

## **Applied Policies for Lifelong Learning in Greece: The Opportunity of E-Learning for Large Adult Populations**

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*Abstract:* - Life long learning is one of the three basic axes on which Greece bases all of its efforts to upgrade Greek reality in all levels, such as the financial, the social and the cultural in both terms of quantity and quality. To win the bet of adult education in the country, all possible ways of delivering educational and training services should be explored and used. Distance learning has to be used more widely in parallel and additionally with the traditional educational settings. The use of electronic means in distance learning shows remarkable results. In Greece the use of distance e-learning is relatively poor thus the corresponding data, financial and educational are equally poor for a thorough financial comparison between traditional education with e-learning. The present paper attempts to focus on the newly established Center for Distance Adult Education in comparison with the traditional Adult Education Centers and concludes with the results of the analysis and the proposals for establishing a national policy for distance adult e-learning.

*Key-Words:* -Distance Learning, Adult Education, Electronic Means of Education, National Policy

## 1 Introduction

In the present paper we will try to provide some comparative economic facts between formal education and electronic distance learning in the field of adult education. More specifically, we will focus on the example of the Adult Education Centres (AEC) run by the General Secretariat of Adult Education (GSAE), branch of the Ministry of Education, which consist structures for the provision of training and further education of adults using traditional methods on a national level. So we will see the cost of adult education with traditional-formal methods and we will compare it with the respective cost, possible to arise if the General Secretariat tries to educate the same number of trainees using a) a model of pure Electronic Distance Learning (EDL) and b) a blended model.

The rest of the paper is structured as follows: Firstly, it is presented the framework under which GSAE selected the respective model of blended EDL. Then, it is attempted a financial comparison between traditional adult education with distance electronic adult education and finally it concludes with the Center for Distance Adult Education which has been established recently in Greece

## 2 Distance Learning Characteristics

The basic dilemma faced by a medium providing education is that of choosing between an autonomous model providing distance learning and a blended system, where in parallel to the provision of formal education they offer distance learning either complementary to the existing programs or totally designed for distance learning. GSAE as one of the basic mediums of lifelong learning, in Greece, aspires to belong to the category of the blended type since parallel to the traditional education classes it may combine structures of electronic distance learning. The choice concerning the dilemma does not always follow rules. Several researchers face the choice of the one or the other way as completely coincidental depending on the prevailing conditions [3]. Other researchers consider the number of trainees that the organization aims to educate to be a basic criterion of choice [2]. In the end the choice depends on the theoretic knowledge possessed by the people in charge for distance learning, the cost analysis, the social, political, and educational structures of a society as well as its educational traditions.

Taking the above into consideration, and knowing that the modern philosophy on education claims that the didactic systems for all ranks of

education and especially adult education, must be 'open', meaning to be learner-centered, GSAE is called upon to choose which model serves better the goal of applying electronic distance learning. Thus, every choice should be based on the trainee who is placed in the center of the learning context and is surrounded by the teachers, by learning resources and by tools and services facilitating the learning procedure. Therefore, the characteristics governing a distance learning system are the following:

- *Trainees.* As it had been already seen trainees are the basic constituent of a distance learning system. In the case of GSAE the trainees are working people, far from formal education, experienced, ambitious and study to give a new dimension in their job, have less free time, seek for the best use of it and are able to pay for complete services. Also, one of their basic characteristics is that they need individual training and stay away from the instructor and the learning team [2].
- *Possibility of quitting.* This is probably the most important problem for a distance learning system of education and must be taken seriously into consideration when designing such a system. Dropping out is a basic criterion for the success of a distance learning system [4].
- *Time spared by the trainee.* The time devoted to studies is the only significant factor predicting the success or failure of distance learning educational programs [5].
- *Educational programs & teaching material.* Perhaps the most important element of an educational system, traditional or not, it is the cornerstone of the training procedure and ensures a degree of success of the whole system to a great extent. Almost every course can be taught through distant learning [1].
- *Certification.* Along with the quality of the training programs it contributes immensely to the establishment of the validity of distance learning. Nobody studies or applies to be trained devoting time just to get a certificate without power in the labor market. It is essential that the medium providing distance learning has ensured a valid certification which will provide for the trainee and thus work to the benefit of the system.
- *Choice of the educational means.* These means are selected on the basis of the quality and validity of the provided training so as to avoid quitting as well as their cost. The consequences of choosing the means on the cost of the system will be permanent throughout its duration [2].
- *Administration of the medium providing distance learning.* Depending on the functional model

