Virtual Education Relation to Economic Profit of Educational Subjects

MARTINA KADAVOVÁ
Department of Economics and Management
University of Hradec Kralove
Rokitanskeho street, 500 03 Hradec Kralove
CZECH REPUBLIC

Abstract: - Distance education has become a very up-to-date item. The article describes the categorization of distance education costs and their integration into cost and revenue functions. The aim of the article is to define the break even point – i.e. the economic effectiveness of a course, and thus specify the number of students for the minimal effectiveness of the course for the educational institution.

Key words: - Virtual university – cost - efficiency – students – profit – benefit – break even point

1 Introduction

Current educational subjects (both in private and state sectors) tend to behave as pure economic subjects. They try to maximize the asset which may be hidden in various shapes. Generally, the number of educational courses and their quality is mentioned, increasing the attractiveness of the study in the educational subject. But in the background there is one common denominator. It is the trading profit. In case educational activities bring profits, the institution is able to widen the educational offer.

In the article we would like to attract attention to economic differences between traditional and distance education, especially from the point of costs and assets which means dealing with the problem of the distance education profitability for the educational institution.

2 Categorization of costs

In the process of comparing costs and revenues in the distance and traditional education, clear defining the basic terms is necessary, i.e. what they consist of. We will not consider the whole virtual university but one distance educational course only.

2.1 E-learning study costs

The standard structure for cost and revenue classification is used as in common sphere of commerce, i.e. the variable and fixed costs will be counted.

2.1.1. Fixed costs

Designing study materials – when creating an e-learning course, at the very beginning study materials must be prepared, including their electronic form in the e- environment. This is a non-recurring action.
Authors´ royalties for creating study materials in the text form – authors must be evaluated in terms of finance.
Printing study materials
Designing an e-course costs

2.1.2. Variable costs

Virtual environment user license
Running an e-course – tutors and administrators of each group are evaluated
Consumer material costs
Rental service costs paid for tutorial rooms
Printing study materials
Staff costs

2.2 Traditional course costs

2.2.3. Fixed costs

Designing study materials – preparing study materials for full-time students taught in the present form.
Authors´ royalties for creating study materials in the text form – authors must be evaluated in terms of finance.
Printing study materials
Hardware + Software

2.2.4. Variable costs

Running an e-course – teachers and administrators of each group are evaluated
Consumer material costs
Rental service costs paid for tutorial rooms
Printing study materials

Staff costs

2.3 Comparison of present (traditional) and distance education costs

University of Hradec Kralove (UHK), Faculty of Informatics and Management (FIM) made the cost comparison of the ECDL course and the results [8] were as follows (see Table 1 a Fig. 1):

According to this graph the distance course is profitable from the number of 115 participants.

Proceeding from our own experience we confirm the number. Currently we are running two projects on virtual university: RIUS a EVENE. Both of them required immense starting costs on preparation of courses. International researches mention the number of 300 students at a minimum.

When preparing simple courses, e.g. consisting of one module only, the level of costs is mainly given by:

- the text study materials (design, print, authors royalty),
- an e-learning course in a virtual learning environment,
- the virtual learning environment user license,
- tutor's and administrator's salary,
- rental service costs paid for tutorial rooms,
- indirect expenses and
- VAT.

These distance courses were profitable from the number of 115 participants. Separating fixed and variable costs could be one of the reasons. Fixed costs prevail in virtual courses (except the tutor's salary, but it could be considered fixed as well because the tutor has a contract for a determinate period and the salary varies according to the number of course participants. Another difference are the immense starting costs in virtual courses. But they are very slowly increasing with the growing number of participants. In present courses the starting costs are not so high but increase considerably with the growing number of students. Graph 2 displays the comparison at FIM UHK.

International research in this field [1], [2], [14], [15] etc. shows the total number of 300 students in courses to be effective. This number is influenced by the level of course demand ness, i.e. how demanding and sophisticated the preparation was.

3 Profits

The traditional and distance course revenue varies and consists of two items:

- Contribution on each student (either from state or public institution supporting education).
- Contribution from each student (some universities require full or partial fees from students).

Total of these sums creates the income per one student.

4 The break even point

Finding the rate of return comes from a principle of comparing costs and profits and finding the number of students, who have to be in a course so the course is profitable. In economical formulation it is the break even point. To be able to find the point we must formulate costs and profits functions.

4.1 The cost function

The cost function reflects variable and fixed costs.

