Cost analysis for e-learning foreign languages

Demetra Mantzari and Anastasios A. Economides
[mad@otenet.gr] and [economid@uom.gr]
[http://conta.uom.gr]

Information Systems Department
University of Macedonia
[http://www.uom.gr]
Thessaloniki, GREECE

ABSTRACT

A cost analysis model for e-learning and a methodology for setting up a virtual foreign languages school is presented. The Total Cost is expressed as a function of the number of months (or quarter, or semester), the number of courses and the number of students taking a monthly course. Furthermore, unlike previous research that analyzes the costs of virtual universities, this paper uses the Breakeven Point Analysis to determine the number of students' and/or courses, for a Virtual Foreign Languages school to be profitable.

KEYWORDS

Breakeven Point Analysis, Cost analysis, E-learning, Virtual Foreign Languages School.

I. INTRODUCTION

Several definitions of e-learning have been proposed, for example "the use of network technology to design, deliver, select, administer and extend learning" [1]. Another definition of e-learning is [2] " the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, PDA's) as they are developed and adopted. E-learning can take the form of courses as well as modules and smaller learning objects. E-learning may incorporate synchronous or asynchronous access and may be distributed geographically with varied limits of time". Cisco Systems suggest that the "components can include content delivered in multiple formats, management of the learning experience, and a networked community of learners, content developers and experts." Technologies that compose an e-learning environment include the following: Computer Based Training (CBT), Web Based Training (WBT), Instructor Led Training (ILT), Virtual Classroom (VC) etc.

Recently the E-learning market is expanding very rapidly. The Futures Project's investigation of change in higher education led to an unexpected revelation [3]: the forces affecting higher education around the world are strikingly similar. This is true in at least four important areas: expanding enrollments; the growth of new competitors, virtual education and consortia; the global activity of many institutions; and the tendency for policy makers to use market forces as levers for change in higher education. Expansion of enrollments, accompanied by shifts in student demands and expectations, is a global phenomenon. The number of tertiary students worldwide doubled in size in just twenty years, growing from 40.3 million students in 1975 to 80.5 million students in 1995.

Most of previous literature on costing e-learning deals with the cost analysis of developing virtual universities [4, 5, 6, 7]. The differences in these approaches are mainly on the extent of the detailed examination. M. Turoff [4] makes a clear distinction between Faculty Costs (Salaries, benefits, equipment) and Non Faculty Costs (Computer Equipment, Physical Campus, Non Faculty Personnel). On the other hand Greville Rumble [5] claims that the institutional costs of a fully developed e-education system should include: Developing e-materials, Teaching (and assessing) students online, Accessing the web site, Administering students online, Providing the infrastructure and support within which e-education can operate, Planning and managing e-education at the macro-level. Tim L. Wentling and Ji-Hye Park [6] focus on Cost Efficiency and Cost Effectiveness of e-learning programs. Efficiency is defined as the ratio of output to input, that is the quantity, and effectiveness is concerned with only the output, which is the quality. Bates [8] has developed a model named ACTIONS (Access, Costs, Teaching Functions, Interactions and user-friendliness, Organization, Novelty and Speed) for assessing costs and benefits. Bourdeau and Bates [9] list the following key cost areas: Fixed and Capital Costs, Production and Delivery Costs, Equipment and Teaching Materials, Variables Impacting on Costs, Costs and Decision Making. Whalen and Wright [10] use Breakeven Point Analysis in order to determine the number of students and/or courses, at a certain point where the fixed costs are fully covered by the number of students, as well as the Return on Investment (R.O.I.) which indicates the financial benefit or loss. "For example, an ROI of 300% means that $3 was saved in reduced delivery costs for every $1 spent on Web-based training".

In this paper, we propose a cost analysis framework for e-learning and present the cost analysis for a Virtual Foreign Language School.

II. COST ANALYSIS FRAMEWORK

In this section we propose a cost analysis model. We separate the costs in two phases: a) in the initial phase of establishing an e-learning organization, the costs depend mainly on the number of courses (considering a large number of students), b) in the latter phase of operating it, the costs depend on the time duration, on the number of courses and on the number of students.

