



CHAPTER 2

LITERATURE REVIEW

2.1 Economics of education

In economics view, education can both consuming and investment. One buys an education service not only to satisfy oneself but also to gain more earnings in the future from higher education (Boonyaratapan, 1991). Education is regarded as an investment, as a resource for producing more products and services, or a better quality leading to increasing their income and better job selection (Sheehan, 1973, Marshall, 1959, Smith, 1952).

Education affect both human resources and country economic. Schultz stated that education increase work efficiency, develop human resources which is important in economic development (Schultz, 1961). This was the same as Uttakorn " developing country should regard education as investment that make the society a better human resources, education is very important in developing the country"(Uttakorn. 1975). Satom pointed" education investment is to improve the population quality, which is the most cost effective than any other investment" (Satom, 1981).

2.2 Cost theory

Cost definition

The input in both financial and non-financial which used in production process.

Cost classification

Unit cost or average cost is the expense in producing one unit of good or service. The “unit” could be anything, depends on the study designed (Kanchanakul, 1980).

“Cost per service” unit is the total cost occurred in one patient service or expense of the service provider in providing one visit (Wannavake, 1990).

Cost is expenses or resources in term of money paid for products or services in view of accountants but in view of economists, they include the opportunity cost. The economics cost always greater than the account cost.

2.3 The Cost of Education

The economics of education is the study of how men and society choose, with or without the use of money, to employ scarce production resources and to produce various types of training, the development of knowledge, skill, mind, character and so forth (Elchanan and Terry, 1989).

Richard Perlman coterogised cost of education into two categories (1) direct cost which is the direct expense of the student eg. tuition fee, transportation, book etc. (2) indirect cost this is the opportunity cost of the student from going study inspite of going work (Perlman, 1973).

Economists define cost as the value of resources used to produce something, including a specific health service or a set of services (as in a health programme) (Creese and Parker, 1994). An economist thinks of cost differently from an accountant, who is concerned with the firm's financial statements. Accountants tend to take a retrospective look at a firm's finances because they have to keep track of assets and

liabilities and evaluate past performance. Accounting cost includes depreciation expenses for capital equipment, which are determined on the basis of the allowable tax treatment by the Internal Revenue Service. Economists - and we hope managers - take a forward - looking view of the firm. They are concerned with what cost is expected to be in the future, and with how the firm might be able to rearrange its resources to lower its cost and improve its profitability. They must therefore be concerned with opportunity cost, the cost associated with opportunities that are foregone by not putting the firm's resources to their highest value use. (Pindyck and Rubinfeld, 1998)

The study of indirect cost of undergraduates done by National Education Council, Ministry of Prime Minister. They used the regression analysis equation of income (from previous study of the National Economics and Social Development) in estimation and corrected by unemployment rate (National Education Council, 1985).

Meefuengart studied the rate of return on education in MBA graduates by regression analysis equation and adjusted with unemployment rate (Meefuengart, 1998).

2.4 The analysis of cost of education

Analysis of cost of education

The analysis of cost of education is the application of cost of production theory that is the analysis between input and output in financial term. When apply to education, the cost of education depends on the output or number graduates (Boonyaratapan, 1991).

The studies of cost of education in the universities had two types:

1. The cost analysis using the fiscal budget, non-fiscal budget and foreign aids divided by the number of students, to be the unit cost.

2. The cost analysis concerning the capital cost using the depreciation factor.

The land accounted the opportunity cost of interest foregone. The building cost using the depreciation factor after Mark Blaud (Blaud, M 1971). There were also studies of the indirect cost of the students.

Process in analysis of cost of education

Analysis of cost of education was applied using various studies. There were four steps as follow:

1. Cost center identification and grouping
2. Direct cost determination of each cost center
3. Indirect cost allocation
4. Unit cost calculation.

