COURSE MANUAL

Elementary Concepts in Economics of Education

EME101

University of Ibadan Distance Learning Centre
Open and Distance Learning Course Series Development

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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 plat form 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.

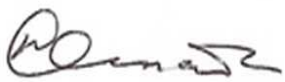
Apart from the responsibility for you to read this course material with others, you are also advised to seek assistance from your course facilitators especially academic advisors during your study even before the interactive session which is by design for revision. Your academic advisors will assist 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 Bayo Okunade

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About this course manual

Elementary Concepts in Economics of Education EME101 has been produced by University of Ibadan Distance Learning Centre. All course manuals produced by University of Ibadan Distance Learning Centreare structured in the same way, as outlined below.

How this course manual 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 Self-Checkss 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 Sessionoutcomes.
- Core content of the Study Sessionwith a variety of learning activities.
- A Study Session summary.
- Self-Checkss and/or assessments, as applicable.
- Bibliography

Your comments

After completing Elementary Concepts in Economics of Education 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 Self-Checkss.
- Course assessments.
- Course duration.
- Course support (assigned tutors, technical help, etc.)

Your constructive feedback will help us to improve and enhance this course.

Course Overview

Welcome to Elementary Concepts in Economics of Education EME101

This course provides an introduction to the various aspects of the economics of education. It applies the tools of economic analysis to educational policy and problem solving. Main discussion will be on education supply and demand, investment, cost and benefits.

Course Aims

- explain the role of economics in the design of education policy
- apply economics to the analysis of education policy
- discuss and debate contemporary education policy issues and solutions

Getting around this course manual

Margin icons

While working through this course manual 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 course manual.

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

 Activity	 Assessment	 Self-Checks	 Case study
 Discussion	 Group Activity	 Help	 Outcomes
 Note	 Reflection	 Reading	 Study skills
 Summary	 Terminology	 Time	 Tip

Study Session 1

Meaning, Scope and History of Economics of Education

Introduction

In this study session, you will explore the history of economics of education. You will also differentiate between the concepts of economics and that of economics of education. You will as well examine the basic problems of economics of education and explore how these problems can be solved.

Learning Outcomes

Outcomes

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

1.1 discuss the concept of economics of education
1.2 identify the fundamental problem of economics of education
1.3 list and explain limitations to education resources

Terminology

Education	The process of receiving or giving systematic instruction, especially at a school or university
Economics	The branch of knowledge concerned with the production, consumption, and transfer of wealth
Economic education	The study of economic issues relating to education, including the demand for education and the financing and provision of education
Economics of Education	The application of Economic principles, concepts and laws to the process of Education.

1.1 Meaning of Economics of Education

Now that you are preparing to manage education, and will be taking this course, it is important that you familiarise yourself with key concepts in "economics of education".

You will start your study by looking at the following definitions:

- Economics
- Education
- Economics of Education
- Education Economics

Defining Economics

Economics

The study of how society chooses to allocate its scarce resources, which have alternative uses, to provide goods and services.

What do you think **Economics** is? The study of money? Wealth?

You are not too far; let us examine how others have defined economics:

- According to the Quality Assurance Agency for Higher Education, Economics is the 'study of the factors that influence income, wealth, and well-being'.
- Economics concerns itself with how society chooses to allocate its scarce resources among competing and conflicting alternatives, so as to arrive at the most rational and desirable outcome.

http:/whystudyeconomics.ac.uk/what-is-economics/

As you can see, economics is not just the study of how to spend money, rather, it deals with:

- allocation of scarce resources, using appropriate criteria for the purpose of efficient production which in turn leads to growth and development; and also
- planning, financing and costing of plans to ensure effective and efficient use of resources.

Defining Education

Education

The acquisition of knowledge, skills, and attitudes which enables one to contribute to the environment one finds himself.

Let us look at the following definitions for **education**:

- Education is any act or experience that has a formative effect on the mind, character, or physical ability of an individual. (www.en.wikiquote.org/wiki/Education)
- Nyerere (1982) presented that education is the transmission of accumulated wisdom and knowledge of the society from one generation to the next so as to prepare young people for their future membership of the society in which they find themselves.

Education thus refers to that form of learning which leads to the acquisition of knowledge, skills, and attitudes which enables one to adjust and contribute to the environment one finds himself.

Activity 1·1

If you look closely at these definitions you will see that there are certain words which appear in both.

Can you identify two of these words? Write them down in the space provided below:

_____

_____

Well done! You certainly identified "transfer" and "acquisition" of knowledge and skills! So you can conclude that education leads to increased cognitive, social and psychomotor capacity of an individual.

Education takes place in a formal setting, such as the type received in schools. It also takes place in informal settings (such as a home), as well as the non-formal environment.

Reflection

Education leads to the acquisition of knowledge, skills and attitudes which enables one to contribute to the environment one finds himself.

Defining Economics of Education

As you can see, there is no single definition for "economics" or "education". So how can we attempt a definition of "economics of education"? Let us first examine how these terms apply to each other. In doing this, we will study the case study presented below.

Case Study

Many national governments have launched programmes on mass literacy. In Nigeria, for example, President Musa Yar' adua has highlighted functional education in his seven point agenda. He noted that via education programmes, the entire populace will acquire basic skills which will help them to contribute meaningfully to the overall economy of the country in the long run. However, the streams of national income (including oil) are drying. His government must decide how much to spend on education, amidst other important social needs, such as electricity, security and road projects. This government must also choose which level of education to prioritise: early childhood to basic education or higher education within the available fund.

Adapted from source:
http://www.medwelljournals.com/fulltext/?doi=sscience.2009.636.643

Discussion

From the foregoing, it is clear that Government (or stakeholders in education) must ask certain questions:

1. How much to spend on each stage of education (i.e. what to produce)?
2. How to provide educational services in a way that maximises its benefits to society (i.e. how to produce education)? and
3. Who should have access to each stage of education (i.e. for whom is education provided)?

In carrying out the modalities aimed at addressing these fundamental issues, economic tools are applied. We just encountered a typical example of how economics apply to education.

Activity 1·2

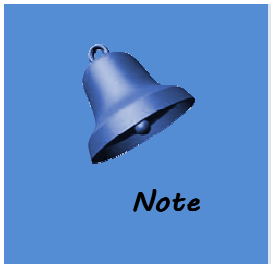
Now that you see how economics apply to education, how would you define "Economics of Education"? Write down your own definition in the space provided:

Do you just say economics of education is the study of human behaviour (in terms of human decisions), action(s) and reaction(s) to schooling?

For the sake of this course, let's define economics of education as:

> *The study of how stakeholders in education make or approve choices, within available but scarce resources, in a bid to achieve best educational outcomes.*

Your definition was probably not very different from the one we gave you. The important thing is to keep in mind that economics of education applies economic principles and concepts to the process of Education.



Distinguishing Economics of Education from Education Economics

It is easy to confuse the term **economics of education** with **education economics** since both terms comprise the same keywords: economics and education. Education economics is, however, a course in education that equips pre-service teachers with teaching methods, strategy, and skills of delivering the curriculum content of economics to students.

1.2 The Fundamental Problems of Economics of Education

There are three decision makers or stakeholders in the educational system. These are:

1. The society
2. The institutions or providers (suppliers) of education and
3. Individuals or households (purchasers of educational services).

The twin problem of scarcity and choice face these major stakeholders. The fundamental problem of the economics of education is how the society, institution and the households make use of the limited human and material resources they have, to best satisfy their unlimited wants for education. The solution to the fundamental problem requires the application of certain economic concepts which shall be dealt with in this course.

ITQ

Question

List the three decision makers or stakeholders in the educational system?

Feedback

They include:

- The society
- The institutions or providers (suppliers) of education
- Individuals or households (purchasers of educational services)

1.3 Limitedness of Education Resources

Resources such as men, money, materials are limited in supply and serve as input into the educational system. These inputs include

1. Men (M): teachers, policy makers, non-teaching staff;
2. Materials (M): students (raw materials), teaching and research materials, teaching aids and other equipment;
3. Money (M): cash, cheque and banknotes;
4. Management (M): policies, plans, programmes, time table and educational laws; and
5. Time.

One noticeable characteristics of resources in education is that they are not always enough, knowing fully well that the education industry is a centre for production of educated manpower, who are invariably injected into the economy of different nations. For example, there is 24hours in a day and as an undergraduate student in the Department of Educational Management; you are required to offer courses in Department of Teacher Education, Special Education, Guidance and Counseling, General Studies plus courses in other Faculties outside the Faculty of Education. You will discover that in the process of your academic work, you will have so many Self-Checkss, tests and personal issues to attend to each of the days. You will however find out that the 24hours in a day will not be enough for you to carry out all that you want to do and you may be tempted to ask God to increase the length of the day for you. This is an example of how time, which is an input can be limiting factor in the process of you getting educated in the University. Economics of education is therefore concerned with the problem of economizing all available required and scarce resources.

1.3.1 Educational Wants are Unlimited

Hardwick, Khan and Langmead (1994) affirmed that individual wants are virtually unlimited, whilst the resources available to satisfy those wants are scarce. Educational wants create a demand for scarce resources, and this implies that wants are competing for the same resources. If the above happens, it is therefore rational to conclude that wants that are most pressing will be satisfied first under direct competition. Really, it is not possible to satisfy all identified educational wants at the same time, because educational resources are limited. To this end, decision makers will have to make choices among the alternative educational wants. Consequently, economics of education concerns itself with how to use the limited educational resources to satisfy the unlimited educational wants.

1.4 History of Economics of Education

We have discussed the meaning of economics of education and examined how scarcity of resources limits educational resources. Let’s now look at how economics of education began.

Economics of Education is known to be the study of how man and the society used to choose either with or without money, employ scarce productive resources in the production of different types of training, knowledge development, skills, mind, character and behaviour. This is done through formal schooling that can be provided within a stipulated time and at a given or designated venue. Economics of education has its own history which is notable among the Classical Economists during the 18th and 19th Century. The Classicalists believed that education has great relevance especially as a form of national investment, which will yield returns which can be pecuniary (monetary) or non-pecuniary (non-monetary). Economists are, more often than not, associated with ensuring that those profit-making companies and the overall economy functions well, but they have however slowly expanded their interests to new spheres of society. The foundation of the economics of education as a significant field within economics dates back to the theoretical and empirical developments that were made by American economists such as Gary Becker, Jacob Mincer, Mark Blaug and even George Psacharopoulos, and so on in the 1960s. Their works introduced the idea of education as human capital and they attempted to calculate the economic returns to acquiring education.

In fact, more than the past decade, there has been an enormous growth of interest by economists in issues such as education policy, financing of education, demand and supply of education, efficiency and productivity both in the United Kingdom, America and other parts of the world, and it has been accompanied by a growing political interest in market-based reforms across the public sector. These types of reforms include devolvement of financial planning to front-line institutions such as hospitals and schools and giving consumers of public services choice about which provider to use. Economists from other fields such as labour economics have been attracted by the growing availability of large-scale datasets that facilitate complex statistical analysis to analyze the impact of particular policy initiatives. Examples of these data include that of the National Pupil Database as it exists in England. Such database has been collected to make available information annually on variables like the background characteristics and Key Stage attainment data of all pupils in state-maintained schools.

Study Session Summary

Summary

In this Study Session, you defined economics of education as a branch of economics which uses economic tools to solve educational problems. You also explored the fundamental problems of economics of education. Finally, you identified the basic problems of economics of education and explored how the problems can be solved.

Assessment

Self-Checks

1. Define economics of education
2. Differentiate between ordinary economics and the economics of education
3. What is the fundamental problem of economics of education?
4. Explain what an economist of education does to solve the fundamental problem in the educational system.
5. Write brief history of economics of education

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Reading

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Study Session 2

Demand for Education

Introduction

The last study session was on the definition of economics of education and you also learnt a brief history of economics of education. In this study session, you will be introduced to one of the important concepts in economics of education, and that is the concept of demand for education.

Learning Outcomes

Outcomes

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

2.1 explain the following concepts of demand:
- demand
- price
- time
- demand for education

2.2 explain both the consumption and investment views of educational demand
2.3 define educational demand schedule
2.4 draw the education demand curve
2.5 analyse the law of educational demand
2.6 explain the factors that influence demand for education
2.7 explain the concept of elasticity of educational demand

Terminology

Demand	A consumer's desire and willingness to pay a price for a specific good or service.

2.1 Basic Concepts of Demand

Many at times as human beings, we have wants, we also have needs. We are, however, unable to attend to all our desires due to the scarcity of resources. Thereby, we resort to making choices between alternative wants. Making choices leads us to demand goods and services which we desire and willing to pay for. Let's see how the concept of demand applies in education.

2.1.1 Demand

Demand

An economic principle that describes a consumer's desire and willingness to pay a price for a specific good or service

This is the quantity of a commodity (goods and services) that consumers are willing, able and ready to buy at a giving period of time and at a particularly given price. Dear students, you need to understand that there is what is called effective **demand**, and demand is said to be effective when the desire of the consumer is backed up by his/her ability to pay (purchasing power/money). In other words, there must be a willingness on the part of the consumer to buy together with his or her ability to pay. For example, for a man to demand a wife requires that such man must be willing to have a wife. The willingness to have a wife is a necessary but not enough condition for a man to get married and the willing man must be ready. Furthermore, willingness and readiness are not enough conditions. The man must be able to shoulder marriage responsibilities. It should be noted that a man without a job (employment) will not very likely be ready to get married because of lack of substance (money, etc.) to sustain such a family.

2.1.2 Price

This is the cost or value or worth of a given good. The cost is monetary and that is the reason why you will ask your fellow lady “how much did you buy your Mary Kay powder?” The answer will be “it was bought at ₦1,200. Also, a man will ask his fellow colleague how much he bought his ‘Home Theatre’. The answer will be “it was bought at ₦55,500. In the process of you getting educated in the university or your child(ren) in their respective schools, you pay a price for this in terms of the school fee(s) and other fees.

2.1.3 Time

This is the exact point in time at which the consumer requests for the given good or service. Invariably, the academic session during which you started your course at the Distance Learning Centre, University of Ibadan is the time I am discussing here. Remember that for each of our(human) activities that we undertake under the earth, there is a time.

2.2 Demand for Education

This is the quantity of educational service(s) that a consumer is willing, ready and able to ask for from the producer/supplier (school-primary, secondary, tertiary institutions) at a given price and at a given time (period). For example, if a parent wants to demand for educational service from either the Nigerian public or private University, this will be done at a given price (school fees) charged by the public or private university and also at a particular time, which can be 2013/2014 academic year or during the 2014/2015 academic year as the case may be. Parent or guardian of such student must be willing, ready and able to pay the prescribed school fees and other fees and at a particular time.

2.2.1 Demand for Education from the Consumption point of view

The demand for education can be viewed from consumption angle. But you need to be familiar with what consumption is. Ordinarily, it means to eat, spend, burn up something. In essence, there is an education that can be eaten up, burnt up which will not bring any returns, if we view such education properly, it is considered or seen as a consumer durable which has consumption benefit such as additional social and intellectual amenities that are derivable from education. Education also brings about current consumption benefit such as social, intellectual and athletic activities for student consumption. As a rule, the higher the consumer price index, the higher the enrollments demand. Any form of an increase in consumer goods price raises the value of the current consumption benefit from enrollment, but may not increase the net present value of the benefit to education. In other words, when you consider what you will spend to enjoy some similar amenities outside, you may decide to enroll as a student. For example, life may be cheaper, as a student than as a worker when consumer goods are very expensive. In addition, it may be cheaper to feed on a campus (as done in Nigerian Universities many decades ago, before the Buhari/Idiagbon Military administration cancelled the programme in 1983) than in one's personal house or even in eateries such as Mr. Biggs, Tantalizers, Shoprite, or hotels. Additionally, it may be cheaper to be accommodated in hostels than in privately rented buildings and it may still be cheaper to wear uniforms than to wear personal dresses.

2.2.2 Demand for Education from the Investment point of view

Demand for education can be viewed from investment angle if the consumer's decision to get enrolled in an educational institution is a function of the net benefit of such education. In this situation, someone may pursue University education with the view that the present value of the expected stream of benefits (monetary and non-monetary) resulting from such education, exceeds the present cost of sacrifice (monetary and non-monetary) of the University education. For instance, when you wanted to decide whether or not to enroll as a Distance Learning Student, your decision to enroll would be considered as an investment if such decision was made in the light of the expected monetary and non-monetary benefits and costs involved in enrollment on the Distance Learning programme.

ITQ

Question

What are the two (2) ways by which demand for education can be viewed?

Feedback

They are:

1. Demand for education from an investment point of view
2. Deman for education from consumption point of view

2.3 Educational Demand Schedule

Do you know that you can place the prices of a product side by side with the amount of the product that people are willing to buy? The table you will come up with is known as demand schedule.

Simply put, a demand schedule is a table that shows both the price at which a product is demanded and the quantity of such product that is demanded. To this end, educational demand schedule is a table that shows the various school prices (school fees) charged by the schools and the number of students that are enrolled in the various schools based on the different schooling prices charged. The table below shows the various schooling prices and the various enrollments of students in line with the different schooling prices.

Table2.1: Educational Demand Schedule

School Fees (₦'000)	Quantity/Enrollment
60	100
50	200
40	300
30	400
20	500
10	600
5	700

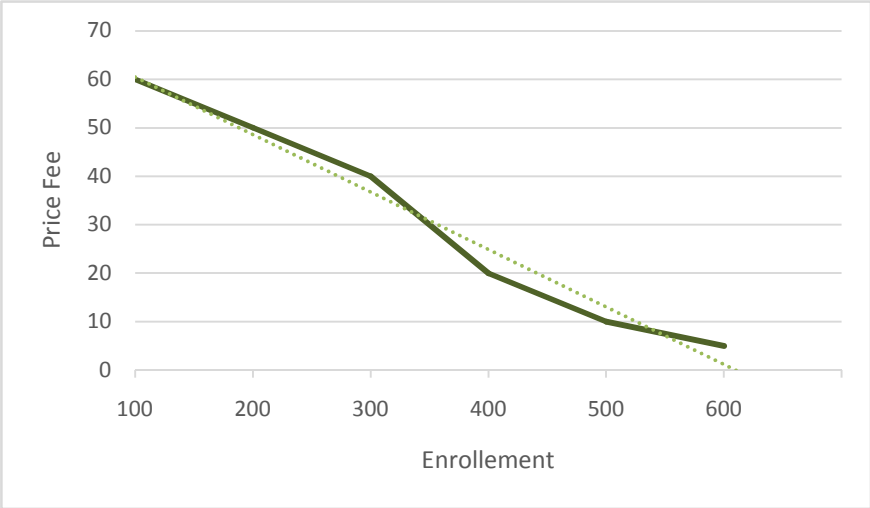
Table 2.1(the schedule above) reveals that when the price of education (school fees) was ₦60, 000 per student, 100 students were enrolled. When the school fees reduced to ₦50, 000 per student, the student enrollment increased to 200. You need to observe that as the school fee reduces the number of students that enrolled increased. This is how we as human being behave in response to the price increase and decrease. So, whenever there is an increase in the school fees, parents will react by reducing the number of children that will be enrolled in a given school. What parents do is to seek for alternative schools that their school fee is relatively affordable.