We may distinguish two scenarios regarding the responsibilities of the teachers: a) design, development & teaching the e-learning material, b) only teaching the e-learning material. In the second scenario, we may purchase the e-learning material, or give it outsourcing, or hire specialists dedicated to this job.

1. INITIAL FIXED & COURSE-DEPENDENT COSTS

1.1 INITIAL PLANNING

Business Plan

Initial Curriculum Organization

Initial Marketing

1.2 PERSONNEL (FACULTY, STAFF, TECHNICAL SUPPORT)

Initial Personnel Hiring

Initial Personnel Training

1.3 INFRASTRUCTURE (BUILDING, FURNITURE, EQUIPMENT, UTILITIES, HW, SW, E-LEARNING PLATFORM, NETWORKS)

Initial Infrastructure Planning & Specifications

Initial Search & Evaluation of Infrastructure alternatives

Initial Infrastructure Design & Development or Purchase or Outsourcing

Infrastructure Installation

Infrastructure Evaluation & Validation

1.4 E-LEARNING MATERIAL (CONTENT, ASSESSMENT, etc.)

Initial Course Planning & Specifications

Initial Search & Evaluation of alternatives

Initial Design & Development or Purchase or Outsourcing

Installation

Initial Evaluation & Validation

Licensing Fees, Leasing Fees, Copyright Fees

2. TIME-DEPENDENT, COURSE-DEPENDENT & STUDENT-DEPENDENT COSTS

2.1 PERSONNEL

2.1.1 FACULTY (TEACHERS, TUTORS, COORDINATORS, etc.)

Faculty Training & Development

Faculty Research

Continuous Updating E-Learning Material Design & Development

Continuous E-Learning Content Evaluation & Validation

Student Teaching/ Lecturing/ Advising

Student Tutoring/ Assisting/ Supporting

Student Coordinating/ Monitoring

Student Assessment/ Reporting/ Accrediting

Course Management

Course Evaluation

2.1.2 MANAGEMENT & STAFF

Organization Management

Personnel Management

Staff Training

Advertising, Marketing & Public Relations

Accounting & Financial Management

Outsourcing activities

Student Administration (e.g. Selection, Admission, Registration, Career Counseling, Credit Recording)

2.1.3 TECHNICAL SUPPORT (for Infrastructure, Personnel & Students)

Technical Support Personnel Training

Infrastructure Management

Website & E-Learning Platform Management (Analysts, Designers, Programmers & Specialists on Web, Multimedia, Graphics, Video, TV, Databases, Art, Psychology, Statistics, etc.)

E-Learning Material Support ((Analysts, Designers, Programmers & Specialists on Web, Multimedia, Graphics, Video, TV, Databases, Art, Psychology, Statistics, etc.)

Outsourcing activities

2.2 INFRASTRUCTURE SUPPORT & MAINTENANCE (BUILDING, FURNITURE, EQUIPMENT, UTILITIES, HW, SW, E-LEARNING PLATFORM, NETWORKS)

E-Learning Delivery (e.g. mobile networks)

Operation (e.g. computer consumables, repairs)

Upgrading (e.g. communication lines, routers, modems, SW)

Replacement

Evaluation & Validation

Licensing/Leasing (e.g. SW)

Copyright Fees

Utility Fees (e.g. energy fees)

Renting (e.g. communication lines)

Depreciation

Outsourcing activities

2.3 EXTRA

Insurance

Other services (e.g. medical, social, cultural)

The TotalCost is the sum of the InitialCost plus the time dependent cost, which is the Number of months times the monthly Cost:

$TC = Cin + Nmo * Cmo$

where

TC : TotalCost

Cin: InitialCost

Nmo: Number of months

Cmo: monthly Cost

The InitialCost is the sum of the initialFixed Cost plus the course dependent initial course, which is the Number of courses times the initialCourse Cost:

$Cin = FCin + Nco * CCin$

where

FCin: initialFixed Cost (we incorporate in this cost the infrastructure's cost assuming that there will be a large number of students)

Nco: Number of courses

CCin: initialCourse Cost (cost for design & development of e-learning material)

The monthly Cost is the sum of the monthly Fixed Cost plus the monthly course cost (which is the Number of courses times the monthly Course Cost) plus the monthly student cost (which is the Number of students taking a monthly course times the monthly Student Cost):

