INTEGRATING LMSs IN THE EDUCATIONAL PROCESS: Greek Teachers' Initial Perceptions about LAMS

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ABSTRACT

E-learning with the use of Learning Management Systems, has been increasingly adopted in Primary, Secondary and Higher Education with the expectation to increase students' motivation and infuse activity-centred learning strategies with various educational benefits.

This study has investigated the initial perceptions of Greek teachers about the integration of LAMS, a Learning Activity Management System, in the educational praxis. Through a multifaceted research method, involving a small scale participatory action research, the research team attempted to investigate the preconditions required to integrate LAMS in the everyday lesson. Two tutorial workshops were organized with the participation of 46 educators from geographically diverse urban areas, from K-12 to Tertiary Education.

Results indicated that teachers have developed a positive attitude towards LAMS and the use of collaborative online tools during the educational process. Although teachers have certain objections on integrating LMSs, which stem mainly from the current status of the Greek educational system, they accept relative advantages of integrating online collaborative approaches over the traditional face-to-face approach. Well-organized and carefully implemented tutorial workshops can spark teachers' interest and bring about change in the educational process. Small scale interventions such as these can prove to foster dialogue among teachers of various backgrounds and set the foundations to create online communities of practice for innovative teachers.

Keywords: **LMS, LAMS, distance learning, blended learning.**

INTRODUCTION

Several authors argue that there is a gap between students' expectations and what they receive in the classroom (Prensky, 2001; Ratto et. al; 2003, Renner, 2003).

Pupils and students of today are computer literated individuals who are used to interact with devices that provide rich interactive media such as computers, mobile devices or video game consoles. Hence, pedagogical strategies with such learners in mind may become invalidated with respect to content and interaction. Information and Communication Technologies (ICTs) hold considerable promise for teaching and learning. Nevertheless current practices may prove insufficient in taking full advantage of the resources and preparing individuals to learn in resource-rich environments. Teachers' professional development need to include ICT literacy and pedagogical strategies which correspond to e-learning and constructivist approaches.

After many years of reflection and investigation, the issue of applying technology in schools is still modern and worth attention. It is generally accepted that schools are inherently conservative institutions, thus changes and reforms are not easily implemented. When referring to educational reforms such as technology integration, teachers are in a strange position of being both the subject and the agent of change. They are required to transform their beliefs and their routine in order to meet the specifications of integrating ICTs in their everyday lessons. However, educators are more likely to change if they see clear benefits of a new method over an old one. According to Roblyer (2003) educators are willing to accept relative advantages if:

- **the methods adopted, are consistent with their cultural values and beliefs,**
- **the innovation is easy enough to learn and not time-consuming,**
- **they are given the ability to try new learning perspectives at an early stage, before they take their final decisions and**
- **they have the ability to reflect on their colleagues' innovative work.**

Considering teachers' professional development as an integral part of technology and curriculum integration, we can deduce that their success as e ducators, in today's digital age, depends on their ability to communicate effectively with various technology-mediated environments. In recent years, we have witnessed a growing introduction of Learning Management Systems (LMSs) in all levels of education in Greece (Manitsaris, Perdos & Pavlidis, 2006; Pentaris et al., 2008; Karasavvidis, 2011). Innovative teachers contemplate on their current teaching problems and identify e-learning as a means that could offer some good solutions (Heinze & P rocter, 2004; Ajala, 2009). Many teachers seek e-learning resources that would provide them with support for assisting teaching and learning, using direct instruction or inquiry-based methods. Teachers and instructors who use a LMS have the opportunity to share course materials, calendars, notes, links, syllabus, opinions, and online assignments. Despite the increase in LMS adoption in schools and universities, interest has been expressed whether LMSs are actually being used as effective learning tools or merely as electronic document repositories (Badge, Cann & Scott, 2005).

This paper describes an intervention, which utilized the Learning Activity Management System (LAMS), a Learning Design System, which provides environments for user administration, student run-time delivery of sequences, teacher run-time monitoring of student interactivity and teacher authoring/ adaptation of sequences (Dalziel, 2003).

It is new generation web-based educational software which moves from a content-centered approach to an activity-sequence approach. In order to help gauge Greek teachers' initial attitudes towards the integration of e-learning in the classroom, two tutorial workshops were conducted to familiarize them with LAMS, an innovative, open-source Learning Management System. Through our investigation, initial perceptions on the usability of the system and its potential as a tool to enhance learning are examined.

THE LEARNING ACTIVITY MANAGEMENT SYSTEM (LAMS)

LAMS is an open source online learning environment for educators, which affords them with means to design, manage and deliver online collaborative learning activities. LAMS development began in 2002 by Macquarie University in Australia and was released as open source software in 2005. It is now supported by a wide learning community (http://lamscommunity.org) and it can be used either as a stand-alone system or in conjunction with other Learning Management Systems such as Moodle, Sakai, Blackboard, etc.