2.4 Educational Demand Curve

The demand curve is the translation (or representation) of information (price and quantity) on a demand schedule to a curve. The educational demand curve is the translation (or representation) of information on

school fee and student enrollment that is shown on a schedule to a curve. The information on the schedule or table 2.0 above will be represented by a curve as shown below:

Fig 2.1: Educational Demand Curve



From the educational demand curve above, you can see that the curve slopes downwards from the left-hand side to the right-hand side depicting that when the school fee was low(for example ₦5,000) consumers enrolled more of their children(for example 700) in the school. But as the school fee was increasing, the number of students enrolled was reducing as you can see that when the school fee increased to ₦60, 000, the student enrollment was 100.

2.5 Law of Educational Demand

The law of educational demand expresses a relationship between the school fee charged and the number of students enrolled in schools. The school fee is one of the factors that influence enrollment in schools. Economists of education have long deduced that the higher the school fee charged the lower will be the enrollment. On the other hand, the law that the lower the school fee charged, the higher will be the student enrollment. One of the fathers of Economics in the person of Alfred Marshall put the law of demand follows that "amount of product demanded increases with a fall in price, and diminishes with a rise in price". You as student need to observe carefully that this principle/law is applicable to the already stated law of educational demand above. The inverse relationship between the price of a commodity (school fee) and quantity demanded (student enrollment) is referred to as the law of educational demand. The inverse relationship between the price of the commodity (school fee) and quantity demanded (student enrollment) is referred to as the law of demand or better put law of educational demand. The inverse relationship is due to two effects which are:

1. **Substitution Effect: -** Whenever the price of a commodity falls, such commodity becomes cheaper in relation to other goods. At this point, a consumer will be able to buy more of the goods and

thereby satisfy his needs at minimal cost. This if applied to education, shows that, if the school fees charged by a school is not high, many parents will be able to send many of their children to the school, thereby purchasing large quantities of the available educational services at minimal cost.

2. **Income Effect :-**The income effect comes about when there is a fall in the price of a commodity and consumers' income remains constant or unchanged such that more goods and services can be bought with the unchanged income. For example, if a school earmarks the sum of ₦50, 000 yearly for the purchase of books and other laboratory equipment, and as a result of a decrease in the price of these items, the school may purchase more quantities. The consequent increase in the ability of the school to purchase more equipment implies an increase in real income and this is the income effect.

Limitations of the Law of Education Demand

As earlier mentioned, the higher the price (school fee), the lower the quantity of goods (enrollment) demanded and the lower the price (school fee), the higher the quantity of goods(enrollment) demanded. However, this law is only valid under normal circumstance as there are exceptional cases where the law is not valid.

The exceptional cases include: -

1. **War:** If a shortage is envisaged (feared) in anticipation of war, people may start buying for building stocks, for hoarding even when the price rises. This is applicable to education in that when there is war, many schools will be destroyed thereby, leaving few schools left to render educational services to the public not affected by the war. The school fees that these few schools will charge will be unnecessarily high, and parents will have no option than to pay the high school fees that is charged especially during war period.

2. **Ostentation:** This can otherwise be called flamboyance or lavishness whereby the potential school entrants' demand for the educational service even when the fee of such educational service is on the high side. For example, the school fee charged by some private schools (nursery/primary/secondary/university) is high. But you find that some parents that are rich will still enroll their children in such schools, while the parents that are not rich will not enroll their children in such school, rather enroll their children in the public schools whose fees are relatively affordable or they are not charging school fees at all, through the provision of free education. The demand for such schools with high school fees may not decrease as the tuition fees increase. This is because it is the desire of such parents to be exclusive (elitist) and so dissociate themselves from common people and therefore exhibit the snobbish effect.

3. **Speculation:** The law of demand does not apply to demand in a campaign between groups of speculators. In fact, speculation about increase or decrease in the price of education may cause a

breakdown in the law of demand. For example if consumers feel that the price of an educational service will rise in future, such consumers will prefer to enroll on such programme now, rather than when the school fee will be on the high side. If however, many potential entrants behave in such a way, a rise in the price of education may lead to an increase in the number of people that will enroll in schools as a result of the fact that others are doing so. Babalola (2003) established that speculations may create a bandwagon effect whereby because others are doing one thing, some many others too will copy and also do the same.

4. **Inferior Educational Services:** These are likely to attract fewer consumers if there is an increase in real income of the consumers. This is as a result of the thinking that prices are indicators of quality of items. For example, if two private schools are charging ₦6,000 and ₦8,500 per pupil, per term, parents are likely to favour the more expensive school with the belief that the prices are indicators of quality and thereby demand less of the ₦6,000 school. However, what is inferior to a high income earner may not be inferior to a low income earner. Inferior education is usually patronized by the poor people because they cannot afford the superior education. But if there is a rise in the incomes of the poor people, they will shift from the inferior to the superior education system.

2.6 Factors Influencing Demand for Education

1. **Price of the Education:** Price is one of those factors that cause changes in demand/enrollment for education. Price of education includes tuition fee, cost of books, stationeries, feeding, transport, etc. If the fees are fully paid for by prospective parents, cost of education will be high because the fees were not subsidized, so the quantity demanded of such education will be lower. But if the fees were subsidized, the price of education will be lower and demand will increase. In most cases if the government of a nation wants to increase. If the price of a given education changes, there is every likelihood that the demand for such an education will change. If the price of an education, say a private primary school falls, the demand for it will increase because of the fact that more people will be attracted to obtain the education service.

2. **Derivable Benefits from Education–** There are huge benefits derivable from acquisition of education. These benefits are either pecuniary or non-pecuniary in nature. Pecuniary benefits can otherwise be called monetary which can be in the form of earning of salary and wages. Non-Pecuniary is otherwise called non-monetary benefits, which can be in the form of been able to fill tax form, venturing into other businesses outside the normal salaried job, e.t.c.

3. **Income of the Consumers –**The income per head received by consumers of educational services in their places of work is a big determinant of demand for educational services. Consumers have

lots of items (responsibilities) that grapple with their salaries, out of which payment for educational services is one. Necessary calculations have to be done by individuals with respect to how to expend the salary. If the cost of acquisition of education will be on the high side, some re-ordering of responsibilities will be done by such individuals. If on the other side, the government provides free education for the citizenry, this will alleviate the problem of educational funding of parents from their meager salary to a large extent.

4. **Availability of Non-Education Alternatives**- The provision of education services to consumers have their alternatives, which is the engagement in family businesses, learning of a trade, travelling out of the country and so on. Once there are alternatives to getting educated, some parents might opt for these alternatives which however will be paid for later in life. It is important to ensure that getting educated is given high priority at all times.

2.7 Concept of Elasticity of Educational Demand

As a student, you would have seen elastic at one time or the other probably with your fashion designer. If you have also used rubber band, it falls into this category which is elastic in nature. This section has to do with elasticity of educational demand. Please remember that you can expand the elastic that you lay your hand on to any extent and likewise the rubber band that is on you. Further remember whenever you transact business in the bank and you are given large sums of money, you ask the bank teller to give you rubber band to firmly hold your money. Elasticity has to do with how one can stretch (extend, elongate, make longer, e.t.c.) the elastic that is on you. If we however apply what we have been examining to our discussion, that is demand for education, the consumers can allow large number of their children to attend schools or decide to reduce the number of their children that will attend school due to changes in price. This decision of allowing large or small number of children to attend school or get enrolled in school based on the fees that are charged is called elasticity of educational demand.If we attempt to define elasticity of educational demand, we can say that it is

the responsiveness of change in student enrollment (enrollment demand) in schools with respect to changes in prices or school fees.

The formulae for elasticity of educational demand is given as:

$$e = \frac{percentage\ change\ in\ enrolment}{percentage\ change\ in\ school\ fees}$$

Demand for education can be inelastic, unitary of elastic. But on a general note, Babalola (2003) confirmed that demand for education is generally inelastic when it is compared to its price. It implies that the educational demand usually drops by much less than One percent (1%) , while the price of education(school fee) rises by One percent(1%).

The relationship between change in enrollment demand and change in price of education can be expressed as shown below:

LOG=1, where e=elasticity of demand and it is expressed as follows:

L= Less than one showing an inelastic demand for educational services (e < 1)

O= One showing exactly a unitary demand for educational services (e = 1)

G= Greater than one showing an elastic demand for educational

Services (e > 1)

Example: By increasing the level of fees from ₦200 to ₦600, the total private cost of education charged changed from ₦2000 to ₦2,400. Enrollment also changed (negatively) from 30,000 to 25,000. In order to calculate the elasticity of demand with respect to private costs of education, we need the percentage differences in both demand and cost.

$$e = \frac{(30000 - 25000)/\ (30000)}{(2400 - 2000)/(2000)} = \frac{16.67}{20.00} = -0.83$$

Note that 0.83 is less than 1 and it shows that the private cost elasticity of enrollment demand is inelastic. Enrollment demand dropped by 16.67%, while the private cost of education rose by 20.00% during the same period.

Study Session Summary

Summary

In this Study Session, we defined demand as the quantity of a commodity that consumers are willing, ready and able to pay for at a possible alternative price within a given period of time. We explained the inverse relationship between the price and the quantity demanded of a commodity and noted that the law of demand states that the higher the price, the lower the quantity of goods demanded and vice versa. We discussed the educational demand schedule as well as the educational demand curve. Finally, we stated the law of educational demand, listed and explained factors influencing demand of education.

Assessment

Self-Checks

1. Explain the consumption view of educational demand
2. Explain the investment view of demand for education
3. Define what educational demand schedule means and construct a hypothetical educational demand schedule
4. Draw the education demand curve
5. State the law of educational demand
6. Explain the limitations of law of educational demand
7. Explain the factors that influence demand for education
8. Explain the concept of elasticity of educational demand

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Study Session 3

Supply of Education

Introduction

In this study session, we will discuss the concept of supply as well as the supply of education. We will also state the law of educational supply. Finally, we will examine factors influencing the supply of education as well as the concepts of elasticity of educational supply.

Learning Outcomes

Outcomes

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

3.1 Explain the following concepts of supply:
- supply
- Price
- time
- supply of education

3.2 define educational supply schedule and draw a hypothetical educational supply schedule

3.3 state the law of supply of education

3.4 give details of the factors that influence the supply of education

3.5 elucidate on the concept of elasticity of supply of education

Terminology

Supply	The total amount of a specific good or service that is available to consumers

3.1 Basic Concepts of Supply

3.1.1 Supply

This is the quantity of a commodity (goods and services) that producers are willing, able and ready to sell (put on the market) for a giving period of time and at a particular given price. The suppliers of educational services who can be the public schools or the private schools will be willing to make available quantities of educational services to whoever that demands for it. Dear students, you can see that at one time or the other, you had thought of enrolling for the Distance Learning Programme for your degree programme. Here the Distance Learning Centre (DLC) is

the supplier of educational services that you as a consumer demanded at a time or the other. So, the DLC is willing to supply as many educational services to those students that are willing to consume such educational services at any time. Successful consumption of such services is dependent on the willingness and the ability of the student to pay the requisite fees.

3.1.2 Price

This is the cost or value or worth of a given good that the supplier or the institution will make available to the students. The price or the cost is monetary and that is the reason why you will ask your fellow lady how much did she pay for the school fees. The answer will be "l paid ₦67, 777.77k. You might then go ahead to compare the school fees you paid to that of the Distance Learning Studies (DLS) of the University of Lagos. You will based upon many factors best known to you conclude that it is better you should continue with the DLC programme of the University of Ibadan. You will still encourage many of your colleagues to even enroll on the DLC programmes.

3.1.3 Time

This is the exact moment in time at which the producer is ready to make the educational service available to the students. This might be in the 2013/2014 academic session or the 2014/2015 academic session. Invariably, the academic session during which you decided to start your course at the Distance Learning Centre, University of Ibadan and you have structured lectures is the time educational services is supplied to you by the DLC. You need to still remember that for each of our (human) activities that we undertake under the earth, there is a time.

3.2 Supply of Education

This is the quantity of educational service(s) that a producer (a school owner) is willing, ready and able to make available to the consumers of educational services (children, youths, adults, physically challenged and so on) at a given price and at a given time(period). For example, if a school (primary, secondary or tertiary institution) advertises its educational products on the radio, television or in the newspaper, it is one of the indicators that the school is getting ready to make available its educational services to the Nigerian public or consumers of various educational services. This will be done at a given price (school fees) to be charged by the public or private institution and also at a particular time, which can be 2013/2014 academic year or during the 2014/2015 academic year as the case may be. The school owners will be ready to make available their educational services at a given fee and other fees and at a particular time.

3.2.1 Educational Supply Schedule

A schedule is a table that shows both the price at which a product is supplied by the school operator and the quantity of educational service or of product that is demanded by the consumers or the individuals in the

public. To this end, educational supply schedule is a table that shows the various school prices (school fees) charged by the schools and the number of students that are enrolled in the various schools based on the different schooling prices charged. The table below shows the various schooling prices and the various enrollments of students in line with the different schooling prices.

Table 3.1: Educational Supply Schedule

School Fees (₦'000)	Quantity/Enrollment
70	800
60	700
50	600
40	500
30	400
20	300
10	200
5	100

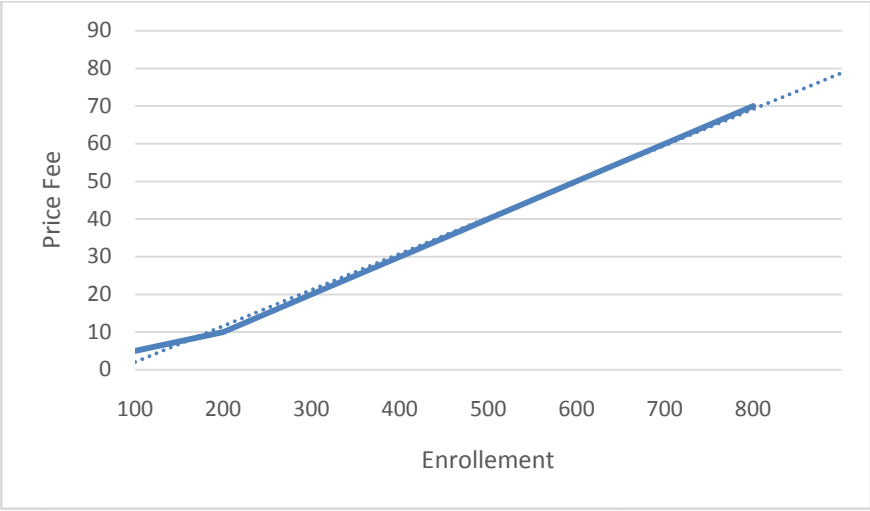
Table 3.0 or Schedule above reveals that when the price of education (school fees) was ₦70, 000, the quantity of student places that the educational producer will be willing to make available to the public is 800. When the school fees reduced to ₦50, 000, the quantity of educational services that the producer of education will be willing to make available will be reduced to 600 student places. Remember that suppliers, especially private entrepreneurs are into business to make as much profit as possible, while public school providers are into supply of educational services to render service(s). Though, the public school providers will at one time or the other also charges some fee, which cannot be compared to the private education providers. You need to observe that as the school fee reduces the number of students that enrolled are also reduced, especially if one considers the private entrepreneurs who are into schooling business to make a profit. This is how suppliers behave in response to the price increase and decrease. So, whenever there is an increase in the school fees, producers will react positively by making available more schooling spaces for the students. But if there is a reduced school fee, normally, the producers will reduce their spaces available for students because their expected profits will also be reduced.

3.2.2 Educational Supply Curve

The supply curve is the translation (or representation) of information (price and quantity) on a supply schedule to a curve. The educational supply curve is the translation (or representation) of information on school fee and student enrollment that is shown on a schedule to a curve. The information on the schedule or table 3.0 above will be represented into a curve as shown below:

Price (Fee) (₦'000)

Fig 3.2 Showing Educational Supply Curve



From the educational supply curve above, you can see that the curve slopes upwards from left-hand side to the right-hand side depicting that when the school fee was high(for example ₦70,000) suppliers made available more schooling spaces for the consumers of education services (for example 800) in the school. But as the school fee was decreasing, the number of students' spaces available was reducing as you can see that when the school fee decreased to ₦60, 000, the student enrollment was 700 and so on.

3.3Law of Educational Supply

The law of supply expresses a relationship between the school fee charged and the number of students enrolled in schools. The school fee is one of the factors that influence education providers to make enrollment spaces available in schools. Economists of education have long deduced that the higher the school fee charged the higher will be the enrollment spaces that education providers will be willing to make available to the public.

On the other hand, the law states that the lower the school fee charged, the lower will be the student enrollment. Succinctly, the law of educational supply states that the higher the school fees the higher will be the available school spaces, and the lower the school fees, the lower will be the available schooling spaces available for the consumers of educational services.

You as student need to observe carefully that this principle/law is applicable to the already stated law of educational supply above. The direct relationship between the price of a commodity (school fee) and quantity supplied (student enrollment) is referred to as the law of educational supply. The direct relationship between the price of commodity (school fee) and quantity supplied (student enrollment) is referred to as the law of supply or better put law of educational supply.

3.4Factors Influencing Supply of Education

Resource Quantity: In the educational sector, resources such as labour, capital, land, and entrepreneurship is needed for a successful delivery of educational service. How sufficient and available these resources are help the educational service supplier to supply enough. Take, for example, if there is no enough land space where a school is established, it will affect the quantity of educational services that a provider will make available to the public. It is against this that the Nigerian government make as policy the land space that prospective school owners must have before embarking on the construction of schools.