$Cmo = FCmo + Nco * CCmo + Nos * SCmo$

where

FCmo: monthly Fixed Cost

CCmo: monthly Course Cost

Nos: Number of students taking a monthly course

SCmo: monthly Student Cost (this cost exists even if the student does not take any course, it is related to student administration costs and it is independent of the course cost)

The monthly Course Cost is the sum of the e-learning material Maintenance Cost plus the monthly teaching cost, which is the Number of students taking the monthly course times the monthly Teaching Cost per student for one course:

$CCmo = MCmo + Nos * TCmo$

Where

MCmo : Maintenance Cost (Updating the E-learning material) for a monthly course

TCmo: Teaching Cost per student for one month course

Finally, the TotalCost becomes:

$$TC = FCin + Nco * CCin + Nmo * [FCmo + Nco * (Nmo * Cmo + Nos * TCmo) + Nos * SCmo]$$ or

$$TC = FCin + Nmo * FCmo + Nco * (CCin + Nmo * MCmo) + + Nos * Nmo * (SCmo + Noc * TCmo)$$

Thus, we have expressed the TotalCost as a function of the Number of courses (Nco) and the Number of students taking a monthly course (Nos).

III. DESCRIPTION OF BUSINESS ACTIVITY

In the next sections, we shall analyze the cost of establishing an enterprise which will offer services for learning foreign languages through the World Wide Web. Our enterprise will offer the chance to learn from distance 7 different foreign languages:

- British English
- American English
- German
- Spanish
- Italian
- French
- Dutch

and in 8 different levels for each language:

- Beginner,
- Intermediate, Intermediate +,
- Advanced, Advanced +,
- Business, Business +, Business ++

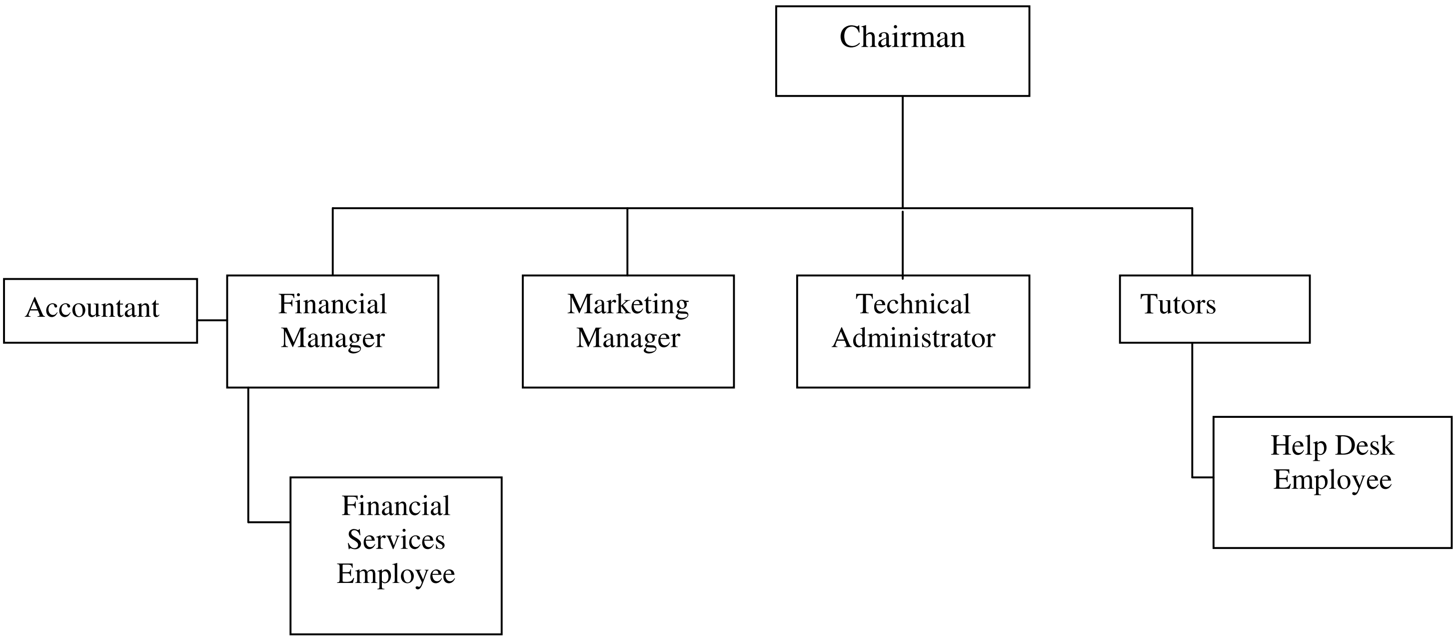
The users of our services will be students and adults having access to the Internet. The headquarters of our company is laid on a surface of $250m^2$ in which the faculty, the administrative personnel and the technical personnel work. The courses are developed digitally on a special educational software platform that is purchased to cover the needs of our company and it is installed on the collocated server. Afterwards the users of our services submit their own personal passwords and ID's in order to get connected to the server and attend the lessons through the Internet.

