

# E-LEARNING: AN OPPORTUNITY TO SUPPORT THE INDIVIDUAL, THE GROUP AND THE COMMUNITY

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**Abstract** The authors proposed a content management approach to develop a Web-based learning platform that were implemented and used to support both presential and distance education. The project, named EFTWeb, focus on the need to support both content and context. It provided the basis for the current research concerning the impact of new learning approaches.

This paper presents current research extending EFTWeb to provide a broader environment that takes advantage of e-learning concepts by augmenting the framework to include beyond content and context, the experience dimension.

The augmented framework relates education activities with the individual, the group, and the community, addressing how e-learning can be used to support learning experiences.

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## 1. INTRODUCTION

Education, learning and training are among the areas of great potential for innovation. This enormous potential can promote modifications both in the processes and in the way that these activities are performed. Despite presential teaching almost remains the same for the last four centuries (Puttnam, 1996), with current available information technologies and its impact each day new signs can be seen of the growing difference between what students want and what society needs and what institutions can provide. Even teachers seems somewhere lost by the pace of change and by the lack of interest among students to attend, discuss, and produce work in a traditional education environment.

Opportunities to take advantage of information technologies in educational settings are reported by several authors, as described by Harasim: (Harasim, 1995) and Papert (Papert, 1993). In particular, there is an opportunity to innovate by reinventing time and space constraints in educational settings (Gouveia, 1999) and introducing computer and network support on presence teaching (Gouveia, 1998).

However, the use of Information and Communication Technology – ICT – generally does not introduce innovation into educational practices although they offer tremendous opportunities for that (Goodyear, 1999).

Additionally, rethinking education, training and learning is crucial. We can state that, more and more, students are seen as customers and also as information and knowledge buyers. Why not to consider them also as knowledge builders? To address this, a different approach concerning their production as papers, essays, and other work must be considered. A model taking into account a content management approach is proposed in the following section, named as EFTWeb.

## 2. THE EFTWEB MODEL

The EFTWeb results from research efforts concerning the lack of integrated solutions to reuse the contents generated ongoing by teachers and students from each discipline. System functionality is extended in order to make possible content reuse between different disciplines from different teachers and within different educational situations. EFTWeb supports Education, Learning and Training, taking advantage of existing Web facilities. In the proposed system, teachers and students are treated as clients. These clients can choose a profile, use credits they have acquired, and be certified as content producers. The EFTWeb implementation has several integrated services: webmail, chat, recommender system, and document sharing providing a platform used to test the EFTWeb model ideas. A browser interfaces these services as well as the access to on-line information for both presence and distance learning.

The model novelty is to use a database structure, whose focus was directed to clients, security and cost supervision. The discussion of existent cases studies and current uses are presented in (Borges Gouveia et al., 2000), and a comparison with other well known web based learning platforms is provided by (Gouveia et al., 2000a). In order to fulfil security and cost requirements, some integration mechanisms have been developed. In the system core, contents classification based on thesaurus technology is placed along with the contents, allowing great flexibility for classifying and searching. This approach also allows the creation of context description of a given knowledge topic as it can be used to inform a textual search engine and thus provide integration with available content by providing a selected set of terms / words that can be related with a given topic, a particular content or need.

The EFTWeb takes advantage of being a Web-based system and it attempts to address both the requirements of presence and distance education. For presence education use, EFTWeb deals with the content management issues of relating contents allowing their reuse. In distance education it extends those facilities providing the means for synchronous and asynchronous interaction between users (students and tutors) and allowing them to share content. Additionally, by providing a semantic description for content (the thesaurus use) as a strategy for content management, an extra level of flexibility is provided for use in many forms of education and learning and to support those who have strong reuse content requirements.

### 2.1. Discussion of EFTWeb merits

Taking into consideration current education, learning and training processes, EFTWeb stresses content reuse by allowing its combination based on existing context creation facilities. These facilities are implemented by the creation of a thesaurus and its flexibility based on alternative catalogues for each context allowing alternative contexts to access content. These contexts can exist and be used at the same time for different users and be replaced at any time for each user, providing alternative support to access content. Two important issues arise: first, there is a need to deal with the available resources in a flexible way – specially the ones concerned with content; second, allow combining different

education activities for extending and explicitly describe resources as contents and as contexts.