Prices of Inputs used in Production: How affordable are the prices of the resource input helps in determining the supply of educational services. If the price of resource input is very high, it might not be possible for the producer to supply the school spaces. This is because the burden of the high prices will be passed over to parents to bear and this will be in the form of hiked school fees.

Availability of Technology: The availability of technology in terms of Information Communication Technology, computer, laptops, printers, and projector and so on helps in determining the supply of educational services to the consumers. If these technological facilities are available, it will make possible to a great extent the lesson deliveries in the class and invariably the supply of educational services by the knowledge supplier.

Population: The availability of population in terms of size that is affected by births, deaths, migration makes the population to either be available in a large manner or small manner. If the number of births is increasing, deaths reduce and migration is reduced, the number of population that will be available for schooling will be high, But if it is otherwise whereby birth is reduced, death is increasing and migration out of the country is increasing, the number of population available for schooling will reduce. Reduction in population can also be as a result of emigration, wars, famine diseases and natural disasters.

Speculation- This is speculation on the part of the educational provider(s) whereby he/she assumes or guesses that the consumers of education will demand the educational services that he has packaged together. In this wise, the provider will supply the education service greatly if he is fortunate that his assumption works.

Advertising or Commercial Activities: Embark on advertising or commercial activities is a factor that determines the supply of educational places by education providers. While advertising, many people are made to be aware of the available educational services, and some prospective consumers will therefore demand the educational services provided by the supplier of educational services.

3.5Concept of Elasticity of Educational Supply

The concept of elasticity was introduced to you under study session of educational demand. We will still examine the concept as it is applicable

to supply of education. Remember very well that supply has to do with the supplier or producer of educational services to the public. Once again, as a student, you have seen an elastic at one time or the other, probably with your fashion designer. Also, if you have also used rubber band probably at home or in the office, it falls into this category and it is expandable in nature. This section, therefore, has to do with the elasticity of educational supply. Please remember that you can expand the elastic that you lay on your hand to any extent and similarly the rubber band that you have on you. Additionally, remember that whenever you have reasons to transact business in the bank or with any financial institution, and you probably safe or withdraw large sums of money, you would have used the rubber band to hold the large sum of money or you will ask the bank teller to give you rubber band to hold firmly your money. Elasticity has to do with how someone can stretch (extend, elongate, make longer, e.t.c.) the elastic that is on you. If we, however, apply what we have been examining to our discussion, that is a supply of education, the consumers can allow a large number of their children to attend schools or decide to reduce the number of their children that will attend school due to changes in the price of education.

This decision of allowing a large or small number of children to attend school or get enrolled in school based on the fees that are charged is called elasticity of educational demand.

Tip

Elasticity of educational supply is the responsiveness of change in supply of educational places to change in the price of education (school fees).

In simple term, when there is a change in the price of education (or school fees) to be paid by students, the supplier (or otherwise called the producer) of education will also react in line with the change in the school fees. You need to know that the school fees can increase and this will make the supplier be ready to supply more or make more spaces available for consumers of educational services. On the other way round, the supplier of educational services will also react negatively by reducing the available schooling spaces if there is a reduction in the school fees that is charged, because of the fact that this reduction in school fees will adversely reduce the profit that will accrue to the educational service provider.

Realistically, and in the real sense, l do not think we have come across situations where schools (private or public) will reduce their school fees that are charged. What we can find is a situation of non-increase of such fees, instead of a reduction in the fees.

Elasticity of supply of education can be (i) Less than one (e<1), (ii)Unitary or exactly One(e=1) and (iii) Greater than One (e> 1). If elasticity of supply of education is less than one, it implies that the responsiveness of supplier of education in terms of making available schooling places to intended school entrants due to change in the school

fees charged (positively or negatively) is less than one, and so, not too many observable changes in the availability of school places.

If the responsiveness of the educational service provider is unitary, it means that the reaction of the supplier of education to change in the price of education is equal to each other. So, if the change in school fee is equal to 30% and the change or responsiveness of the educational service provider in terms of available school places is also 30%, then you can see that there is equality in the change in school fees and the change in available school places. Due to this equality in the two variables (school fees and available school places) we talk about unitary(e=1) elasticity of supply of school places

The formulae for elasticity of educational supply is given as:

$$e = \frac{percentage\ change\ in\ available\ school\ places}{percentage\ change\ in\ school\ fees}$$

$$e_s = \frac{e_{s1} - e_{s0}}{(Sf_1 - Sf_0)/Sf_0}\ OR\ \left\{\frac{E_{s1} - E_{s0}}{E_{s0}}\right\} \div \{\ (Sf_1 - Sf_0)/\ Sf_0$$

Where : e_s = elasticity of supply of education

Es_0 = Old school places

Es_1= New school places

Sf_0 = Old school fees

Sf_1 = New school fees

Example: If there is an increase in the price of education from ₦5,000 to ₦ 7,000, the education provider increases the available school places from 10,000 to 15,000. What is the elasticity of supply of education and the interpretation of the result?.

$$e_s = \frac{(E_{s1} - E_{s0})/E_{s0}}{(Sf_1 - Sf_0)/Sf_0}$$

$$e = \frac{(15{,}000 - 10{,}000)/(10{,}000)}{7{,}000 - 5{,}000)/(5{,}000)}$$

$$= \frac{50\%}{40\%}$$

$$=1.25$$

The result is 1.25 and it is greater than one, otherwise called elastic elasticity of supply of education. It implied that when the school fee was increased, the education service provider reacted greater than increased school fees by providing more schooling places for the expected school entrants.

There can be situations where the education service provider will not react up to 1 and this is called inelastic elasticity of supply of education, while finally, the provider of education can react just in the same way the

change in school fees was. This is called unitary elasticity of educational supply.

Study Session Summary

Summary

This study session looked at the supply of education, the various supply of education concepts such as supply, price, time. It also defined supply of education and explained what educational supply schedule means. We also represented the educational supply schedule on the supply curve, while the law of educational supply was further stated. The various factors that influence the supply of education were explained. The concept of elasticity of educational supply was explored and how such elasticity could be calculated, and the result properly interpreted accordingly.

Assessment

Self-Checks

1. Explain the following concepts of supply: supply, price, time, supply of Education
2. What do you understand by educational supply schedule and draw a hypothetical educational supply schedule?
3. Draw on a graph sheet, the information on your hypothetical educational supply schedule
4. What does the law of educational supply states?
5. Explain the factors that influence supply of education
6. Explain the concept of elasticity of supply
7. Assume that there is an increase in the price of education from ₦10,000 to ₦ 18,000, the education provider increases the available school places from 7,000 to 10,000. What is the elasticity of supply of education and the interpretation of the result?

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Study Session 4

Concept of Equilibrium Analysis in Education

Introduction

I guess that you may have heard or read about equilibrium before? In this study session, we will concentrate on the concept of equilibrium analysis in education. Our interest also will be on the attainment of equilibrium when the quantity of education demanded equates the quantity of education supplied at a particular price. We will examine market interventions by the government or private donors.

Learning Outcomes

Outcomes

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

4.1 explain the concept of equilibrium in educational demand and supply
4.2 create a hypothetical demand for education and supply of education schedule
4.3 illustrate the Equilibrium Point of demand for education and supply of education as shown on the hypothetical demand for education and supply of education schedule
4.4 discuss what is meant by (i)excess demand for education and (ii) excess supply of student places
4.5 explain the factors that can reduce students' demand for education below the socially desirable level?

Terminology

Equilibrium	A state in which opposing forces or influences are balanced

4.1 Meaning of Equilibrium

Equilibrium ordinarily means a stable state or position, where balance is attained. You are satisfied when you don't need more at that point in time. Has any of you reached the state of satisfaction before? For instance where your stomach is not ready to take additional water. That state is referred to as equilibrium. We had examined the demand for education and the supply of education. It has been discovered that consumers of education will demand education, while suppliers of education will

supply education services. Since there is an interaction between the demand and supply of education and the consumer and supplier of education, there will be the need to examine the point of stability or balance otherwise called the point of equilibrium where quantity of education demanded by consumers equates the quantity of education supplied by the supplier of education services and at a particular price. The point at which quantity of education demanded equate quantity of education supplied is called the equilibrium point, designated by letter "E". Symbolically, E= Q_{ed} = Q_{es}.

The equilibrium point can be viewed from the combined demand and supply of education schedule below in table 4.1.

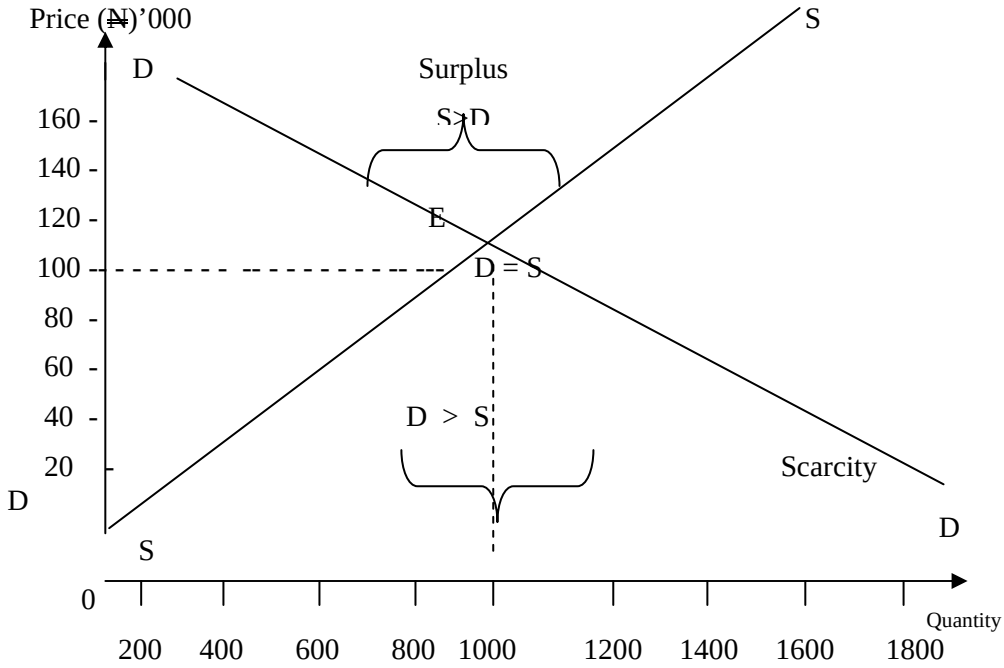
Table 4.1: Demand for Education and Supply of Education Schedule

Price (School fees) (₦)'000	**Quantity of Education Demanded**	**Quantity of Education Supplied**
160	400	1600
140	600	1400
120	800	1200
100	1000	1000
80	1200	800
60	1400	600
40	1600	400
20	1800	200

From above schedule, three columns can be seen and they represent the price of education otherwise called the school fees, quantity of education demanded by the consumers of education at various prices and the third column represents the quantity of education or school places supplied or made available by the suppliers of education. Please remember that we have examined the law of educational demand that states that "as the price of education increases, the quantity of education demanded reduces and as the price of education reduces, the quantity of education demanded increases". Also, with respect to the supply of education, the law of supply of education states that "as the price of education increases, the quantity of education or school places increases, while when the price of education decreases, the quantity of education also decreases. You need to carefully examine the table 4.0 above (demand for education and supply of education schedule) and realize that the information on columns of price of education and quantity of education demanded obeyed the law of demand, for education, while the combination of information on columns of price of education and quantity of education supplied also obeyed the law of supply of education. But at a unique or common price ₦1000,000 , the quantity of education demanded(1000) equated the quantity of education supplied(1000). This is the unique point where the quantity of education demanded equates the quantity of education supplied but at the common price of ₦1000,000, which is the equilibrium price.

Graphically, the information on the equilibrium analysis as shown in figure 4.1 is shown below in the equilibrium graph:

Figure 4.1:



4.2 Equilibrium Point of Demand for Education and Supply of Education

Point E on the graph above is the equilibrium point where the quantity of education demanded equates quantity of education supplied. It is also a point at which the educational demand curve intersects the educational supply curve. So, at point E, Quantity of Education Demanded = Quantity of Education Supplied

4.2.1 Excess Demand for Education

Excess demand for education represents a situation where the number of people seeking admission into an educational system is greater than the number that can be accommodated by the school. For example, 30,000 people may be seeking admission into the University while only 15,000 spaces can be provided. The difference between 30, 000 and 15,000, which is 15,000 is excess demand for education. From the graph showing the equilibrium point above, it is found that the lower portion of point E depicts a situation where quantity demanded is greater than the quantity supplied (D>S). The excess demand occurs as a result of low financial contribution of students or their parents to education in terms of fees and other forms of private cost of education. As a matter of fact, the philosophy of free education adopted by some political parties in Nigeria also contributed to the greater demand for education. If there is excess demand for education [student places(s)], an increase in fee would generate added revenue. Assuming that the government too will channel

the extra funds to the provision of more spaces, then the greater the increase in fees, the more funds are generated, and therefore, the larger is the potential supply of places.

4.2.2 Excess Supply of Student Places

The excess supply of student places is a situation where the number of students enrolled is less than the number of available or provided student places by the respective suppliers (providers) of education (that is, institutions of learning). This situation is depicted at the upper part of the equilibrium graph (point E) where supply is greater than Demand (S>D). The excess supply or surplus situation occurs as a result of high user charges charged by the respective providers of educational services. If students are charged high fees initially, the number of people seeking admission will be very low. For example, assuming that in one of the private Universities in Nigeria, the fees charged is ₦106, 000 per academic session, and the number of people that sought admission to the University is 20,000, while the number of spaces available for new students is 25,000. Assume further that all the applicants (20,000) will be able to afford and pay the charged fee (₦106, 000). It then follows that the available (supplied) student places in the institution are greater than the demand for student places in the private University charging ₦106,000 per session. Additionally, this is a situation of low demand for school places, while the supply of school places remains high, thus making the supply to be higher than the demand. We have not started experiencing a surplus situation in Nigeria yet. What we are currently experiencing is a scarce situation where applicants for the available student places are more than those offered admission. In America, however, they have started experiencing a situation of surplus supply of educational services.

One good way that surplus can be disposed of, is by reducing the user charges paid by the students and thereby attract more demand for education. In addition, the surplus situation can still be disposed of by converting the schools to some other uses. As the level of fees declines, the number of people willing to be educated and ready to pay will increase. At the same time, the initial decrease in revenue will have its adverse effect of constraining expansion of educational facilities and thereby reduce the supply of student places.

4.3 Market Intervention by Government or Private Donors

The private market alone cannot lead to an efficient resource allocation in education. The reason is that there is need for interventions through influences on both educational demand and supply. Without any intervention, students would be the only sources of demand for educational places. That is, enrollment demand would reflect student's willingness to pay for education. In that case, demand for education would reflect the students' desire to save and invest in education. It will also reflect their perception of the returns from educational investment

relative to other uses to which they can put their savings. In addition, enrollment demand would depend on the individual's valuation of education as a consumer good. Nevertheless, students' demand is not likely to be the same thing as social demand for education. There are three factors that can reduce students' demand below the socially desirable level. These factors are:

4.3.1 Undiversified Risk

People seeking admissions are usually faced with risks of failure in school and later in the labour market. Although, the society is faced with these risks, it is possible for the society to diversify the risks. The society can pull the risk of dropping out of school to those students who have less risk of either repeating or dropping out. That means, the number of successful completers would at the end compensate for the number of failure. The risk of failure would, therefore, become minimal when one thinks of the corresponding successes from investing on education. Consequently, the society can afford to invest in education and later in the labour market. Society can spread these risks on many taxpayers. By this, we mean that the society would not feel the impact of failure as an individual would feel it because, when the society fails, it is felt by many people thus making the pain less severe than when the whole failure is borne by an individual. Society can pull or spread risks but an individual cannot. So, individuals with high risks will not be willing to pursue education except there is some support.

4.3.2 Difficulty of Borrowing

There are so many students who consider investment in education as an important, profitable and necessary venture, but because of the difficulty of borrowing against future returns in education, they cannot afford education without intervention. In many countries of the world, the ability to enforce loan terms for private lender without a guarantee is limited. In most cases, lenders would require very high-interest premiums to compensate for default risk.

Consequently, marginal students are left out of the fact that those marginalized people desire education and are willing to pay. Thus, students' demand alone cannot lead to efficient allocation of resources since many people will not enroll in the educational system despite the fact that investment in such educational system is worthwhile.

4.3.3 Externalities in Education

Individual potential students are largely concerned with net benefit accruing to them. Whereas, there are other social net benefits that might be received by others from a student's education. Enrollment demand would thus not necessarily reflect the social net benefits others might receive from student's education. Due to this reason, there is the need to intervene in the interaction between forces of private demand for education and institutional supply.

Apart from intervention at the demand side, there is the need to control the supply aspect as well for two reasons:

4.3.4 Inadequate Funding of Basic Research

If there is no intervention in the provisions made for basic research in the educational system, less than the desired level of such research will be carried out. Institutions may be interested more in contract research than in basic (theoretical) research because the latter is usually not funded directly. Students would be willing to pay for the incremental quality of instruction resulting from basic research if they were asked to do so. However, what the students will be willing to pay will be less than the value of the basic research. It, therefore, becomes important that the supply of such basic research be influenced.

4.3.5 Institutional Monopoly

Monopoly within educational institutions may make the prices that institutions charge for instruction different from the actual minimum costs. Their effect is to make prices exceed actual minimum costs and to make differences in supply prices for various categories of instruction more uniform than differences in minimum possible costs. Some institutions have specialized academic programmes owing to their location or their year of establishment. For example, the University of Ibadan has become a special and Unique University as a result of its age and past glories. The vantage position of this university may lead to monopoly pricing restrictions. The University of Ibadan might have some degree of power to exact prices in excess of minimum cost when compared with other Universities in the country. Additionally, some smaller institutions may be forced to charge prices below the minimum possible instructional costs in areas such as science and technology which are more expensive to run than courses in arts and education. Consequently, there is need to intervene in institutional supply so as to ensure efficiency in the allocation of scarce resources.

ITQ

Question

_____is defined as a stable state or position, where balance is attained.

Feedback

Equilibrium is the state in which opposing forces or influences are balanced.

Study Session Summary

Summary

In this Study Session, we examined the concept of equilibrium and to this end, the definition of educational supply schedule was examined and hypothetical educational supply schedule was shown, while the schedule was translated to educational supply curve. We also listed and explained the factors influencing the supply of education. Eventually, we discussed

the concept of elasticity of educational supply.

