An Evaluation with Respect to e-Learning and Economic Analysis of the Graduate Program Offered in Anadolu University's Institute of Educational Sciences

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ABSTRACT

In this study, an e-learning platform was formed to enable school teachers and administrators to attend graduate programs in the field of educational administration, supervision, planning and economics. In this framework, for the non-thesis educational administration, supervision, planning and economics graduate programs to be conducted in the Institute of Educational Sciences in Anadolu University with using the e-learning method, cost of technical infrastructure for e-learning method, unit costs of students attending a program, cost advantage per credit and time advantage between e-learning and formal education were calculated. In addition, profitability of educational investment in e-learning and application of e-learning were discussed. A descriptive research method is used in the study. Research universe is the students, attending educational administration supervision planning and economics graduate program in Anadolu University's Institute of Educational Sciences in the 2003-2004 academic year. Universe but not sampling, was used as the research universe in this study.

In evaluation and economic analysis of the e-learning model, inflation rate and risk free rate of interest variables are used as the main variables. The value of annually compound rate of nine months Treasury bill (29.90 %), opened bids on November 4, 2003 was used as the risk free rate of interest in the economic analysis. In the economic analysis of the non thesis web based application model of educational administration, supervision, planning and economics program as an educational investment, five year present values of discount rates were calculated according to the %29.90 discount rate value for determining incomes and variable expenditures. Findings of the study can be stated as follows: Unit costs per students for e-learning method is lower than formal education. e-learning method provides cost advantage per credit. Due to the absence of fixed costs from the beginning of the second academic year, total incomes are larger than total expenditures which makes investments in e-learning graduate program profitable. The e-learning method is also found to be time saving when compared to formal education.

Keywords: an e-learning, cost, education, Turkey, Open Education Faculty.

INTRODUCTION

In our networked world, we can add the letter ''e'' to almost anything such as, e-commerce, e-business, e-government and e-learning (Oblinger and Katz, 2000, p.1). According to the technological speed of change, people must keep in step with this rapid change. Gaining the skills of accommodation for this continuous period of change can be increased economically and rapidly by education.

This is the basic duty of educational systems (Toffler, 1996, p.313). Changing technology affects the world of education. As a response for developing new technologies, access, quality and costs are the three main variables for educational systems. Also technology can increase access, improve quality and decrease costs (Daniel, 2002, pp.8-9). Technology based education or e-learning will change higher education systems. It will bring about a need for new kinds of data to support all management and administrative functions. New approaches for collecting data must be developed for learners and teachers. This type of learning will open a wider range of student choices. E-learning will make a transformation from an institutional centred context for the delivery of instruction to a learner centred emphasis (Wallhaus, 2000, pp.21-22).

PROBLEM

For the educational semester of 2002-2003 there are approximately 600.000 teachers and 60.000 schools in Turkish Educational System. Every year new schools are therefore being opened, and the demand for educational administrators for these schools is also increased. Demand for graduate education is being increased year by year. When the number of graduate students and the total number of existing schools and students are compared with each other, the number of graduate students is lower than the total number of existing schools and students. There are some difficulties for the teachers who are admitted into Public Management graduate programs. In Turkish Educational System Educational Administration, Supervision, Planning and Economics graduate education programs are being conducted in 7 Institutes of Educational Sciences and such Social Sciences Institutes. Therefore, the number of graduate students who are registered for these programs is low. Even if the quotas of Educational Administration, Supervision, Planning and Economics graduate education programs are being increased, teachers will not be easily able to attend the graduate programs for such reasons. These problems include transportation from one city to another in which the institute of educational sciences is being located on, the work loads of teachers and the necessity of the continuity of teachers for the graduate education programs.

Table: 1

Number of Students Graduating from Educational Administration, Supervision Planning and Economics Programs in the Period of 1992-2002

Academic Year	Total	Economics of Education and Planning	Educational Administration and Supervision
1992-1993	17	6	11
1993-1994	14	9	5
1994-1995	33	11	22
1995-1996	34	18	16
1996-1997	12	3	9
1997-1998	41	19	22
1998-1999	55	24	31
1999-2000	29	16	13
2000-2001	88	-	88
2001-2002	113	1	112
TOTAL	436	107	329

Source: Adapted From 1992-2002 OSYM (Student Selection and Placement Center) Higher Education Statistics.