There are certain points in which our services differ from the conventional syllabus resulting in a competitive advantage over our competitors. These points are:

- The absence of traditional classrooms which leads to reduced Operating Costs,
- Absence of traditional way of teaching, reinforcement of autonomous learning.
- Offering our services 24h a day, 7days a week leads to maximum exploitation while at the same time it is more convenient for the users.
- Flexible pace of attending the lessons.
- Reduced fees due to the continuous functioning and the reduced operating costs.

In order to achieve our goal we have to create 2 separate sections:
Section A: the place where the personnel (both faculty and administrative) works.
Section B: the place where the server and the educational software is installed.
Regarding section A, our company uses a space of 250m ^{2}. Regarding Section B, we propose the solution of Collocation Hosting, since it offers many maintenance advantages and helps us save a huge amount of expensive networking equipment purchase and installation costs.

Company's Organ Chart



In order to set up the virtual school of teaching foreign languages we will need a Learning Management System (LMS). After extensive market research in Greece as well as through the Web, we came to Auralog, a French software company. Auralog Company is offering an e-System named TeLL me More which is the basic LMS. The main features of the TeLL Me More System are:

- Speech recognition technology
- The speech graph and pitch curve
- SETS Technology (Spoken Error Tracking System)
- 3D phonetic animation
- Automatic transfer of learners' progress to the tutors
- Synchronous/Asynchronous Communication Tools
- Detailed students' follow up
- Tutor's possibilities
- File Management
- Data Base with Frequently Asked Questions
- Individualized Learning Paths and adaptable Parameters
- Internet Services for building linguistic skills

Auralog's Financial Proposition

The prices for user licenses per student, per language and per year are the following:

100 licenses: 15.250€ (152.50 € per license)

500 licenses: 45.790€ (91.50 € per license)

1000 licenses: 80.000€ (80,00 € per license)

10000 licenses: 650.000€ (65,00 € per license)

30000 licenses: 1.500.000€ (50,00 € per license)

There are also some additional costs such as:

- Training on Pedagogical and Administrative subjects: 5 days for 4 Tutors in Paris: cost 4.500,00 €
- Installation on a dedicated server: cost 3000,00€ plus transport costs
- Training a technician to ensure installation and technical maintenance: cost 2000,00€

System requirements

(Recommended configurations are noted in parentheses)

For the server

TABLE 1: SERVER REQUIREMENTS			
Number of TeLL me More® users connected to the network at one time (students or Tutors)	1-10	11-50	51 and more
Processor	Pentium 200	PII 400 MHz	Multiprocessor or several servers
RAM	64 MB (128 MB)	256 MB	512 MB
Operating system	Windows(tm) 95, 98, Millennium, NT4 (128 MB), 2000 or XP (192 MB)	Windows(tm) NT4, 2000 Server, XP	Windows(tm) NT4, 2000 Server, XP
Server bandwidth	10 MB/s	1 MB/s for each active workstation	
Disk space required	220 MB + 1 MB per learner		
Network protocol	TCP/IP		
Administrator Tool	Spreadsheet (Excel, Lotus 123) for importing student lists into **AdminTools**		

For student workstations

Pentium (PII)

32 MB RAM (64 MB)

Microsoft Windows ™ 95, 98, Millennium (64 MB RAM), NT4 (128 MB) or 2000 (192 MB)