Assessment

Self-Checks

1 Elucidate the concept of equilibrium in educational demand and supply
2 Construct a hypothetical demand for education and supply of education schedule
3 Demonstrate the Equilibrium Point of demand for education and supply of education as shown on the hypothetical demand for education and supply of education schedule in question 2 above
4 Discuss in details what is meant by (i)excess demand for education and (ii) excess supply of student places
5 Explain comprehensively the factors that can reduce students' demand for education below the socially desirable level.

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Study Session 5

Cost Benefit Analysis, Productivity, and Efficiency

Introduction

In this Study Session, we will examine Cost-Benefit analysis and the various steps that are involved in its calculation. We will also explain productivity and its full measurement, efficiency and its link with productivity. Additionally, we will discuss some issues connected with productivity and efficiency, especially its connection between low external productivity in the face of high internal efficiency. Lastly, we will examine the relationship between external productivity and cost-benefit ratio.

Learning Outcomes

Outcomes

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

5.1 define cost-benefit analysis
5.2 explain the steps involved in the calculation of cost-benefit analysis
5.3 elucidate the social aspect of the cost-benefit analysis
5.4 explain carefully the following terms:
- productivity
- efficiency

5.5 use a table, to explain some issues that are connected with productivity and efficiency.

Terminology

Cost-benefit analysis	A systematic approach to estimating the strengths and weaknesses of alternatives that satisfy transactions, activities or functional requirements for a business.

5.1 Concept of Cost-Benefit Analysis

Cost-benefit analysis

A process by which business decisions is

Cost – benefit analysis is a technique or an investment decision-making tool used for describing, quantifying and comparing the costs and benefits of investment projects in order to determine whether the projects to be invested in are worthwhile, and to what extent.

analyzed

5.1.1 Steps Involved in Cost – Benefit Analysis

There are four steps in the process of comparing of costs and benefits of a project. The four steps are:

1. Identification of all the advantages (merits) and disadvantages (demerits) of a project to be invested in.
2. Quantification of the identified merits and demerits so as to place numerical value on each cost and each benefit.
3. Monetization of the quantified merits and demerits so as to bring all quantifiable costs and benefits to a common denominator of money.
4. Aggregation of monetized costs and benefits using the appropriate formulae which include:
   a. Net Present Value (NPV)
   b. Internal Rate of Return (IRR) and
   c. Benefit – cost Ratio (B-CR)

5.1.2 Social Aspect of Cost – Benefit Analysis

Cost – benefit analysis has both private and social aspects. When an individual wishes to establish an industry or embark on a venture, he may want to know the costs and the benefits of such an industry or venture. The difference between the costs and the benefits is the Net Benefit. Note, however, if the value of the benefits is greater than the value of the costs, the investor will consider such project viable, profitable and worthwhile. But if the value of the benefits is the same or less than the value of the costs, the individual investor may decide not to embark on the project. This is because such project brings no profit (gain). What really matters to the private investor is whether or not project (venture) is worthwhile. He is careless about what the society will gain or lose from such an investment.

Cost–benefit analysis must not only identify and quantify private costs and benefits; it must also measure social costs and benefits. That is, it must be concerned with what will be the positive and negative effects of the project on the society as a whole

The BenueState government as at January 5, 2005, decided to set up her own power generating firm and so, set aside the sourcing of power generation through National Electric Power Plc (NEP Plc). This was as a result of the inefficiency of the NEP Plc. Before coming to this conclusion of private power generation, the BenueState government would have considered the benefit and cost of such project, and also discovered that the society will benefit greatly upon venturing on such power generation project. On the whole, an investor must not only concern himself with the private net benefit of establishing an industrial

outfit, he must also concern himself with the net benefit to the society. It is the social aspect of Cost – benefit analysis that distinguishes it from ordinary investment appraisal method or feasibility study.

5.2 Productivity

Productivity denotes the relationship between output and one or all associated input, in real terms. It may be defined simply as output per unit of input. The concept of productivity is based on the notion of production function which states that the volume of output depends on the volume of inputs used in production and on the state of the art or technology. The purpose of productivity measurement is to provide a yardstick of economic efficiency in different time periods for individual firm within an industry; or for an industry considered as a whole. Productivity is to ensure that output is increased while inputs are kept static or put another way, outputs are the variable and inputs are held constant. Productivity is said to increase when the same inputs lead to a greater output than before. So, greater productivity comes not from spending more or from working harder but from working smarter. Productivity is centrally concerned about the maximization of the real output of education and training.

5.2.1 Measurement of Productivity

The following steps should be taken in order to measure productivity of a firm or an industry:

1. Definition of all inputs and outputs
2. Measurement of all inputs and outputs in quantitative terms
3. Isolation of variation in quality of output and inputs
4. Expression of inputs and outputs in real term
5. Combination of various real inputs and outputs into a single index
6. Division of output by input.

5.3 Efficiency

In layman's term, efficiency is the ability to produce the desired effect with minimum of effort, expense or waste. The criterion of efficiency demands that, of two alternatives having the same cost, one be chosen which will lead to a greater attainment of the organizational objectives. It also demands that, of two alternatives leading to the same degree of attainment, one is to be chosen which entails the lesser cost. On one hand, efficiency involves the maximization of output as inputs are considered as fixed, and on the other hand, the minimization of inputs, if outputs are considered as fixed. It is concerned with the maintenance of a positive balance of output over input. Summarily put, efficiency is the optimal combination of inputs to produce a given output that is, producing that output at least cost.

5.3.1 Link between Productivity and Efficiency

It is through maximized productivity that maximum efficiency is achieved. The higher the output per unit input, the higher the ability to produce the desired effect with minimum input and vice-versa. As earlier stated, the essence of productivity measurement is to provide a yardstick of efficiency. Two ways by which productivity can be maximized by an organization and therefore achieve maximum efficiency are listed below.

1. Any given set of inputs should be utilized so as to produce the largest value of output.
2. For a specified output and quantity level, inputs should be chosen and utilized in order to minimize production costs.

5.3.2 Issues Connected with Productivity and Efficiency in Education

The Distinction between immediate outputs and ultimate benefits of education. The distinction laid out in table 5.1 must be made between immediate outputs and ultimate benefits of education in order to understand the difference between productivity and efficiency in education.

Table 5.1:Distinction between Immediate Outputs and Ultimate Benefits of Education

	Criterion	Immediate Output	Ultimate Benefit
1	Composition	Comprises of all that a graduate acquired in the process of being educated. For example, all the acquired learning, skills and attitudes that students carry away from the educational system is far greater than what they brought to it initially.	Comprises of all that can be gained through the application of the skill, learning, and attitude acquired by graduates. For example, a better job, higher income, more satisfying family life, a greater sense of participation, higher production, better living standards, the supply of more effective leaders etc.
2	Connotation	Connotes learning achievement or the difference between entry and exit behaviours of graduates	Connotes advantages of education to both individual and the society. It concerns the relevance of the knowledge skill and attitude acquired while in school.
3	Measurement	Examination results can be used to measure the differences between what students carry away from the educational system and what they brought to it initially. The number of graduates can also be compared with the numbers who were admitted initially. The rate of dropout can, therefore, affect immediate output.	Both qualitative and quantitative measures of the different education have made in the life of the graduates and in the economy. Economic measures used include lifetime earnings, increased productivity, and tax contribution resulting from the education acquired.

The following hypothetical cases illustrate the points on immediate output.

Table 5.2

Student	Entry Behaviour	Exit Behaviour	Value Added
Mr. A	20%	50%	30%
Mr. B	40%	60%	20%

Differences in both Entry and Exit Behaviours (Case 1)

Looking at table 5.2, you will find out that there exists a difference between the educational values added to the students by their exposure to the particular educational process. Mr. A's output (value added) is greater than that of Mr. B. While Mr. A's output is 30% that of Mr. B is 20%. However, Mr. B's final result is better than Mr. A's final result. You will even see that while Mr. A scores 50%, Mr. B scores 60%. Nevertheless, while Mr. A enters the system with only 20% knowledge, skill, and attitude, Mr. B enters with 40%. The difference in entry behaviour may be as a result of differences in family or cultural background, career aspiration, motivation, inherent ability, etc. You can now see the reason why the learning achievement of Mr. B (20%) is lower than that of Mr. A (30%) despite Mr. B's better performance in the final examination. Mr. B, therefore, gains less than Mr. A in terms of added value to their education.

Table 5.3

Student	Entry Behaviour	Exit Behaviour	Value Added
Mr. C	20%	40%	20%
Mr. D	20%	60%	40%

Equal Entry Behaviour but Different Value Added (Case 2)

Take another look at table 5.3, you will notice that both C and D enter with 20% respectively, but at the end Mr. D records higher than Mr. C. Having assumed that both C and D are equally brilliant and equally prepared while the process of teaching is not discriminatory, the difference in value added may be as a result of either drop out or repetition on the side of Mr. C. Instead of 6 years, maybe Mr. C has only spent 4 years and consequently has not been able to acquire the same knowledge, skill and attitude which Mr. D must have repeated twice, thereby acquiring the same education more than once.

Note

There was no value added at the period when Mr. C was repeating. I will like you to note that internal efficiency relates the learning achievements with the input used to produce them. In other words, it relates the input with the immediate output while productivity relates the cost of producing learning results in a particular period with the cumulative benefits. What I am saying is that internal efficiency is related to immediate output, while external

productivity is related to the concept of ultimate benefit.

Low External Productivity In the Face of High Internal Efficiency

An educational system can have high internal efficiency yet low external productivity. This can happen when there is high learning achievement or added value but low socio-economic impact of the knowledge, skill, and attitude acquired in the education system. Maybe the educational system is producing graduates with little or no repetition or dropout. And at the same time, wrong things have been taught. The education is not relevant to either the needs of the student or that of the economy. Specialists in Educational Management may have been well trained but if too few jobs are available in that field, the investment in their training is likely to produce few benefits. Thus, the relevance and fitness of what an educational system teaches its students at a particular time and place have a major bearing on the system's ultimate productivity.

Note

This is an emphasize the point that ultimate productivity may also be affected by the inability of the economy to effectively put to use the knowledge, skill, and attitude acquired by students in the process of their education. A relevant course may attract little or no benefit if the economy does not create job opportunities for the graduates or the school leavers.

Relationship between External Productivity and Cost-Benefit Ratio

Cost – benefit ratio of an educational system is an indicator of the external productivity. As earlier defined, external productivity relates the cost of producing learning results in a particular period with the cumulative benefits that subsequently accrue from those learning results over a long period. Similarly, cost – benefit ratio is the relationship between the cost of producing learning results (outputs) and the cumulative benefits of education. If the accrued benefits to individual and to society substantially exceed the educational costs, then that particular educational effort can be viewed as a good investment.

Table 5.4: Showing the Differences between Efficiency Approach and Productivity Approach to Production

	Characteristic	Efficiency Approach	Productivity Approach
1	Definition	Cost per unit of a constant level of output.	Volume of production per unit of input
2	Measurement	Money terms	Classically, physical output
3	Inputs	Treated as variable (the aim is to reduce them)	Treated as constant

4	Outputs	Constant for measurement purposes	Variable
5	Workloads	Variable (aim is to increase them)	Constant (although nature of work may change)
6	Work organization including range of skills needed)	Constant for measurement purposes	Variable (and a primary source of productivity advance)
7	Planning horizons	Short – term cost savings	Long – term capacity increases
8	Flexibility of output	Tendency to homogeneous output	Tolerates range of outputs
9	Accountability implications	Favours internal accountability	Favours external accountability
10	Industrial relations implications	Hostile management driven and top down	Potentially cooperative

Adapted from Marginson (1991)

ITQ

Question

List three steps that should be considered in order to measure productivity of a firm or an industry

Feedback

If any point from the under-listed points is included in your answer, you are correct.

- Definition of all inputs and outputs
- Measurement of all inputs and outputs in quantitative terms
- Isolation of variation in quality of output and inputs
- Expression of inputs and outputs in real term
- Combination of various real inputs and outputs into a single index
- Division of output by input.

Study Session Summary

In this Study Session, we examined Cost-Benefit analysis and the various steps that are involved in its calculation. The social aspect of cost-benefit analysis was also explained. We also explained productivity

Summary

and its full measurement, efficiency and its link with productivity. Additionally, some issues connected with productivity and efficiency, especially its connection between low external productivity in the face of high internal efficiency was explained. The study session also examined the relationship between external productivity and cost-benefit ratio.

Assessment

Self-Checks

1. What is cost-benefit analysis?
2. What are the steps involved in the calculation of cost-benefit analysis?
3. Explain the social aspect of cost-benefit analysis
4. Explain the term productivity
5. Explain fully how productivity is measured.
6. (i)Explain the term Efficiency (ii) Explain the link between productivity and efficiency
7. Using a table, explain some issues connected with productivity and efficiency.

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Study Session 6

National Income and Growth Rate

Introduction

This study session introduces you to the concepts of national income and growth rate. As you will later realize, income means revenue, earnings or proceeds that come in for a person after working for a given time period by giving up one's time in the service of an organization. Such a person is invariably rewarded by the payment of such income. But our interest here is that of the income that a nation accrues to herself in the course of transacting businesses, and finding out how such income increases.

Learning Outcomes

Outcomes

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

6.1 define the following terms:

a. national income
b. gross domestic product
c. gross national income
d. per capita income

6.2 explain why national income is computed on an annual basis; and

6.3 compute per capita income and growth rates.

Terminology

National income	The total amount of money earned within a country
Gross domestic product	The value of the goods and services produced by the nation's economy less the value of the goods and services used up in production, adjusted for price Changes
Gross national income	The total domestic and foreign output claimed by residents of a country, consisting of gross domestic product (GDP) plus factor incomes earned by foreign residents, minus income earned in the domestic economy by non-residents
Per capita income	The mean income of the people in an economic unit such as a country or city

6.1 National Income

National income

The total value of a country's final output of all new goods and services produced in one year

National income is the monetary value of goods and services that are produced in a country (an economy) over a given period of time. The growth of a country is measured by using the rise in national income over a year. National income is usually computed on annual basis and this will give room for ascertaining of the growth that is experienced in an economy. To measure the economic development of a country, a structural analysis of the national income must be made, instead of using ordinary values of the national income. The national income values alone give nominal values without giving necessary information on the structure such as population and capital capability of a country. Further discussion is deferred to the section on per capita income after we would have learnt about Gross National Income and Net National Income.

6.1.1 Gross Domestic Product (GDP)

Gross Domestic Product

The monetary value of all the finished goods and services produced within a country's borders in a specific time period

Gross Domestic Product (GDP) is the value of the total output that is produced by factors of production resident within an economy during the period for which national income is being computed. The GDP is strictly for the shores of a given country, and so it has a geographical boundary as it takes into consideration all the factors of production belonging to both citizens and foreigners living in a country. By the time depreciation is deducted from the GDP, the result that is obtained is the Net Domestic Product.

6.1.2 Gross National Income (GNI)

Gross National Income

The sum of value added by all producers who are residents in a nation, plus any product taxes (minus subsidies) not included in output, plus income received from abroad such as employee compensation and property income.

The Gross National Income (GNI) otherwise known as the Gross National Product (GNP) is defined as the total value or the monetary measurement of the total output produced by the factors of production that are around the citizens irrespective of where the citizens are living during a given period of time, say one year. The gross national product includes net income from abroad. Only the final products should be taken into account while estimating the GNP of an economy. This is to prevent the problem of double counting which can arise when value of item(s) are accounted for at their different stages of production. Symbolically, GNI = GDP + X – M where GDP = Gross Domestic Product;

X = Export and M = Import

By the time depreciation is subtracted from the GNI, the result will be Net National Income. Symbolically, NNI = GNI – Depreciation. There are three major approaches used in estimating the GNI and these are

a. Income Approach
b. Expenditure Approach
c. Value Added Approach

6.1.3 Per Capita Income

Per capita income

The average income earned per person in a given area (city, region, country, etc.) in a specified year.

This is the income earned by an individual within a given society. Put in another way, it is the total income of a group divided by the number of people in the group. **Per capita (not capital) income** is the income per head of a given population. The per capita income is more of an estimate than the real contribution of each individual to the national income. It should be realized that while some citizens have contributed much or little than the per capita income to the overall national income, some other citizens might have contributed nothing to it at all. The values of per capita income are better index for measuring development than those of national income. For example, assume that the national incomes of two countries B and D were N30 million and N36 million in the year 2013 respectively. The population figures of the countries B and D were 10,000 and 104,400 in the year 2013 respectively.

Thus, the per capita incomes of countries B and D in 2013 will be as follows:

$$a.\ CountryB'sPer\ Capita\ Income = \frac{Income}{Population} = \frac{30{,}000{,}000}{10{,}000}$$
$$= ₦3{,}000$$

$$b. Country\ D'sPer\ Capital\ Income = \frac{Income}{Population} = \frac{36{,}000{,}000}{104{,}400}$$
$$= ₦344.83$$

From the findings above with respect to countries B and D, one will be tempted to conclude that country D with ₦36 million was richer than country B with only ₦30 million. Whereas, when we get the per capita income of these countries, it was revealed that country B had more money per person than country D, whose per capita income was ₦344.83.

6.1.4 Growth Rate

The growth rate is usually made used of in the field of economics, especially when examining the country's national income and population growth. The growth rate is, therefore, the rate of change in any measure of development over a period of time. The growth rate of a country in relation to national income can be calculated as given below:

$$Growth\ Rate = \frac{Y_1 - Y_0}{Y_0} \times \frac{100}{1} \quad =$$

Where Y_0 = Income in base Year 0

Y_1 = Income in target year 1

Example: Given that a country's national incomes in 2008 and 2013 were ₦30 million and ₦35 million respectively. The growth rate over the period under consideration will be:

$$= \frac{Y_1 - Y_0}{Y} \times \frac{100}{1}$$

While $Y_0 = Y_{2008} =$ ₦30 million

$Y_1 = Y_{2013} =$ ₦35 million

$$= \frac{35{,}000{,}000 - 30{,}000{,}000}{30{,}000{,}000} \times \frac{100}{1} = 16.67\%$$

The above result shows and implies that the national income of the country under consideration has increased by 16.67% between the years 2008 which was the base year and the target year 2013.

Average Growth Rate

This is the annual or yearly change in the given measure under consideration (that is income, population etc.) of a given nation over a period of time relative to the duration of the period.