LAMS can support a wide range of pedagogical approaches, giving the opportunity for educators to select the activities that match their preferred style. The activities can include a variety of individual tasks, small group work or whole class activities based on both content and collaboration. By using such new generation learning design tools, learners-whatever their preferred learning style-may become actively engaged and challenged. Once a sequence is proved to be effective, it can be redistributed for use in different contexts through an active online community; thereby creating a repository of effective templates. Taking advantage of the shared experience and creativity, instructors can save time and reduce the workload necessary for planning and developing e-learning sequences. LAMS provides three environments in order to:

- **author learning sequences (Author Environment),**
- **implement them (Learner Environment) and**
- **monitor the learners' online activities (Monitor Environment).**

In the Author Environment teachers and instructors are provided with a visual authoring environment for creating, storing and re-using learning activities. The produced sequences could form part of a course delivered either in the classroom or as a remote component that could support students learning outside the classroom. In the Learner Environment (fig. 1), content that has been created by teachers (authors) is available to students (Learners). Student sequence navigation, which is facilitated with visual interactive, user-friendly navigation tools, may include exposure to text, images, video or music. Students' progress can be monitored through the Monitor environment (fig. 1).

LAMS has been used world-wide in many educational sectors such as K-12, vocational and corporate training and in Higher Education institutions as well. Recognizing LAMS' contribution in the impactful use of technology worldwide, it has won, in conjunction with the associated wide spread usage LAMS Community, a Gold Award and Best Learning System at the IMS Global Learning Consortium's Learning Impact Awards (LIAs) at 2009.

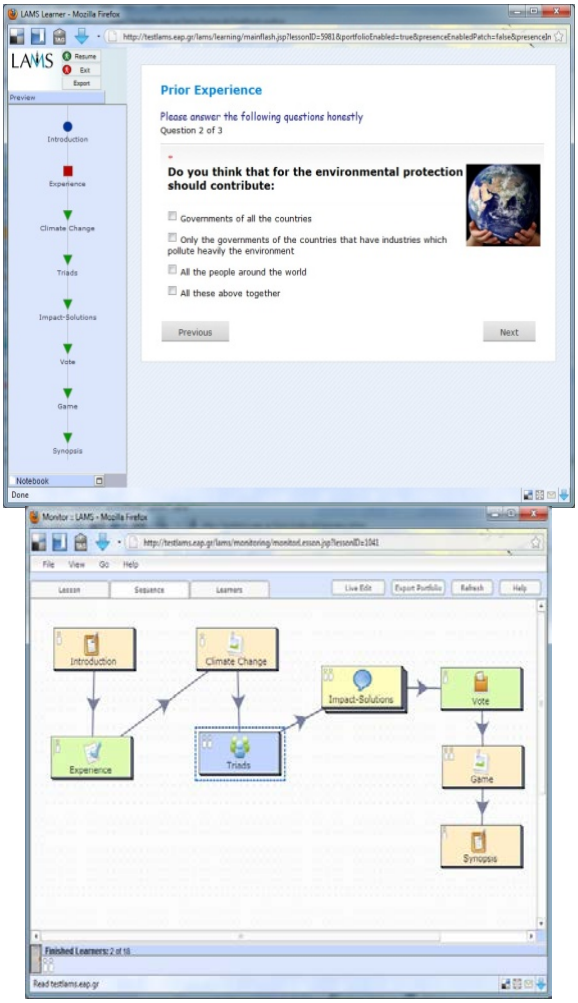

Figure: 1
LAMS Learner and Monitor Environment

AIM AND OBJECTIVES

This research aimed to gauge the pre-suppositions needed to infuse e-learning practices in the contemporary Greek K-12 classroom and Higher Education. Through a multifaceted research approach, we tried to contemplate on our personal beliefs and cross-examine them with the perceptions of a sample of Greek teachers from various subject backgrounds, on the potential of integrating LAMS in the everyday lesson.

Specifically, our basic objectives were to:

- **Delineate our beliefs on the potential of the integration of LAMS in the Greek classroom, as well as the obstructions that are encountered, through a dialogical framework.**
- **Organize a framework for a tutorial workshop in order to familiarize Greek educators on LAMS.**

- **Implement the workshop in two conferences and write down the participants' perceptions about LAMS as an e-learning platform and how it can be integrated in their everyday lesson practices.**
- **Gauge whether the participants' perceptions differ according to gender and age.**

METHODS AND MATERIALS

The research design was driven by a multifaceted approach, combining qualitative and quantitative data. It integrates analysis of participant observation data and measurement scales from a developed questionnaire. Acknowledging the gulf between qualitative and quantitative research, a mainstream mixed method literature has been developed throughout the last years, demonstrating a good theoretical basis for combining methods in social and behavioural sciences (Hammersley, 1992; Brannen, 1992; Tashakkori & Teddlie 2003).

While qualitative research is being conducted in natural settings, attempting to make sense (or interpret) social phenomena and human behaviours, quantitative research involves, mainly, numerical measurements and abstracts from particular instances, in order to seek generalized theories and causal relationships between variables.

Voices from the empirical approach impose objections on the subjectivity of qualitative research, referring to the researchers' personal beliefs, preconceptions and past experiences when they conduct their project plans, claiming that qualitative research cannot hold sound reliability.

On the other hand, qualitative researchers assert that no such thing as neutrality and objectivity can occur in any form of social life.

As Bogdan & Biklen (1998, p. 34) refer, "no matter how you try you cannot divorce your research and writing from your past experiences, who you are, what you believe and what you value". Holistic research approaches (Schostak, 2002) activate the self-aware role of the researcher, bringing to light the researcher's personal theory (ontological, philosophical, and pedagogical).

