E-learning in the public sector: training and empowering users of e-government

Maria A. Lambrou, Nikolaos Marianos
University of the Aegean, Business School, Department of Shipping Trade and Transport, Chios, Greece

Abstract—Today, the latest technological developments and practices in e-learning are exploited in order to help public servants and private sector employees to master electronic services in order to improve their work performance in an increasingly interactive, digital environment. This paper presents results of two projects dealing with e-learning for e-government. The comparative analysis of these case studies aims at presenting the background, common themes and peculiarities of e-learning in the public sector, in particular regarding ICT training.

Index Terms—e-government, e-learning, employee empowerment, public sector.

I. INTRODUCTION

The work environment conditions in most sectors, including the public sector, have become considerably demanding; therefore various forms of life-long learning appear to play an important role for employees’ career development, as well as for organizations’ productivity improvement and human resources’ efficiency. The flexibility, and cost effectiveness that e-learning offers is very significant, in most cases.

The drive to apply Information and Communication Technologies (ICT) to government services is a global phenomenon. A recent policy document from the EC (“i2010 – A European Information Society for growth and employment”, EC, June 2005) outlines the importance of ICT in making public services better, more cost effective, and more accessible. E-government refers to the use of technology, particularly Web-based Internet applications, to enhance the access to and delivery of government information and services to citizens, business managers and employees, other governmental agencies, and third parties. The perceived benefits of e-government account to governments being able to (1) be more accountable to citizens, (2) provide greater public access to information, (3) be more efficient and cost-effective, and (4) provide more convenient services. On the other hand, according to the above mentioned policy document, today over half of the EU population either does not reap these benefits in full or is effectively cut off from them. Among the most important barriers to e-government is currently the lack of a skilled, adequately trained in new ICT, public sector employees and business users that are aware of and trained in ICT and e-government services’ use (demand side).

E-learning is productively combined with e-government as the latter requires considerable training efforts as e-government users (such as public servants, business employees) being dispersed across a country, need to smoothly adapt in their newly introduced and ICT enabled work duties, in order to effectively promote, operate and deliver e-government services. The combination of e-learning and e-government can provide a momentum both initiatives appear to need in order to materialize the benefits proclaimed.

In this paper, important dimensions regarding the effectiveness of e-learning initiatives for ICT training in the public sector are highlighted, including: (i) the overall digital inclusion strategies for public servants (supply side users) and company employees (demand side users), (ii) project management aspects of the e-learning initiatives in the public sector, (iii) pedagogical models adaptation based on user needs analysis which varies considerably and may cover cases of technology savvy or technophobic users of e-government, (iv) e-learning system/platform sophistication and technology infrastructure design based on a rationalized and contextualized approach, (v) content elaboration and presentation issues.

II. E-LEARNING FOR E-GOVERNMENT

The focus of e-government [1] today has shifted from a technology-driven approach to include political support, organizational adaptability as well as change management aspects, success factors often neglected in earlier projects. It is also broadly realized that in order to fully exploit technology and infrastructure investments, emphasis should be put on improving governance and avoiding supporting obsolete and inefficient organizational structures and processes with ICT. E-government requires substantial investments in human resources and social enactment.

Thus, e-government education programs are most often included in national and supranational initiatives that aim to modernize public administrations, focusing on adapting best practices to local situations.

Examples of particular needs include improving the ICT skills of personnel working in local government, as well as empowering specific groups, including and citizens/professionals in rural areas.

An e-learning for e-government project must be considered as a “business case”, that is, there must be cited and managed in a certain context which entails a particular viable socio-economic model.

It is worth mentioning that according to [2], the IT/Telecommunications sector is amongst the sectors with highest usage of e-learning, whereas the government and the agriculture sector lag behind. Furthermore, one of the concerns of scholars is whether e-learning is as effective for those with lower levels of computer efficacy [3]. Perhaps unsurprisingly, the studies reviewed in [3], found that lower levels of computer efficacy were related to lower learning outcomes. Finally, the anecdotal evidence seems to suggest considerable savings are possible; however, savings could be made if there is a critical mass
of dispersed employees to train, and if the training is to be re-used.

A. Project Management Aspects

A thorough understanding of the mission, the functioning of public administration structures as well as the mapping of structures, processes and roles to competence elements, including knowledge, skills and mentality, appear as mandatory in the context of e-learning for e-government projects.

An e-learning system for e-government can widely vary in size: the scope of each system represents an important element where upon to plan and design the training activities to be carried out, in terms of platform, technology and e-learning services’ sophistication.

E-learning activities within public administration structures evidently need to take into account the profile of target learners (i.e. public servants), the exact learning goals to be achieved, and the type of training services/content the project will offer. Most commonly, e-learning activities directly relate to the specific learning environment that platforms available on the market offer, however a contextualized approach regarding user needs, and a respective customized design and implementation solution are most commonly mandatory and should not be avoided.