Mathematically

$$\textbf{Average Growth Rate} = \frac{\textbf{Overall Growth Rate}}{\textbf{Number of Years Interval}}$$

From the example given above,

Overall Growth Rate = 16.67%

Number of Years Interval = 5

Therefore, Average Growth Rate = $\frac{16.67}{5}$ = 3.33 per year

ITQ

Question

Differentiate between GDP and GNI

Feedback

Gross Domestic Product (GDP) is the value of the total output that is produced by factors of production resident within an economy during the period for which national income is being computed; while the Gross National Income (GNI) otherwise known as the Gross National Product (GNP) is defined as the total value or the monetary measurement of the total output produced by the factors of production that are around the citizens irrespective of where the citizens are living during a given period of time, say one year

Study Session Summary

Summary

In this Study Session, we discussed the concept of national income as the monetary value of goods and services that are produced in a country (an economy) over a given period of time. Terms like Gross National Income (GNI), Per Capita Income (PCI) and Growth rate were also examined.

Assessment

Self-Checks

1. Explain the following terms extensively:
   a. National Income
   b. Gross National Income
   c. Per capita Income
2. Why is national income computed on an annual basis?
3. Use the table below to answer questions (a) – (d)

National Income and Population of Country B

Year	National Income	Population
2008	₦180 million	15 million
2013	₦210 million	21 million

a. The national income growth rate is
b. The population growth rate is
c. Average national income rate is
d. The 2013 per capita income is?

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Study Session 7

Physical and Human Capital

Introduction

Many of you are familiar with the word "capital". To some people, it means the town or city where the seat of government of a country, state or local government is based (situated). You have also heard about capital letters as we have in English grammar. In the field of Economics, there is the concept of capital, which you will be exposed to in this study session. We are going to fully discuss both the physical and human capital.

Learning Outcomes

Outcomes

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

7.1 define and differentiate between
   a. Physical and human capital
   b. Expenditure and cost
   c. Consumption and Investment
7.2 identify four characteristics of capital
7.3 calculate the average and marginal costs

Terminology

Expenditure	The action of spending funds
Average cost	The total cost divided by the number of goods produced (the output quantity, Q).
Marginal cost	The change in the total cost that arises when the quantity produced is incremented by one unit, that is, it is the cost of producing one more unit of a good
Physical capital	One of the three main factors of production in economic theory. It consists of manmade goods that assist in the production process, like machinery, office supplies, transportation, and computers.
Human capital	The stock of knowledge, habits, social and personality attributes, including creativity, embodied in the ability to perform labor so as to produce economic value

7.1 Physical and Human Capital

7.1.1 Physical Capital

Physical capital refers to the acquisition of machines, money and materials for further productive activities. The physical capital can be seen and touched. In fact, it is concrete and is used for the creation of more materials.

7.1.2 Human Capital

This refers to the acquisition of trained and skilled men for productive activities. Human capital is the equipping or empowering of humans who will ensure the continuous survival of different nations in the world. Human capital is the manpower base of a given economy.

7.2 Characteristics of a Capital

7.2.1 Capacity Increase is a Must

Both physical and human capitals have a capacity of increasing the productive capacity of an organization. For example, a trained man with the ability to handle and manipulate machines will increase the output of an organization. Also, whenever a machine is introduced into the operation mode of an organization, the rate of increase in the output of such a firm will be greater when compared with another organization depending on manual operation. It should be realized that there is a limit to the extent to which operations can be done manually because of the limitation in human power and ability. But the machine invented by man can carry out greater functions within a limited time.

7.2.2 Pay-Off Time is long

Both capitals (human and physical) require a long period of time before they can pay off. An educated man would have to work for some years before he or she can pay off the money spent on his or her education. In a similar vein, a machine that is bought and put into adequate use would be in use for some time before it can pay-off the money spent to acquire it. In this while, one can imagine the amount of money, spent by the government, parents, relatives, family members and even oneself on education right from primary school to the University level. It could be thought over that how many years of full-time employment do I think I will need to pay off my educational expenses? Note that such expenses include tuition, allowances, and salaries of teaching staff, books, clothing, transportation, building and teaching equipments.

7.2.3 Building-Up Period is Long

Both human and physical capitals require a lengthy period of time to build up. For somebody to be a trained and qualified secondary school teacher having a B.Ed. certificate, you must have spent at least 16years in primary, secondary and the University levels. Also, it requires lots of savings, self-denials and resources on research and development.

7.2.4 Depreciation is Certain

Capital whether human or physical must depreciate over time. It is a must that depreciation must set in into these capitals as a result of usage Depreciation manifests in human knowledge and skills, and to this end, human capital requires some updating through the organization of in-service training, seminars, workshops, further education etc. If you cast your mind back, you will realize that you were not as strong in the AD2000s as compared with the 1990s. Additionally, compare the number of times you visited hospitals every now and then. Further imagine what will remain of your power of work by the time you are 65years old. Human capital certainly wears and tears like physical capital such as cars, engines, buildings etc.

Memory Aid: CAPABUDE

1. Ca = Capacity increase is a must
2. Pa = Payoff time is long
3. Bu = Building-up time is long
4. De = Depreciation is certain

7.3 Expenditure or Outlays

Expenditure is the monetary value of the resources that are directly used up by a producer or manufacturer) or a consumer in the process of production.

7.3.1 Current Expenditure

This is the money outlay on a goods and services that bring short-lived benefits to the consumer. The short-lived benefits is usually for not more than a year.

7.3.2 Capital Expenditure

The capital expenditure is the money on goods and services that bring long-lived benefits usually for more than a year. This is expenditure incurred on capital items such as building, investment in share purchase, and so on. One major difference between the current and capital expenditures is in the duration within which one enjoys the goods and services on which expenditure has been incurred.

7.4 Cost: Opportunity Cost

Cost is a measure of what is given (sacrificed) up in order to produce or consume a commodity or service. It may be in the form of opportunity cost in which case what is given up is the next best alternative to what is being produced or consumed. Opportunity cost is highly concerned with the real sacrifice involved in achieving something. It is also the value of the alternatives or other opportunities which must be forgone in order to

achieve a particular thing or target. Cost can, therefore, be divided into the following types:

7.4.1 Total Cost

This is otherwise denoted by TC and it is the value of all what you have to sacrifice in order to achieve something. The total cost is made up of fixed cost and variable cost.

Symbolically

TC = TFC + TVC

Where TC = Total Cost

TFC = Total Fixed Cost

TVC = Total Variable Cost

Total Fixed Cost

This is a cost that does not vary with output. It is incurred on fixed items that must be readily available before any productive activity can take place in a given organization. The total fixed cost is also referred to as overhead cost. This cost includes cost of management, rental expenses, cost of buildings and interest on borrowed capital. For example, if the rent paid on accommodation is ₦2,500 a month, when the output is 10bags. If the output increases to 20bags, the rent will still be ₦2,500 a month for accommodation. On the other hand, if the output falls or reduces to 5 bags, this output reduction does not imply that there will be a reduction in the accommodation fee of ₦2,500 a month. Such person will still be required to pay ₦2,500. Total fixed cost is arrived at by adding together the values of all items whose costs do not vary with output.

Total Variable Cost

This is a cost that varies with the level of output. This is also called direct cost and examples of the cost are those of raw materials, fuel, stationeries etc. It is denoted by TVC.

7.4.2 Average Cost

Is the unit cost and it is total cost divided by output. It is symbolically denoted as

$$\frac{TC}{Q}$$

The average cost could also be seen as the sum of average fixed cost (AFC) and average variable cost (AVC)

Symbolically, AC = AFC + AVC

Average Fixed Cost

This is the total fixed cost divided by the unit of output. That is

$$\frac{TFC}{Q}$$

Average Variable Cost

It is the total variable cost divided by the unit of output. In symbol,

$$\frac{TVC}{Q}$$

7.4.3 Marginal Cost

This is denoted by MC, and it is a change in total cost associated with a unit change in output. So, it is the additional cost to total cost as a result of a unit increase in the level of output. That is in symbol,

$$MC = \frac{\delta TC}{\delta Q} \; OR \; \frac{DTC}{DQ}$$

Where MC = Marginal Cost

TC = Total Cost

δQ = DQ = Change in quantity of output

For example, given that 100 and 150 units of a product amount to the total cost of ₦250 and ₦300 respectively. The marginal cost of producing an extra unit will be given as shown below:

$$MC = \frac{DTC}{DQ} = \frac{₦(300 - 250)}{150 - 100}$$

$$MC = \frac{₦50}{50} = ₦1$$

The above implies that the cost of both the 100units and 150 units as shown below:-

Average cost for 100units

$$= \frac{TC}{Q} = \frac{₦250}{100} = ₦2.50$$

The above implies that the cost for a unit of 100 items produced when the total money cost was ₦250 is ₦2.50.

Furthermore,

Average Cost for 150 Units

$$= \frac{TC}{Q} = \frac{₦300}{150} = ₦2.00$$

7.5 Consumption and Investment

Consumption and investment can be viewed as antonyms. While investment deals with building up of assets and other capital things

against the future, consumption on the other way round does not build up but eats up for the provision of immediate satisfaction. So, consumption is the total expenditure on goods and services which are used up within a specified short period of time, which is usually a year. Investments are made to satisfy long-term benefits. Investment can be in the form of subscription into the purchase of any asset, or the undertaking of any commitment which involves an initial sacrifice followed by subsequent benefits.

ITQ

Question

List what the total cost is made up and explain.

Feedback

They are **fixed cost** and **variable cost**.

Fixed cost is a cost that does not vary with output

Variable cost is a cost that varies with the level of output

Study Session Summary

Summary

In this Study Session, we defined physical capital as the acquisition of machines, money and materials for further productive activities and human capital as the acquisition of trained and skilled men for further productive activities. We highlighted the four characteristics of capital are as capacity – increase potential is a must,pay-off time is long, building-up time is long and depreciation is certain. We also discussed the concept of expenditure or outlays. Finally, we noted that cost is a measure of what is given up (sacrificed) in order to obtain something. It may be in terms of opportunity cost or outlay (expenditure) and consumption is made to satisfy immediate wants, but investment, on the other hand, involves an initial sacrifice followed by subsequent (later) benefits.

Assessment

Self-Checks

1. what is the only difference between current and capital expenditure?
2. Using the data below, which is in respect of a given firm, to answer questions (a) and (b)?

Unit of Goods Produced	*Total Cost (₦)*
200	₦750
300	₦900

a. Find the average cost of producing 300 Units
b. Find the marginal cost of producing 300 units

3. If commodity "X" can only provide immediate satisfaction to Mr. A, while it would provide satisfaction to Mr. B for a long period of time, what does this mean?
4. Highlight the four characteristics of capital.

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Study Session 8

Index Number: Laspeyre's Index

Introduction

You have been taught that economics is a study of human behaviour and this behaviour can change from time to time and even from place to place. There are some signs which will make an observer to recognize when and where there is a change in the economic behaviour of man. These signs of the economic behaviour of man are referred to as indexes which you will be introduced to in this study session. Index numbers are used for making comparisons such as food or other activities in a city during a year compared with those of a previous (former) year.

Learning Outcomes

Outcomes

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

8.1 define the term index number
8.2 identify and write formulae for the three types of index numbers
8.3 calculate Laspeyre price index
8.4 calculate Laspeyre quantity index

Terminology

Index numbers	Tools of numerical measurement of the magnitude of change in a variable or any event or group of related variables taking into consideration the time, geographic location, income and other features.
Laspeyre's index	The ratio of the total cost of purchasing a specified group of commodities at current prices to the cost of that same group at base-period prices and multiplying by 100.

8.1 The Concept of Index Number

As a manager of education programme, you will often need to make comparisons of programmes and projects. You can use index numbers when making comparisons over time. An index starts in a given year, the base year, at an index number of 100. In subsequent years, percentage increases push the index number above 100, and percentage decreases push the figure below 100. An index number of 102 means a 2% rise from the base year, and an index number of 98 means a 2% fall.

There is usually a starting point which is called the base year, and it is given the value of one hundred percent (100%). There is also the target year index number that is related to the base year by dividing the value in year "n" with the value in a base year. One must note that government, corporate bodies, and economic organizations are usually involved in the computation of index numbers. This is done for the reason of forecasting of business and economic conditions and to provide relevant information that is necessary for human existence. Furthermore, we can have the following indexes, which are: wage indexes, production indexes, unemployment indexes, cost – of –living index and even consumer price index.

$$The\ index\ in\ year\ n = \frac{Value\ in\ year\ n}{Value\ in\ base\ year}$$

If the prices and quantities of various items or products bought in certain years are given, the price index of such products can be calculated. There are three main types of index numbers:

1. Laspeyre price and quantity index
2. Paasche price and quantity index
3. Value index

Other types are:

4. Weighted average of price relatives and
5. Chain index

Worked Example

Question

From the data below and using 2010 as the base year where appropriate, draw up:

1. A Laspeyre price index
2. A Laspeyre quantity index

	2010		2011		2012		2013	
Item	P_0	q_0	P_1	q_1	P_2	q_2	P_3	q_3
A	0.20	20	0.25	24	0.35	20	0.50	18
B	0.25	12	0.25	16	0.10	20	0.125	16
C	1.00	3	2.00	2	2.00	3	2.00	4

Solution

1. Formulae for Laspeyre price index

$$Laspeyre\ price\ index = \frac{\sum P1\ q0}{\sum p0\ q0} \times \frac{100}{1}$$

This is a base – year quantity weighted index

Where P_0 and q_0 = Price and quantity at the base year

P_1 = Prices at subsequent years i

Σpq = the price and quantity of each item in turn are first multiplied together and the products are then added. (i.e. (i) multiply each price by quantity for each items A,B and C and (ii) add up the three products of price and quantity).

Step 1: Calculate $P_1 q_0$ for item A

a. $P_0 = 0.20$ and $q_0 = 20 \therefore P_0q_0 = .20 \times 20 = 4.0$

b. $P_1 = 0.25$ and $q_0 = 20 \therefore P_1q_0 = .25 \times 20 = 5.0$

c. $P_2 = 0.35$ and $q_0 = 20 \therefore P_2q_0 = .35 \times 20 = 7.0$

d. $P_3 = 0.50$ and $q_0 = 20 \therefore P_3q_0 = .50 \times 20 = 10.0$

Step 2: Calculate P_1q_0 for item B

a. $P_0 = 0.25$ and $q_0 = 12 \therefore P_0q_0 = 0.25 \times 12 = 3.0$

b. $P_1 = 0.25$ and $q_0 = 12 \therefore P_1q_0 = 0.25 \times 12 = 3.0$

c. $P_2 = 0.10$ and $q_0 = 12 \therefore P_2q_0 = .10 \times 12 = 1.2$

d. $P_3 = 0.125$ and $q_0 = 12 \therefore P_3q_0 = .125 \times 12 = 1.5$

Step 3: Calculate P_1q_0 for item C

a. $P_0 = 1.0$ and $q_0 = 3 \therefore P_0 q_0 = 1.0 \times 3 = 3.0$

b. $P_1 = 2.0$ and $q_0 = 3 \therefore P_1q_0 = 2.0 \times 3 = 6.0$

c. $P_2 = 2.0$ and $q_0 = 3 \therefore P_2q_0 = 2.0 \times 3 = 6.0$

d $P_3 = 2.0$ and $q_0 = 3 \therefore P_3q_0 = 2.0 \times 3 = 6.0$

Step 4: Add up P_0q_0 of items A, B and C

Item	P_0 = 2010
A	$P_0q_0 = 4$
B	$P_0q_0 = 3$
C	$P_0q_0 = 3$
Addition: $\Sigma p_0q_0 = 10$	

Step 5: Add up $P_1 q_0$ of all items

item	P_1 = 2011	P_2 = 2012	P_3 = 2013
A	$P_1q_0 = 5.0$	$P_2q_0 = 7.0$	$P_3q_0 = 10.0$
B	$P_1q_0 = 3.0$	$P_2q_0 = 1.2$	$P_3q_0 = 1.5$

C	$P_1q_0 = 6.0$	$P_2q_0 = 6.0$	$P_3q_0 = 6.0$
Addition	$P_1q_0 = 14.0$	$P_2q_0 = 14.2$	$P_3q_0 = 17.5$

Step 6: Apply the formula

$$\frac{\sum P1\ q0\ year\ by\ year}{\sum p0\ q0}$$

$$\text{Base year (2010)} = \frac{10}{10} \times \frac{100}{1} = 100\%$$

$$2011 \text{ index} = \frac{14}{10} \times \frac{100}{1} = 140\%$$

$$2012\ index = \frac{14.2}{10} \times \frac{100}{1} = 142\%$$

$$2013\ index = \frac{17.5}{10} \times \frac{100}{1} = 175\%$$

2. Formula for Laspeyre quantity index is given as:

$$Laspeyre\ quantity\ index = \frac{\sum q1p0}{\sum q1p0} \times \frac{100}{1}$$

The index is a base – year price weighted index where q_1, p_0, q_0, Σqp are defined under formula (a)

Step 1: Calculate q_1p_0 for item A

$q_0 = 20$ and $P_0 = .20$ ∴ $q_0P_0 = 4.0$

$q_1 = 24$ and $P_0 = .20$ ∴ $q_1P_0 = 4.8$

$q_2 = 20$ and $P_0 = .20$ ∴ $q_2P_0 = 4.0$

$q_3 = 18$ and $P_0 = 20$ ∴ $q_3P_0 = 3.6$

Step 2: Calculate q_0p_0 for item B

$q_0 = 12$ and $P_0 = 0.25$ ∴ $q_0P_0 = 3.0$

$q_1 = 16$ and $P_0 = 0.25$ ∴ $q_1P_0 = 4.0$

$q_2 = 20$ and $P_0 = 0.25$ ∴ $q_2P_0 = 5.0$

$q_3 = 16$ and $P_0 = 0.25$ ∴ $q_3P_0 = 4.0$

Step 3: Calculate q_1p_0 for item C

$q_0 = 3$ and $P_0 = 1.00$ ∴ $q_0P_0 = 3.0$

$q_1 = 2$ and $P_0 = 1.00$ ∴ $q_1P_0 = 2.0$

$q_2 = 3$ and $P_0 = 1.00$ ∴ $q_2P_0 = 3.0$

$q_3 = 4$ and $P_0 = 1.00$ ∴ $q_3P_0 = 4.0$

Step 4: Add up q_1P_0 of items A, B and C

Item	q_0 = 2010	q_1 = 2011	q_2 = 2012	q_3 = 2013
A	4.0	4.8	4.0	3.6
B	3.0	4.0	5.0	4.0
C	3.0	2.0	3.0	4.0
Addition	10.0	10.8	12.0	11.6

$$step\ 5: apply\ the\ formula\ \frac{\sum\ \ p1q0\ year\ by\ year}{\sum q1p -}$$

$$2010\ (base\ year) = \frac{10}{10} \times \frac{100}{1} = 100\%$$

$$2011 = \frac{10.8}{10} \times \frac{100}{1} = 108\%$$

$$2012 = \frac{10}{12} \times \frac{100}{1} = 120\%$$

$$2013 = \frac{11.6}{10} \times \frac{100}{1} = 166\%$$

It should be noted, however, that there is a difference between Laspeyre price index and quantity index. This is with respect to which of the variables p(price) and q (quantity) actually varies. It is the price (p) that varies in the price index, while the quantity varies in quantity index. If it is the price "p" that varies, we put P_iq_0. But if is quantity "q" that varies, we put q_ip_0 as the numerator in the formulae respectively.