This framework was filtered through a qualitative perspective taking into account the theoretical background and personal perceptions of the members of the research team, whereas recordings of a compiled questionnaire, which was delivered in-situ and filled in by the workshop attendees, served to triangulate research findings. By looking at the inquiry from different standpoints, it was assumed that a more comprehensive view of the research plan could be acquired.

The project was accomplished through a small scale participatory action research project, which offered the opportunity for a holistic view of the research framework. Action research is a method which has the dual aim of action and research (Dick, 1993). According to Kemmis (2007), it is "a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of:

- **their own social or educational practices,**
- **their understanding of these practices and**
- **the situations in which the practices are carried out".**

Participatory action research is an alternative instance, which is focused on research that enables action. Action is achieved through successive reflective cycles, whereby participants collect and analyse data, which determine what action should follow (Baum, MacDougall ? Smith, 2006). It involves building relations and trust, negotiating roles and boundaries, learning from colleagues, and striving to contribute to the education field (Clark & Moss, 1996; Cooper, 2006).

The Action Research Procedure

The action research project was carried out through a three phase cyclical procedure (fig. 2), lasting for about five months, from early December 2009 to mid April 2010. During this period two tutorial workshops were conducted in order to familiarize LAMS to educators.

The workshops were embodied in the proceedings of two national conferences, concerning the integration of ICTs in education. The research plan included the accomplishment of the following procedures:

- **Bring to light the researchers' personal beliefs on the issue of e-learning integration in the everyday procedures of the Greek classroom.**
- **Designate a framework to implement specific workshops to familiarize LAMS to Greek teachers.**
- **Implementation of the workshops.**
- **Observation of the workshop workflow, through, observation sheets, memos and diaries.**
- **Gathering quantitative data from a compiled questionnaire.**
- **Self-reflection on the acquired quantitative and qualitative data.**
- **Redefinition of the planned procedures for further actions.**

Figure: 2
Development of the action research cycles

During Cycle 1 of the research plan, called "*the preparatory stage*", personal perceptions and attitudes towards the use of e-learning and specifically learning management systems in the educational praxis were negotiated, part of the building partnership phase.

Communication between the members of the research team was administered asynchronously and synchronously (through e-mail and Skype), due to the fact that they were located in three remote locations, allowing us to denote the use of an "e-action research" process. Philosophical and pedagogical background issues, empirical preconceptions and contextual aspects of each member served as the primary qualitative data. To formulate the starting point of our personal theory, the following guided questions were pinned down to focus dialogue:

- **What is the status of ICT in each educational level, according to our empirical background?**
- **What are the main obstacles encountered by teachers in their attempt to integrate ICTs in classroom practice?**
- **How can change be brought about, in order to integrate e-learning in the educational praxis?**

The deductions from Cycle 1 offered the available feedback to enter Cycle 2, called "the organizational stage", where issues concerning the implementation of the first workshop, scheduled to take place in Chania, Crete, were quested.

Taking into consideration primary data from conversations, written statements and personal preconceptions, a common framework on what is needed to develop a successful workshop to introduce LAMS firstly and e-learning theory, as an educational by-product, was the next challenge.

In order to acquire quantitative data about participants' attitudes and beliefs in using LAMS's as a learning tool, a questionnaire was designed and distributed. Our main focus, during this phase, was to put down what is needed to help participants, communicate, negotiate and (perhaps) reconstruct their personal beliefs on instructional design in conjunction with e-learning strategies. Cycle 2 research questions were:

- **Which features of LAMS need to be given more attention?**
- **How should the workflow of the workshops be scheduled?**
- **What kind of scaffolds should be offered?**
- **How will the workshop be evaluated?**

The answers to the above questions, paved the way for the next phase. Cycle 3 included *the implementation of two workshops*, which took place in two consecutive weekends, the first in Chania, Crete and the second in Naousa, Macedonia.

The feedback acquired from the first workshop guided the improvement frame for the second workshop, although changes proved to be of minor significance. Quantitative data from a compiled questionnaire formed a source of data triangulation during this last phase of the "research journey". Comparison between quantitative data of the two workshops, through a statistical analysis of the main variables, enabled us to cross-examine and confirm or reject our personal theories and beliefs whereas the quantitative and qualitative data, that had been taken from the discussion phase of the workshop (through memos), served as a means of interpreting research findings. Specifically during this phase we:

- **Implemented two workshops, part of two national conferences in Greece.**
- **Gathered measurable data from the questionnaire created during the previous phase.**
- **Cross-examined the quantitative data towards our personal perceptions and qualitative data, derived from our memos, observations, oral dialogues and pedagogical preconceptions.**
- **Evaluate our findings and construct a joint knowledge base on how can e-learning activities is integrated in everyday lesson practices in Greek classrooms.**

Research Samples and Instruments

Authors of this paper comprised the research team, i.e. four educators from Primary to Tertiary Education, a fact that highlighted the need to contrast personal beliefs on the basis of the educational context of each level, whereas teachers from various subject backgrounds, who attended the two workshops (table 1), have provided quantitative and qualitative data, referring to the potential usability of LAMS in the everyday lesson procedures.

