TOOLS FOR EXPERIENTIAL LEARNING: 
THE “E²-LEARNING” APPROACH 

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Abstract

“Tell me, and I will forget. Show me, and I may remember. Involve
me, and I will understand.”

Confucius, around 450 B.C.

Learning is a complex task where personal, cultural and social factors play a crucial influence in the
process’s efficiency. Nevertheless, such complexity may be smoothed when learning is achieved through
a natural process and thus made more efficient.

This is what is intended with experiential learning, the process of learning through experience, actively
involving and motivating participants to use their skills in the most positive way to accomplish a set of
tasks previously structured through a variety of instructional methods.

After an experiential recognition of the path to solve a problem, individuals become more able to make
their own reflections and construct different analogies to similar problems. They enhance their global
understanding of facts and develop best practices to solve problems in their everyday life. Also, they
become more able to communicate and thus disseminate knowledge by discussing facts, problems and
solutions within workgroups. This is a whole new level, where experiential learning leads them to the
improvement of their capacity to apply what they learned. It may be considered as an integration or
generalization stage.

We are trying to build e-learning tools as complementary elements of experiential learning in the
education of 12-14 years old kids, bearing in mind the use of outdoor activities as a motivational driving
force to lead the students in maintaining and developing their interest on the subjects being studied.

In this document we resume the work being done in Portugal, with a pilot experience that involves
the study of geography.

We also present WebLets (Web-Learning Education Training System), a tool developed as an e-learning
infrastructure directed to experiential and mobile learning.

E-Learning Information Systems

Since it’s beginnings in the late eighties, internet technologies claimed an important role in education, of
being able to revolutionise the educational system. This promise was not fulfilled. In fact, more than ten
years later, education is probably one of the elements of information society where the impact produced
by technology is less visible.

The problem was probably not with technology but with the emphasis given to technology itself instead
of the improvement it could bring to the learning process. As stated in [3], the mere existence of a tool
may not be a justification for its use in particular ways.

One reason for the limited success of the hypermedia systems in education is associated with the
cognitive overload that results from learners getting lost in hyperspace. Hypermedia is a web of
information rather than a cohesive expository presentation. Thus, when used in an educational system,
care must be taken with the interface in order to minimize ‘disorientation’ [2]. The number of options
available as alternative paths to gather the information and the level of relevance of the information also
has a crucial impact in the efficacy of the system. These navigational difficulties may consequently bring
frustration to the learner that becomes uncertain of his original learning objectives.
These internet based systems also have positive aspects that can be used to give hype to the learning process. The learners have the opportunity to define their own paths in a web full of information, and the system may provide gathering points where different people may interact and exchange experiences. Many approaches to the development of e-learning systems made their emphasis in content management. Those systems were developed as particular applications of traditional database backed websites, providing the same type of functionality as most corporate websites. Specific approaches to content delivering based on user progression and evaluation were the “difference” that tagged a system as educational, and mechanisms for user interaction were in most cases byproducts with limited interest. Many of these systems made their way to the present, being excellent applications, great content repositories but failing as educational tools. This happened mostly because this type of systems place the burden for learning mostly in the shoulders of the learner, thus making learning an individual effort that the system helps to measure and define. But, when we think of our own learning experiences we remember not only what we learned but how and where we learned. A very large part of the value we derive from our educational experiences comes socially and informally from the context [1]. This is particularly felt when we remember some of our early learning experiences as kids, where the social factor (the relationships built around the discovery process) are probably still present in our memories, and are undissociable from them.

When developing e-learning tools for 12-14 years old students, we had to bear in mind the importance of these social factors and we tried to design some new elements that could bring the group context to the frontline and reintroduce the experiential phase in the learning (or e-learning) methodology.

The Virtual side of Experiential Learning

The use of virtual learning environments, emphasized the “virtual” i.e., the non-real contact with the world, as opposed to the experiential approach that assumes a necessity to participate in active real world experimentations.

When we approached the problem of developing virtual learning environments for K12, and assumed as a main objective to develop mechanisms that promote experiential learning, we didn’t want to be tied to a particular trend or line of thought that may be subjacent to this term. We’re developing tools for kids that will be used as complement for their regular classes and could helpfully bring some themes out of the classroom, creating opportunities for their use (for instance) in experiments, games or competitions. Make those themes “sticky” as stated by Malcom Gladwell in The Tipping Point [4]. Therefore, our experiential learning encompasses a broad range of proposal from Kolb’s approach [5] to Priest [6], taking in consideration the work that is being done in collaborative e-learning, contextual learning and the use of social software as learning tools.

We follow the idea that “E-learning should be first and foremost about creating a social space that must be managed according to the teaching and learning needs of those inhabiting that space”[1]. Kids create a very strong community, which results from most of their daily life being organized around the school and their colleagues. Notice that, this type of community is normally stronger than those normally found in the university, in spite of being short termed.