ITQ

Question

What are the three main types of index numbers?

Feedback

They are:

1. Laspeyre price and quantity index
2. Paasche price and quantity index

3. Value index

Study Session Summary

Summary

In this Study Session, we discussed the concept of index number: laspeyre. We also noted that index numbers are used for making comparisons such as food or other activities in a city during a year compared with those of a previous (former) year.

Assessment

Self-Checks

From the table below, calculate the Laspeyre price index

Item	2010		2011		2012		2013	
	P_0	q_0	P_1	Q_1	P_2	q_2	P_3	q_3
A	0.20	10	0.30	10	0.40	15	0.50	15
B	0.25	8	0.30	9	0.20	15	0.30	12
C	0.70	5	0.80	4	0.90	5	1.00	7

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Study Session 9

Index Number: Paasche's Index

Introduction

In the last study session, we introduced the concept of index number and explained Laspeyre's index. In this study session, therefore, we will introduce Paasche's index. We will explain both paasche's price index and paasche's quantity index.

Learning Outcomes

Outcomes

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

9.1 Paasche price index; and
9.2 Paasche quantity index.

Terminology

Paasche index	One where the numeraire is the bundle of goods using current year prices and current year quantities

9.1 The Concept of Paasche Index

In computing the Paasche index, it is important about both the prices and quantities to be used for computation. Thus, a Paasche index serves to measure the total cost of a given – year market basket relative to what the cost would have been if the purchase had been made in the base year.

The formulae for Paasche price index and Paasche quantity index is given below:

$$a.\ Paasche\ price\ index = \frac{\sum q1p1}{\sum q0p1} \times \frac{100}{1}$$

$$b.\ paasche\ quantity\ index = \frac{\sum q1p1}{\sum q1p1} \times \frac{100}{1}$$

You must note that:

1. The Paasche Price is current year quantity price-weighted indices respectively.

2. The difference between Paasche and Laspeyre is the use of current year weight in Paasche and the use of base year weight in Laspeyre.

Example

From the data below, calculate

a. the Paasche price index

b. the Paasche quantity index

Item	2010		2011		2012		2013	
	P_0	q_0	P_1	q_1	P_2	Q_2	P_3	q_3
A	0.20	20	0.25	24	0.35	20	0.50	18
B	0.25	12	0.25	16	0.10	20	0.125	16
C	1.00	3	2.00	2	2.00	3	2.00	4

Solutions

$$price\ index = \frac{\sum q1p1}{\sum q0p1} \times \frac{100}{1}$$

Step 1: calculate P_1q_i and P_0q_1 for item A as follows:

a. P_0q_0 = .20 x 20 = 4 | p_0q_0 = .20 x 20 = 4.0

b. P_1q_1 = .25 x 24 = 6 | p_0q_1 = .20 x 24 = 4.8

c. p_2q_2 = .35 x 20 = 7 | p_0q_2 = .20 x 20 = 4.0

d. p_3q_3 = .50 x 18 = 9 | P_0q_3 = .20 x 18 = 3.6

Step 2: calculate P_iq_i and P_0q_0 for item B

a. P_0q_0 = .25 x 12 = 3 | p_0q_0 = .25 x 12 = 3

b. P_1q_1 = .25 x 16 = 4 | p_0q_1 = .25 x 16 = 4

c. p_2q_2 = .10 x 20 = 2 | p_0q_2 = .25 x 20 = 5

d. p_3q_3 = .125 x 16 = 2 | P_0q_3 = .25 x 16 = 4

Step 3: calculate P_iq_i and P_0q_i for item C

a. P_0q_0 = 1 x 3 = 3 | p_0q_0 = 1 x 3 = 3

b. P_1q_1 = 2 x 2 = 4 | p_0q_1 = 1 x 2 = 2

c. p_2q_2 = 2 x 3 = 6 | p_0q_2 = 1 x 3 = 3

d. p_3q_3 = 2 x 4 = 8 | P_0q_3 = 1 x 4 = 4

Step 4: Sum up P_iq_i and P_0q_i as shown below:

Item	2010		2011		2012		2013	
	p_0q_0	p_0q_0	p_1q_1	p_0q_1	p_2q_2	p_0q_2	p_3q_3	p_0q_3
A	4	4	6	4.8	7	4	9	3.6
B	3	3	4	4	2	5	2	4
C	3	3	4	2	6	3	8	4
Sum Total	10	10	14	10.8	15	12	19	11.6

Step 5: Apply the formula $= \frac{\sum q1p1}{\sum q0p1} \times \frac{100}{1}$

Year	Paasche Price Index
2010	(10 ÷ 10) X 100 = 100.0%
2011	(14 ÷ 10.8) X 100 = 129.6%
2012	(15 ÷ 12) X 100 = 125.0%
2013	(19 ÷ 11.6) X 100 = 163.8%

2. Quantity index

The Paasche quantity index formula is given as follows:-

$$= \frac{\sum q1p1}{\sum q1p1} \times \frac{100}{1}$$

By using the table used in calculating Paasche's Price index, we will also use the table for calculating Paasche quantity index according to the steps below:

Step 1: Calculate q_ip_i and q_0p_i for item A

$q_0p_0 = 4$	$q_0p_0 = 20 \times .20 = 4$
$q_1p_1 = 6$	$q_0p_1 = 20 \times .25 = 5$
$q_2p_2 = 7$	$q_0p_2 = 20 \times .35 = 7$
$q_3p_3 = 9$	$q_0p_3 = 20 \times 50 = 10$

Steps 2: Calculate q_ip_i and q_0p_i for item B

$q_0p_0 = 3$	$q_0p_0 = 12 \times .25 = 3$
$q_1p_1 = 4$	$q_0p_1 = 12 \times .25 = 3$
$q_2p_2 = 2$	$q_0p_2 = 12 \times .10 = 1.2$
$q_3p_3 = 2$	$q_0\ p_3 = 12 \times .125 = 1.5$

Step3: Calculate q_ip_i and q_0p_1 for item C

$q_0p_0 = 3$	$q_0p_0 = 3 \times 1 = 3$
$q_1p_1 = 4$	$q_0p_1 = 3 \times 2 = 6$
$q_2p_2 = 6$	$q_0p_2 = 3 \times 2 = 6$
$q_3p_3 = 8$	$q_0p_3 = 3 \times 2 = 6$

Step 4: Add up q_ip_i and q_0p_i

Item	2010		2011		2012		2013	
	q_0p_0	q_0p_0	q_1p_1	q_0p_1	q_2p_2	q_0p_2	q_3p_3	q_0p_3
A	4	4	6	5	7	7	9	10
B	3	3	4	3	2	1.2	2	1.5
C	3	3	4	6	6	6	8	6
Sum Total	10	10	14	14	15	14.2	19	17.5

Step 5: Apply the Paasche Quantity formula

$$= \frac{\sum q1p1}{\sum q1p1} \times \frac{100}{1}$$

Year	Paasche Quantity Index
2010	(10 ÷ 10) X 100 = 100.0%
2011	(14 ÷ 14) X 100 = 100.0%
2012	(15 ÷ 14.2) X 100 = 105.6%
2013	(19 ÷ 17.5) X 100 = 108.6%

ITQ

Question

What is the main difference between a Paasche index and a Laspeyre index?

Feedback

The difference between Paasche and Laspeyre is the use of current year weight in Paasche and the use of base year weight in Laspeyre.

Study Session Summary

Summary

In this Study Session, we introduced Paasche's index and explained both paasche's price index and paasche's quantity index.

Assessment

Self-Checks

1. Calculate the Paasche
   a. Price index
   b. Quantity index from the table below:

Item	2010		2011		2012		2013	
	P_0	q_0	P_1	q_1	P_2	q_2	P_3	q_3
A	0.20	10	0.30	10	0.40	15	0.50	15
B	0.25	8	0.30	9	0.20	15	0.30	12
C	0.70	5	0.80	4	0.90	5	1.00	7

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Study Session 10

Index Number: Value Index

Introduction

The present study session is on value index which is another type of index number which has been the focus of studies for the past two study sessions.

Learning Outcomes

Outcomes

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

10.1 calculate a value index.

10.1 The Concept of Value Index

$$= \frac{\sum q1p1}{\sum q0p0} \times \frac{100}{1}$$

Worked Example

From the table given below, calculate the value index for:

a. item A alone

b. items A, B, and C

	2010		2011		2012		2013	
Item	P_0	q_0	P_1	q_1	P_2	q_2	P_3	q_3
A	0.20	10	0.30	10	0.40	15	0.50	15
B	0.25	8	0.30	9	0.20	15	0.30	12
C	0.70	5	0.80	4	0.90	5	1.00	7

Solution

Item	A	B	C	Year
P_0q_0	.20 x 10 = 2	.25 x 8 = 2	.70 x 5 = 3.5	2010
P_1q_1	.30 x 10 = 3	.30 x 9 = 2.7	.80 x 4 = 3.2	2011

P_2q_2	.40 x 15 = 6	.20 x 15 = 3	.90 x 5 = 4.5	2012
P_3q_3	.50 x 15 = 7.5	.30 x 12 = 3.6	1 x 7 = 7	2013

Year	**Value index for item A alone**
2010	(2 ÷ 2) x 100 = 100%
2011	(3 ÷ 2) x 100 = 150%
2012	(6 ÷ 2) x 100 = 300%
2013	(7.5 ÷ 2) x 100 = 375%

Year	**Value index for items A, B and C**
2010	(7.5 ÷ 7.5) x 100 = 100.0%
2011	(8.9 ÷ 7.5) x 100 = 118.7%
2012	(13.5 ÷ 7.5) x 100 = 180.0%
2013	(18.1 ÷ 7.5) x 100 = 241.3%

Note however that,

$P_0q_0 = 2 + 2 + 3.5 = 7.5$

$P_1q_1 = 3 + 2.7 + 3.2 = 8.9$

$P_2q_2 = 6 + 3 + 4.5 = 13.5$

$P_3 q_3 = 7.5 + 3.6 + 7 = 18.1$

Apply the formula to obtain your answers

ITQ

Question

Write the formula for calculating value index

Feedback

$$= \frac{\sum q1p1}{\sum q0p0} \times \frac{100}{1}$$

Study Session Summary

In this Study Session, we discussed the concept of value index and tackled some examples.

Summary

Assessment

Self-Checks

Given that

$$\text{Value Index} = = \frac{\sum q1p1}{\sum q0p0} \times \frac{100}{1}$$

Value Index = (Price Index) (quantity index)

Where P_0 and q_0 = price and quantity of product A in the base year.

P_i and q_i = Price and quantity of Product A in subsequent years respectively.

Use the data below to answer questions (i) – (iii)

Item A

2010	2011	2012	2013
₦10 P_0q_0	₦14 P_1q_1	₦15 P_2q_2	₦19 P_3q_3

i. calculate the value index for product A in 2010 is

ii. calculate the value index for product A in 2011

iii. calculate the value index for product A in 2012

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Study Session 11

Index Number: Chain Index

Introduction

This study session will be the last on the concept of index number. Here, we will discuss chain index.

Learning Outcomes

Outcomes

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

11.1 compute

a. ordinary quantity index;
b. ordinary price index
c. chain index

Terminology

Chain index	An index number in which the value of any given period is related to the value of its immediately preceding period (resulting in an index for the given period expressed against the preceding period = 100)

11.1 Concept of Chain Index

Formulae

$$\boldsymbol{ordinary\ quantity\ index = \frac{q_1}{q_0} \times \frac{100}{1}}$$

$$\boldsymbol{ordinary\ price\ index = \frac{p_1}{p_0} \times \frac{100}{1}}$$

$$\boldsymbol{quantity\ chain\ index = \frac{q_1}{q_{1-1}} \times \frac{100}{1}}$$

Where

q_1 = quantity in year i

q_{i-1} = quantity in year (i – 1). That is year preceding year i.

Work Example

	2010		2011		2012		2013	
Item	P_0	q_0	P_1	q_1	P_2	q_2	P_3	q_3
A	.20	20	.25	24	.35	20	.50	18

Use the table above to compute

a. An ordinary quantity index for item A
b. An ordinary price index for item A
c. A quantity chain index for item A

Solution

a.

Year	Ordinary quantity index for item A
2010	(20 ÷ 20) x 100 = 100.0%
2011	(24 ÷ 20) x 100 = 120.0%
2012	(20 ÷ 20) x 100 = 100.0%
2013	(18 ÷ 20) x 100 = 90.0%

Note: The base for calculation is 2010 for all the subsequent years

b.

Year	Ordinary Price index for item A
2010	(.20 ÷ 20) x 100 = 100.0%
2011	(.25 ÷ 20) x 100 = 125.0%
2012	(.35 ÷ 20) x 100 = 175.0%
2013	(.50 ÷ 20) x 100 = 250.0%

c.

Year	Quantity Chain index for item A
2010	(20 ÷ 20) x 100 = 100.0%
2011	(24 ÷ 20) x 100 = 120.0%
2012	(20 ÷ 24) x 100 = 83.3%
2013	(18 ÷ 20) x 100 = 90.0%

Note

The chain index, unlike ordinary index, is not based on the base – year figure alone. The calculation is based on the year immediately preceding the year of interest. For example, the quantity in 2012 was 20 while in 2011 it was 24. The quantity chain index for 2012 can, therefore, be calculated thus:

(20 ÷ 24) x 100 = 83.3%

Study Session Summary

Summary

In this Study Session, we discussed the concept of chain index, ordinaly price index and ordinary quantity index.

Assessment

Self-Checks

1. Using the table below, compute the enrollment index with the following methods:
   a. Ordinary quantity index with 2008 as the base year
   b. Quantity chain index

Year	Enrollment
2008	17, 820
2009	18, 250
2010	20, 530
2011	21, 600
2012	23, 120
2013	25, 200

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Reading

Spiegel, M. R. (1992). *Theory and Problems of Statistics, Schaum's Outline Series.* New York: McGraw-Hill Book Company.

Study Session 12

Time Value of Money

Introduction

One big problem in investment decision is how to know the future value of money that is being tied down to a particular investment at present. Assume that we know that ₦1,000 today will become ₦5,000 tomorrow, then we will not mind doing everything to save that ₦1,000 in order to get ₦5,000 later. This was one of the strong reasons why some people invest in stocks, treasury bills, shares and even fixed deposit of money with their banks, knowing fully well that the money (initial) invested on such venture(s) will appreciate later than now. In this study session, you will learn how to convert present value of money to future value and vice versa.

Learning Outcomes

Outcomes

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

12.1 define an amount, present value and future value of money

12.2 explain the present and future value of a given amount.

Terminology

Time value of money	The idea that money available at the present time is worth more than the same amount in the future due to its potential earning capacity

12.1 The Concept of Time Value of Money

An amount is a specific value of money to be paid or received on a specific date. Assume that your monthly take home pay (salary) is ₦5,000 while tax deduction is ₦140 per month, the amount which you will receive will be different from the amount payable to you because of the tax deduction of ₦140. Therefore, the amount you will receive will be ₦4, 860 instead of ₦5, 000. Both the said ₦4,860 (received) and ₦5000 (paid) are amounts.

12.1.1 The Present Value

The present value is the value today of an amount taking into consideration the interest that can be earned. That is:

$$PV = A\left(\frac{1}{1+i}\right)^n$$

Where PV = Present Value

A = Amount

i = Interest Discount rate

n = Time Specified

Deduction

A. There is an inverse relationship between the present value and interest rate. The smaller the interest rate, the higher the present value and the higher the interest rate, the smaller the present value.

B. There is also an inverse relationship between the present value and the number of years (n). The longer the number of years the amount is to be paid or received, the lower the present value and vice versa.

Worked Example

1. Find the present value of ₦1,000 in 5 years, if the discount rate is 10% per year.

Hint: Assuming that a bank lends you an amount in the year 2008 which you must pay back in the year 2013 (in 5 years). If the capital plus the interest will amount to ₦1,000 in 2013, how much did you actually receive from the bank in the year 2008?

Note that the present year is 2008 while the future year is 2013. The present amount is not known but we are given the future value. We are therefore expected to find the present value of the said ₦1,000 that must be paid back to the bank in the year 2013.

Solution

Using the Present Value formula,

$$PV = A\left(\frac{1}{1+i}\right)^n$$

Where

A = ₦1,000

$i = 10\% = \frac{10}{100} = 0.1$

n = 5 years

$$\therefore PV = 1000\left(\frac{1}{1+0.1}\right)^5$$

$$\therefore PV = 1000\left(\frac{1}{1.1}\right)^5$$

$= 1000\ (0.9091)^5$

$= 1000\ (0.6210) = ₦621$

12.1.2 The Future Value

The future value is the value of an amount at a specified future date taking into consideration the fact that interest too can be earned. That is.

$$FV = A(1 + i)n$$

Where

FV = Future Value

A = Amount

i = Interest rate or discount rate

n = Time

Deductions

1. There is a direct relationship between the future value and interest rate. So, the higher the interest rate, the higher the future value.
2. There is also a direct relationship between the future value and time. Therefore, the longer the number of years, the higher the future value.

Work Example

Assume that an amount of ₦1,000 is deposited in an account that earns 10% interest. In 5 years that amount would have grown to how much?