Moreover, the high production costs for materials to be used in high quality e-learning activities make it very convenient to increase cooperation among different structures, so that the teaching resources can be reused in an efficient way. This requires teaching materials to be devised in compliance with international standards that guarantee portability and interoperability in different environments.

The complex nature of such projects can, in some cases, require outsourcing [4], thus, public administration officials and employees should actively participating in the planning, implementation, and operation phases. In cases where a technology services provider - Application Service Provider (ASP), or Learning Service Provider (LSP) is used, the adequacy of the service levels provided will need to be checked, interoperability with the existing system is also to be ensured. It is therefore necessary to set up a dedicated team assigned with roles and responsibilities regarding planning and management of the outsourced training activities.

B. Technology and system design

E-learning for e-government system design is typically based on fundamental constraints that entail available financial resources, commercially available technology platforms and learning environments and “accessibility” of e-learning solution vendors/consultants. The exact hardware and software tools’ capabilities of comparable, candidate platforms are also a conditioning factor.

Today, a broad spectrum of commercial and free and open source e-learning platforms is available, offering integrated or presumably easy to integrate functionality of LMS, LCMS and VC systems. Although a convergence in the main e-learning components’ functionality is reached, the exact functionality and platform capabilities vary considerably across e-learning products.

Thus, e-learning for e-government platform selection, customization and integration are far from trivial today.

C. Pedagogical Aspects

A number of pertinent pedagogical and instructional design issues should be considered in an e-learning for e-government project. Firstly and foremost, selecting the trainees and identifying their needs, in terms of personal, professional and competence characteristics.

Defining training requirements entails analyzing individual requirements as well as role and organizational characteristics and constraints, in the light of legislation and newly designed work processes and job responsibilities for the public administration.

Defining teaching programs (subjects and instructional forms), pedagogical models (self-paced, collaborative, problem-based), teaching and delivery modes (blended, on line synchronous mode, on line asynchronous mode, off line) and content (multimedia) of e-learning for e-government programs is as central part that is expected to be supported by state of the art e-learning, instructional design methodologies.

Defining the verification and individual appraisal system as well as the evaluation and monitoring system for the training project is considered as also mainstream task for e-learning for e-government projects.

It is worth mentioning that pedagogical aspects are critically intertwined with, and quite often unilaterally determined by the e-learning platform capabilities.

D. Policy-National Strategies

In E.U. there is stated priority and a vivid enactment for a European Information Society for growth and employment, (i2010), which actively promotes the use of ICT in the public, business and individual sphere.

In July 2005, the Greek Government presented an integrated “Digital Strategy” policy for the period 2006-2013. The new digital strategy places ICT high in the country’s agenda and treats new technologies as a strategic priority for Greece, adhering to the principles of the EC “i2010” Information Society action plan. The aim is to perform a digital leap to productivity and quality of life”, via enhanced business productivity through the use of ICT, and new skills. Against this background, a number of administrative structures, policy, financial and management tools have been leveraged in order to materialize the implementation of e-services in the Greek Public Administration (GPA) and, not surprisingly, in most cases e-government and e-learning efforts are closely intertwined and supported.

III. THE SYZEFXIS CASE

The SYZEFXIS project (www.syzefxis.gov.gr) that implements the broadband communication network of the (GPA) which connects all the bodies of the public sector (hospitals, social insurance agencies, libraries etc), as well as local authorities. Thus, SYZEFXIS provides all citizens and enterprises with access, via the Internet, to all the e-services and applications of the public administration (e-taxation, e-health, e-certificates etc). The main target of SYZEFXIS is the improvement of the operations of the GPA and is dealing in particular with the upgrading of the communication services offered to the various agencies of the GPA and the offering of advanced information technology and security services. The project is subdivided into nine smaller ones, of which one is
concerned with the training of GPA users regarding the implemented ICT and security services.

The SYZEFXIS e-learning project implemented a notably sophisticated and costly environment, based on the customization and integration of two different, commercial LMS, CMS and Content Authoring platforms that support blended learning for public servants of GPA on ICT topics that employees are required to master in their daily professional activities.

The SYZEFXIS systems is comprised of the Saba Centra platform as the main online learning environment offering a highly interactive virtual classroom learning, e-meeting, and webinar functionality with a learning content management system that supports blended learning, real-time training and collaborative sessions.

It is integrated, however, to the EXODUS e.Learn platform, a Learning and Content Management System which enables all the information relevant to the learning process to be assembled efficiently and the learning process itself to be administered, documented, and assessed.

A complex and heavyweight project planning and implementation process characterized the SYZEFXIS e-learning for e-government project. An ambitious and “textbook” approach aimed at bringing the best possible technical solution to the project environment and resulted in a costly, laborious to integrate and marginally justified rich functionality to be offered to technical and organizational officers of GPA that should be trained in communications, information technology and security topics.