The necessity to train educational administrators for the Turkish Educational System requires new kinds of educational approaches. E-learning is being considered as one of these new kinds of educational approaches.

AIM OF THE RESEARCH

In this study, an e-learning platform was formed to enable school teachers and administrators to attend graduate programs in the field of Educational Administration, Supervision, Planning and Economics. In this platform, information of students can be saved, assessment of participating students (homework, exam results, program registration information) can be done, courseware can be downloaded, academic advisory services can be provided by the members through synchronous delivery. Web based courses of Educational Administration, Supervision, Planning and Economics graduate program are being organised as formal education programs. The total number of courses is 11 for 3 periods of terms. Each course offers 3 credits and students must complete 33 credits to graduate from the program.

First Year:

4 courses x 3 credits = 12 credits (first term)

4 courses x 3 credits = 12 credits (second term)

Second Year:

3 courses x 3 credits = 9 credits (third term)

Total = 33 Credits

All courses were organised as 14 units. For a three term period students must complete 11 courses. Therefore 11 Courses x 14 units = 154 units were prepared and downloaded on e-learning platform by teaching staff. Student passwords are given to students. All students can gain accessed to Educational Administration, Supervision, Planning and Economics e-learning platform by using these passwords. A virtual library can be organised by downloading instrumental course materials. The Educational Administration, Supervision, Planning and Economics e-learning platform was formed on a basic assumption. Each year 100 students can be registered for the web based Educational Administration, Supervision, Planning and Economics program. The number of students who are being given web-based educational services for a five year period will be 900. Advisory programs of courses for each year and student numbers are given as follows:

ADVISORY PROGRAM OF FIRST YEAR FIRST TERM

Members of Teaching Professor, Associate Professor, Assistant Professor		Hours of Advisory 18:00-19:00	Hours of Advisory 19:00-20:00	Hours of Advisory 20:00-21:00
Days	Courses			
Monday	Course A	35 Students	35 Students	30 Students
Tuesday	Course B	35 Students	35 Students	30 Students
Wednesday	Course C	35 Students	35 Students	30 Students
Thursday	Course D	35 Students	35 Students	30 Students

ADVISORY PROGRAM OF FIRST YEAR SECOND TERM

Members of Teaching Professor, Associate Professor, Assistant Professor		Hours of Advisory 18:00-19:00	Hours of Advisory 19:00-20:00	Hours of Advisory 20:00-21:00
Days	Courses			
Monday	Course E	35 Students	35 Students	30 Students
Tuesday	Course F	35 Students	35 Students	30 Students
Wednesday	Course G	35 Students	35 Students	30 Students
Thursday	Course H	35 Students	35 Students	30 Students

ADVISORY PROGRAM OF SECOND YEAR FIRST TERM

Members of Teaching Professor, Associate Professor, Assistant Professor		Hours of Advisory 18:00-19:00	Hours of Advisory 19:00-20:00	Hours of Advisory 20:00-21:00
Days	Courses			
Monday	Course A	35 Students	35 Students	30 Students
Tuesday	Course B	35 Students	35 Students	30 Students
Wednesday	Course C	35 Students	35 Students	30 Students
Thursday	Course D	35 Students	35 Students	30 Students
Friday	Course I	35 Students	35 Students	30 Students
Saturday	Course J	35 Students	35 Students	30 Students
Sunday	Course K	35 Students	35 Students	30 Students

ADVISORY PROGRAM OF SECOND YEAR SECOND TERM

Members of Teaching Professor, Associate Professor, Assistant Professor		Hours of Advisory 18:00-19:00	Hours of Advisory 19:00-20:00	Hours of Advisory 20:00-21:00
Days	Courses			
Monday	Course E	35 Students	35 Students	30 Students
Tuesday	Course F	35 Students	35 Students	30 Students
Wednesday	Course G	35 Students	35 Students	30 Students
Thursday	Course H	35 Students	35 Students	30 Students