Table: 1
Attendee's profile

Sex			
		Frequency	Percent
Valid	Men	27	58.70%
	Women	19	41.30%
Total		46	100.00%

AGE			
		Frequency	Percent
Valid	<30	13	28.3
	30-40	9	19.6
	40-50	15	32.6
	>50	8	17.4
	Total	45	97.8
Missing	System	1	2.2
Total		46	100

The quantitative data were collected through a compiled questionnaire that had been created during cycle two of the ongoing framework and forwarded to the participants of the two workshops, before the follow-up discussion stage and gathered at the end.

The questionnaire was constructed taking into consideration theoretical assumptions of multiple literature perspectives (Gillham, B., 2000; Oppenheim, A.N., 1992; Sapsford, R., 1999).

In order to bridge the researchers' different perspectives about valid information schema, certain goals were clarified, which reached to an agreed compromise. Practical problems such as length and administration issues, type of questions and measurable scales were flagged up. A 5-point Likert scale format was agreed with responses from "strongly agree" to "strongly disagree" as well as open ended questions. Open-ended questions were necessary to record personal attitudes, while a specific plan delineating how these data would be analyzed, had to be plotted (Boynton, P.M., 2004). The questionnaire included four separate sections:

- **A section with entries recording the attendees' profile, such as gender, age, subject background and further qualifications.**
- **A section which would offer responses to evaluate the workshops' effectiveness consisted of three open-ended questions and seven Likert scale questions.**
- **A section reflecting LAMS interface usability.**
- **A section comprised of three Likert scale questions and one open-ended question, enquiring whether online communication through chats and forums could offer a rich interaction environment in the learning praxis.**
- **Qualitative data were recorded through follow-up memos and notifications, reflecting observation data from the workshop procedure. These were collected by gathering tools that included:**

    - **observations, journals, diaries and written documents that each member of the research team kept;**
    - **recordings of researchers' meetings (conversations and events), from e-mails, Skype connections, and other online meeting tools.**
    - **individual face-to-face conversations with key-participants (attendees, with which we had private dialogues and conversations).**

RESULTS

During cycle 1 the research team attempted to self-reflect on the potential of integrating LAMS in the everyday classroom procedures, providing situational data. In summary, during this phase, throughout our conversations and insights, regarding our personal beliefs and experience as teachers in different educational levels, we have concluded that:

- **The adopted approach of ICT integration in Greek Primary Education (K-6) is mainly content-centred. Teachers use mainly articles or multimedia products to complement the learning process. Although there are few innovative teachers, there is a lack of technology fluency among the educational community of Primary Education.**
- **Secondary Education has adopted a technology driven approach. Students' learning experiences involve technological literacy, what is plainly expressed as learning about the computer in contrast with the movement of learning with the computer.**
- **Throughout the last decade, Tertiary Education has utilized ICT tools widely, mainly as a means of content distribution and delivery, as well as facilitating communication with students. Moodle is the dominant application used. It seems that the implementation of LMSs do not support a wide range of pedagogical approaches or give the opportunity to designers to select the activities that match their teaching style.**
- **There is a lack of technical readiness within schools to support e-learning while low levels of staff readiness to adopt new methods perpetuate this situation.**
- **Curriculum standards both in Greek Primary and Secondary Education and the way of teaching do n ot facilitate online learning collaboration learning.**

- **There is a need for learning environments to provide teachers and students with tools and methodologies to promote motivation and self study. Furthermore, ICT practices should be integrated in the everyday practices of school activities.**
- **LAMS is an appropriate tool to support collaborative learning among students and a supportive tool for teachers to enhance instructional design skills. It encompasses a safe environment for students to collaborate, get engaged in learning tasks and offers abilities for differentiating instruction through branching sequences.**
- **If we want to promote communication and interaction in class, more interaction channels should be created. The 45 minutes lesson is not adequate time to, fully, promote collaboration and inquiry learning approaches. By integrating blended-learning perspectives, with the use of e-learning platforms, such as LAMS, limitations of space and time are altered, leading to situational learning and constructivist approaches.**

On the other hand, our findings are consistent with several articles that pinpoint the assumption that although the World Wide Web has made the production and deployment of distributed learning material easy, certain curriculum changes should be forwarded, in order to produce high quality learning environments (Nykaenen & Ala-Rantala, 1998; Jung, 2001; Oliver, 2003).

Moreover, as we have entered the new digital era, where social interaction through digitalized means dominate, we need to readdress philosophical and pedagogical implications on what kind of knowledge and what skills are considered available for a 21st century competent global citizen.

Based on the data retrieved from cycle 1, we decided to organize two workshops, in order to familiarise Greek teachers with e-learning perspectives in the classroom.

Our general pre-suppositions favour the assumption that the classroom is an active entity and the teacher should have the ability and the affordances to design an e-learning course according the needs and the contextual framework of his class, rather than implementing "ready to use" paradigms.

A good approach is to get familiarized with the use of Learning Management Systems. Our choice was LAMS, since it has been studied and implemented in class by all of the research team members. During cycle 2 we set down the organizational details, including workshop specifications, such as what assignments and scaffolds are needed, presentations, materials and role allocations.