The details of each step were:

1. Cost center identification and grouping to be three groups.

- Administration unit
- Education unit
- Curative unit

2. Direct cost determination of each cost center

The total cost was the summation of the labor cost, material cost and capital cost.

- Labor cost: salary, overtime allowance, medical allowance etc.
- Material cost: the material each cost center used, electricity water telephone expense and the maintenance cost.
- Capital cost: the equipment and building cost using the depreciation factor in calculation.

3. Indirect cost allocation

The indirect cost allocation there were 4 methods as follows:

Method of cost allocation (Drummond, 1998)

- (1) Direct allocation (ignores interaction of overhead departments). Each overhead cost (e.g. central administration, housekeeping) is allocated directly to final cost centers (e.g. programs like day surgery; departments like wards or radiology). Program X's allocated share of central administration is equal to central administration cost times. Note program X's proportion is Program X's paid hours divided by total paid hours of all final cost centers, not total paid hours for the whole organization. The latter method would underestimate the costs in all final cost centers;
- (2) Step down allocation (partial adjustments for interaction of overhead departments). The overhead departments are allocated in a stepwise fashion to all of the remaining overhead departments and to the final cost centers;
- (3) Step down with iterations (full adjustment for interaction of overhead departments). The overhead departments are allocated in a stepwise fashion to all of the other overhead departments and to the final cost centers. The procedure is repeated a number of times (about three) to eliminate residual unallocated amounts;
- (4) Simultaneous allocation (full adjustment for interaction of overhead departments). This method uses the same data as (2) or (3) but it solves a set of simultaneous linear equations to give the allocations. It gives the same answer as method (3) but involves less work.

4. Unit cost calculation

The unit cost calculation was the summation of the direct and indirect cost and divided by the total number of outputs.

2.5 Cost of producing health care graduates

Data from the study of Ministry of University Affairs estimated a figure of 1.8 million Baht to train a medical school graduate in a public university, slightly lower for a dentist (1.62 million Baht), for a pharmacist 0.9 million Baht and 0.16 million Baht for a nurse while the cost of production in two private universities are 1.1, -, 0.3 and 0.21 million Baht respectively. For the cost of producing one medical doctor, the government could produce twice as many pharmacists and eleven as many nurses (Wibulpolprasert 1997).

Public universities and colleges have a huge share in the production of health care manpower graduates (Table 2.1). During the early 1990s, the economic growth in private sector affect a great impact on the public, particularly the health sector. The brain drained from public health sector to the private made a big shortage of health care provision especially in the rural. The study on the requirement of doctors based on the projected services demand and service utilization patterns of both urban and rural populations by a nation-wide survey on health services utilization. Another study on the relationship between the GDP per capita and the population-to-physician ratio. From the studies they summarized that over the next twenty-five years (up to year 2020), it will require a population-to-physician ratio of between 1,400: 1 to 1,600:1. That is a requirement of 44,064 to 50,359 (an average of 47,212). From the estimation of the future supply, discounted by the economic crisis, there will be a moderate shortage of physicians, especially during the first 10 years. An oversupply could occur if there is low economic growth and with a low loss rate of physicians (Sirikanokwalai et al, 1998).

Table 2.1 Number of graduates during 1992 – 1996 by source of production

Categories	Public Universities					Private Universities				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Medicine	837	816	826	825	848	0	0	0	0	0
Nursing	3,139	3,355	3,134	3,136	3,037	295	335	322	332	356
Pharmacy	471	470	623	602	808	28	78	45	101	92
Dentistry	289	311	340	351	317	0	0	0	0	0
Medical	245	261	313	295	313	48	30	29	18	20
Technology										
Rehabilitation	88	86	177	99	121	30	37	34	24	13
Public Health	2,233	2,245	2,230	2,332	2,300	0	0	0	0	0

Source: Wibulpolprasert et al (1997)