F_1 - designing study materials
F_2 – authors royalties
F_3 – print
F_4 – creating e-course

V_1 – virtual learning environment license
V_2 - running an e-course
V_3 – consumer material
V_4 – rental services for tutorial rooms
V_5 – indirect expense
V_6 – staff costs

N – Number of participants in a course

$$TC = (F1 + F2 + F3 + F4) + (V1 + V2 + V3 + V4 + V5 + V6) * N$$

(1) The Costs function

Other elements could be the costs which were not displayed here, or still unknown, and margin of the educational institution.

4.2 The revenue function

As presented above, it also respects the revenue particularity.

R_1 – contribution on each student
R_2 – Contribution from each student
R_3 – revenue from grants

N – Number of students

$$TR = (R1 + R2) * N + R3$$

(2) The revenue function

4.3 The break even point

The break even point introduces the place of the equilibrium between costs and revenues, i.e.:

$$TR = TC$$

or

$$(R1 + R2) * N + R3 = (F1 + F2 + F3 + F4) + (V1 + V2 + V3 + V4 + V5 + V6) * N$$

(3) The Break event function

5 Conclusions

Having found the break even point, the number of students is set to create and run a profitable course. The effectiveness of any course can be calculated and compared when using this simple method.

Granted finance was not counted in the example but they are often the principal starting point which enables the work.

The contribution shows that any profitable and effective distance module requires large numbers of participants, according to foreign researches at least 300 students to cover the costs (including fees and payments for printed and multimedia study materials). Good and general information on provided possibilities is essential for the system approach to virtual university development.

Working in a virtual learning environment brings advantages to universities, e.g. decreasing costs on operation, traveling expenses, accommodation, effective training, continuous updating, etc.

Even though the distance and virtual study is running in some large and rich states (Great Britain, France, Germany, Ireland), it is financially demanding and cannot work without considerable state grants and support. The cost calculations cover author's royalties, salaries, distribution costs, rental service costs, etc. Starting costs which may include establishing (building) administrative and study centers, preparing LMS, are very high. That is the reason why the virtual study is supported from several sources (foreign supportive programmers, tuition, production of teaching aids for other customers, selling the study materials, etc.) [1], [14].

6 Appendices

Number of participants	Distance course	Traditional course
20	483 750 CZK	137 500 CZK
40	547 500 CZK	275 000 CZK
60	611 250 CZK	412 500 CZK
80	675 000 CZK	550 000 CZK
100	738 750 CZK	687 500 CZK
120	802 500 CZK	825 000 CZK
140	866 250 CZK	962 500 CZK
160	930 000 CZK	1 100 000 CZK
180	993 750 CZK	1 237 500 CZK
200	1 057 500 CZK	1 375 000 CZK