A. Critical Success Factors

Main success factors of the SYZEFXIS e-learning for e-government project are considered: (i) the visionary, and highly knowledgeable, committed project management team (IS S.A.) (ii) the high levels of technophilia and computer efficacy of the targeted GPA employees/trainees alongside with a very positive perception of the overall initiative as related to quite good learning outcomes (iii) a blended learning approach that was enabled the abundant state resources (physical infrastructures, compensated employee involvement), (iv) the scale of the GPA training population and the high degree of its geographic dispersion (v) the advantageous policy environment promoting generous investments in new technologies as connected to close enforcement by the E.U. administration (vi) the very nature of the GPA mechanisms and organizational culture that allowed for a persistent, fault-tolerant, contextualized enactment of the e-learning for e-government activities.

IV. THE RURAL E-GOV CASE

The second case study is based on results of the Rural-eGov project (http://rural-egov.eu/) which proposes and pilot tests adapted instructional models (such as blended learning) and e-learning content so that professionals of rural areas throughout Europe can get familiarized with e-government services, understand how they can benefit from using them in their business practices, and thus become members of the Information Society.

the user groups directly targeted by the project are [5]:

- SMEs: owners or people working in very small, small and medium enterprises in rural areas. They are expected to be living in an area where there exists no direct physical access to some of the public authorities or governmental agencies that are required for SMEs to do business. For example, the SMEs in a small Aegean island where a taxation office has not been established.
- Governmental agencies and public authorities: governmental structures offering services to professionals on a national level, and who avoid maintaining costly and ineffective physical structure in order to serve some rural areas with low population numbers. Also regional authorities who aim to improve the quality of life and the level of services offered to their citizens, as well as facilitate the development of business activities in their regions.

The Rural-eGov project aims to address the following needs in relation to the above user groups:

- To support SMEs in rural areas in different EU regions, so that they keep their business activities in these areas and not migrate closer to urban centres.
- To enhance vocational training of rural SMEs in the use of online services, so that they can take advantage of ICT and become more competitive in the knowledge economy.
- To find alternative ways for governmental agencies and public authorities to serve the citizens (and in particular the businesses) in rural areas, where the deployment of physical services and personnel is costly or not possible.

Rural-eGov uses a lightweight, open source infrastructure, comprised of Moodle and a dedicated web based online point of reference which SMEs can continuously access for information and content, that is the Rural e-Gov Observatory, based on metadata and ontology technology. Actually, the Rural e-Gov Observatory is considered as an innovative, added value feature and a major enabler to achieve the aims of the project, through which rural SMEs will be able to find information on e-government offerings in their region, and e-learning content about their use. The Rural-eGov Observatory provides two main functionalities to its users: it allows them to search, locate and access listings of eGovernment services that are provided in their regions; and allows them to search, locate and access listings of training content about e-government services and technologies, stored in a digital format. These functionalities required the implementation of two appropriate metadata schemas.

A. Critical Success Factors

Rural-eGov adopts a holistic approach, on a pilot basis, in order to analyze and address the needs of SMEs in the regional areas of UK, Greece, Germany, Poland and Slovenia who have different types and levels of eGovernment services and deployment. The main strengths of the Rural-eGov e-learning for e-government project are:

(i) it addresses both awareness and vocational training activities in order to help the target SMEs use and exploit e-government services. (ii) the training methodology adopts a blended learning approach, using a combination of ICT based learning, as well as more traditional forms of learning such as seminars etc. (iii) highly customized e-learning content is developed that supports various training scenarios (e-government - business situations)
which will be tested with rural SMEs. As added value feature (iv) the Rural-eGov Observatory provides access to a representative collection of e-government services that may support the needs of SMEs in each region. Finally, (v) a set of policy recommendations is developed and disseminated in EU agencies, National Governments and Rural administrations.

V. SUMMARY
The drive to apply Information and Communication Technologies (ICT) to public administration is a global phenomenon. E-government requires substantial investments in human resources and social enactment in order to materialize effectively its technological and organizational potential.

E-learning is productively combined with e-government as the latter requires considerable training efforts in order public servants (supply side) and private sector employees (demand side) to smoothly adapt in their newly introduced and ICT enabled work duties.

In this paper, two cases of e-learning for e-government efforts are outlined in order to highlight the breadth and commonalities of the area including policy, project management aspects, and instructional methodologies’ issues alongside with technological aspects.

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AUTHORS
Maria A. Lambrou is Assistant Professor at University of the Aegean, Business School, 2A, Korai, 82100, Chios Greece (e-mail: mlambrou@aegean.gr).

Nikolaos Marianos is a Ph.D candidate at at University of the Aegean at University of the Aegean (n.marianos@chios.aegean.gr)

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