We designed our system as a virtual community, and gave user interaction center stage importance placing it as the most notorious element on the screen. From there it is possible to contact the other elements of the community (colleagues and teacher) and include other elements not directly connected to the school’s environment.

A class web log (blog), where all elements of the community can post and comment was used as an alternative to a discussion forum. The web log works a class diary, which can be used to describe ongoing experiential tasks, the evolution of a “learning competition” or just to help writing the class history.

Online materials are present, as in a traditional e-learning system, where it’s possible to define different forms of content delivery, based on the completion of specific tasks and tests, or freely available. The experiential approach is supported in the form of small tasks proposed to the class, where different groups work together or compete against each other to find the best solution. The fulfillment of these tasks is only possible by experiential activities developed in the real world. The solution of the problem is not automatically obtained after the submission of the group results, there is space for an open discussion based on the results obtained by the different groups and only after an online or in class debriefing the solution is revealed.

These experiential tasks may assume different methodologies and are roughly divided in three main types:

- TPPR - Teacher Proposed, Parallel Resolution task
- SPPR – Student Proposed, Parallel Resolution task
TPCR – Teacher Proposed, Collaborative Resolution task

A TPPR task is essentially a task proposed by the tutor, that the different groups of students will try to achieve independently, with limited interaction. The different solutions obtained may be discussed, as after submission, each group may access information regarding the solutions submitted so far. These results are presented anonymously, but they refer the different solutions obtained and the number of groups that supported each solution. These results, which may be pre-edited by the tutor, are unavailable for all the groups that didn’t submit their solutions. It’s possible to re-submit a different solution (or not), and information about all group interactions is kept by the system.

The second type of task (SPPR) differs from the first in the sense that the some particularities of the task are defined by the different groups. Typically, this activity assumes the form of a competition where each group proposes a problem that must be solved by the remaining groups. These problems are clearly defined under the scope of a specific task, for instance, in the context of our case study, the problem could be to “hide” the treasure, and define its localization using geographic coordinates. The same principles apply in respect to the discussion of results and final debriefings before any final results are assumed.

The last type of task (TPCR) is a collaborative task where each group will have a different role in the development of the project. In this case, all the groups are expected to be collaborative in the fulfillment of each others tasks and the discussion and interaction among all the elements is expected and promoted during the whole process.

Mobility may play an interesting role in the efficacy of this solution, making it possible to interact with system directly from the field. In our examples, which we explore in the case study, the use of a GPS (Global Positioning System) equipped PDA makes it possible to precisely define the position of objects used in experiential tasks. The use of these handheld devices may also be interesting as a form to record audiovisual information that may be used later, in the classroom and in the discussion phase of the results.

The use of video may represent an interesting complement of this type of experiential work, as the availability of equipments for recording and home editing may bring video to the frontline of the educational tools. Video is, in many fields, a fundamental tool for analysis and performance assessment. Its use opens the possibility not only to review the technical and tactical aspects of the solution adopted in the task resolution, but also to see it from a different perspective, an outsider perspective. But the use of video (digital video) may be greatly enhanced by the use of a technology that is already being used in other fields: video annotation [7, 9].

With this type of tools it’s possible to make annotations over a video, i.e., to insert small textual notes as well as images or even other audiovisual elements. The notes are stored along with the video and may (or not) be shown when replaying the video. The notes written over the video of an experiential activity may be an interesting form of discussion in the debriefing phase of the task and an interesting element that may be reused as a new learning content.

The video annotation tool, which is being developed by MaDLabs as a standalone utility, is integrated with the system in its collaborative form, enabling different users to create notes and review the movie with each other notes [10]. The user may define the annotations he wants to see when playing the video, based on the author and theme of the note.

Finally, a system like this needs personalization mechanisms, which give each user the opportunity to adapt the system to their own needs. Personalization may be present in different forms from content to layout personalization, explicit defined by the user or automatically suggested based on user profile analysis [8]. The personalization features are in an early development phase and at this stage particular emphasis is being given to group personalization. The creation of implicit and explicit groups of users, as a form to promote interaction based on natural social networks and on the similarity, sometimes unnoticed, of user preferences or interests.

WebLets

WebLets (Web-Learning Education Training System) was developed as an e-learning infrastructure with expansion modules directed to experiential and mobile learning. Its core is a traditional e-learning platform with support for shared information, collaborative features, user tracking, and different mechanisms for user interaction. It offers a set of tools that constitute data repositories relative to presentations, resources, references, links, homework, notes, files and other information.

Interactivity with the WebLets’ platform is accomplished by using a web browser as a client. WebLets manages several user profiles, according to which different interaction styles and methods are made possible.

It supports progressive and conditional content delivering, based on time and user evolution. The modules under development will extend this content delivering to conditions based in user localization. These
mobile modules are very important in the context of experiential learning since they will enable students to go practice “in the field”, be connected to the system and gather information and to answer some (practical) questions.