COURSES AND STUDENT NUMBERS

Academic Year	Term	Courses	Student Number
First Year	First Term (A, B, C, D)	4	100
	Second Term (E,F,G, H)	4	
Second Year	Third Term (I, J, K)	3	100
	First Term (A, B, C, D)	4	100
	Second Term (E,F,G, H)	4	
Third Year	Third Term (I, J, K)	3	100
	First Term (A, B, C, D)	4	100
	Second Term (E,F,G, H)	4	
Fourth Year	Third Term (I, J, K)	3	100
	First Term (A, B, C, D)	4	100
	Second Term (E,F,G, H)	4	
Fifth Year	Third Term (I, J, K)	3	100
	First Term (A, B, C, D)	4	100
	Second Term (E,F,G, H)	4	
Number of Students Who Are Being Given Web- Based Educational Services For A Five Year Period			900

In this framework, for the non-thesis Educational Administration, Supervision, Planning and Economics graduate programs to be conducted in the Institute of Educational Sciences in Anadolu University by using the following e-learning method:

- **Cost of technical infrastructure for e-learning method**
- **Unit costs of students attending a program**
- **Cost advantage per credit**
- **Time advantage between e-learning and formal education were calculated**
- **In addition, profitability of educational investment in e-learning and application of e-learning were discussed.**

METHOD

Research Model

A descriptive research method is used in the study. The research universe consisted of 25 students, all attending Educational Administration Supervision Planning and Economics graduate program in Anadolu University's Institute of Educational Sciences in the 2003-2004 academic year, fall semester. Universe but not sampling, was used as the research universe in this study.

Data and Collection

In the evaluation and economic analysis of the e-learning model, inflation rate and risk free rate of interest variables are used as the main variables. Inflation rate that was used in this study is 25%. This rate was used for calculating incomes, fixed and variable costs. Economic values which are being calculated increased with the 25% inflation rate each successive year. The value of annual compound rate of nine months Treasury Bill (29.90 %), opened bids on November 4, 2003 was used as the

risk free rate of interest in the economic analysis. In the economic analysis of the non thesis web based application model of Educational Administration, Supervision, Planning and Economics program as an educational investment, five year present values of discount rates are calculated according to a 29.90% discount rate value for determining incomes and variable expenditures.

ECONOMIC ANALYSIS OF THE GRADUATE PROGRAM OFFERED IN ANADOLU UNIVERSITY'S INSTITUTE OF EDUCATIONAL SCIENCES

Inflation rate and risk free rate of interest are the variables which were being used in this analysis. Inflation rate is the percentage increase in the overall price level from one year to next (Taylor, 1998, p.9). The real risk free rate of interest is defines as the interest rate that would exist on a riskless security if no inflation was expected, and it may be thought of as the rate of interest that would exist on short term Treasury securities in an inflation free world. The term risk free rate is descriptive of a nominal risk free rate, which includes an inflation premium equal to the average expected inflation rate over the life of the security (Brigham and Gapenski, 1994, pp.104-105). Finding the present value of money is the main point of the analysis. Present value is the value today of a future payment or series of payment discounted at the appropriate interest rate. The process of finding the present value of a future payment or a series of future payments; the reverse of compounding is called discounting (Dickerson, Campsey and Brigham, 1995, p.476). A small equation which was formulated by Dickerson, Campsey and Brigham (1995, p.476) about discounting is used in the economic analysis process.

PV= FV$_n \left[\frac{1}{(1+k)^n} \right]$

PV= Present value

FV$_n$**= Future Value**

(1+ *k*)^n **= Interest factor**

***k*= Rate of discount**

PVIF = $\frac{1}{(1+k)^n}$ **Present value interest factor, can be shown in detail by using k rate of discount and n year project period as follows:**

1. Year Present Value Interest Factor $\frac{1}{(1+k)^1}$

2. Year Present Value Interest Factor $\frac{1}{(1+k)^2}$

3. Year Present Value Interest Factor $\frac{1}{(1+k)^3}$

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n. Year Present Value Interest Factor $\frac{1}{(1+k)^n}$

Five year present values of discount rates are calculated by using present value discount rate formula PVIF = $\frac{1}{(1+k)^n}$