followed by the provider (autonomous medium or blended medium) the administration system is analogous. It is important that the medium has undertaken the responsibility to observe its commitments towards its distant trainees and the two basic categories resulting by this are the development of educational products and the trainee support services [2].

Relying on the above, the model proposed for GSAE is that of the blended type (since GSAE provides formal training) and is characterized by the following:

- An electronic distance learning system of the asynchronous type which gives the opportunity to the trainee to complete a thematic unit using their own PC and with their personal pace.
- The creation of educational material and programs strictly for use in the aforementioned system with respect to the trainee and also adjustment of the existing programs of formal education for use in the above system.
- The granting of certification when asked. The system includes self-assessment methods (papers, tests, etc.) which allow the trainee to control the level of knowledge on their own and then go on to the next thematic areas or be monitored periodically by a trainer who corrects the papers (face to face or through distance) before the final exams for certification which is valid for both cases.
- Constant support of the trainee with electronic services through the internet, electronic secretariat, immediate answers to their questions via email, immediate correction of papers and tests, discussion forums, electronic mail, online chat, etc. In other words a full range of services which do not exclude or marginalize any trainee from the learning process.
- Access to traditional forms of education if it is required and periodical meetings with trainers. Also the power to access educational material through any P.C is granted with the exclusive use of access rules.

### 3 Cost of Distance Learning

Some citation of definitions and characteristics described in the above paragraphs are considered to be fundamental since they place distant learning in the appropriate framework and drive the decision about choosing a distant learning system for GSAE to the most important factor which is the cost of education. In this chapter the cost of traditional education offered by AEC is analyzed. Then the cost

of the suggested electronic distant learning with or without the ability of periodic meetings face to face among trainees and trainers is comparing.

#### 3.1 Adult Education Centers (AEC) & Cost of Education

Adult Education Centers are a structure of GSAE operated through EPEAEK II of the Ministry of Education and Religious Affairs (Framework 1.1. Action 1.1.2) and are funded by the EC by 75%. Adult Education Centers consist an innovative approach in the context of life long learning and equal opportunities in education. They are the coordinating medium on the scale of a prefecture for the development of adult education programs, the cooperation with local bodies and their connection to the central realization medium, simultaneously promoting the idea of life long learning on a local and national level.

The main goal of Adult Education Centers (AEC) is not only teaching new basic skills and knowledge but also upgrading and updating of the already existing ones so as to secure better conditions for equal opportunities and accession of trainees to the labor market, reduction of social exclusion and formation of an active citizen attitude through the acquisition and upgrading of basic social skills. The planning of the programmes was done on the basis of principles governing adult education, while innovative teaching methods and specifically designed educational material are used.

AEC aims at training 42.000 adults countrywide through the creation of 3.500 classes of 12 people each using the traditional model where trainer and trainees are in the same space and comprise the learning team. For the creation and the function of these classes many resources are required which are (for the time being) granted by the European Community Fund per 75% and by National Funds per 25%. More specifically the cost categories taken into consideration in the analysis as well as the economic facts are (Table 1):

<b>Number of trainees</b>	42000
<b>Number of Classes</b>	3500
<b>Average number of trainees / class</b>	12

<b>Cost category</b>	<b>Budget</b>	<b>Cost per trainee</b>
AEC instructors	4.200.000 €	100,00 €
AEC staff	1.869.000 €	44,50 €
Operational expenses	213.800 €	5,09 €

