply of qualified manpower contribute to national development.
SAQ 6.2  

Your responses should capture some of the following

1. There is imbalance in the distribution of students at different educational level- reflecting the growth without development and a lack of coordination and control of the educational system.

2. Low level of enrolment ratios for the first two levels of education.

3. There is high rate of increase in the unsatisfied demand for university education in the country.

4. There is shortage of teaching staff and the concomitant question of the quality of those in service.

SAQ 6.3  

The economic benefits of investing in education are reflected by the increase in income of educated people. This increase in income is due to improvement in the skills of the educated, which of course increase their productivity at work. The direct benefit of education to society is the higher productivity of educated workers and the additional contributions to national income over their entire working lives (Psarcharopoulos in Nwadiani, 2000).

The individual gets widened employment possibilities, decreased unemployment, improved fringe benefits and working conditions, improved health and longer life, efficient consumer behaviour and improved ability to manage personal assets.

Families also benefit from education. For instance, there are improved childcare services which schools provide while mothers are at work. There are improvement in the health of wives/mothers and their children. There is effective control of family size with planned fertility behaviour. Neighbours and communities also
benefit from the education of an individual. They benefit from counselling services. The educated teach and spread new farming techniques to their community. They participate actively in community development efforts. Some of the educated people who find themselves in good positions use their education to better their communities. All these among other things constitute benefits of investing in education.

**SAQ 7.1  …**

Cost benefit analysis (CBA), sometimes-called benefit-cost analysis (BCA) is a systematic approach of estimating the strengths and weaknesses of alternatives (for example in transactions, activities, functional business requirements). It is used to determine options that provide the best approach to achieve benefits.

According to this analysis, individuals, firms and government should take an action or embark on a project if and only if the benefits to be derived from such a task or project is at least equal to its cost. If otherwise, such a task or project is not worthwhile and should not be embarked upon.

**SAQ 7.2  …**

Your answer on how beneficial is cost benefit analysis to the Nigerian educational system should include the following:

i. It is a tool for estimation of the rates of return to different levels and types of education.

ii. It has an advantage of considering other options and alternatives before making a decision on where to invest any money in education. It therefore provides a rational basis for decision-making.
iii. It provides educational planners with solid guidance whenever they are planning education.

SAQ 8.1 …

In most cases, the terms efficiency and effectiveness are used interchangeably to have meant the same thing. Yes, these two terms relates with the performance of organization overtime, yet they do not mean the same thing.

Efficiency best refers to the ratio between the output of an organization and inputs used in producing the output or the optimal relationship between inputs and outputs in an enterprise. Efficiency on the other hand explains the extent or degree to which the stated or expected objective of an organization is achieved.

Applying these two terms into the field of education. Efficiency in education refers to the process of achieving a desirable level of output from given inputs. It is the ability of the educational system to experience a desirable level of output from a minimum number of input. Thus, if so much input go into a country educational activities, and the corresponding output never matches the inputs, then the educational system is characterized by inefficiency.

On the other hand, effectiveness in education refers to the ability of the educational system to achieve its stated objective. When the achievement within a given educational system commensurate with the already stated or expected objective, then such educational system is said to be effective.

SAQ 8.2 …

The term 'wastage’ refers to a situation or process of losing or destroying something by using it carelessly or extravagantly. To the
field of education, wastages in education refers to the inefficient or lack of useful teaching and learning materials or use of educational resources. It also refers to a situation whereby the available educational resources are not used optimally and productively. Three major factors are responsible for wastages in education. These are:

i. the nature of educational inputs
ii. the nature of educational processing
iii. the nature of educational outputs

Details about each of these factors can be found in sub-study session 8.2.1

SAQ 9.1 …

Education can be defined as the level or type of education in which interested consumer is ready, willing and able to pay for at a given price and a particular period. This should not be confused with mere wants resulting from those who want or desire to be educated but cannot pay the price. Thus, effective education demand represents desire for education backed by the willingness, readiness and ability to pay its price (both financially and materially).

Several factors determine the demand for education. These include:

1. The price of education itself (cost)
2. Income of the consumers
3. Government policies or regulations
4. Attitude towards education
5. Cost of been uneducated

SAQ 9.2 …

Equilibrium in education represents a point or situation whereby demand for education equals its supply. This best describes a
situation whereby those who are willing, ready and able to afford the price of education succeeded in having educational system that meets their standards and requirements both quantitatively and qualitatively. When this occurs, then the educational system is said to be in equilibrium.

It must however be pointed out, that to attain this point of educational equilibrium, the social demand for education must be equal to the supply of education. It is at the point of intersection between social demand for education and supply of education that equilibrium is attained.

Social demand for education represents the total number of individual demand for education places over time, while supply of education represents number of educational opportunities available to the people.

Equilibrium between social demand for education and supply of education can only occur when the following factors are put in proper consideration. These factors are:

- Human capital formation;
- Class formation and peer effects;
- Resource effectiveness; and
- Resources efficiency.
References


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