A Case Study on Tomorrow’s Smart Classroom: The Greek Paradigm

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Abstract

In this report we are going to provide a glimpse of the future of the Lower Secondary (Gymnasio) schools of Greece, thus the attempt of implementing broad use of ICT in the classroom and the issues and constrains that this attempt posses to the educational system, the teachers and the students altogether. More specifically after a number of analogous projects in the past, the Greek Ministry of Education, Lifelong Learning & Religious Affairs (Ministry), realized that the time for a broader use of ICT in the Greek educational system has came. According to various studies the appropriate level of education for this implementation was Gymnasio. So the decision was taken and the first step was to provide pupils and teachers with the adequate amount of notebooks, in a “1-1” model. The next steps would be to install in each Gymnasio the appropriate infrastructure (server & wireless network), training teachers, provide educational software and support. But above all was the necessity for a master plan that would evaluate all aspects and provide a blueprint for the entire implementation.

1. Introduction

Today almost all second grade schools in Greece have at least one traditional Computer’s Lab. That is a special class separated from all the others were, mainly, a number of old PC’s plays the role of workstations. In spite the fact that there are software applications for the support of the teaching of a number of curricula (like history, geography, etc), the computers in the Computer’s Lab are mainly used for the sole purpose of teaching Informatics.

The situation was totally changed in the fall of year 2009 when the introduction of the “1-1” computer model (one laptop per pupil) took place. That time more than 126.000 mini laptops have been given to students of the 1st class of the Gymnasio all over Greece.

That was the beginning of the era of the Smart Classroom of Tomorrow (SCT). Or is it not? Many question and concerns follow this project. Can this step change the way the school works, the way teachers teach and finally the way students, young kids, learn? Is there a bigger plan, something that covers all angles of the problem?

We shall examine, herein, all the aspect of this major effort as proposed in the strategic plan by Research Academic Computer Technology Institute (RACTI). RACTI has been a technical and scientific consultant for the Ministry for the last 15 years. Within this framework it undertook the elaboration of a strategic plan on the way to SCT. In this paper the first steps towards the realization of that plan are described.

2. Lessons Learned

Rapid global technological and economic developments have placed greater demands on education systems around the world [4]. As a reaction to these challenges various countries have responded in different forms and at varying levels so as to enable their people to adapt to change, inspire creativity and innovation, and enhance their ability to apply knowledge and solve emerging problems with confidence.

Policies and strategies have been developed to integrate ICTs into education [1, 3, 6, 7]. A wealth of experiences, good practices and lessons has been generated for the benefit of countries where ICT use in education has just begun as well as those countries where ICT application and integration in education are well established:

1. Advanced countries with integrated ICT in the education system. Some typical characteristics of these countries are as follows: almost all classrooms are equipped with computers and other ICT tools; the student/computer ratio is high; Internet access is available in all schools; curriculum revision ensures nationwide ICT integration; delivery of education is increasingly online.

2. Countries where national ICT policies and master plans have been formulated and various ICT integration strategies are being applied and tested (although ICT is not fully integrated in the education system). While there is great variation in their characteristics, there are nevertheless some common features as follows: national ICT policies in education have been
developed, and the goals and objectives for introducing ICT in various aspects of education have been established.

3. Some countries where efforts towards ICT integration efforts and formulation of national policies have just begun. There are also countries that have no relevant policies but are running pilot ICT projects. In both instances, however, there is insufficient budget to implement policies and work plans and ICT infrastructure and penetration are poor.

Greece is positioned between the second and the third group: The last 10 years various projects have been implemented towards the introduction of ICT in secondary (and not only) school [10]. Nevertheless, it is just the last months that a master plan for that purpose is being under development.

Within this framework, various approaches and relative initiations were examined [2, 5, 8, 9]. Additionally an analysis of experiences and best practices and associated problems has generated lessons learned, which are currently assessed in order to focus on the parts that are applicable in our case.

Based on the above, in the next sections of the paper, the first steps that have already planed are described, in more details.

3. Designing the SCT

The implementation of the SCT should be based on four major pillars: Infrastructure, Content, Training and Support. We shall examine each pillar in more detail.

First we have the Infrastructure, meaning computers & networking equipment. And by computers we mean one mini laptop for every student in a classroom and one for every teacher and a file server for each school. By networking we mean wi-fi access throughout the school, and broadband internet access for every school, through the Greek School Network (the Greek Schools’ Network (GSN - www.sch.gr) is the educational intranet of the Ministry (www.ypepth.gr), which interlinks all schools and provides basic and advanced telematics’ services). All classrooms will also be equipped with an Interactive Whiteboard, a video projector and a locker that will provide safety and power for all mini laptops in the classroom.

The next pillar is Training. And by that we mean training the teachers so that they can perform their extra duties in the classroom. Thus how to use the ICT tools, the mini laptops, the interactive whiteboard, the educational software and the rich content in the classroom. Learn how to provide a better educational experience to their students and how to become better teachers altogether by and through the use of ICT.

Then we have the Content. “Content is the King”, is a saying of our days and is certainly very important. Content, thus rich multimedia one, hyperextend, annotated is the plus to the modern ICT classroom. No more monolithic software. Content that is flexible, reusable and adaptable. Educational components, small and reusable pieces of rich text, adapted to the need of the teacher for a specific lesson.

And last but not least Support. Support in the classroom, in the school, at home, everywhere. Without a proper and sturdy support mechanism the entire construction could collapse at the first blow.

Those are the four pillars of the school of tomorrow. Each one so distinct from the other, but everyone plays its role in this delicate structure.

Moving forward let us give some more insights about this major project.