Solution:

Using the future value formula,

$$FV = A\ (1 + i)n$$

Where:

A = ₦1,000

$i = \frac{10}{100} = 0.1$

$n = 5years$

FV = ₦1, 000 $(1 + 0.1)^5$

= ₦1, 000 $(1.1)^5$

= ₦1, 000 (1.6105)

=₦1, 610.50

ITQ

Question

Define the following terms briefly: $FV = A(1 + i)^n$

Feedback

FV = Future Value

A = Amount

i = Interest rate or discount rate

n = Time

Study Session Summary

Summary

In this Study Session, we discussed the time value of money. We also defined present value as the today's value of an amount taking into consideration the interest that can be earned as well as the future value as the value of an amount at a specified future date taking into consideration the interest that can be earned. The longer the number of years specified to receive or pay, the lower the Present Value (PV) and the higher the Future Value (FV) and Vice Versa

Assessment

Self-Checks

1. The value today of an amount, taking into consideration the interest that can be earned is otherwise known as?
2. Suppose that an amount of ₦100 is deposited in an account that earns 11% interest. In 5 years time, that amount would have grown to how much?
3. What is the present value of ₦200 in 10 years of the discount rate is 8% per year?

Study Session 13

Meaning, Nature and Types of Educational Planning

Introduction

This study session thirteen is on planning and specifically educational planning. Some or almost all of us has been involved in planning in one way or the other. I believe we agree to that? Let's define the concept now. Planning has to be done by everyone because to fail to plan is to plan to fail. As much as possible it is the duty of everyone as a man or woman to plan so that we will not fail in our endeavours. In this study session, you will learn what educational planning is, the nature of planning and the types of planning that we have.

Learning Outcomes

Outcomes

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

13.1 define the concept of educational planning
13.2 discuss the nature of educational planning
13.3 list and explain the different types of educational planning

Terminology

Educational planning	An instrument for providing the needed coordination and direction of the different components of an educational system

13.1 Meaning of Educational Planning

The procedure of making preparations or provision to make smooth the process of the training, instruction or study that leads to the acquisition of requisite skills or knowledge, or the development of reasoning and judgment. Educational planning implies the taking of decisions for future action with a view of achieving pre- determined objectives through the optimum utilization of scarce available resources. Coombs (nd)made known that educational planning, in its broadest generic sense, is the application of rational systematic analysis to the process of educational

development with the aim of making education more effective and efficient in responding to the needs and goals of its students and society.

13.2 Nature of Educational Planning

Educational planning is an instrument for providing the needed coordination and direction of the different components of an educational system. It also ensures that widely accepted long-term goals, such as universal primary education, are approached more objectively. It provides a realistic appraisal of the country's resources (human, non-human and institutional) which is an important factor in the successful implementation of the plan. Through educational planning, a country indicates its willingness to effect an orderly change or reform in its educational system by bringing into focus the short-comings or needs that hither to had been ignored or unknown and so that appropriate action be affected. Overall educational planning, either as a part of the National Development Plan or as an independent plan is characterized by bringing a balanced development of all sectors of the educational system.

13.3 Types of Planning

Let's examine some types of planning here. Some of you may have heard of some of the types we will learn today.There are different types of planning as recorded by Aggarwal and Thakur (2003). The experts made it known that there are two basic kinds of planning, which are: strategic and operational.

13.3.1 Strategic Planning

This is also called long range, comprehensive, integrated, overall and managerial planning, and it has three levels which are: the identification and examination of future opportunities, threats and consequences; the process of analyzing an organization's environment and developing compatible objectives along with the appropriate strategies with policies capable of achieving those objectives; and the integration of the various elements of planning into an overall structure of plans so that each unit of the organization knows in advance what must be done at what time and by whom.

13.3.2 Operational Planning

Operational planning can also be known as divisional planning. It is more concerned with the implementation of the larger goals and strategies that have been determined by strategic planning. Additionally, it is also concerned with improving current operations and with the allocation of resources through the operating budget.

Other Types of Planning

Macro Planning- Macro Planning deals with broad entities that have a large magnitude, aggregates, and averages as National Income, Per Capita Income, National Expenditure on consumption and income; Balance of Trade and Balance of Payment, National Population, Total Enrollment, Enrollment

Note

Ratios, Age Structure etc. Thus, macro-planning deals with broad plans in its entirety, but does not take note of breakdowns between skills or scheme implementation at grass root level.

Micro-Planning: Micro-planning takes into consideration the little bits that macro will not concern itself with. In the economic perspective, microeconomic theory analyses consumption and investment of households, prices of particular goods, output, sales and purchase decisions of individual firms and industries. Micro-Planning in education, however, starts from grass root level. For instance, the head of an institution (primary, secondary, tertiary) has to plan how best he/she should bring all the children to school in his/her area. Here planning at the village level has to be done.

He or she has to still plan of how most excellent individual schools can bring and retain all the children in the schools. Further, each of the school heads must plan of how schools in individual habitations can be provided; and whether eligible students are getting their scholarships on time.

Decentralized Planning: Aggarwal and Thakur(2003) said decentralization implies a distribution of administrative powers and functions among local constituents. To them, decentralized planning means to confer the authority of planning on the local development. They made known that in India; the 73rd and 74th constitutional amendments have placed the primary education under the control of Panchayati Raj institutions. Under the decentralized planning model, all local units prepare their plans after due consultations with their people and analysis of the strengths and weaknesses of the planning area are made known so as to prepare towards their rectification. These local level plans are then coordinated and summated to make the district plan by taking into account the availability of the physical and financial resources. Apart from this, in India, the Government have also delegated financial and administrative powers to the heads of educational institutions to which budget is also allocated for being spent by them according to their requirements. Such financial delegations according to Aggarwal and Thakur(2003) are available in the general Financial Rules. The administrative powers are delegated according to the provisions contained in the state Education Code of each state. In most instances, decentralization is opposite to centralization. For instance, in the socialist countries such as former Russia, the concept of centralized planning was practiced as the central authority did all planning. These plans were then passed on to the grassroots for implementation.

Rolling Plan: A long-term plan that is revised regularly and each revision is projected forward again for the same period as the original plan.Thus, a three-year Rolling Plan might be revised each year so that at the end of year one the plan is revised and fresh projections made to the end of the year four.

Strategic Planning: This according to Aggarwal and Thakur (2003) is the managerial process of developing and maintaining a viable link between the organization's objectives and resources and its environmental opportunities.

Contingency Planning: This is a planning technique, which determines actions to be taken by individuals and groups at specific places and times if abnormal threats or opportunities arise.

Corporate Planning: It is a technique, that aims to integrate or put together all the planning activities of a company and ensure that they are related to the best overall objectives of the company.

Manpower Planning: This is the planning that ensures that scarce resources are used for the production of various types of manpower (human resources) that will be injected into various sectors of an economy. Such manpower includes teachers, doctors, engineers, economists and so on that the economy needs in order to progress and meet the needs of the future generation yet unborn.

Process Planning: This is a type of planning that determines how in the manufacturing sector a product or part of it should be manufactured by referring to the component and assembly drawings and:

(i) Drafting an operation sequence for each component;

(ii) Deciding the machines or hand tools to be used;

(iii) Drawing up the manufacturing layout for each component and sub-assembly, the departments and type of labour to perform the operations and specifying the tools, fixtures, and gauges to be used. This if applied to education has to do with determining the processes by which a primary one class student will be taught a topic in Mathematics and teacher ensuring that such a student understand the topic he is taught. This is applicable to all other teachers teaching other topics in Primary One and so on.

Indicative Planning: According to Aggarwal and Thakur(2003), indicative Planning is planning by agreement and indication of desirable targets rather than by compulsion or decree. It is also known as Participative Planning.

ITQ

Question

list and briefly explain the two other types of planning

Feedback

1. micro-planning
2. macro-planning

Macro Planning- Macro Planning deals with broad entities that have large magnitude, aggregates, and averages as National Income, Per Capita Income, National Expenditure on consumption and income

Micro-Planning: Micro-planning takes into consideration the little bits that macro will not concern itself with

Study Session Summary

Summary

I believe it's not difficult to define planning anymore In this Study Session, we examined the meaning of educational planning, the nature of planning and the types of planning that we have. The types of planning include strategic planning, operational planning, macro planning, micro planning, decentralized planning, rolling planning, strategic planning, contingency planning, corporate planning, and manpower planning and so on.

Assessment

Self-Checks

1. What is the meaning of educational planning?
2. Discuss the nature of educational planning
3. Explain the different types of educational planning that you were taught.

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Study Session 14

Application of Economic Concepts in Education I

Introduction

You have been taught ordinary economic concepts without much attention to their application. In this study session and subsequent study sessions, We will learn how to apply some of the basic concepts in economics can be applied in education. We will also concern ourselves with the application of the concept of demand.

Learning Outcomes

Outcomes

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

14.1 apply the following economic concepts to educational problems and issues:

a. Demand

b. Price or cost

c. Opportunity cost

d. Income or Economic returns

Terminology

Opportunity cost	The loss of potential gain from other alternatives when one alternative is chosen
Economic returns	The distributions or payments awarded to the various suppliers of the factors of production

14.1 Economics Concept of Education

Demand for education is the willingness of the society or the individuals to expend a fixed monetary outlay on a particular type of education or training even at the risk of losing alternative opportunities.

The factors that affect the demand for education are as follows:

a. The price of education

b. The price of alternative

c. Price of complimentary educational good/services opportunities
d. Price of substitutable ventures
e. Income of consumers and
f. Tastes and preferences of consumers

We shall now discuss these above-stated factors one after the other:

14.1.1 The Price of Education

The price of education can otherwise be said to be the cost price of education. This cost price can be viewed from two sides, and these are from the side of the supplier of education and from the side of those consuming (consumers) the educational service(s). So far education is a social service, it is provided by the society and in this third millennium, it is also provided by the individuals as well. The cost prices of education do affect the quantity of education to be demanded by the public. If the price of education is not affordable by the masses, there will definitely be a reaction (negatively) in the quantity of education that will be demanded, and vice – versa. For example assuming that a country has ₦10 million to spend on education, while it costs ₦10,000 to train a child. This implies that the society will be able to provide education for only 1,000 children. If on the other hand, it costs only ₦5,000 to educate a child, the country will be able to educate 2,000 children. This then means that the higher the cost of education to the society the lower will be the quantity of education demanded by its citizens.

Note

At the individual level, assuming that the private costs (including tuition fees) of education are very high. It implies that very few individuals will demand that education moreover, those who have acquired education to a particular level may no longer be able to go further even if they are willing and ready to further their education to acquire additional certificate. Hence, the higher the selling price (tuition fees), the lower the private demand for education and vice – versa. In fact, one of the reasons why there is lower demand for postgraduate degrees relative to undergraduate degrees in the University is the higher price being charged for the postgraduate courses.

14.1.2 The Price of Alternative Opportunity

There is a thousand and one available alternative opportunity to getting educated, and among such is to be a trader or be employed on the government job. If the sacrifice or the opportunity cost for education is too high, the society or the individual may decide to drop the idea of investing on education. Assuming that you are earning ₦8,000.00 per month and you are asked to forego your present salary in order to be educated. If job opportunity is limited in this era of worldwide unemployment, will you be willing to resign your appointment in order to further your education? Your answer is likely to be a “No”. Therefore, the higher the price of the alternative opportunity or the opportunity cost, the lower the demand for education and vice-versa.

14.1.3 The Price of Complimentary Educational Goods/Services

There are some items that serve as a complement to successful education, and these are books, uniform, writing materials, hostel accommodation, laboratory equipment etc. If the price(s) of these, complimentary educational goods/services are higher. The demand for education will be lower and vice – versa.

14.1.4 Price of Substitutable Ventures

There are divergent views about substitutes to education. Whereas, some people believe that ignorance is the only alternative, others believe that trading, farming etc. are alternatives to education. However, if a substitute exists, the lower the price of such substitute, the lower the demand for education since demand will shift from education to the available cheaper alternative. For example, one close substitute to university education through traditional route is the distance learning programme. If the price of the distance learning programme is relatively low, then demand for University education will shift from the regular internal degree to the distance learning programme. Consequently, more people will be willing to acquire university education through distance learning method particularly when the sacrifice for distance learning in terms of opportunity foregone is very low.

14.1.5 Income of Consumers

The income received by the society as well as that of the individual consumers of education will determine the demand for education. A subsistent economy may not be able to support a large quantity of education because individual savings margin will be too low. Whereas, if the income of the individual is high, he will be able to spend more money to educate himself and his children. In essence, higher income will lead to increased demand for education even though; the cost of education remains the same over the period.

14.1.6 Tastes and Preferences of Consumers

The taste of an individual differs and likewise there are differences in the tastes of one society from another. In fact, there are differences in preferences of one individual from another. Some individuals prefer to pay the school fees of their wards rather than to buy clothes, jewelry etc and to some other parents, it is vice – versa. There exist variations among individuals as far as tastes and preferences for education are concerned. Therefore the higher the taste, the higher the demand for education. Also, the higher the preference for education, the higher the demand for such education.

Study Session Summary

Summary

In this Study Session, we discussed the demand for education as the willingness of the society or the individuals to expend a fixed outlay on a particular type of education or training even at the risk of losing alternative opportunities. We also explained the factors influencing the demand for education and finally defined opportunity cost of education.

Assessment

Assessment

1. Define opportunity cost of education
2. In a subsistent economy, what will the private demand for education be?
3. Which of the following factors cannot influence private demand for education in Nigeria?

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Study Session 15

Application of Economic Concepts in Education II

Introduction

In this study session, we shall discuss investment and consumption in education. Remember that our concern is the application of these economics concepts to education.

Learning Outcomes

Outcomes

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

15.1 apply the concepts of investment and consumption to education.

Terminology

Investment	The creation of capital or goods capable of producing other goods or services
Consumption	The using up of goods and services by consumer purchasing or in the production of other goods.

15.1 Education: an Investment or Consumption Expenditure?

Investment is the undertaking of any commitment which involves an initial sacrifice followed by subsequent benefits. Education as an investment, therefore, means that by spending our savings on purchasing or providing education, our future wants will be guaranteed for a long period of time.

If education of a person is an investment to either the society or to him, such education should be able to transform both the society and the individual in a desirable manner. Spending savings on the education of such a man should improve the skill of such an individual. This is the major reason why nations invest in the education of their citizens and

sometimes non-citizens. That is to say, by improving the skills of the educatees, future production levels may be increased with the result that economic growth will be faster. An educated person will thus become a capital like money or machine which has the ability to improve the production capacity of an organization or a nation.

Investment in human capital (that is, in educating human beings) is necessary because it is the man who will identify, maintain, utilize, mobilize and allocate money and machine in the process of production. So, if a man is not educated or trained in the act of identification, maintaining, mobilizing, utilizing and organizing other resources, all money spent on machinery and equipment becomes useless. Investment in education involves initial sacrifice. For example, by investing in education, funds are taken out of consumption purse (that is money available for satisfying immediate wants) and are diverted into an investment fund. This means that the consumption bag is made smaller while the investment box is made bigger. That is the resources that are devoted to education becomes largely out of current consumption funds irrespective of whether the individual who spent on education considered himself as satisfying the immediate or long term wants.

Note

If you want to know whether the money you are expending on your education is an investment, or not, you can find out if such spending is made in order to satisfy your immediate wants. If there is a future want your present education will help to satisfy, then your current efforts and expenditure will be considered as an investment in education. For example, if by being educated, you will be able to become a school principal in the future, then all sacrifices made because of such education are meant to satisfy your future want to become a school principal. It, therefore, means that without a specified level of education, you cannot be made a school principal. Consequently, investment in education involves future benefits.

It is the general assumption that when education is completed, part of the benefits will go to the educated person while some part will go to some members of the society. Whether or not the benefit goes to the educated or to another member of the society, investment in education is capable of paying off in the long run.

Generally, investments in education are made to obtain long-term benefits. The money spent on education is an investment if such money is more or less reserving for future enjoyment. The educated people, as agents of production, will be improved by this investment which will yield a continuing return in the future.

Money spent on education can also be consumption. In the first instance, education of one type (say polytechnic education) in one country may act to increase future output while another type (general education) of education in the same country does not. For example, if the motive of a spender is to pursue education for the sake of it and if he does not hope to use such education to better his life and that of others, then expenditure on such an education is consumption. Let me ask you one question: Do you think that expenditure on your present education is an investment? If yes, why? If your reason includes I am not going to use the certificate or the knowledge or the skill acquired at the end of this course of study to

improve my present productive and earning capacities: then, all or part of the expenditure on your present education is a consumption and not investment. If you send one of your young ones to school to acquire more education, if it turns out that the additional education acquired by that person makes him to be more productive when he got absorbed in the labour market, this makes the additional schooling year(s) an investment.

ITQ

Question

Define education as an investment

Feedback

Education as an investment defined as spending of our savings on purchasing or providing education, our future wants will be guaranteed for a long period of time

Study Session Summary

Summary

In this Study Session, you learnt that expenditure on education can be both investment and consumption and that it is an investment if it involves a sacrifice initially, if it generates long-term benefits and if the motive of the spender is to use the education for further productive activities. And on the other hand, it is an expenditure on education can be consumption if the motive of the spender is not to use the education for further productive activities or if such education is unable to improve the earning and working capacities of the beneficiary (educatee).

Assessment

Self-Checks

1. What does it mean for an expenditure on education to be:
   a. an investment?
   b. a consumption?
   c. both investment and consumption?

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Study Session 16

Application of Economic Concepts in Education III

Introduction

This is the last study session in this course and our concern is the application of the concept of efficiency to education. It is highly believed that after this study session, you will be able to apply all these concepts in the economics of education to educational issues and problems.

Learning Outcomes

Outcomes

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

16.1 apply the concept of efficiency to education.

Terminology

Efficiency	The state or quality of being efficient (working in a well-organized and competent way)

16.1 Efficiency in Education

Efficiency in education is the ratio between the inputs and outputs of education. An educational activity is being performed efficiently if a given quantity of outputs is obtained with a minimum of inputs or, alternatively if a given quantity of inputs yields maximum outputs. The concept of educational efficiency assumes that education can be compared to some industrial firm in that it receives certain inputs and applies to these inputs a given production technique, thereby transforming the inputs into outputs.

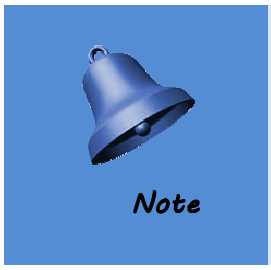
The inputs into the educational system are twofold. First, there are, the pupils (raw materials) entering a given educational system or cycle; secondly, there are different kinds of educational supplies and services, teachers, textbooks, equipment (for laboratories and workshops), school buildings, social services, school transport etc. which will be spent on those new entrants in the course of their school career. The value of pupil – time is measured by the amount of money a child could have earned if

not in school, and this is called foregone earning. This is added to the monetary value of labour, capital and intermediate materials to get the total expenditure on educational input.