EFTWeb proposes a model to support the need to store, represent and maintain both contents and semantic of contents in order to allow contents relations in an independent and not previous known ways. This characteristic allows context support along with contents also with semantic support given by using thesaurus technology.

The EFTWeb system tries to bring innovation to education, training and learning processes, through the use of the Web by presenting a framework that bases teacher and students' interaction on the materials and tasks to be accomplish. In the proposed model content has the same importance than the means for classifying it (Gouveia et al., 2000).

The EFTWeb model is implemented with available widespread technology. To support content distribution, World Wide Web becomes the natural solution. It has a lot of information available that needs to be mediated for being trusted. Also, its information can be searchable and exists in a digital format, in particular using a textual search engine. Web access is possible with a personal computer and standard software which turns its cost acceptable.

To support content, database technology is used. This technology eases the storage and retrieval of contents and allows multiple and concurrent accesses supporting multimedia storage and logs activity. It also provides proven means for search and dynamic maintenance of contents and model data structures.

To support semantic structures, where relations between contents are of importance, thesaurus technology is used. This will provide the necessary flexibility to access content by using a set of ordered concepts that allows to store, with each content, independent semantic and high order relationships.

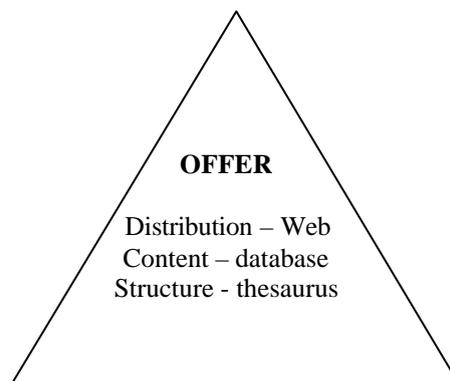


Figure 1: The offer concept within the EFTWeb model

The combined use of World Wide Web, databases and thesaurus technologies are designed as the support for the system offer (distribution plus content plus structure) and constitutes the system core added value. Figure 1 represents the offer concept.

One of the more relevant features of this model is the use of thesaurus technology to structure content related semantics. The thesaurus is used to describe a particular model of knowledge about a given area in terms of keywords and relations between these keywords. The system allows the creation of several different structures in the thesaurus, for different overlapping classification systems to use at the same time (Gouveia and Borges Gouveia, 2002).

The model proposes two types of services: administrative services that allow users to enter the information necessary for system operation, such as user information, content and structure information; and regular services for system operation, and user services.

The administrative services are:

- ? *certifying and authoring*: certifying contents and authoring scripts;
- ? *version control*: promoting and maintain related content collections;
- ? *catalogue creation*: complementing the thesaurus with additional information by introducing lists of available thesaurus keywords with correspondent weighting factors.

The EFTWeb user services are (Borges Gouveia et al., 2000):

- ? *mail*: each client must have access an email address to send/receive messages;
- ? *dialog*: allow client chat in real time. The service is organised in rooms that groups users by topic;
- ? *personal area*: works as a system portal, proposing a link collection;
- ? *personal folder*: the place where the client place his documents with the option to share them;
- ? *search engine*: available for textual search and thesaurus search (by directory);
- ? *guides*: defining the content sequence (*knowledge road*) to be used. It groups available guides, units, and content.

## 2.2. EFTWeb limits: the need for a experience dimension

To describe a given context, EFTWeb uses its thesaurus and catalogue facilities. The thesaurus provides the structure support for content reference. The catalogue allows to leverage the use of thesaurus both by providing equivalent terms to refer a given context wording and to add extra semantic to the one provided by the thesaurus.

For example, for a thesaurus entry, named *client*, we can have different associations with alternative catalogues. One such catalogue can be used to describe a Medical Care context as *patient*. Another one can be a Government context where we have *client* related with *citizen*, or considering a School Context we may have *student*.

