Cost analysis for e-learning foreign languages

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Abstracts

English 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.

Greek Abstract

Το άρθρο παρουσιάζει ένα μοντέλο ανάλυσης κόστων της ηλεκτρονικής μάθησης και μια μεθοδολογία για δημιουργία ενός εικονικού σχολείου ξένων γλωσσών. Το συνολικό κόστος σχηματίζεται ως συνάρτηση του αριθμού των μηνών (ή εξαμήνων), του αριθμού των μαθητών και του αριθμού των μαθητών ανά μήνα (ή εξαμήνιο) μάθησης. Επιπλέον, ενός προηγούμενος ερευνητικός άρθρος άνευ επήλθη το κόστος νομισμάτων, αυτό το άρθρο χρησιμοποιεί Ανάλυση Επιπλέον Σημείων για να προσδιορίσει τον αριθμό των φοιτητών και/ή του αριθμού των μαθητών ανά μήνα, έναν εικονικό σχολείο ξένων γλωσσών να είναι προοπτική.

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.


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 Total Cost is the sum of the Initial Cost plus the time dependent cost, which is the Number of months times the monthly Cost:

\[ TC = Cin + Nmo \times Cmo \]

Where

- \( TC \) : Total Cost
- \( Cin \): Initial Cost
- \( Nmo \): Number of months
- \( Cmo \): monthly Cost

The Initial Cost is the sum of the initial Fixed Cost plus the course dependent initial course, which is the Number of courses times the initial Course Cost:

\[ Cin = FCin + Nco \times CCin \]

Where

- \( FCin \): initial Fixed Cost (we incorporate in this cost the infrastructure's cost assuming that there will be a large number of students)
- \( Nco \): Number of courses
- \( CCin \): initial Course 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):

\[ Cmo = FCmo + Nco \times CCmo + Nos \times SCmo \]

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:

\[ CCmo = MCmo + Nos \times TCmo \]

Where

- \( MCmo \): Maintenance Cost (Updating the E-learning material) for a monthly course
- \( TCmo \): Teaching Cost per student for one month course

Finally, the Total Cost becomes:

\[ TC = Fcin + Nco \times CCin + Nmo \times [FCmo + Nco \times (CCin + Nco \times MCmo) + Nos \times SCmo] \]

Thus, we have expressed the Total Cost 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 250m² 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 250m². 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)

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 3,000,00 € plus transport costs
- Training a technician to ensure installation and technical maintenance: cost 2,000,00 €

System requirements

(Recommended configurations are noted in parentheses)

For the server

<table>
<thead>
<tr>
<th>TABLE 1: SERVER REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of TeLL me More® users connected to the network at one time (students or Tutors)</strong></td>
</tr>
<tr>
<td>Processor</td>
</tr>
<tr>
<td>RAM</td>
</tr>
<tr>
<td>Operating system</td>
</tr>
<tr>
<td>Server bandwidth</td>
</tr>
</tbody>
</table>
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), 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. Internet connection
2. Collocation Hosting
3. Headquarters 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>
<thead>
<tr>
<th>TABLE 2: LAN &amp; INTERNET CONNECTION COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch</td>
</tr>
<tr>
<td>Router</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th></th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL (per year)</td>
<td>618.96</td>
</tr>
<tr>
<td>ADSL Internet</td>
<td>1.140.00</td>
</tr>
<tr>
<td>UPS</td>
<td>1.050.03</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.350.28</td>
</tr>
</tbody>
</table>

3. Headquarter office

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

<table>
<thead>
<tr>
<th></th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workstations</td>
<td>15.968.00</td>
</tr>
<tr>
<td>LAN cards</td>
<td>561.28</td>
</tr>
<tr>
<td>Ms Office Xp</td>
<td>4.418.56</td>
</tr>
<tr>
<td>Printers</td>
<td>601.68</td>
</tr>
<tr>
<td>Scanners</td>
<td>359.34</td>
</tr>
<tr>
<td>Zip Drives</td>
<td>1.891.36</td>
</tr>
<tr>
<td>Zip Disks</td>
<td>290.56</td>
</tr>
<tr>
<td>Cd-R</td>
<td>37.50</td>
</tr>
<tr>
<td>Cds</td>
<td>16.00</td>
</tr>
<tr>
<td>Office staff</td>
<td>300.00</td>
</tr>
<tr>
<td>Laser Toners</td>
<td>153.00</td>
</tr>
<tr>
<td>Paper for Printers &amp; FAX</td>
<td>94.20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>24.691.48</td>
</tr>
</tbody>
</table>

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)**

<table>
<thead>
<tr>
<th></th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>12.000.00</td>
</tr>
<tr>
<td>Electricity supply</td>
<td>840.00</td>
</tr>
<tr>
<td>Telephone</td>
<td>2.400.00</td>
</tr>
<tr>
<td>Water supply</td>
<td>360.00</td>
</tr>
<tr>
<td>Heating</td>
<td>1.200.00</td>
</tr>
<tr>
<td>TOTAL (1)</td>
<td>16.800.00</td>
</tr>
</tbody>
</table>