The members of the research team unanimously accepted that LAMS is a sophisticated yet user friendly application, which offers opportunities for instructional design and implementation of learning units, in authentic situations adapted in contextual frames that correspond to various personal and social learning networks.

Actions and decisions of this phase included:

- **It is not possible to present thoroughly all the features of LAMS, of all the features of LAMS, the author environment would be presented comprehensively, as it is the core feature of educational change, contributing towards the transition from the passive educator to the active educator, emphasizing the creative aspect of teaching.**
- **Oral contributions from the discussion phase of the workshops, along with a follow up questionnaire, would serve as primary data from this phase.**
- **Each member of the research team would undertake a separate task to present, while the others would serve as a supportive framework, so that the workshops would be more efficient.**
- **Apart from the support team, written assignments and succinct written tutorials for each LAMS feature would serve as a scaffold for the learning process. The assignments included step by step instructions, on how to author a hybrid learning sequence, about climate change and its effect on humanity. On the other hand, the succinct tutorials, which were to be written by the research team, would offer a short description of each LAMS environment and its features. This material would be distributed to the participants at the beginning of the workshop.**
- **Promotion of a Greek knowledge based community (http://blogs.sch.gr/groups/lams) which can promote interaction and support to teachers, along with the international community of LAMS (http://www.lamscommunity.org) would be forwarded.**
- **Perceptions and attitudes of the workshop should be evaluated through a compiled questionnaire.**

As part of the research plan to examine teachers' initial beliefs on LAMS, cycle 3 offered quantitative and qualitative data about the attendees' preconceptions and ongoing attitudes towards LAMS.

The satisfactory level of the attendees regarding the organization and implementation of the workshops was a parameter that was of great importance. The attendees' attitude was recorded through a 5-point Likert scale questionnaire section, which was consisted of 9 questions.

The overall internal reliability of the section was measured through Cronbach's alpha (α) reliability analysis and revealed an acceptable scale of 0.744 while the mean value of the overall questionnaire section acquired a positive 4.217, with scores ranging from 1 (strongly negative value) to 5 (strongly positive value).

An independent samples t-test was used to compare the participants' satisfaction level of the workshop according to gender, which illustrated that no statistical difference can be accepted ($p<.05$). Both men (N=27, M=4.24) and women (N=19, M=4.17) found the workshop interesting and worth attending.

A one-way ANOVA procedure was used to compare this variable by age (table 2), giving similar results (F=.534, Sig=.661), meaning that the impact of the intervention was not differentiated by the age of the attendees. Multiple comparison tests (Least Square Tests), indicated no significant difference between age distributions and the satisfaction levels of the participants (0.231>Sig. level>0.961)

Table: 2
Satisfaction level of the workshop implementation according to age

Age	N	Mean
<30	13	4,18
30-40	9	4,10
40-50	15	4,28
>50	8	4,17

Time allocation for the workshop turned out to be a rather weak point. This was emphasized during the feedback session between the two workshops and confirmed after the second workshop and the questionnaire analysis. The mean value of the responses to the question "Did you have you enough time to test and experiment on LAMS?" was 3.39. The time offered to the research team, from the organizational board of the conference for the first workshop was one and a half hours while for the second two hours, a duration that proved to be insufficient.

Nevertheless, attendees reported their satisfaction about the organizational framework and the distributed time for each feature of LAMS that presented. The statistical analysis revealed that the workshops reached their expectations (mean value: 4.31) and found the workshops interesting (mean value: 4.63).

The written assignments support and the brief written tutorials of the application served as a positive scaffold for participants throughout the workshops (mean values: 4.435 and 4.239 respectively).

LAMS interface usability was tested through a questionnaire section inspired by Nielsen's ten usability heuristics and adapted for empirical interface evaluation (Hartson, H., Andre, T. & Williges, R. 2001).

Heuristic Evaluation (Nielsen & Molich, 1990; Nielsen, 1994) is a method of usability evaluation where an analyst finds usability problems by checking the user interface against a set of supplied heuristics or principles. Inspired by Nielsen's interface categories, we had adapted the questionnaire which resulted in 11 questions. The aim of this section of the questionnaire was to trace the attendees' perception of the application usability.

Reliability analysis using Cronbach alpha (α) scale indicated a value of 0.840 for the internal consistency of the questions, while the mean value of the section scored a strongly positive 4.17. Given the fact that most attendees were not aware of Learning Management Systems, their comments reflected general impressions of LAMS as a general web application rather than an e-learning system.

User autonomy, aesthetic appearance, feedback provision, flexibility and efficiency for the task designed, were the basic features examined. Mean Values and contributions of each category indicate a positive initial stance towards LAMS as an application (table 3).

The difference between men (M=4.22) and women (4.10) responses was tested through an independent samples t-test, deriving no statistical significance (p=.368).

Table: 3
LAMS Usability Evaluation

Category	N	Mean
Flexibility and efficiency of use	46	4.28
Help and documentation	36	3.81
Match between system and the real world	46	4.48
Visibility of system status	44	4.30
Consistency and standards	43	4.28
Error prevention	39	3.95
Recognition rather than recall	40	4.08
User control and freedom	37	4.14
Aesthetic and minimalist design	45	4.16
Help users recognize, diagnose and recover from errors	38	4.16

Attempting to compare the usability status of the application, according to the participants age, a one-way ANOVA procedure revealed that age was not a variable that influenced the attendees' perceptions about LAMS usability (F=.941, Sig=.430). Differences between the age distributions, one by one, using the Least Square Test revealed scores of significance ranging from 0.130 to 0.920.