The creation of additional extensions for existing structures (provided by thesaurus) can be obtained using catalogues. This approach follows the use of Concept Maps and implements it as a set of catalogue terms. Concept Maps provide context information and the high level meaning to a specific situation or approach (McAleese, 1999). Thus allows existing content to be found using a textual search or, alternatively, taking advantage of existing content classification using the catalogue terms, more close to a particular user context, and taking advantage of its association to thesaurus entries. A more detailed discussion of the thesaurus and catalogues use is provided by (Gouveia and Borges Gouveia, 2002).

Although a number of successful uses of the system have been reported, (Borges Gouveia et al., 2000) the system lacks the mechanisms to support user orientation concerning the learning process. Even when having specific tasks to be accomplished, the present of someone that provides orientation and guidance is a requirement. For example, having a number of alternative contents, even with a precise context, can bring users to the feeling of information overload, which degrades their understanding (Wurman, 1989).

With the creation of contexts, the effort goes into providing such environment where a user can interact and solve its problem in a finite and well behaved space. Such strategy can

provide limited results, especially when more complex and unstructured situations are in place. Thus, to learn more about complex settings and become able to resolve them in a normal environment, it will help to offer an augmented framework, when compared with EFTWeb, where available content and contexts can be explored and experimented.

The basic idea beyond the concept of experimentation is the process where error, negotiation, trial and construction is based on collaborative efforts and mediated by people and not by non-human elements as content and context (Hutchins, 1995).

### 3. THE EXPERIENCE DIMENSION AND E-LEARNING

The use of a number of technologies to support computer based learning provide the opportunity to foster the learning experience. The use of collaborative facilities made possible by new ICT devices, CSCL systems (Computer Supported Collaborative Learning) and virtual environments promise to advance new ways to deal with data, information and knowledge (Gouveia, 2001).

Experience can be seen as the “ultimate strategy for learning”. In fact, as is the case of an ancient Chinese proverb: “*I hear and I forget, I see and I remember, I do and I understand*”, experience has been for many years considered as a key factor to the learning process. Other example of such assertions comes from Sophocles: “*One must learn by doing the thing. For though you think you know it. You have no certainty until you try*”.

Botturi proposes knowledge as relationship (Botturi, 2002). The same author defends that cognition is a process aimed at establishing effective knowledge relationships between the subject and the world. Such position provides an interesting perspective concerning the use of ICT in education, learning and training.

Although it has also a dynamic, learning can be described as a process with three main steps (Lonergan, 1990):

- *experience* (objects of perception): the subject perceives the object. Perception is to be understood as a partially unconscious but active process;
- *understanding* (objects of thought): the subject reconstructs a mental model for the specific knowledge object. This is the main focus of the constructivism in education.
- *judgment* (objects of knowledge): the subject turns to the acquired understanding or concept, requiring the gathering of evidence in order to accept the model constructed by the learner: thought is transformed in knowledge.

Botturi defends that having such processes in mind, ICT can not guarantee learning, but may help establishing knowledge relationships by managing adequately data and information, providing support for conceptualisation and creating a favourable social environment (Botturi, 2002). E-learning as the means to use both a digital paradigm and infrastructure to support learning, provides those advantages reported by Botturi.

Shneiderman proposes four activities of the new education, learning and training (Shneiderman, 2002):

- *collect*: gather information and acquire resources;
- *relate*: work in collaborative teams;
- *create*: develop ambitious projects;
- *donate*: produce results that are meaningful to someone outside the classroom.

For our purposes, we define three different set of humans considering the learning process. The first is the Individual itself. Each one of us acts independently and learns in a very particular way. Learning is considered by many as an individual activity as was boldly stated by Willard Wees: “*Nobody Can Teach anybody anything*” (Shneiderman, 2002). The second is the group, considered here as a finite set of individuals who are grouped together for a common goal or activity (Oravec, 1996). The third and last one is the community. Communities are groups of people engaged in similar activities although no formal rules at least of a structured nature apply (Oravec, 1996).