Production or/and purchase of educational material	310.000 €	7,38 €
Supply of books	70.000 €	1,67 €
Stationery	210.000 €	5,00 €
Rents (besides the education premises which are not charged)	58.000 €	1,38 €
Telecommunications & Transports	52.000 €	1,24 €
<b>Sum totals :</b>	<b>6.982.800 €</b>	<b>166,26 €</b>

Above numbers are verified and derive from the budget estimation submitted from AEC for the years 2004-2006. The rate of education up to now (number of trainees) confirms the target number and at the reader's disposal are analytical tables with the trainees per term, area and age. We should note that AEC are not burdened with costs for rents or utility of premises since they are based on existing structures of GSAE or on structures offered for free by the Local Authorities or other public authorities. On rare occasions is a place rented as shown in table 1. Moreover the training is provided for free and the trainees get a certificate of attendance.

We observe that the cost per trainee with the traditional form of education is 166,26€ or 1995€ per class. We also observe that 60% of the cost in total goes to the payment of trainers while a balance of 27% is the cost of the people working for the AEC. In a distance learning education system these costs are drastically cut down and even nullified in some cases. The above numbers are not an exception in relation to other educational programs co-funded by EC and national funds of other bodies or ministries. Particularly we can mention that the cost of creating and operating a traditional learning class starts from 1700€ and reaches up to 2500€ in the event of renting a premise. Generally, AEC were chosen for this analysis from the perspective of their catholic character and the rational management of their budget.

### 3.2 GSAE Centre of Electronic Distance Learning

As already mentioned GSAE wishes to create an electronic distance education system which will include all characteristics so as to be autonomous and educationally sufficient. To define the respective cost categories we will analyze exactly what this system should include. Here we have to remark that the architecture of the proposed system includes the installation of peripheral servers in every area where there is an AEC. These servers can

be avoided if the GSAE decides that all users are served by one central point. However we consider that: a) the cost of the local servers (undertaking part of the load of the central server) is cumulatively the same with the cost spent to enforce the central server so it can handle all users itself and b) since there is actual presence of AEC in every prefecture of the country then the local server can take over extra work with the least possible cost for preservation since it is included in the existing equipment of each AEC achieving thus scale economies.

On the basis of these admissions the following system is proposed, aiming to connect the GSAE (central node) to the AEC (peripheral nodes) for the provision of advanced services of electronic learning, as shown by Fig.1. Internet access for the AEC is done through the school network with an ISDN or ADSL line.

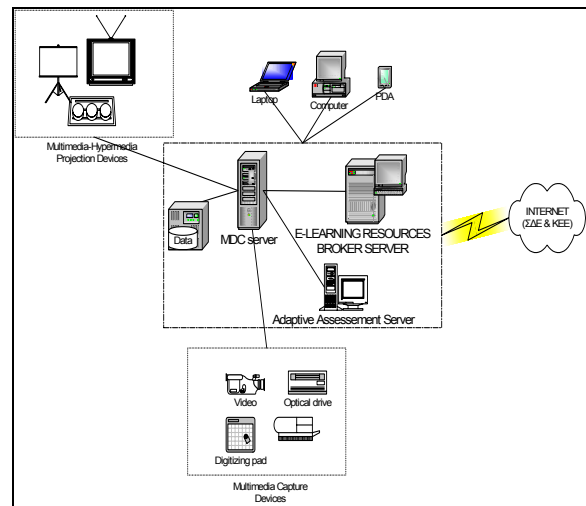


Fig.1.GSAE Central node for the provision of advanced internet services of electronic learning

GSAE will host the main node as the provider of internet educational services and the applications of monitoring and managing the central and peripheral nodes. More specifically the GSAE will host:

- The Subsystem for the management of educational material for multimedia/hypermedia and information content, the entry and filing in the central node (data archives) as for the preparation to download educational material to peripheral node or nodes. The archiving of learning material resources includes educational videos, textbooks, educational supplements, books, (e-books), sound etc.
- The Subsystem exploiting the advanced technologies of multimedia processing for the production, editing of process and codification of the material of multimedia educational resources in any digitally compressed morph

type so as to be stored in Subsystem 1 and be disposed to the nodes of the AEC.