The next step was to examine the conditions and pre-suppositions needed to integrate LAMS into the everyday teachers' lesson practises.

A third section with two open ended and three closed questions aspired to gain information about the possibility of enhancing user interaction during lesson projects, using LAMS. By using open-ended questions we tried to obtain the participants perceptions about the potential of LAMS as a tool that could enhance student motivation and interaction and help teachers to promote a self-passed learning community.

Questions such as "Can communication through digital environments enhance student involvement?" and "Can digital communication tools enhance cooperation among students?" gave responses that were contradictory. It was argued whether students would authentically get motivated to participate in online conversations that involved curriculum tasks.

Nevertheless, the adoption of controlled collaboration methods with the use of on-line collaboration tools (chats and forums) in the educational process was warmly welcomed by the attendees (mean values: 4.442 and 4.119 respectively). It seems that although teachers tend to welcome the learning approaches that can be fostered by LMS tools, they are sceptical about their readiness to manage the class. When coming to terms of real-time classroom conditions, a group of attendants addressed the question: "Two hours of a lesson unit is enough to foster peer collaboration in the classroom?" It appears that one and a half hours (the total time of two lesson units) is merely not enough time to promote peer interaction fully (mean value: 3.227).

More time for interaction and can be afforded by utilizing online communication tools, integrated in lesson units. By mobilising students to contribute in written dialogues in forums, chats and other online communication means, the teacher rely on their initial knowledge and therefore, gain an enhanced starting point to negotiate meaning in the lesson unit.

DISCUSSION

This project was a process of intertwining qualitative and quantitative data. During cycle one, we attempted to bring to light and juxtapose the pre-suppositions of each member of the research team. Apart from our different backgrounds, regarding the educational level in which each of us functions, we agreed that LMSs offer something different to educators and students. On the one hand educators need to get involved in procedures of utilizing rich media content and digital collaborative tasks, in a way that corresponds to their classroom needs and the contextual background of classroom community and offer chances of enhanced interaction. On the other hand, students need to get to grips with the new era communication and collaboration tools that seem to dominate in the global marketplace.

This seems difficult in primary education but is substantial in Tertiary Education. In order to have a normal transition from one educational level to the other, the school must afford students with incentives of digital social negotiation.

Are teachers ready to play this role? Are they competent? Can LAMS help toward this renovation in teaching approaches? Quantitative data, derived from the questionnaire, have shown that teachers tend to have an interest in this innovation. As presented in the previous section, teachers had a positive stance towards LMSs and especially LAMS. Their appreciation of the workshop content was very high. And LAMS triggered their interest. During the follow up workshop discussions, it was evident that a positive attitude was generated towards the application and affordances that LAMS can offer educators (in terms of learning design). However, many teachers expressed their concern and scepticism if e-learning, as an instructional perspective, is legitimate for the everyday classroom. Therefore, scepticism about the potential of pure e-learning procedures integration in the classroom was expressed.

Teaching and learning in Greek schools (in primary and secondary level) is predominantly book-centred. Teachers in high schools and elementary schools are highly concerned of transmitting the subjects' contents, in order to fulfil their tasks. Knowledge acquisition is basically measured through measurable tests strictly organized to test whether cognitive schema are acquired. However, minor concern is given to students' creativity and problem solving skills, a fact that was highlighted during the preparatory phase and triangulated at the follow-up discussion workshop sessions.Due to the fact that Greek educational system is highly centralized, teachers seldom have the opportunity to deviate from the official guidelines of the curriculum. Despite their efforts, innovative teachers often feel suppressed and find it difficult to integrate modern teaching elements, such as ICTs, in order to promote student collaboration and problem solving approaches in their teaching practices.

Moreover, the need for mastery of different kinds of knowledge, such as problem-solving, collaborative, affective and meta-cognition skills require new teaching approaches. All in all, it was highlighted that should we, as educators, want to play a crucial role on today's students and tomorrow's citizens, a new approach towards teaching and learning may need to be explored.

Learning takes place in any aspect of everyday life and interacts with social prejudices and cognitive misinterpretations. The heterogeneity of the audience helped to forward a dialogue about the effectiveness of various e-learning types such as distance learning, blended-learning and face-to-face learning. Given the fact that ICTs intrinsically allure students, leading therefore to increasing learners' active participation, we can deduce that e-learning is a powerful means of educational improvement (Clark & Mayer, 2011). Nevertheless, learning is a socially constructed product and face to face interaction is an integral part of the learning climate.

A frequent statement stressed by the participants of the two workshops was "Why choose online interaction when students can interact by using speech in the real world of the classroom". It was argued that the 45 minutes lesson unit does not give the opportunity for extensive peer interaction, nor can it foster students' ability to retrieve informational schema and resources. Blended-learning can take the best of both face-to-face and e-learning approaches, expanding the borders of today's classroom.

On the other hand, there were some statements that opposed to this approach, noting that children already spend too much time on chats and online discussions where common language regulations are rather violated.