Table 1 Both types of courses - total costs

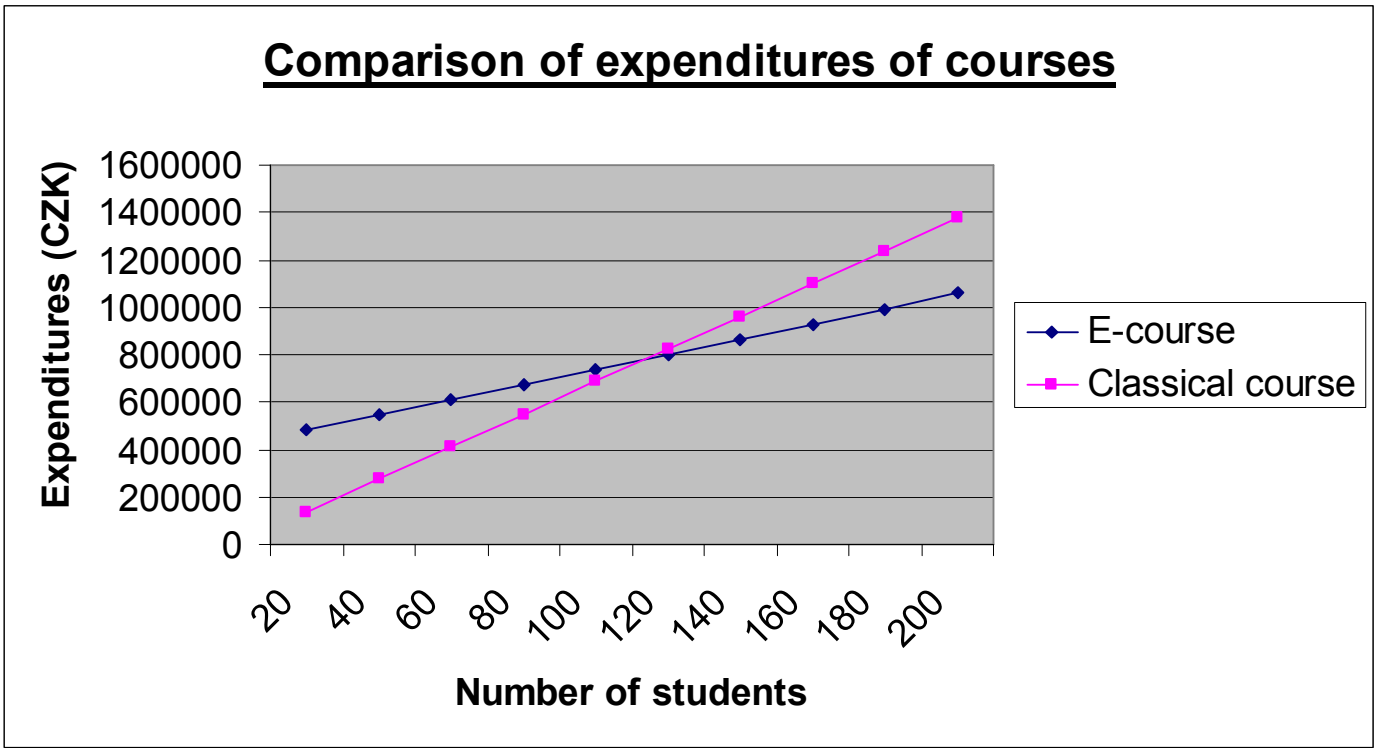

Fig. 1: Comparison of costs

References:

[1] Bakešová, M.., Koudelka, F..: *Ekonomika distančního vzdělávání*, CODV Olomouc 2001, ISBN 80-244-0274-2

[2] Bakešová, M.., Koudelka, F.: *Management a marketing distančního vzdělávání,* CODV, Olomouc 2001, ISBN 80-244-0282-3

[3] Gerhard, J., Mayr, P.: Competing in the E-Learning Environment – Strategies for Universities, *Proceedings of the 35thHawaii International Conference on System Sciences – 2002*, [online], [cit. 2002-6-5] http://lide.uhk.cz/home/fim/ucitel/mikulpe1/www/dIZS/Temata/temata.htm,

[4] Jochmann, V, Koudelka, V.: *Logistika distančního vzdělávání*, CODV Olomouc 2001, ISBN 80-244-0284-X

[5] Kadavová, M., Slabý, A., Bílek, M., Cyrus, P.: Process Based Modeling of Virtual University, IGIP 2006, *Engineering Education – The Priority for Global Development*, Book of Abstracts, 35th International IGIP symposium, ISBN 9985-59-646-3.

[6] MIT Open Courseware, http://ocw.mit.edu/index.html, [online], [cit. 2007-8-6]

[7] Paquette, G.: *Modeling the Virtual Campus*, www.licef.teluq.uquebec.ca/gp/docs/pub/campus/mvc.doc, [on-line], [cit. 2006-10-8].

[8] Poulová, P., Šrámková, H.: *Distance form in further education at FIM UHK*, http://www.csvs.cz/publikace/NCDiV2004_sbornik/PoulovaSramkova-249-254.pdf

[9] Project EVENE, https://www.uhk.cz/fim/projekty/1740, [online], [cit. 2007-8-8]

[10] RIUS Interuniversity study in the network of selected universities in the Czech republic project EU ESF No. CZ.04.1.03./3.2.15.1/0067

[11] Slabý, A., Kadavová, M.: ICT in Education and Models of Virtual University, *WSEAS Transactions on Advances in Engineering Education*, Issue 11, Volume 3, November 2006, ISSN 1790-1979

[12] Slabý, A., Kadavová, M.: Process Based Modeling of Virtual University, WSEAS 2006, *Proceedings of the 5th WSEAS International Conference on Education and Educational Technology*, Tenerife, Canary Islands, Spain, December 16-18, 2006, CD: ISSN: 1790-5117, ISBN: 960-8457-57-2.

[13] Turoff, Murray: *Costs for the Development of a Virtual University,* http://web.njit.edu/~turoff/Papers/cbdevu.html

[14] Zlámalová, H. *Principy distanční vzdělávací technologie a možnosti jejího využití v pedagogické praxi na technických vysokých školách*, http://icosym-nt.cvut.cz/telel/zlamalova.html [online], [cit. 2006-11-5].

[15] Zlámalová, H.: *Úvod do distančního vzdělávání*, CODV UP Olomouc, Andragogika, 2001, ISBN 80-244-0276-9