- The subsystem of adaptable self assessment regarding exploitation of existing educational resources or created by former subsystems and the creation of adaptable evaluation tests for the Internet.

Each peripheral node of the AEC requires the installation of a managing local information server which will host local data (data available to the trainees). A brief diagram of the connection among the peripheral nodes of AEC and the central node of GSAE as it is shown in Fig.2. The peripheral node (server) of the AEC will host software systems allowing trainees to search and project local available educational material resources depending on their subject, the management and downloading of educational multimedia from the peripheral node to the central one for further processing and distribution by the responsible people of GSAE etc

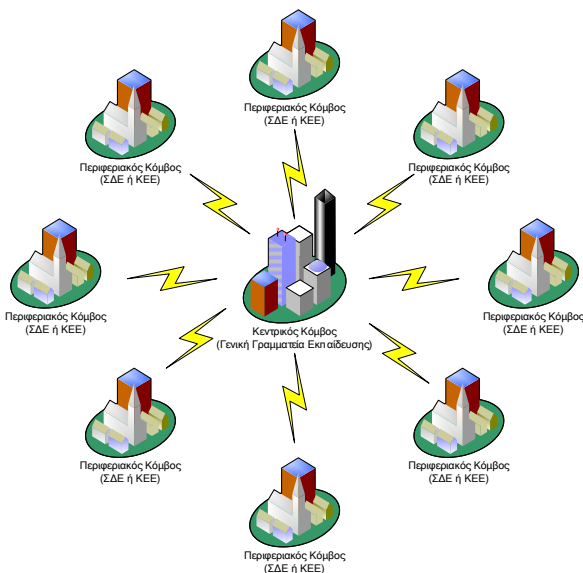


Fig.2. Connection of the peripheral nodes of the AEC to the central node of GSAE

### 3.3 Cost of Electronic Distance Learning

In this case it is attempted to detect the cost of training 42.000 trainees in the following two cases:

- A) Electronic distance learning without face to face meetings between the trainer and the trainee
- B) Electronic distance learning with face to face meetings between trainer and trainee (blended)

These two cases do not differ greatly. Their difference is rather qualitative and not quantitative. In the first case the support of the trainee is done by the system where there is staff answering questions, correcting papers, responds to emails, etc for example. In this case there is great danger of trainees quitting, ending their studies due to

estrangement. Sometimes the exclusion from the learning team is the advantage of the case A, since it offers individual learning and ensures the secrecy of the student. In case B we inhibit possible dropping out, we bring the students closer to the learning team, make them feel as active members of the team they belong, trying to solve their own problems or correct their papers with personal contact making learning personalized.

More specifically the cost category taken in mind in the analysis as well as the economic facts are for category A and are shown in Table 2:

Cost category	Budget	Cost per trainee
Central node	80.000 €	1,90 €
Peripheral nodes	105.000 €	2,50 €
Electronic distance learning Platform	100.000 €	2,38 €
Adaptable Self assessment Platform	80.000 €	1,90 €
Telecommunications & Transports	30.000 €	0,71 €
Staff of central node	107.520 €	2,56 €
Staff for Education support central	600.000 €	14,29 €
Maintenance of central node	10.000 €	0,24 €
Maintenance of Peripheral nodes	42.000 €	1,00 €
Functional expenses	42.000 €	1,00 €
Consumables - spare parts	20.000 €	0,48 €
<b>Totals:</b>	<b>1.216.520 €</b>	<b>28,96 €</b>

In the above facts we have the costs regarding the equipment of the system (Central-peripheral nodes, consumables, and spare parts), the software of the system (education platform, assessment platform, electronic secretariat, usage permissions) and the staff which in this case as in traditional education has the biggest share of cost per trainee. We remark that the above categories are the most essential for the function of the electronic distance learning system, and we can always add more facts. The above structure makes the system functional.