Network card: 10 MB/s

Network protocol: TCP/IP

90 MB available on hard disk (150 MB)

640x480, 256-colour display (1024x768, 65 536 colors)

16-bit Windows™ -compatible sound card

Microphone and speakers or headset

For Tutor workstations

Pentium (PII)

32 MB RAM (64 MB)

Microsoft Windows ™ 95, 98, Millennium (64 MB RAM), NT4 (128 MB), 2000 (192 MB), or XP (192 MB)

Network card: 10 MB/s

Network protocol: TCP/IP 90 MB available on hard disk (150 MB)

640x480, 256-colour display (1024x768, 65,536 colors)

16-bit Windows™ -compatible sound card

Microphone and speakers or headset

Access to a spreadsheet (Excel, Lotus 123) in order to export the student tracking as a file

Applications of TeLL me More Pro

Auralog's Software has the following features and applications:

The TeLL me More PRO Server

This corresponds to a shared directory on the network, generally found on the network server. It contains all the TeLL me More PRO databases as well as the data from the lesson CD-ROMs.

AdminTools

Software for managing Tutors, student and language groups, student accounts, the lessons installed on the network and the workstations connected to TeLL me More PRO.

Tutor Tools

Software allowing the Tutor to communicate with the students, to send them a specific learning path or options file, to view their overall tracking, their detailed tracking including the precise answers that were given and to listen to the most recent voice recordings.

TeLL me More

Student software.

IV. COST ANALYSIS

Regarding the cost accounting of our services we break down the costs into seven different categories. These categories are the following:

1. LAN & Internet connection
2. Collocation Hosting
3. Headquarter office
4. Operating Costs & Fixed equipment costs
5. Preparation Costs
6. Personnel's salaries & Wages
7. Amortizations

1. LAN & INTERNET connection

In the headquarters we need a LAN in order to connect the personnel's workstations. Therefore we need a switch, a router, an ADSL from the Telecommunications Provider, access to internet through an ADSL Internet provider, a UPS and of course UTP cable which is given to us for free by the Telecommunication Provider who sets up our LAN.

TABLE 2: LAN & INTERNET CONNECTION COSTS	
Switch	385,65 €
Router	154,74 €
ADSL (per year)	618,96€
ADSL Internet (per year)	1.140,00 €
UPS	1.050,03 €
UTP	-
TOTAL	**3.350,28 €**

2. Collocation Hosting

Considering the hosting needs of our enterprise we ended up to the solution of Collocation Hosting because it offers many advantages and helps us save a huge amount on installation costs.

TABLE 3: COLLOCATION HOSTING COSTS	
Server	5.221,27€
Operating System	1.356,90 €
Collocation Hosting (per year)	13.206,24 €
Educational Software's licenses	45.750,00 €
TOTAL	**65.534,41€**

3. Headquarter office

The Headquarter office costs include all the equipment cots from the workstations to the consumable like papers, toners etc. The workstations are under annual amortization.

TABLE 4: HEADQUARTERS OFFICES COSTS	
Workstations	15.968,00 €
LAN cards	561,28 €
Ms Office Xp	4.418,56 €
Printers	601,68 €
Scanners	359,34 €
Zip Drives	1.891,36 €
Zip Disks	290,56 €
Cd-R	37,50 €
Cd-RW	16,00 €
Office staff	300,00 €
Laser Toners	153,00 €
Paper for Printers & FAX	94,20 €
TOTAL	**24.691,48 €**

4. Operating Costs & Fixed equipment Costs

Operating and Fixed equipment costs include all the costs needed in order for an enterprise to run properly

TABLE 5: OPERATING COSTS (ANNUAL)	
Rent	12.000,00 €
Electricity supply	840,00 €
Telephone	2.400,00 €
Water supply	360,00 €
Heating	1.200,00 €
TOTAL (1)	**16.800,00 €**

TABLE 6: FIXED EQUIPMENT COSTS	
Desks	3.200,00 €
Desk Chairs	3.200,00 €
Chairs	1.600,00 €
Bookshelves	600,00 €
Fax, Copier	2.000,00 €
TOTAL (2)	**13.800,00 €**
TOTAL (1)+(2)	**30.600,00€**

5. Preparation Costs

In the preparatory period, the tutors and the technician administrator are being trained. During this period, the Auralog's software is also installed. The cost of the above elements is shown in the following table.