However, in order to arrive at an adequate and concise statistical expression for these two input components, we may define as inputs into a given educational cycle the number of pupils entering the cycle, multiplied by the number of school years which each of them actually spends in the cycle. This type of evaluation is useful in the measurement of educational wastage or internal efficiency. Inputs are thus measured in "pupil – years". Anyone pupil – year stands for both a pupil's personal efforts and the educational supplies and services spent on him in the course of one school academic year.

Economists of education have come out with obtaining a total input index which is done by estimating both the direct and the indirect costs of education for many years. The money value is then translated into the real value by dividing it by the cost of living index.

Educational output can be defined basically as the number of pupils successfully leaving an educational cycle. Application of this general definition depends on the meaning of "success" in school. If one contends that only completion of the full cycle represents a success both for the individual and for the society, then, of course, only graduates will be defined as the educational output. However, supporters of the alternative definition argue that every partial period of schooling adds to the attainment of a pupil and can, therefore, be regarded as some partial "success". They take over, in other words, the economic distinction between intermediate and final output, ascribing some value to the former. Technically speaking, this definitional approach takes a successful graduate as a whole one and drop out as less than one, the fraction getting smaller the earlier the drop out occurs.



There is another school of thought that believed that the quantity of the final graduates should be measured according to their performances in the examination as well as the minimum prerequisite for job and for admission into a higher level of education. For example, we may consider the number of secondary school leavers by the number of passes or credits obtained in the final examination. The number of credit passes is transformed into a weighted index referred to as an academic index.

The definitions of inputs and outputs of education adopted depend on the type of problem of efficiency being solved. Efficiency in education has two dimensions namely:

a. Internal efficiency and
b. External efficiency.

The internal efficient educational cycle is one which turns out graduates without wasting any student – year or without dropouts and repeaters. But the same educational cycle may be externally quite inefficient if the graduates it turns out are not the sort the society, economy or higher

levels of education wants. They may be wrongly qualified, not meeting the University entrance requirements, be unemployable and redundant.

16.2 How to Improve the Level of Educational Efficiency

There are many potential ways to improve educational systems efficiency. Generally speaking, they fall into 3 categories viz:

1. Changing the amounts, quality and proportions of inputs or utilizing present inputs more intensively, without basically altering the system's existing form and technology or production functions e.g. a change in the pupil – teacher ratio or the qualification mix of teachers; and fuller utilization of buildings.
2. Modifying the system's basic design substantially, involving the introduction of distinctly new components and technologies.
3. Designing a brand new alternative teaching – learning system that is different radically from the conventional (old) one e.g. distant learning on radio/correspondence.

ITQ

Question

Name the two (2) dimensions of efficiency in education

Feedback

- Internal efficiency
- External efficiency.

Study Session Summary

Summary

In this Study Session, you have learnt that efficiency in education which can otherwise be called internal efficiency is the relationship between the outputs and inputs of an educational system. Also, you learnt about how to improve the level of educational efficiency

Assessment

Self-Checks

1 What is educational efficiency?
2 In the educational setting, when the number of school buildings or teachers is related to the number of graduate produced, such measurement is known as

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Feedback to Self-Checks

Study Session One: Meaning, Scope, and History of Economics of Education

1. Economics of education is one of the branches of ordinary economics, and it is the study of how educational managers make official or approved choices from scarce available resources which is meant for the realization of the best possible educational outcomes. Economics of education therefore is the systematic study of how to choose those alternative(s) that would give mankind the greatest satisfaction especially in issues related to schooling and education in general.
2. Ordinary economics is related to the social sciences, while economics of education is the application of the economic principles to education issues
3. The fundamental problem of economics of education is how the society, institution and the households make use of the limited human and material resources they have, to best satisfy their unlimited wants for education.
4. Economists in the field of education use economic tools to solve educational problems and tackle educational issues.
5. History of Economics of Education shows how economics of education evolved and it showed its interest in the issues such as financing of education, productivity and efficiency as applicable to education. The foundation of the economics of education as a significant field within economics dates back to the theoretical and empirical developments that were made by American economists such as Gary Becker, Jacob Mincer, Mark Blaug and even George Psacharopoulos and so on in the 1960s. Their work introduced the idea of education as human capital and they attempted to calculate the economic returns to acquiring education.

Study Session Two: Demand for Education

1) (i)Demand- It is the quantity of a commodity (goods and services) that consumers are willing, able and ready to buy at a giving period of time and at a particularly given price.
   (ii)Price- This is the cost or value or worth of a given good.
   (iii)Time-This is the exact point in time at which the consumer requests for the given good or service

(iv) Demand for education- This is the quantity of educational service(s) that a consumer is willing, ready and able to ask for from the producer/supplier (school-primary, secondary, tertiary institutions) at a given price and at a given time (period).

2) Consumption view of educational demand- This is the education that can be eaten up, burnt up and will not yield any returns and has consumption benefit such as additional social and intellectual amenities that are derivable from education.

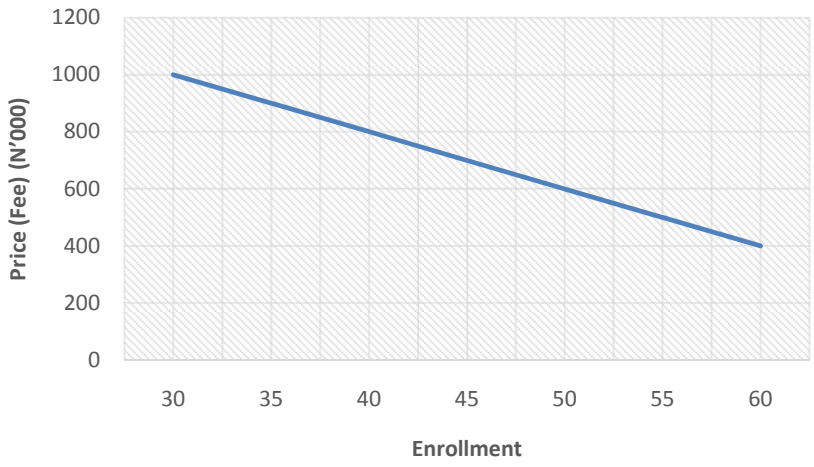
3) Investment view of demand for education- Demand for education can be viewed from investment angle if the consumer's decision to get enrolled in an educational institution is a function of the net benefit of such education. University education is embarked upon with the view that the present value of the expected stream of benefits (monetary and non-monetary) resulting from such education, exceeds the present cost of sacrifice (monetary and non-monetary) of the University education.

4) Educational demand schedule- Educational demand schedule is a table that shows the various school prices (school fees) charged by the schools and the number of students that are enrolled in the various schools based on the different schooling prices charged.

A Hypothetical Educational Demand Schedule

Price (₦'000)	Quantity Demanded
1000	35
900	40
800	45
700	50
600	55
500	60

5) **Education Demand Curve**



6) Law of educational demand- It states that that the higher the school fees charged the lower will be the enrollment and the lower the school fees the higher will be the school enrollment.
7) The limitations of law of educational demand include: war, ostentation, speculation, inferior education services and so on
8) Factors that influence demand for education- The factors that influence demand for education include: price of education, derivable benefits from education, income of the consumers, availability of non-education alternatives
9) The Concept of elasticity of educational demand- It is the responsiveness of change in student enrollment (enrollment demand) in schools with respect to changes in prices or school fees.

Study Session Three: Supply of Education

1. (i)Supply- This is the quantity of a commodity (goods and services) that producers are willing, able and ready to sell (put on the market) at a giving period of time and at a particular given price.

   (ii)Price- This is the cost or value or worth of a given good that the supplier or the institution will make available to the students.

   (iii)Time- This is the exact moment in time at which the producer is ready to make the educational service available to the students**.**
   (iv)Supply of Education- This is the quantity of educational service(s) that a producer (a school owner) is willing, ready and able to make available to the consumers of educational

services (children, youths, adults, physically challenged and so on) at a given price and at a given time(period).

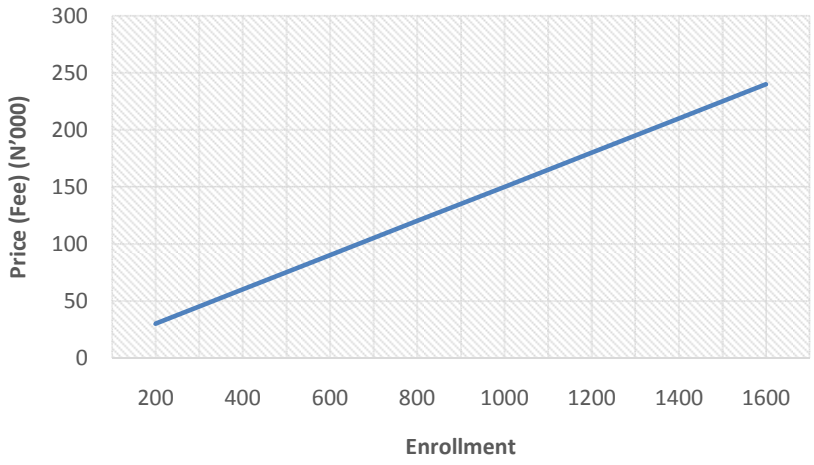
2. Educational supply schedule and draw a hypothetical educational supply schedule-Educational supply schedule is a table that shows the various school prices(school fees) charged by the schools and the number of students that are enrolled in the various schools based on the different schooling prices charged.

Hypothetical Educational Supply schedule

School fees (₦'000)	Quantity / Enrollment
70	1000
60	900
50	800
40	700
30	600
20	500

3. Hypothetical Educational Supply Schedule

Educational Supply Curve



4. Law of educational supply states-Law of educational supply states that the higher the school fees the higher will be the available school spaces, and the lower the school fees, the lower will be the available schooling spaces available for the consumers of educational services.

5. Factors that influence supply of education- Resource Quantity, Prices of Inputs used in Production, Availability of Technology, Population, Speculation, Advertising or Commercial Activities and so on

6. Concept of elasticity of supply of education- it is the responsiveness of change in supply of educational places to change in the price of education (school fees).

7. Assume that there is an increase in the price of education from ₦10,000 to ₦ 18,000, the education provider increases the available school places from 7,000 to 10,000. What is the elasticity of supply of education and the interpretation of the result?

$$e = \frac{\text{percentage change in available school places}}{\text{Percentage change in school fees}}$$

$$e_s = \frac{(E_{s1} - E_{s2}) \,/\, E_{s0}}{(Sf_{s1} - Sf_{s0}) \,/\, Sf_{s0}}$$

$$e = \frac{(10{,}000 - 7000) \,/\, 7000}{(18{,}000 - 10{,}000)/(10{,}000)} = \frac{0.4285}{0.8} = 0.53$$

This result is inelastic because it is less than One (e<1). It implies that the response of the supplier of education in terms of schooling places is less than the increased school fees, and so, an inelastic response on the part of the education provider.

Study Session Four: Concept of Equilibrium Analysis in Education

1) Concept of equilibrium in educational demand and supply- The point at which quantity of education demanded equate quantity of education supplied is called the equilibrium point, designated by letter "E". Symbolically, E= Q_{ed} = Q_{es}
2) Construct a hypothetical demand for education and supply of education schedule

Demand for Education and Supply of Education Schedule

Price (School fees) (₦)'000	Quantity of Education Demanded	Quantity of Education Supplied
240	400	800
210	600	700
180	800	600
150	1000	1000
120	1200	800
90	1400	600
60	1600	400
30	1800	200

3) Demonstration of the Equilibrium Point of demand for education and supply of education as shown on the

hypothetical demand for education and supply of education schedule in question 2 above.

4) (i) Excess Demand for Education - Excess demand for education represents a situation where the number of people seeking admission into an educational system is greater than the number that can be accommodated by the school

(ii) Excess Supply of Student Places- The excess supply of student place is a situation where the number of students enrolled is less than the number of available or provided student places by the respective suppliers (providers) of education (that is, institutions of learning).

5. Factors that can reduce students' demand for education below the socially desirable level - (i) Undiversified Risk (ii) Difficulty of Borrowing (iii) Externalities inEducation

Study Session Five- Cost-Benefit Analysis, Productivity and Efficiency

1. Cost-Benefit Analysis-Cost – benefit analysis is a technique or an investment decision-making tool used for describing, quantifying and comparing the costs and benefits of investment projects in order to determine whether the projects to be invested in are worthwhile, and to what extent

2. Steps involved in the calculation of cost-benefit analysis-

(i) Identification of all the advantages (merits) and disadvantages (demerits) of a project to be invested in.

(ii) Quantification of the identified merits and demerits so as to place a numerical value on each cost and each benefit.

(iii) Monetization of the quantified merits and demerits so as to bring all quantifiable costs and benefits to a common denominator of money.

Aggregation of monetized costs and benefits using the appropriate formulae which include:

a. Net Present Value (NPV)

b. Internal Rate of Return (IRR) and

c. Benefit – cost Ratio (B-CR)

3. Social aspect of cost-benefit analysis- It is the social aspect of Cost–benefit analysis that distinguishes it from ordinary investment appraisal method or feasibility study.

4. Productivity- Productivity denotes the relationship between output and one or all associated input, in real terms

5. Measurement of Productivity – The following steps are followed in measurement of productivity:

a. Definition of all inputs and outputs

b. Measurement of all inputs and outputs in quantitative terms

c. Isolation of variation in quality of output and inputs

d. Expression of inputs and outputs in real term

e. Combination of various real inputs and outputs into a single index

f. Division of output by input.

6. (i) Efficiency- Efficiency is the optimal combination of inputs to produce a given output that is, producing that output at least cost.

(ii) Explain the link between productivity and efficiency - It is through maximized productivity that maximum efficiency is achieved. While there are two ways by which productivity can be maximized by an organization and therefore achieve maximum efficiency. These are listed below.

a. Any given set of inputs should be utilized so as to produce the largest value of output.

b. For a specified output and quantity level, inputs should be chosen and utilized in order to minimize production costs.

7. Using a table, explain some issues connected with productivity and efficiency - To explain some issues connected with productivity and efficiency, the provided explanation of the distinction between immediate outputs and ultimate benefits of education in order to understand the difference between productivity and efficiency in education will suffice, as shown below:

Distinction between Immediate Outputs And Ultimate Benefits Of Education

	Criterion	Immediate Output	Ultimate Benefit
1	Composition	Comprises of all that a graduate acquired in the process of being educated. For example, all the acquired learning, skills and attitudes that students carry away from the educational system is far greater than what they brought to it initially.	Comprises of all that can be gained through the application of the skill, learning, and attitude acquired by graduates. For example, a better job, higher income, more satisfying family life,a greater sense of participation, higher production, better living standards,the supply of more effective leaders etc.

2	Connotation	Connotes learning achievement or the difference between entry and exit behaviours of graduates	Connotes advantages of education to both individual and the society. It concerns the relevance of the knowledge skill and attitude acquired while in school.
3	Measurement	Examination results can be used to measure the differences between what students carry away from the educational system and what they brought to it initially. The number of graduates can also be compared with the numbers who were admitted initially. The rate of dropout can, therefore, affect immediate output.	Both qualitative and quantitative measures of the different education has made in the life of the graduates and in the economy. Economic measures used include life time earnings, increased productivity and tax contribution resulting from the education acquired.

Study Session Six- National Income and Growth Rate

1. National income is the monetary value of goods and services produced in a country over a given period of time.
2. The national income is computed on an annual basis so as to ascertain the annual (yearly) growth in an economy
3. (a) i

   (b) iii

   (c) i

   (d) iv

Study Session Seven- Physical and Human Capital

1. (a)
2. (a)
3. (a) (iii)

   (b) (iii)
4. (c)
5. (a) Capacity growth is a must

   (b) Pay – off time is long

   (c) Building – up period is long

   (d) Depreciation is a must

Study Session Eight- Index Number: Laspeyre's Index

Laspeyre's Index: 100%, 105.6%, 74.8% and 68.5% (2009) (2010) (2011) (2012)

Study Session Nine- Index Number: Paasche's Index

Paasche's Price Index: 2010 (100%), 2011(126.2%) 2012 (131.7%) and 2013(166.1%)

Study Session Ten- Index Number: Value Index

1. a
2. c
3. b

Study Session Eleven- Index Number: Chain Index

1. 2008 = 100.0

   2009 = 102.4

   2010 = 115.2

   2011 = 121.2

   2012 = 129.7

   2013 = 141.4
2. 2008 = 100.0

   2009 = 102.4

   2010 = 112.5

   2011 = 105.2

   2012 = 107.0

   2013 = 109.0

Study Session Twelve – Time Value of Money

1. c
2. c
3. c

Study Session Thirteen- Meaning, Nature and Types of Educational Planning

1. Definition of Educational Planning- Educational planning is the application of rational systematic analysis to the process of educational development with the aim of m.aking education more effective and efficient in responding to the needs and goals of its students and society.
2. Nature of Educational Planning- Educational planning is an instrument for providing the needed coordination and direction of the different components of an educational

system. It provides a realistic appraisal of the country's resources (human, on-human and institutional) which is an important factor in the successful implementation of the plan. Through educational planning, a country indicates its willingness to effect an orderly change or reform in its educational system by bringing into focus the short-comings or needs that hither to had been ignored or unknown and so that appropriate action be affected.

3. Types of Planning- These are: (i) Strategic planning (ii) Operational planning (iii) Macro Planning(iv) Micro-Planning (v) Decentralised Planning (vi) Rolling Plan (vii) Strategic Planning (viii) Contingency Planning (ix) Corporate Planning (x) Manpower Planning (xi) Process Planning (xii) Indicative Planning

Study Session Fourteen- Application of Economic Concepts in Education 1

1. c
2. a
3. d

Study Session Fifteen- Application of Economic Concepts in Education II

1. Expenditure on education is an investment if
   a. it involves a sacrifice initially
   b. it generates long-term benefits, and
   c. the motive of the spender is to use the education for further productive activities
2. Expenditure on education is a consumption if the motive of the spender is not to use the education for further productive activities or if such education is unable to improve the earning and working capacities of the educated.
3. It is both investment and consumption if it combines the features of (1) and (2)

Study Session Sixteen - Application of Economic Concepts in Education III

1. d
2. c