It is noted that the cost of educational material development is included neither in the case of electronic distance learning (in both cases) nor in the traditional one. It happens because of the cost for both categories which is the same and does not affect the final allocation of percentages except from the final price per trainee. Consequently, we do not introduce this factor since it induces nothing important in the final conclusions. Still, it is not certain how many and which educational packages can be developed and at what price for the above cases. A necessary condition for the use of the same

educational materials in both categories of education is their development on the basis of international usage models in electronic education platforms. Therefore when a body like GSAE announces elaboration of educational programmes for common use between the two systems, the adaptation of the educational program to be used in platforms of electronic education following international prototypes must be included in the prescriptions.

It is noticed that the above facts are far less than those of traditional education. Without making any comparisons at the moment, since we see them in another unit, it is worth mentioning that the cost per trainee in the case of electronic distance learning (case A) is only 17% of the cost of traditional learning. This result is far less than the expected 25% pointed out by studies till this day [6]. This is partly due to the ‘electronic’ part of electronic distance learning and partly to the nature of the AEC which provide training and not formal education.

Below, it is presented the cost categories of case B (Table 3) and what it differs in relation to case A and traditional education:

Category of cost	Budget	Cost per trainee
Central node	80.000 €	1,90 €
Peripheral nodes	105.000 €	2,50 €
Platform of electronic distance learning	100.000 €	2,38 €
Platform of adaptable Self assessment	80.000 €	1,90 €
Telecommunications & Transfers	30.000 €	0,71 €
Staff of Central node	107.520 €	2,56 €
Staff for Educational support Centrally	600.000 €	14,29 €
Staff for Educational support Peripherally	924.000 €	22,00 €
Maintenance of central node	10.000 €	0,24 €
Maintenance of Peripheral nodes	42.000 €	1,00 €
Functional expenses	42.000 €	1,00 €
Consumables –spare parts	20.000 €	0,48 €
<b>Totals :</b>	<b>2.140.520 €</b>	<b>50,96 €</b>

The only cost category which is different from case A is the cost of the training staff which supports the trainees on a local level and in face to face meetings for every subject offered by the AEC. More specifically in both cases A & B the staff for educational support has been estimated centrally (30 experts, at least one for every thematic area, and more in fields like Information Technology or/and basic literacy, with work contracts for all inclusive services). In case B we have estimated an expert per thematic field with standard payment on a local level.

In case B the cost per trainee is significantly smaller than that of the traditional education (30%). Nonetheless it is greater (almost double) than the cost in case A. This is a direct connection to the percentage of humans participating in the educational structure. The greater the number of staff is the greater the cost per trainee and the greater percentage of communication and personal contact.

#### 4 Financial Comparison-Conclusions

According to the above great economic differences between the traditional and the electronic distance learning is noticed. Actually, it was not unpredictable. It clearly confirms the valid studies in the case of the AEC as well and the results that have come out globally in comparisons of this kind. It is known that the average cost per trainee in distance learning is about only 25% of the cost of traditional education and specifically the cost of human resources has a ratio of 16%. In the tables cited we can see that a system of electronic distance learning focusing on the communication via computers can effect a significant saving of resources and cutting down of expenses if the number of trainees is over a specific threshold. But it would be interesting if the results of the comparison were seen more explicitly:

- The cost analysis of the distance learning system is significantly different from that of traditional education.
- The electronic distance learning education system has a significant stable cost and low variable cost compared to traditional education. What we mean is that the cost of installation function and maintenance of a distance learning system (stable cost) is very high and stable independent of the number of trainees while the variable cost which is a connection to the number of trainees is low, since no money is spent on the ‘care’ about the trainee as happens in a traditional learning team. In our analysis we observe that the stable cost of case A is 42% of the total cost and stays unaltered even in case B where it decreases to 24% of the total cost since staff payments soar up rapidly.
- When the number of trainees is high then the cost of electronic distance learning stays low allocating thus the average cost to a bigger number of trainees, succeeding scale savings. When the number of trainees is reduced the average cost increases and approaches the cost of traditional training. In every distance learning system there is always a crucial number of



trainees which if exceeded then the system becomes beneficial and succeeds scale savings (Fig. 4)