We can consider the use of the EFTWeb model as a possible core for a larger and more ambitious model. EFTWeb provides the services to share, develop, and reuse context and even context and experience initiatives. Additionally, it also considers the need to synchronise those resources with activities such as education, training and instruction as well the individual, the group and the community. However, as the core of the proposed augmented framework specifies, alternative platforms, technologies and models can be adapted and used.

Figure 2 summarises the integration of all these elements in an augmented framework to support e-learning. In fact, e-learning can be introduced as an overall “bird’s eye” of the augmented framework. To support content, context and experience and take advantage of such concepts for the individual, the group and the community, we need to have ICT to support them in an effortless way. The use of digital strategies seems to have a high potential as it provides the means to collect, relate, create and donate information, necessary to the learning process.

Taking figure 2, another level of relationship can be made. For the individual, its relationship with content and experience provides him/her with the motivation for proceed his/her learning. For the group, its relationship with content and context seems to be more related with the school or enterprise environment, where a group of learners are engaged into a number of detailed and standard learning activities. For the community, its relationship with context and experience provide the “ad hoc” learning resulting from our activity as citizens, users, professionals, clients and, above all, humans.

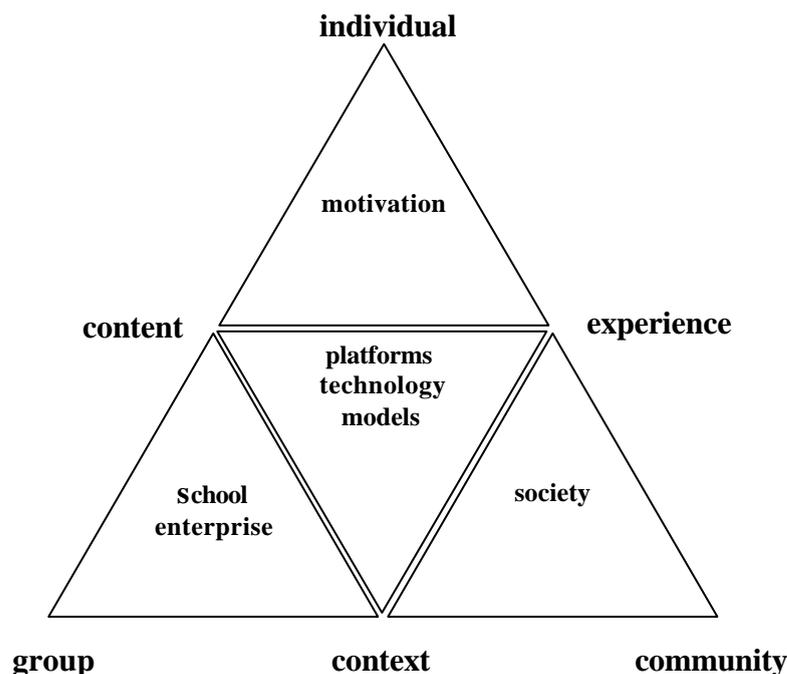


Figure 2: The augmented framework

#### 4. FINAL REMARKS

This paper presented the ongoing research resulting from extending EFTWeb in order to provide a broader environment that takes advantage of e-learning concepts by augmenting the framework to include beyond content and context, the experience dimension.

A high order framework is proposed to provide an integrated view that relates the notions of education activities with how they can support the learning of the individual, the group, and the community. Considering three education activities such as the traditional education setting – education, the case of oriented and practical learning – training, and a more focused situation where particular settings for learning are built – instruction. Those education activities can be supported by an infrastructure that combining content, context and additionally provide the means to support the experience dimension.

The authors argue that with the proper setting, we can taking advantage of existing Web-based learning platforms and create new strategies to relate the individual, the group and the community within a learning experience by fostering their interacting.

The augmented framework that relates the education activities with the individual, the group, and the community provide a viable approach to further research how e-learning can be used and considered an opportunity to support learning experiences and allow the engagement of individuals in the learning process.

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