TABLE 7: PREPARATION COSTS	
Pedagogical & Administrative Training	4.500,00€
Installation on a dedicated server	3.000,00€
Technician's Training	2.000,00€
TOTAL	**9.500,00€**

6. Salaries & Wages

We have 16 people in our company: the Chairman, the Financial Manager, the Marketing Manager, the Financial Services employee, a secretary, 10 tutors, one technical administrator and one accountant. The technical administrator is expected to work as a part-time employee for 4 hours a day while we can hire an outside resource accountant paid 300 € per month, no extras. The rest of the staff work full time. An issue that should be taken into consideration is under what kind of contract will the tutors be employed. They can be hired as full time employees with salaries and benefits (case 1) or paid according to the hours they teach (wages) (case 2). In the Greek legislation, teachers teaching foreign languages can work up to a maximum of 22 hours per week, that makes 88 hours per month plus 10% for the job they do at home which results to 96 hours the maximum. This peculiarity in the kind of tutor's working relationship results in different total costs in salaries and wages in each case.

TABLE 8: SALARIES & WAGES	
Chairman	30.000,00 €
Financial Manager	36.000,00 €
Marketing Manager	30.000,00 €
Technical Administrator	6.420,00 €
Financial Services Employee	12.000,00 €
Help Desk Employee	12.000,00 €
Accountant	3.600,00 €
Tutors (case 1)	98.380,80 €
Tutors (case 2)	114.777,60 €
Total (case 1)	**228.400,80 €**
Total (case 2)	**244.797,60 €**

In case 1, tutors are paid 8,54€[1] per hour and in case 2 they work as full time employees whose salary is 956,48 € per month (including benefits).

The technical administrator works part time 4 hours/day, 100 hours/month, cost/hour 5,35 €, total 535,00€/ month (500€+7%). The accountant works as an outsourcer paid 300,00€ monthly. The salaries of the rest are computed for a period of 14 months per year.

7. Amortizations

The Amortizations are divided in two major categories. The first category has to do with Furniture and the rest Fixed Equipment, and the second category has to do with the Hardware. We amortize the first category over five years and allow a 20% interest rate. Regarding the Hardware we amortize it over three years and allow a 35% interest rate.

TABLE 9: AMORTIZATIONS (ANNUAL)	
Furniture & Fixed Equipment	2.760,00 €
Hardware	9.167,67 €
Total	**11.927,67 €**

[1] 8.54€ / hour is the Total cost, which includes social security. All data regarding salaries and wages are based on real facts according to greek legislation and collective labour bargaining

In the following table we summarize the final total cost.

TABLE 10: TOTAL COST		
LAN & INTERNET Connection	3.350,28 €	
COLLOCATION HOSTING	65.534,41 €	
HEADQUARTERS OFFICES	24.691,48 €	
SALARIES & WAGES*	228.400,80 €	*244.797,60 €
OPERATING COSTS & FIXED EQUIPMENT COSTS	30.600,00 €	
AMORTIZATIONS (1^{ST} YEAR)	11.927,67 €	
PREPARATION COSTS	9.500,00 €	
TOTAL	**374.004,64 €**	**390.401,44 €**

V. BREAK EVEN POINT ANALYSIS

We use the Breakeven Point Analysis in order to determine the number of students and/or courses, at a certain point where total costs are equal to total revenue. We find the point where total costs are fully covered by the tuition of students. First of all we have to split the expenditure into fixed and variable.

