

3. THE CLASSIFICATION OF ACTIVITIES, COSTS AND SYSTEMS

The process of analysing costs will be made much easier if we are explicit and consistent in the terminology used in costing exercises. This section of this handbook therefore considers three issues: (1) the classification of activities in higher education systems, (2) the classification of costs, and (3) the classification of systems and subsystems.

3.1 Classification of activities

The costs of an institution can be aggregated at various levels. The lowest level of aggregation is for our purposes defined as an *activity* if it is a pursuit in which a person or piece of equipment is active, or a *component* if it is a physical entity that is a constituent part of a larger entity. An activity might be a tutorial, a lecture, an examination or a slide show; a component might be a television programme, a textbook, an individual slide or an examination paper.

Activities and components may be brought together in a *course* which is any coherent series of activities and/or components the successful completion of which is 'recognised' as coherent by the institution offering the course; recognition might involve the award of a certificate of some kind although this is not necessarily the case. While a course as defined may stand on its own, it may be part of a wider *line of studies*.

For our purposes a line of studies is any aggregate collection of courses which from the point of view of the institution has coherence and may lead to a qualification (for example, a diploma or degree), or which share a particular characteristic in the sense that they are courses aimed at similar kinds of students (for example, undergraduates, postgraduates) or at a particular kind of target audience (for example, degree programme courses, community education courses, etc).

The sum of all the courses within all the lines of study comprises the *teaching programme* of the institution. This may be contrasted with the *research programme* or the *public service programme* of the university.

Courses or lines of study may be delivered to students in various ways - either full-time or part-time, and either using conventional means or using distance means. We are interested in the distinction between conventional means and distance means and we shall refer to the distinction as one of *modes* - that is, teaching is either by the

Costing distance education

conventional mode or by *distance mode*. An institution that teaches by both conventional and distance means is described in this handbook as a *'two mode' institution*.

While there is a fairly clear idea of what is meant by conventional education (class-rooms and seminars look much the same worldwide) there is much greater diversity of approach in distance teaching. This arises in part because of the range of media used and because of the apparent and obvious differences between simple correspondence systems and systems using broadcasting, audio-visual materials, and 'new technologies' such as telecommunications, transmission networks, electronic mail systems and computer-based instruction. It also arises because distance teaching systems may make use of face-to-face tuition as well as postal, telephone and computer-based and electronic mail-based tuition.

Perhaps the most comprehensive general definition of distance education is that proposed by Keegan (1980, p. 30) who identified the key features of distance education as being (1) the separation of the teacher (as materials producer) from the student in space and in time; (2) the influence of an educational organisation especially in the planning and preparation of the learning materials (thus distinguishing the enterprise from a publishing venture); (3) the use of technical media; (4) the provision of two-way communication between the student and a tutor (thus distinguishing the activity from the preparation of teach yourself type programmes; (5) the possibility of occasional seminars; and (6) participation in a more industrialised form of teaching - a concept based on Peters (1973, p. 225) conclusion that distance education is best described by concepts and criteria applied to the process of industrial production including division of labour (on the side of teachers), mechanisation, automation, the application of organisational principles, scientific control, objectivity of teaching behaviour, mass production, concentration and centralisation.

3.2 Classification of costs

Precisely how costs are defined varies depending on the method of accounting adopted, the particular conventions used in respect of the classification of costs, and the purpose for which the analysis is being undertaken.

Costing distance education

There are two methods for keeping financial records. *Cash accounting* recognises the revenues when cash is received and expenditure when cash is paid. *Accrual accounting* recognises revenues when they are earned and expenditures when materials or assets are used and services performed. It is generally accepted that accrual accounting gives a better reflection of an institution's financial position. However it is also important to manage affairs on a cash basis as well.

Costs are of various kinds. *Capital costs* are those costs incurred in acquiring goods or services that have a useful lifetime greater than the budgetary period (normally one year) within which the cost is incurred. They are distinguished from *revenue or operating costs* which are costs of goods or services that are consumed within the budgetary period. In practice what is defined as a capital cost and what is defined as an operating cost is a matter of judgement. Small pieces of equipment with a useful life of many years (eg pencil sharpeners) are usually classified as consumables and counted as an operating cost. Revenue costs may be *recurrent* or *non-recurrent*. A recurrent cost is a cost which is expected to recur from one year to the next (eg salary costs of permanent members of staff).

Operating costs may vary (increase or decrease) in proportion to the volume of output or level of activity taking place. These are called *variable costs*. Other operating costs may be largely unaffected by the volume of output or level of activity. These are called *fixed costs*. Fixed costs are, however, only fixed in the short term. Ultimately all costs are variable in the sense that the activities can be brought to an end.