**TABLE 6: FIXED EQUIPMENT COSTS**

<table>
<thead>
<tr>
<th></th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desks</td>
<td>3.200.00</td>
</tr>
<tr>
<td>Desk Chairs</td>
<td>3.200.00</td>
</tr>
<tr>
<td>Chairs</td>
<td>1.600.00</td>
</tr>
<tr>
<td>Bookshelves</td>
<td>600.00</td>
</tr>
<tr>
<td>Fax, Copier</td>
<td>2.000.00</td>
</tr>
<tr>
<td>TOTAL (2)</td>
<td>13.800.00</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>TABLE 7: PREPARATION COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedagogical &amp; Administrative Training</td>
</tr>
<tr>
<td>Installation on a dedicated server</td>
</tr>
<tr>
<td>Technician's Training</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>TABLE 8: SALARIES &amp; WAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
</tr>
<tr>
<td>Financial Manager</td>
</tr>
<tr>
<td>Marketing Manager</td>
</tr>
<tr>
<td>Technical Administrator</td>
</tr>
<tr>
<td>Financial Services Employee</td>
</tr>
<tr>
<td>Help Desk Employee</td>
</tr>
<tr>
<td>Accountant</td>
</tr>
<tr>
<td>Tutors (case 1)</td>
</tr>
<tr>
<td>Tutors (case 2)</td>
</tr>
<tr>
<td><strong>Total (case 1)</strong></td>
</tr>
<tr>
<td><strong>Total (case 2)</strong></td>
</tr>
</tbody>
</table>

In case 1, tutors are paid 8,54 € 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>
<thead>
<tr>
<th>TABLE 9: AMORTIZATIONS (ANNUAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture &amp; Fixed Equipment</td>
</tr>
<tr>
<td>Hardware</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

In the following table we summarize the final total cost.

<table>
<thead>
<tr>
<th>TABLE 10: TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN &amp; INTERNET Connection</td>
</tr>
<tr>
<td>COLLOCATION HOSTING</td>
</tr>
<tr>
<td>HEADQUARTERS OFFICES</td>
</tr>
<tr>
<td>SALARIES &amp; WAGES*</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

*244,797,60 €
### V. Break Even Point Analysis

We use the Break Even Point Analysis in order to determine the number of students and/or courses, at a certain point when 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>
<thead>
<tr>
<th>Table 11: Administrative Costs: Salaries &amp; Wages (Except Tutors' Fees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAIRMAN</td>
</tr>
<tr>
<td>FINANCIAL MANAGER</td>
</tr>
<tr>
<td>MARKETING MANAGER</td>
</tr>
<tr>
<td>TECHNICAL ADMINISTRATOR</td>
</tr>
<tr>
<td>FINANCIAL SERVICES EMPLOYEE</td>
</tr>
<tr>
<td>HELP DESK EMPLOYEE</td>
</tr>
<tr>
<td>ACCOUNTANT</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 12: Operating Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>RENT</td>
</tr>
<tr>
<td>ELECTRICITY SUPPLY</td>
</tr>
<tr>
<td>TELEPHONE</td>
</tr>
<tr>
<td>WATER SUPPLY</td>
</tr>
<tr>
<td>HEATING</td>
</tr>
<tr>
<td>COLLOCATION HOSTING</td>
</tr>
<tr>
<td>ADSL OTE</td>
</tr>
<tr>
<td>ADSL OTENET</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 13: Amortizations (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURNITURE &amp; FIXED EQUIPMENT</td>
</tr>
<tr>
<td>HARDWARE</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Table 14: Total Fixed Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADMINISTRATIVE COSTS</td>
</tr>
<tr>
<td>OPERATING COSTS</td>
</tr>
<tr>
<td>AMORTIZATIONS</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

In the next table we analyze the Total Variable Costs

<table>
<thead>
<tr>
<th>Table 15: Total Variable Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUTOR FEES</td>
</tr>
<tr>
<td>Case 1</td>
</tr>
</tbody>
</table>
The formula we use to compute the Break Even Point is the following:

\[
TR (Total\ Revenue) = TC (Total\ Cost) \quad (1)
\]

\[
SF \times NOS = VC \times NOS + FC \quad (2)
\]

**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**

<table>
<thead>
<tr>
<th>Case</th>
<th>Case 2</th>
<th>Case 1</th>
<th>Case 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF</td>
<td>300,00 €</td>
<td>300,00 €</td>
<td>400,00 €</td>
</tr>
<tr>
<td>VC</td>
<td>2,15 €</td>
<td>2,50 €</td>
<td>2,15 €</td>
</tr>
<tr>
<td>NOS</td>
<td>582,95 = 583</td>
<td>583,65 = 584</td>
<td>436,43 = 436</td>
</tr>
</tbody>
</table>

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**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Cost</td>
<td>€ 2,15 per unit</td>
</tr>
<tr>
<td>Fixed Cost</td>
<td>€ 173,633,79</td>
</tr>
<tr>
<td>Expected Sales</td>
<td>1,000 units</td>
</tr>
</tbody>
</table>

**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
derivering 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 less than
traditional education?" but rather "Are the educational outcomes worth the cost?".

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