1. Year $\frac{1}{(1+0{,}2990)^1} = \frac{1}{1{,}2990} = 0{,}770$

2. Year $\frac{1}{(1+0{,}2990)^2} = \frac{1}{(1{,}2990)^2} = \frac{1}{1{,}687} = 0{,}593$

3. Year $\frac{1}{(1+0{,}2990)^3} = \frac{1}{(1{,}2990)^3} = \frac{1}{2{,}191} = 0{,}456$

4. Year $\frac{1}{(1+0{,}2990)^4} = \frac{1}{(1{,}2990)^4} = \frac{1}{2{,}847} = 0{,}351$

5. Year $\frac{1}{(1+0{,}2990)^5} = \frac{1}{(1{,}2990)^5} = \frac{1}{3{,}699} = 0{,}270$

Table: 2
Five Year Present Values of Discount Rates of Turkish Lira

Yıl	Discount Rate %29.90
1	0,770
2	0,593
3	0,456
4	0,351
5	0,270

FINDINGS OF THE STUDY

Findings of the study can be stated as follows:

- **Unit costs per students for e-learning method is lower than formal education.**
- **e-learning method provides cost advantage per credit**
- **Unit costs per students:** $\frac{425.670.051.435}{900} = 472.966.723{,}816$ **TL**
- **Costs per course:** $\frac{472.966.724.}{11} = 42.996.974{,}909$ **TL.**
- **Costs per credit:** $\frac{42.996.975}{3} = 14.332.325$ **TL.**
- **Costs per credits of formal education program offered in Anadolu Unıversity's Institute of Educational Sciences is 100.000.000 Turkish Lira. When we compare the two values which are about costs per credit, costs of e-learning method is lower than formal education.**
- **When we look at the ''Change Values of Total Incomes and Total Costs for Years'' table, due to the absence of fixed costs from the beginning of the second academic year, total incomes are larger than total expenditures which makes investments in e-learning graduate program profitable.**

- **The e-learning method is also found to be time saving when compared to formal education**

Overall Result of Cost Analysis (Present Value)

1 Euro= 1.721.311 TL (Central Bank of Turkey, 2003)

Incomes (Fee of formal education program which is taken from students)	**775.808.085.937 TL**	**450.708 €**
Costs	425.670.051.435 TL	247.294 €
1. Copyright Fees of Teaching Staff for the Web Based Courses	70.253.260.000 TL.	40.814 €
2. Equipment	65.321.431.409 TL.	37.949€
3. Soft wares	26.716.826.436 TL.	15.521 €
4. Frame Relay Connection Fee	256.000.000 TL.	149 €
5. Extra Course Wages of Teaching Staff	119.383.612.857 TL	69.356 €
6. Communication Fee (Frame Relay 1024 Kbps)	112.407.011.719 TL	65.303 €
7. Costs of Maintenance And Repairing For Equipments	15.491.567.360 TL.	9.000 €
8. Costs of Renewing the Software	15.840.341.654 TL	9.202 €

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Change Values of Total Incomes and Total Costs for Years

Variable Costs (TL)					Total Variable Costs (TL)	Fixed Costs (TL)		
Year	Extra Course Wages of Teaching Staff (Gross Value)	Costs of Renewing the Softwares	Costs of Maintenance and Repairing for Equipment	Communication Fee (Frame Relay 1024 Kbps)		Copyright Fees of Teaching Staff for the Web Based Courses	Equipment	Software
1	25.546.640.000	-	-	31.500.000.000	57.046.640.000	70.253.260.000	65.321.431.409	26.716.826.6
2	44.538.550.000	7.075.430.730	6.919.643.158	39.375.000.000	97.908.623.888			
3	55.673.447.200	8.844.288.413	8.649.553.948	49.218.750.000	122.386.039.561			
4	69.592.328.400	11.055.360.516	10.811.942.435	61.523.437.500	152.983.068.851			
5	86.990.150.800	13.819.200.645	13.514.928.044	76.904.296.875	191.228.576.364			

Years	Total Incomes (TL)	Total Income After %30 University Research Fund Cut Off (TL)	Total Costs (TL)	Profit / Loss + / - (TL)	Profit / Loss + / - (EURO)
1	240.000.000.000	168.000.000.000	219.594.157.845	- 51.594.157.845	-29.974
2	412.500.000.000	288.750.000.000	97.908.623.888	+ 190.841.376.112	+110.870
3	515.625.000.000	360.937.500.000	122.386.039.561	+ 238.551.460.439	+138.587
4	644.531.250.000	451.171.875.000	152.983.068.851	+ 298.188.806.149	+173.234

5	**805.664.062.500**	**563.964.843.750**	**191.228.576.364**	**+ 372.736.267.386**	**+216.542**

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