The distinction between fixed and variable costs is crucial to the development of understanding about the way in which the costs of educational systems behave. However, what may be fixed in one circumstance (for example, where there are small increases in student numbers) may be variable in other circumstances (for example, where there are significant changes in the number of students). Given this, the change in the *total cost* of the enterprise may or may not be directly proportional to the variation in level of activity or volume in output. One can usefully talk about costs being fixed within a range of activities or volume of output (eg. within the range 2400 to 3800 students). The additional cost (or saving) per unit change of output or activity is the *marginal cost* of that increase or decrease in output or volume of activity. An example would be the cost incurred or saved by the addition of an extra

Costing distance education

student or the loss of one, respectively.

Those costs which can be directly associated with the output of a particular activity, course, or programme, or with a particular cost centre (q.v.) or system (q.v.) under review, are referred to as *direct costs*. Costs which are incurred by a particular activity, course, programme, cost centre or system along with other activities, courses, programmes, cost centres or systems (for example, a shared telephone exchange, centralised computer, etc) and where the discrete costs of each activity, course, programme, cost centre or system cannot be reasonably accurately, conveniently or cheaply measured, are called *indirect costs*. The total sum of all the indirect costs of an activity, course, programme, cost centre or system, wherever they have been incurred, are the *overhead costs* of the activity, course, programme, cost centre or system.

While there are alternative approaches this handbook assumes that the analyst wishes to carry out a full (or absorption) cost analysis in which all direct costs are allocated against activities, courses, programmes, or systems, and all indirect costs are apportioned between the various activities, courses, programmes or systems. Sometimes it is reasonably easy to *apportion* costs; at other times it is difficult and a relatively crude or arbitrary approach has to be adopted.

A *cost centre* is any location, person or item of equipment (or group of these) for which costs may be ascertained for a budgetary period for purposes of cost analysis and cost control. A cost centre may be a whole institution or any part of it (subsystem, department, activity, programme), depending on the particular exercise being undertaken. The total cost of an activity, course or programme may be incurred by a number of relatively independent departments, systems or cost centres.

A *cost unit* is a unit of product (for example, a television programme, printed correspondence text, or course), service or time (or combination of these) in relation to which costs may be determined or expressed. A *unit cost* is the cost of one of the cost units, however defined. The concept of a unit cost is most useful where the product, service, or period of time is standard (eg. a page of text, a slide). In educational systems this is rarely the case and a more useful concept is that of the *average cost per unit of product*. This is the total cost of the products, services or time divided by the total number of the products or services produced or performed, or the units of time involved.

Costs are incurred over spans of time. Generally the budgetary period

Costing distance education

is one year which may or may not coincide with the calendar year. Educational institutions tend to work within academic years which are broken into terms (usually two or three), although in some systems - notably correspondence-teaching systems - there may be no terms and no fixed academic year. Cost-incurring and resource-generating activities (notably teaching and fee collection) tend to occur on a cyclical basis determined in part by the rhythm of teaching activities (and hence in many systems are term based) or by other rhythms (notably in distance-teaching systems the scheduling of course development, production and delivery systems). Such rhythms frequently do not match the time periods delineated by academic terms or academic, calendar or financial years. They nevertheless need to be taken into account in analysing and comparing costs.

3.3 Classification of systems

Kaye and Rumble (1981, pp. 19-22) outlined a systems model of distance education based on a concept, developed by Miller and Rice (1967) for analysing organisations as open systems which exist by exchanging materials with their environment. The activities carried out by an organisation are divided by Miller and Rice into three categories: *operating activities* which are the specific import, conversion and export processes which define the particular nature and role of the enterprise; *logistical activities* which ensure the supply of necessary resources for the proper functioning of the enterprise (recruitment, training, purchasing, etc); and *regulatory activities* which ensure the overall coordination and control of all the processes within the enterprise as well as its links with the outside environment.

Kaye and Rumble used this approach to analyse the activities of distance-teaching systems into *two* major operating subsystems, a *course subsystem* which covers the development, production and distribution of mediated distance learning materials (texts, audio-visual materials, computer software, etc), and a *student subsystem* which covers the admission of students, their registration on courses and allocation to tutors and support facilities, the organisation of study activities, the assessment of students and their certification. The characteristics of the courses subsystem emphasises the dependence of distance-teaching systems on multimedia publishing. The student

Costing distance education

subsystem is quite separate - in systems terms - from the course subsystem, involving different activities, personnel and resources. The point of contact between the two subsystems occurs when the students receive the course learning materials and start to use them.

The value of this simple systems model is that it clearly identifies the principal activities involved in running a distance-education system and emphasises the specialisation of tasks and divisions of labour inherent in distance education. It also helps to pinpoint the activities which are independent of student numbers (eg course creation) and are therefore susceptible to economies of scale. This makes the model a useful starting point for financial modelling and cost analysis.