- Independently of which system is adopted, traditional or not, the greater cost is the production cost of the educational material. This cost is irrelevant to the number of trainees as well. We can cut down on the production cost of educational material if we choose the appropriate medium of transmission. For example, the production of educational material in digital form for use in the internet is cheaper than the elaboration, writing and reproduction of a book. A big number of trainees consists a guarantee of low cost and greater flexibility in the choice of educational material.
- Transmission of educational material is conversely analogous to the medium counter to the production of it. More specifically, it is easier to teach or transmit-traffic a printed document (book, writing, notes) than to emit a recorded lesson via the internet. The communication of the educational material has to do with the background of every trainee but also with their spreading.
- The most important cost in traditional training is the cost of teaching. In the case of the AEC it is 60% of the total cost. It is an immediate connection to the number of trainees. So in traditional systems the participation of many trainees is to our advantage because the cost is allocated equitably. On the contrary in electronic distance learning the cost of teaching is non-existent and the only thing that is allocated is the cost of developing the educational material and the stable cost. The bigger the number of trainees the smaller the cost of the educational material and function of the system. Generally an electronic distance learning system costs less per unit of product (thematic subject) than traditional systems.
- The use of face to face meetings tends to reverse the economic advantage of the electronic distance learning system since it reintroduces the number of trainees' parameter and that of the teaching staff. In our analysis the cost of face to face meetings in case B almost doubles the total budget and occupies 43% of the total cost. Therefore the use of such meetings must be limited if we want to preserve the financial advantage.
- From the management and organizational point of view the electronic distance learning system is much more complicated and incomprehensible. It is a parameter not always mirrored financially.

With the cost difference and the given fact that the AEC afford the budget shown in Table 1, an electronic distance learning system can train 6 times more students with the same budget than the numbers trained with formal education in case A and 3 times more in case B. Also the number of trainees for which the system of electronic distance learning presents the same cost of trainee with the traditional education is 7.200 trainees in case A (7 times below the number of trainees of formal education) and 12.900 trainees in case B (3 times below).

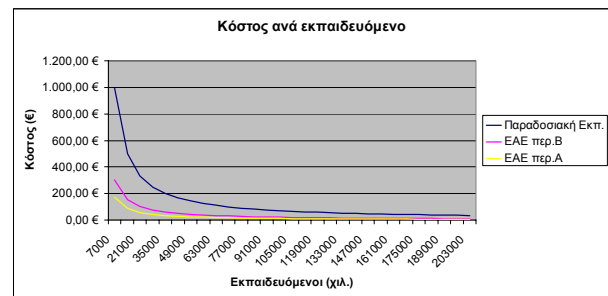


Fig.4. Cost per trainee diagram for the three cases discussed

In Fig.4 we observe the development of cost per trainee in all three cases viewed. We notice that when the number of trainees decreases the cost increases rapidly especially for traditional training. On the other hand the more the trainees' number increase all three cases converge to the same compressed cost. For training scales corresponding to Greek reality it is obvious that the model of electronic distance learning (A&B) is more to our benefit.

To achieve the reduction of cost guaranteed by electronic distance learning we deem the trainee has a competent P/C. This condition governs the whole present paper because without it the results are conversely analogous in relation to the traditional form of education. More specifically when the cost per trainee in electronic distance learning (A & B) is 28,96€ and 50,96€ whereas in the traditional one it is 166,26€ for 42.000 trainees, when we calculate additionally the cost of a P/C per trainee ( 800€ for example) then the scene of the analysis changes dramatically.

The electronic distance learning in Greece and particularly in GSAE can succeed spectacular results either as an autonomous form of education or as a part of a blended model. A necessary and competent condition for success on behalf of the state is the right planning, the strategic approach and vision and the successful application on a national level. The GSAE is already on the way of electronic distance

learning securing resources that will create a national network of life long distant learning in the service of Greek citizens.

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