In the three following tables we analyze the Total Fixed Costs

TABLE 11: ADMINISTRATIVE COSTS: SALARIES & WAGES (Except Tutors' Fees)	
CHAIRMAN	30.000,00 €
FINANCIAL MANAGER	36.000,00 €
MARKETING MANAGER	30.000,00 €
TECHNICAL ADMINISTRATOR	6.420,00 €
FINANCIAL SERVICES EMPLOYEE	12.000,00 €
HELP DESK EMPLOYEE	12.000,00 €
ACCOUNTANT	3.600,00 €
TOTAL	**130.020,00 €**

TABLE 12.:OPERATING COSTS	
RENT	12.000,00 €
ELECTRICITY SUPPLY	840,00 €
TELEPHONE	2.400,00 €
WATER-SUPPLY	360,00 €
HEATING	1.200,00 €
COLLOCATION HOSTING	13.206,24 €
ADSL OTE	539,88 €
ADSL OTENET	1.140,00 €
TOTAL	**31.686,12 €**

TABLE 13: AMORTIZATIONS (ANNUAL)	
FURNITURE & FIXED EQUIPMENT	2.760,00 €
HARDWARE	9.167,67 €
TOTAL	**11.927,67 €**

In the following table we summarize the Total Fixed Costs (Tables 11-13)

TABLE 14: TOTAL FIXED COSTS	
ADMINISTRATIVE COSTS	130.020,00 €
OPERATING COSTS	31.686,12 €
AMORTIZATIONS	11.927,67 €
TOTAL	**173.633,79 €**

In the next table we analyze the Total Variable Costs

TABLE 15: TOTAL VARIABLE COSTS	
TUTOR FEES	
Case 1	98.380,80 €
Case 2	114.777,60 €
TOTAL 1	**98.380,80 €**
TOTAL 2	**114.777,60 €**

The formula we use to compute the Break Even Point is the following:

TR (Total Revenue) = TC (Total Cost) (1)

SF* NOS = VC* NOS + FC (2)

SF: Students' Fees

NOS: Number of Students

VC: Variable Costs / unit (Tutors' Fees / cost of Software User licenses)

