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[OMDE 606]
[10/21/2009]
[Assignment 2]

1. Classify the different cost items as either fixed or variable costs (matching row number to Fixed or Variable as appropriate).

Sections A and B in the list of ingredients graph are fixed costs (rows 1 to 21). These fixed costs do not change depending on the number of students. Section C contains variable costs (rows 24 to 34). These costs change depending on the number of students. Rows 25 and 26 are semi-variable because they remain constant within each group of 25, but change multiples of 25 students are added and "significant changes in activity" occur. (Rumble, 1997, p. 24).

2. Calculate the aggregate *Fixed Costs of Development* (FD) and the aggregate *Fixed Costs of Maintenance* (FM).

FD=$215,683.333

FM=$84,000.000

Total F=$84,000.000+$215,683.333=$299,683.333

3. Calculate the variable cost per student (V)

Total V cost per student=$352.200. Note: since a cost for shipping 2 CD-ROMs was not listed, I assume they were shipped along with the study guides and reader and no additional cost was associated.

4. Calculate the depreciation rate on a basis of the lifetime of the presentation of the project (cf. Rumble Table 6.1) and charge it to each year of presentation. (Use the format of the attached spreadsheet.)

FD (fixed development) annual depreciation is $26,960.417. (over 8 years)

FM (fixed maintenance) annual depreciation is $28,000.000. (over 3 years)

Total fixed annual depreciation is $26,960.417 for years 1-5 and $54,960.417 for years 6-8.

5. Following the template of Rumble Table 6.4, annualize the *Fixed Costs of Development* (FD) over the years of presentation at the required interest over the shelf life of the course and the *Fixed Costs of Maintenance* (FM) for the years the new study guides are offered.

FD (fixed development) annualized rate is $35,423.248. (over 8 years)

FM (fixed maintenance) annualized rate is $31,716.359. (over 3 years)

Total fixed annualized cost is $378,535.058.

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6. Summarize in a short paragraph the reasons for and against annualization.

Annualization is the process of adding interest to future years of as yet to be depreciated fixed cost. It is beneficial because it gives an accurate picture of opportunity cost and can allow comparison of different options based on future costs (Rumble, 1997, p. 50). Although a university is in the business of providing education, it is possible that a portion of a university's endowment (in particular if private) could be in banks earning interest and so decisions on how to use money for education, should take into account that lost interest earning. That said, most universities although for-profit are made to provide education and research opportunities and not loan money to banks (Rumble, 1997, p.47). The decision may not be between spending the money on providing education vs. not, but rather on the options that can be used to provide education. Annualization should therefore be used with caution and in realistic manner.

7. Calculate the equation of *Total Costs* (TC=F+VxN) using the annualized total costs figure and the total number of students (N=expected for the whole shelf life of the course).

TC(N) = $378,535.058 + $352.20*N

For N = 960

TC(960) = $378,535.058 + $352.20*960= $716,647.058

8. Draw the graph of the total cost function using, as above, the annualized total costs figure while N varies over the accumulated number of students.

See attached spreadsheet.

9. Calculate the equation of *Average Costs* (AC=F/N+V) using the the annualized total costs figure and the appropriate N (as above).

AC(N) = ($378,535.058/N) + $352.20

For N = 960

AC(960) = ($378,535.058/960) + $352.20= $746.507

10. Draw the graph of the average cost function, using, as above, the annualized total costs figure while N varies over the accumulated number of students.

See attached spreadsheet.

11. If the student is charged the specified tuition fees calculate the *break-even point*. The break-even point is N=F/(TF-V). TF is the total tutition fee per student for the course.

N= $378,535.058 / ($1395.00-$352.20) = 363

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12. Represent the break-even point graphically (overlaying the graphs of TC and TF).

See attached spreadsheet.

13. Summarize in a short paragraph why it is believed that the TC and AC equations and the specific cost structure of DE suggests that DE may be more cost-efficient than conventional modes of educational provision.

Rumble (1997) explains economies of scale as "unit cost of production of goods or services not rising in direct proportion to the increase in output of good or services" (p. 29). While modern CMC-based DE may not have as a strong an emphasis on economies of scale as previous industrial model of distributed DE, there are still several reasons why DE can be more cost-efficient than f2f learning. CMC-based learning provides a closer connection and stronger sense of community than industrial models of DE from the previous era while still maintaining reasonable variable costs.

There are several reasons why DE is more cost-efficient than f2f, assuming sufficient numbers of students enroll in the DE course. First, physical structures that may be necessary for f2f (classrooms, dormitories, etc.) are not required in DE. Second, since the levels of fluid and spontaneous interactions that exists in f2f learning may not readily exist in DE, learning materials must be designed so well as to preempt confusion on the part of the learner and foster efficient learning. Therefore, student aids or adjunct professors may be substituted wholly or partially, reducing the need for more expensive tenured professors for the conduct of the class. Thirdly, since learning materials are well designed to begin with, they may have a longer shelf life or cost less to maintain. Over time and with higher numbers of students enrolled the cost per student may become closer to the variable cost of tutoring, distribution of material and other relatively cheaper expenses. We see in this example that after 363 students the course begins to make a profit, and the average cost per student is 40% of the average cost at the beginning of the class.

Reference

Rumble, G. (1997). *The Costs and Economics of Open and Distance Learning*. London: Kogan Page.