An estimate of indirect costs due to medical school demands on a large teaching hospital was investigated at Alfred Hospital, which is affiliated with Monash University. It showed that the total expenditure in 1974 - 1975 for Alfred Hospital was AU \$ 21,900,000 (Australian Dollar). of which only AU \$ 41,000 could be attributed to indirect costs arising from student teaching and was incorporated in the total hospital expenditure (Andrew, 1977a). The annual cost for each medical student, is the sum of direct university costs (AU \$4,617), Tertiary Education Assistance Scheme (AU \$1,200) and indirect costs (AU \$44) - in aggregate therefore AU \$ 5,900. Thus the cost of the six - year course for each student is approximately \$35,500 (about Baht710,000) (Andrew, 1977b).

Estimates of medical student education costs appear to vary widely; but such variations derive from the different ways the question has been framed. Costs can be categorized as instructional costs and total educational resource costs. Instructional costs, which can be distinguished further as marginal costs or proportionate-share costs, are those costs that can be related directly to the teaching program and its

support. Total educational resource costs are those costs supporting all faculty deemed necessary to conduct undergraduate medical education in all their activities of teaching, research, scholarship, and patient care. The authors review studies spanning a period of more than 20 years and find that instructional cost estimates of medical student education, when adjusted to a standard base year (1996 dollars), fall within a fairly narrow range: most are between \$40,000 and \$50,000 per student per year. Estimates of total educational resource costs show greater variation, but four of six estimates fall between approximately \$72,000 and \$93,000 per student per year. The authors note that present directions of curricular innovation-small-group learning, investment in information technology, and clinical education in ambulatory sites-offer little solace to those concerned with mitigating the costs of medical student education (Jones, 1997).

Charutsingha studied unit cost of production of physician at the clinical level of the faculty of Medicine, Chulalongkorn University from the perspective of providers. All units of Faculty of Medicine were classified into four cost center categories : administration unit, education unit, curative unit and education supporting unit. The average cost of physician of the 4th, 5th and 6th academic years was Baht281,677/person/year. In practical part, the average cost of the 4th, 5th, and 6th academic years were Baht5,523/person/year/Baht 22,275/prnson/year and Baht6,187/person/yearresepectively. The total cost of production a physician at clinical level was Baht784,182 (Charatsingha, 1996).

Production cost of physician in pre-clinic level of Faculty of Medicine, Chulalongkorn University also studied by Chaimongkol. She found that 29.5 percents of the Faculty budget was used by the pre-clinic level. The cost for the first year was Baht71,676/person/year,the second year was Baht192,647 /person /year and the third year was Baht381,617 / person/ year (Chaimongkol, 1996).

2.6 Tuition fees of health care study

Tuition fees and the direct private costs born by the trainees, play a minute role, and demonstrate personal costs born by the trainees is a small fraction (average 6.8 percent) of the government operating budget. Among universities that mainly produce social science graduates i.e. Thammasart and Prasarnmitr University the personal cost born by the trainees is a highest proportion (19.2 per cent), where the cost of production is lowest, since the tuition fees are the same in all faculties of the same universities. For example a similar tuition fee rate was charged to medical students and health related trainees in Mahidol University where cost of production was the highest. Medical students paid a sum of Baht10,000 for tuition fees per year whereas the total cost of production was Baht300,000 in a public university. Meanwhile a student at private medical school paid a fee of 250,000 Bath per year (National Education Council, 1985)

For tuition fees in the United States, most medical schools have been able to keep tuition at 4 to 6 percent of their budgets, these budgets have increased at a rapid pace over the past 25 years. Although it is admirable that tuition makes up only a small percentage of the annual budget of most medical schools, the actual dollars in tuition are significant because of a real and marked increase in these budgets and are fare in excess of the cost of inflation. Total tuition costs in the United States between 1970 and 1990 increased from \$ 63 million to \$ 840 million. The total cost of tuition and fees between 1990 and 1996 alone increased from \$ 11.1 million to \$ 16.6 million, an increase of 50 per cent (Ariyan, 2000).