The school does not have to enhance this stance. Yet, should the school ignore this and hide it under the carpet, hoping that now-one will discover it, or is it a necessity to seize the opportunity and educate children, in authentic situations, about the proper use of language?

Quantitative data indicated that LAMS, as software, is quite usable and has a user-friendly environment.

Despite the disparity of statements, regarding the potential of its integration in the everyday lesson, the research team felt that LAMS, as an web-based learning environment, can foster student interaction, team cooperation and has the potential to bring about educational change by means of student interaction and active involvement.

This feeling derives from the written statements of the attendees' and the dialogue that followed the workshop.

Data responses to the question "What would you like to do with the conclusion of the workshop?" 40 out of 46 attendees reported that they would like to experiment more on LAMS interface, while 31 statements referred that further recourses and tutorials about the application should be demonstrated. Individuals that do not find applicable and worth implementing an innovation, do not seek for more feedback.

CONCLUSION AND FURTHER RESEARCH PLANS

The focus of our research was to gauge the implications and potential of integrating LMSs in the Greek educational process. First of all Greek teachers had to become aware of this innovative form of e-learning. As Fullan (2007) states, the first phase of educational change is "Initiation", that is "the process leading up to and including the decision to proceed with implementation". Therefore, teachers need to be informed about the existence of LAMS and its basic affordances in order to adopt it and diffuse its use. Workshops, such as the ones that were implemented, can give the incentive to bring about the first spark of interest and provoke reflection among practitioners that want to give an alternative stance in their pedagogical procedures. Having set the theoretical framework and practical considerations, we conducted two tutorial workshops to familiarize teachers with LAMS, an open-source Learning Management System.

This was demonstrated at two national conferences, concerning the integration of ICTs in education. Action Research is a methodology that helped to infuse different theoretical preconceptions and integrate quantitative and qualitative data, regarding the research plan goals, thus connecting theory and action and bringing about change.

Initial perceptions and attitudes regarding whether LAMS could be integrated as a learning tool to create a rich learning environment that promotes peer and student-teacher interaction were to be examined. Despite the initial disparity of the attendees' beliefs, the research team derived the impression that blended-learning has the potential to produce a high quality student-centred learning environment, expanding time and space limitations of the everyday lesson application, was concluded. LAMS as a web application, was warmly welcomed by all the teachers as a user-friendly application that can emancipate them and release their creativeness.

The main advantage of the application is that it offers to teacher tools for applying goals, scheduling materials and organizing the learning workflow according to the needs of the classroom, liberating his creativeness and taking full advantage of the vast recourses available through the web.

It does not offer ready to use teaching approaches or learning materials, and cannot be used unless pedagogical implications are taken into consideration, therefore it can lead to a transformation from the passive teacher that delivers pre-formulated teaching practices to the teacher-creator, who can free up the students' imagination and expand the interaction status of the class. Taking into consideration our personal beliefs as stated during the preparatory phase and the multifaceted data acquired during the last (implementation) phase, we can assume that although teachers have certain objections on integrating LMSs, which stem mainly from the current status of the Greek educational system, they accept relative advantages of integrating on-line collaborative approaches over the traditional face to face approach.

It was argued that LAMS is an application that meets their aspirations on educational change. Teachers are willing to give the technology some opening, as long as several pre-suppositions are met.

In conclusion, we propose that the following suggestions can possibly open a new avenue towards a new instructional approach, which could lead to enhancement of student collaboration and high order learning skills:

- **Instrumentation of professional development strategies, regarding ICT literacy and e-learning pedagogical theory. Conducting tutorial workshops like the those described in this paper is a promising suggestion.**
- **Promotion of an online community, in order to offer collaboration and scaffolding to teachers.**
- **Reformation of the Greek national curriculum of all levels, giving more instructional freedom and emphasizing to student activity and meta-cognition.**
- **Promotion of innovative digital schools, which would focus on the cooperative aspect of learning, in line with constructivist approaches. Students should be motivated to interact with their peers and engage in cross-regional projects.**

Well organized and carefully implemented tutorial workshops can spark teachers' interest and bring about change in the educational process.

Small scale interventions such as these can prove to foster dialogue among teachers of various backgrounds and set the foundations to create on-line communities of practice for innovative teachers.

What is necessary more is to enrich the Greek community of LAMS, by uploading resources, examples of good pr actices and provide feedback and interaction between teachers with common interests?

Empirical evaluation of the integration of LAMS in Greek schools and Universities would offer a comprehensive framework about the potential and the problems encountered in real life learning procedures.