The WebLets platform enables a high level of parameterization and allows the hosting of several pedagogical structures, i.e., a set of elements generated by some methodological system in a coherent way in order to integrate didactic units, modules and/or thematic, to give the content a proper identity. Besides a generic methodological structure, other specific structures may be added in order to fulfill the needs of the client organization.

Mobile services and video annotation are being developed as separated autonomous modules that can be used as standalone utilities and also as part of WebLets.

WebLets was developed by Newmind, a Portuguese Multimedia Company in collaboration with the MaDLabs, Multimedia and Database Laboratories of the Polytechnic Institute of Setúbal.

In its next version, we hope to be able to make WebLets more adaptive by creating tools to transform generic e-learning contents into new formats compatible with standards like EML (e-Learning Markup Language), AICC (Aviation Industry CBT Committee), IMS (Global Learning Consortium, Inc.) and SCORM (Sharable Courseware Object Reference Model).

Case Study – Geography for K12

Our case study proposes the use of WebLets as a complementary tool, to enable off class study through experiential learning. The experience is being developed with 12-14 years old students, with basic knowledge about the use of the Internet and web technologies. The chosen theme was the Portuguese geography curricula of the seventh grade. These experiments took place in a school situated in a small Portuguese village called Sesimbra.

In order to obtain some insights about the way kids of that age react to the use of internet and internet-based systems, we developed some experiences involving the presence of lab members at school to help the kids to develop a web site about their village. Most of the work was developed by school teachers associated with the project, being the presence of lab members occasional and structured as small workshops. This experience took place over the last year, and the kids were taught html language and website design, with the objective of making their sites available on the internet through one of the MaDLabs servers (projects.mdlabs.est.ips.pt/etk12).

During that time, some experiments were made about the creation of web contents related with the geography curricula. The contents were developed according with the manuals used by the students, but they differ from the materials used in classroom. The materials available online are more closely related with exercises and applications of theoretical concepts presented in classroom.

By having some insights about webpage creation students had some curiosity not only about the geography contents but also about the details of the web pages, behaviour not yet assumed as a good or bad achievement.

The experiential tasks described earlier, were tested using a small collaborative infrastructure, and were related with one particular module of geography curricula: localization and cardinal compass points.

Students log to the system, and find problems posed as challenges that require outdoor experimentation, normally in the school backyard. The tasks involved virtual treasure hunting, where the road map was defined as a combination of distance and cardinal compass orientations. The problems were defined as off-class tasks that students would try to achieve during the week.

A small blog played the role of main interaction element, used for discussion and debriefing, while email and sms messaging were not a viable option due to the nature of the social level of that particular community. The students also had the opportunity to use the system to access their homework and upload work materials back to the system after accomplishing some task, but this feature was not used in these experiments, mainly because of limited internet access (most of them only had the opportunity access the Internet at school).

Conclusions and Future Work

The joint work developed by the MaDLabs and the staff of Sesimbra was a very interesting form of cooperation between a school of Technology and a 7-9th grade School. We hope this experience continues, as the new features of the WebLets infrastructure are being developed.

The methodology proposed for introducing experiential mechanisms in WebLets proved to be interesting and motivating for the students, but the level of interaction created among them was still very limited. It’s necessary to develop more appealing forms to promote online interaction and we believe that the blog based class journal or diary may have an important role at this level.
Content development is not a top priority for now, but the focus will continue on the geography curricula of the Portuguese 7th grade. Content creation will be focused on the design and development of new experiential tasks and new forms of interaction during task resolution. A new layout is being developed which improves the usability of the system, and promotes interaction upon content assessment and browsing.

A key element in supporting the new mechanisms being developed is the introduction of mobile devices as means of accessing and providing new contents to the system. We hope it will be possible to provide the school with several GPS enabled mobile devices that may be used to provide input for the system. These new mechanisms place special emphasis on the mobility and localization issues. We assume that, in order to improve this experiential learning approach (“e2-learning”), we must provide the student with the possibility of being more permanently involved in outdoor activities without the necessity of returning to his home/school computer. Mobility plays an important role in this goal, as different types of mobile devices may be used to access and interact with the system.

Other features are based on localization services associated with the mobile devices. Exercises and outdoor activities may be planned based on the geo-localization of elements which the students need to discover and identify.

The video annotation module of the Web Lets will be tested first as a standalone tool, which may be used to create notes over videos filmed during the activities being executed. The experience from other fields of activity showed that video annotation is a natural and easy to use solution, which people easily adopt as an interesting solution for performance analysis and discussion. We believe the role of video annotation as a learning tool is something worth exploring.

Finally, and among all we hope those experiments make learning the joyful task it should be.

References

6. Everything you always wanted to know about judgment, but were afraid to ask. Journal of Adventure Education and Outdoor Leadership, Priest, S. 1990