As a first step to the needed Infrastructure mini laptops were given to all students of the first class of the second grade schools and to the teacher that will participate in this major project. The mini laptop where actually netbook class computers, having low weight (under 1,5Kg), basic networking capabilities (wifi and Ethernet), no optical media drive and a 10" - 11” screen.

Preinstall on this dual boot system (Windows XP & Ubuntu), was OpenOffice, Antivirus & Parental Control software and a set of 16 educational software, that cover some parts of the curriculum of all class of the Gymnasio. Also a full set of all the text books of all the subjects, in .pdf format was copied in each machine.

In every Gymnasio, a server will be installed providing for all netbooks, file and print services, access to educational content, and management of the entire class. The class will be administered with the use of a Classroom Management Software that will monitor all client activity, enable the Teacher to freeze the client, or enable a client’s content to appear to all others.

In each class one or two WiFi wireless access points will provide connectivity of all netbooks, to each other and to the file server. And if needed Internet connectivity (the netbooks will be in a different network island, separated from the administrative school network, providing the necessary security.

An interactive whiteboard and a video projector will be installed in all classrooms that the project application will take place. A locker shall provide power (for recharging the netbooks) and security during off school hours.

The second step is providing adequate Training to all teachers of many disciplines so that they will ready to practice teaching using ICT in the classroom the proper way. They will be made ready to tackle all aspects of the ICT in the class issue, like handling technology, making good use of it and avoiding
technophobia. The stakes are high regarding teacher’s involvement and willingness to carry on with their duties. But with the right training either traditional or blended (traditional and distance learning) the teachers will be ready to perform. The training period shall be divided into three phases. During the first training period, and apart from the standard training, teachers shall prepare education worksheets based on the ICT tools provided and they will test them at schools during the second phase of the training period. And in the third period they will reexamine the outcomes of their in-school practice and further training on specific issues shall be provided to them. After finishing the three phase training, teachers shall be ready to go to their schools and teach students using the ICT tools and methodologies learned.

As to the Content part of the equation, a major issue is to provide for the teachers and the students a well established and easy to use and administer Content Management System, a platform that will enable both parties to collaborate effortlessly. We are aiming in using an Open Source platform so any alterations to the platform could be made without extra cost. This platform shall be hosted in a centralized system, and teachers and learners shall have access through the internet using a standard internet browser and thus providing seamless access to the content. The content should be easily maintained with the CMS, and be as reusable and easily adapted as possible. And then comes the part of creating educational content. The best by far source of educational content is the teacher community. The teachers have the expertise and the deep knowledge of the classroom and what is needed in the context of content. So they will provide, as an ongoing process, content that will be used in the classrooms by their colleagues. A credit awarding scheme shall be established, that will give credit points for those adding high quality content in the CMS. And awards shall be given for those that have the higher score, as a token of their contribution and achievement.

Although there is some specific software available for part of the disciplines that are taught in Gymnasio, some other are not. So the need to develop specific software for those ones is still a need that must be covered. As a first step all software available will be evaluated and tested against the new platform. If gaps where to be found extra provision shall be taken to close them. Keeping in mind that content is our main concern and not the specific software.

And what about the Curriculum? Do we need to adjust, modified or alter it? And how far must we go? This is the trickiest of all. The Curriculum is the foundation on top of which the entire classroom’s teaching is based. And yes, we shall examine the Curriculum in depth, to find all the issues that disallow the implementation of the SCT, and change them. The extent of this modification is not visible yet. But it may be shallow of deep. And it’s a necessity not an option.

Last but not least is the issue of the Support mechanism that has to overlook the entire application of the project since there isn’t a better way to destroy a application than to leave it unsupported. The proposed is a two level support scheme. Well trained informatics teachers shall provide first level support within schools, whereas highly trained engineers shall give the second level support either from the regional educational office or from the Ministry. The training for the informatics teachers shall include handling hardware, network and software issues, as well as support of the teachers of all disciplines in their teaching practices using ICT.

What we hope to accomplish by this massive application?

The stakes are high. We are hoping to provide our students and teachers a new set of tools that will allow them to Use ICT:

- as a tool to promote innovation in the classroom (rich digital content, new teaching and learning methods, new educational environment, etc)
- as an intelligent administrative environment
- as a possibility of broadening the learning process (e-learning, distance learning, etc)
- as a framework for higher thinking (learner centric, self-directed, tailor learning, etc)
- as a way to become better digital citizens for the future to come

And more:

- as a mean of accessing knowledge and information for All from Everywhere
- as a way to overcome technophobia
- as a tool to limit red tape
- as an instrument to diminish isolation and improve inclusion
- as the “answer to our prayers”

4. Conclusions

The last 10 years, the Ministry of Education in Greece, has invested a large sum of money in a number of project for the introduction of ICT in the educational environment [10]. Last year, a major project aiming at the introduction of mini laptops for all students in the 1st class of Gymnasio was launched. In parallel, certain initiatives and supporting actions were designed with an ultimate goal the development of a complete master plan for the introduction of the ICT in Greek secondary education.

In this paper, the immediate actions that are under implementation were described. The obvious next steps include the assessment of the preliminary
results of these interventions as well as the completion of the master plan.

In order to fulfill the last goal, it is obvious that we have to address in depth a number of issues the main of which were identified to be [UNESCO]: (i) broader environmental context, (ii) policy and regulatory environment, (iii) management and financing, (iv) ICT in schools – policy, vision and strategy, (v) technology infrastructure and connectivity, (vi) curriculum, pedagogy and content development, (vii) professional development, and (viii) monitoring and evaluation.

5. References