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REFERENCES

Ayala, J. (2009). Blended Learning as a New Approach to Social Work Education. *Journal of Social Work Education*, *45* **(2), 277-288.**

Badge, J. L., Cann, A., J. & Scott, J. (2005). E-Learning versus e-teaching: seeing the pedagogic wood for the technological trees. *Bioscience Education*, *5*, **(May). Retrieved June 23, 2010 http://www.bioscience.heacademy.ac.uk/journal/vol5/beej-5-6.pdf**

Baum, F., MacDougall, C., & Smith, D. (2006). Participatory action research, *Journal of Epidemiology and Community Health, 60,* **854-857.**

Bogdan, R., & Biklne, S. R. (1998). *Qualitative Research for Education. An introduction to theory and methods*. **U.S.A., Allyn & Bacon pub.**

Boynton P. M. (2004) *Hands-on guide to questionnaire research: administering, analysing, and reporting your questionnaire*. **Retrieved June 20, 2010, from http://www.bmj.com**

Brannen, J. (1992). Combining qualitative and quantitative approaches: An Overview. In Brannen J., *Mixing Methods: Qualitative and Quantitative Research*, **England: Avebury pub., 3-37.**

Clark, C. T., & Moss, P. A. (1996). Researching with Ethical and epistemological implications of doing collaborative, change-oriented research with teachers and students. *Teachers College Record*, *97* **(4), 518-548.**

Clark, C., & Mayer R. (2011). *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning*, **ISBN 978-0-470-87430-1, Wiley & Sons, Published by Pheiffer.**

Cooper, C. W. (2006). Refining Social Justice Commitments through Collaborative Inquiry: Key Rewards and Challenges for Teacher Educators. *Teacher Education Quarterly*, **Summer 2006, 115-132.**

Dalziel, J. (2003). Implementing Learning Design: The Learning Activity Management System (LAMS), Sydney: E-learning Centre of Excellence (MELCOE), Macquarie University. Retrieved May 10, 2006, from www.melcoe.mq.edu.au/documents/ASCILITE2003%20Dalziel%20Final.pdf

Dick, B. (1993). *You want to do an action research thesis? How to conduct and report*, **Interchange Publications, Chapel Hill QLD.**

Fullan, M. (2007). *The new meaning of educational change* **(4th ed.), Teachers College Press: New York.**

Gillham B. (2000). *Developing a questionnaire (real world research)*. **London: Continuum.**

Hammersley, M. (1992). Deconstructing the qualitative-quantitative divide. In Brannen Julia, *Mixing Methods: Qualitative and Quantitative Research*, **England: Avebury pub., 39-55.**

Hartson, H. R., Andre, T. S. , Williges, R. C. (2001) Criteria For Evaluating Usability Evaluation Methods, *International Journal of Human-Computer Interaction*, *13* **(4), 373- 410.**

Heinze, A., Procter, C. (2004). *Reflections On The Use Of Blended Learning*. **Conference Proceedings "Education in a Changing Environment". University of Salford: UK.**

Jung, I. (2001). Building a theoretical framework of web-based instruction in the context of distance education, *British Journal of Educational Technology, 32* **(5), 525–534.**

Karasavvidis, I. (2008). Activity Theory as a theoretical framework for the study of blended learning: a case study. *Proceedings of the 6th International Conference on Networked Learning*: **Chalkidiki, 195-202.**

Kemmis, S. (2007). Action Research. In Hammersley Martin, *Educational research and evidence-based practice,* **Sage Publications.**

Manitsaris, S.; Perdos, A. & Pavlidis, S. (2006). An Open - Source Learning Management System (ASDL) Using ICT for High Schools, *In Advanced Learning Technologies, 2006. Sixth International Conference on Advanced Learning Technologies*, **Kerkrade, The Netherlands , 216-218.**

Nielsen, J., & Molich, R. (1990). *Heuristic Evaluation of User Interfaces*, **In Proceedings of ACM CHI'90 Conference on Human Factors in Computing Systems, pp. 249-256.**

Nielsen, J. (1994). *Enhancing the Explanatory Power of Usability Heuristics*, **Proceedings of the SIGCHI conference on Human factors in computing systems: celebrating interdependence, Boston, 152-158.**

Nykaenen, O., & Ala-Rantala, M. (1998). A design for a hypermedia-based learning environment, *Education and Information Technologies 3*, **277-290.**

Oliver, R. (2003). The role of ICT in higher education for the 21st century: ICT as a change agent for education, *Proceedings of the Higher Education for the 21st century,* **Curtin. Retrieved May 12, 2010 from http://elrond.scca.ecu.edu.au/oliver/2002/he21.pdf**

Oppenheim AN (1992). *Questionnaire design, interviewing and attitude measurement*. **London: Continuum.**

Pentaris, G. et al. (2008). "Evaluation of combined Collaborative and Problem-based Approach in a Web-based Distance Education Course", *Proceedings of the 2008 European LAMS Conference*, **in Cadiz (Spain), 149-159.**

Prensky, M. (2001). *Digital natives, digital immigrants*, **On the Horizon. NCB University Press, vol. 9**

Ratto, M., Shapiro B., Truong T., Griswold W., (2003). *The ActiveClass Project: Experiments in Encouraging Classroom Participation*, **Computer Support for Collaborative Learning, Kluwer Academic Publishers.**

Renner, C., & Renner, M. (2001). But I Thought I Knew That: Using Confidence Estimation as a Debiasing Technique to Improve Classroom Performance, *Applied Cognitive Psychology*, *15* **(1), 23–32.**

Roblyer, M. D. (2003). *Integrating educational technology into teaching. (3rd ed.).* **Columbus, Ohio: Prentice-Hall, Merrill College Publishing Company.**

Sapsford R. (1999). *Survey research*. **London: Sage.**

Schostak, F. J. (2002). *Understanding, designing and conducting qualitative research in education*, **Open University Press.**

Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social & behavioral research,* **Sage Publications.**