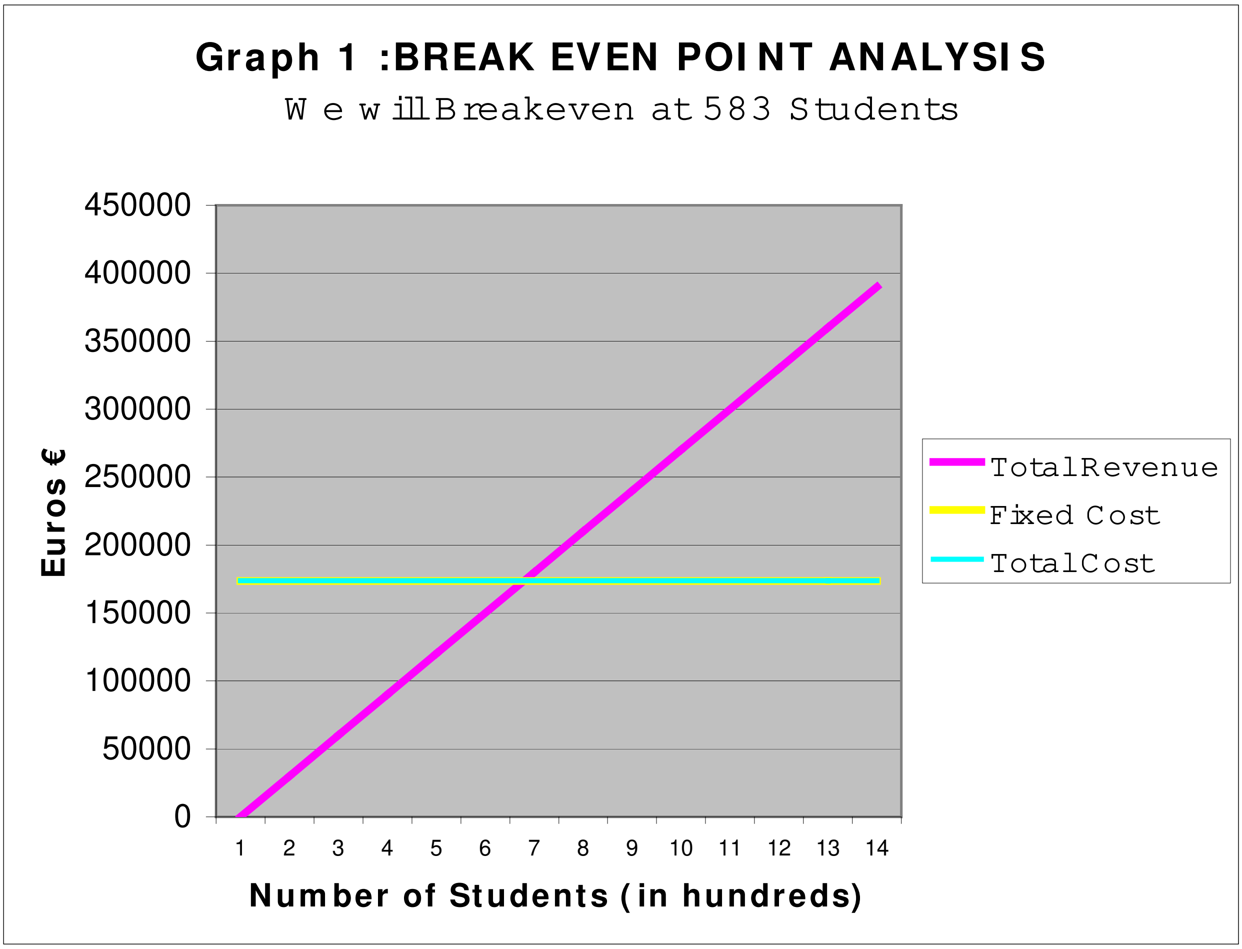
FC: Fixed Costs

TABLE 16: BREAK EVEN POINT ANALYSIS				
	Case 1	Case 2	Case 1	Case 2
SF	300,00€	300,00€	400,00€	400,00€
VC	**2,15€**	2,50€	**2,15€**	2,50€
FC	173.633,79€	173.633,79€	173.633,79€	173.633,79€
NOS	**582,95=583**	**583,65=584**	**436,43=436**	**436,81=437**

Case 1 differs from Case 2 only in the amount of Tutors' Fees (Case 1: paid by hour, Case 2: full time employees), which results in a different Variable Cost. The cost of Software user Licenses is computed for 500 user Licenses (Total Cost: 45.750,00€)

Studying the above table, we realize that there is no significant difference in the final Break Even Point regarding the way Tutors are paid. The difference is only 1 student both in Case 1 and Case 2. Thus we conclude that the Tutors' working relationship does not affect the quantity of students. Therefore the sole reason that puts us into consideration about the Tutors' kind of working relationship is for the general financial planning, especially in the short term .

Breakeven Analysis Summary	
Variable Cost	**€2.15 per unit**
Fixed Cost	€173,633.79
Expected Sales	1,000 units



Price	€300.00 per unit
Total Revenue	**€300,000.00**
Total Variable Costs	**€2,150.00**
Profit	**€124,216.21**

VI. RESULTS AND CONCLUSIONS

After conducting the necessary market research as well as research through the Internet we came to the following conclusions. One of the main problems regarding e-learning is the mentality of the business people especially in Greece. There is absence of Intellectual Capital, both from the Technical as well as the Pedagogical aspect. Content providers, LMS platform and customization of services do not exist as far as teaching foreign languages is concerned. The most critical point is the absence of a constituted syllabus and therefore there is speculation in scheduling the number of tutors and courses, the amount of teaching material and the time needed. The possibility of obtaining a Language Certificate after attending a class through the web is also a subject that we should take into consideration. The decision on the number of students that will take part into this operation is significant not only educationally but also financially. Bates [11] as well as Morgan [12] believes that there is no firm formula for determining the optimum number of students for e-learning programs. Bates [11] mentioned that educational philosophy, course design, and the number of students who can be handled by the technology should determine the appropriate number of students.

According to Joanne Capper [13] "...it is important to completely reinvent how a course is taught when it is put online…" The e-Learning Systems tend to be learner-centric so we have to focus on the educational value and the learner's needs. The learner's satisfaction is of critical importance so that he remains into the e-learning process. Furthermore, we should not ignore the technological obsolescence as Jackson [14] argues that while economies-of-scale are expected to lead to reduced costs, a number of the costs related to delivering courses online tend to vary due to levels of expansion in enrollments and periodically from obsolescence of hardware and software. Finally and according to Thompson [15], the question that we should pose regarding the financial performance is not "Does distance education cost more or les than traditional education?" but rather "Are the educational outcomes worth the cost?".

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