An Economic Model for Evaluating Costs and Benefits for Distance Education Programs

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INTRODUCTION

Distance education has to compete for scarce resources within an educational institution. Not only does a distance education program compete against more traditional forms of education; but, it also competes among countless options in the distance education field. In order to efficiently allocate these resources an educational institution must have an economic model with which to evaluate its distance education programs. This model must be able to assess all the costs and benefits of each program and investigate and identify factors which may yield empirical characteristics of financially successful programs, while conversely, avoiding any possible pitfalls. The development, analysis, and results of this proposed economic model could be used post hoc while modifying and proposing budgetary revisions. It is also hoped that this model can be used to continuously address fiscal solvency, while maintaining services and profitability.

BACKGROUND

The cost of educational technologies, particularly those of distance education, has been studied in depth (Meyer, et. al., 2006). The benefits of educational technology, although harder to quantify, have also been the subject of study. Several studies combined the two to find the cost/benefit of online learning versus traditional learning (Webb & Cilesio, 1998; Webb & Cilesio, 1999). Although these studies were helpful in identifying costs and benefits, they had too narrow of a focus. First, studies on the costs of distance education are for limited amounts of time, usually the first year of the program (Dahl, 2001; Ng, 2000; Rumble, 2001a). Second, these studies use simplistic financial measurement tools such as simple payback period of cost/benefit analysis (Lorenzetti, 2002; Meyer, 2005; Rumble, 2001b). Another problem with these analyses is their failure to account for the time value of money. Finally, most studies on distance education have a one-dimensional perspective. In other words the studies use costs incurred and benefits derived by the educational institution and do not consider the impact on the student nor the community the educational institution serves.

Therefore, the requirements of a broader economic model to evaluate costs and benefits of distance education programs are: use a long time span, use sophisticated financial analysis such as discounted cash flow or net present value, account for the time value of money, be able to evaluate the financial impact on the student, and evaluate the economic impact on the overall community.

LEAST COST PLANNING MODEL FOR EVALUATING DISTANCE EDUCATION

There is a model that does fit these requirements. It is called the least cost planning (LCP) model. It has been used extensively by the California Public Utility Commission in evaluating demand side management (DSM) programs for electric and gas utilities (Tec-Market Works, 2004). This model uses standardized tests based on the perspective of those impacted by a DSM program (Mills, 2001). These tests are: the public purpose test, the participant test, the utility test, and the rate-payer test (CPUC, 2001a). Each program has costs and benefits; however, vary depending on the test and its perspective. The tests also use a Net Present Value (NPV) calculation which takes a discounted stream of cash flows to arrive at a value (CPUC, 2001b).

$$NPV = \sum_{t=0}^{T} \frac{CF_t}{(1+r)^t} = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \ldots + \frac{CF_T}{(1+r)^T}$$

We can customize this model to compare all types of distance education (DE) programs, such as programs that subsidized broadband Internet access at home or

programs that use special software. The model can also compare other types of educational programs to DE programs such as programs using satellite campuses or ones that are a combination of distance education and on-campus learning.

However, there would not be just one value for each program. There would be four tests which would measure the cost and benefits of the programs through different perspectives. This test would be the Public Purpose Test, the School (College or University) Test, the Participating Student test, and the Non-Participating Student test. If an educational program includes all students in a school, then the last two tests would be combined into the Student test.

Table 1 shows the costs and benefits for each test for a category of monies expended. Please note that something that may be a benefit in one test is a cost in another. Also, this is not an all inclusive categorization. There will be other costs and benefits depending on the program. The point is that each cost and benefit can be assigned to test or tests depending upon the impact of that expenditure of money on the perspective (CPUC, 2001a).

In the NPV calculation, $CF_t = B - C$ for each test. Some costs and benefits will be one time costs (CF_0) others will be ongoing costs and benefits ($CF_{1...T}$) (CPUC, 2001a). Some costs and benefits will be difficult to separate and quantify. For instance, most of the non-DE student costs (C*) are dependent on the implementation of the DE program. If existing administration and management is taking on the extra load of supervising a DE program, then there will be fewer resources for the classroom student. Or, if a DE program precludes building new classrooms, this might impact the non-DE student.

Not only does each DSM program have different NPV. Each DSM program impacts the operation of an electric utility in different ways. Primarily, these impacts are measured in either cost per Kilowatt for demand, or per Kilowatt Hour for energy usage. In applying LCP to educational institutions these institutions will want to use measures which impact their operations.

Table 1. Costs and benefits of distance education category to economic test

	Economic Test			
Item	Total resource cost	School test	Participating student test	Non-Participating student test
Equipment and Software	C	C	C	
Course redesign	C	C		
Administration, management, technical support, and help desk	C	C		C*
Avoided Transportation Costs	B		B	
Incentives	C	C	B	
Savings in overhead costs (maintenance, repairs, etc.)	B	B		
Avoided Building Costs	B	B		C*
Increased revenues		B	C	