

Innovative e-learning experimentations by use of Waheeb, a Tunisian platform

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Abstract.

In Tunisia, the development of on-line courses and concrete e-learning experimentations are very rare and yet unexplored [AB99]. In this context, the e-learning team of the Higher School of Sciences and Techniques of Tunis (ESSTT) worked since several years on two aspects: pedagogic and research. The object of this paper is to present experiences and works carried out by this team, especially the pilot e-learning experience recently done by use of the Tunisian e-learning web-based platform Waheeb, and team reflections about the concept of intelligent e-learning system.

1. Pedagogical aspect:

Believing that e-learning is different from classical learning and that needs a new pedagogy which takes in consideration the new situations and tools of learning and teaching, the ESSTT proceeded, via a collaboration Tunisian-Canadian project, to acquire the Canadian platform Theorix for e-learning. This project allowed to train some teachers in numeric pedagogy and production of multimedia courses to diffuse them via Internet. This project allowed to do first experimentation of these new methods of web based teaching. The team of e-learning, constituted mainly by those teachers, contributed in the design of the first Tunisian e-learning platform called Waheeb [CJ02].

Effectively, at the beginning of 1999, Waheeb started as an academic prototype of an e-learning system designed and developed in order to have a pedagogical framework adapted to the Tunisian context and its learning system. Furthermore, at the beginning of 2000, e-com-soft, a Tunisian start-up, adopted the project and took the role of promoting and commercializing it. E-com-soft have worked and continues to work in collaboration with our research team to produce a professional and robust e-learning system that allows colleges and universities, corporations and commercial education providers to bring their academic, administrative, community and other educational services on-line.

1.1 Waheeb description

Waheeb is a Web-based learning platform that provides a fully integrated student environment, learning management system, and a range of custom content creation and publication tools. The goal of Waheeb designers is double: a general goal which is the contribution of the evolution of e-learning by the development of efficient system, rich in functionality and tools who assist users, especially teachers by means of high level Learning Content Services (LCS). Thanks to this LCS, teachers can create multimedia contents, integrating text, images, video, animations,... without requiring HTML programming. The second goal, which makes the originality of Waheeb, is specific : it's related to Arabic language. In fact, due to the unavailability of complete Arabic e-learning platforms, the

objective was the development of a platform which can be used completely in Arabic, of course in addition of other languages such as English and French.

Waheeb offers three modes of use reachable via a Web navigator.

1.1.1. Student mode: student can learn accordingly to his appropriate rate of comprehension. He benefits of a set of tools that assist him during his learning process. The system lets him navigate freely in the course structure, download and print documents, communicate with his colleagues and teachers (an intern e-mail function), plan and organize his learning, homework and exams (calendar function), participate in a forum which is related to his course and animated by a teacher to share ideas and opinions with the virtual classroom, to take personal annotations, to discuss directly with his colleagues (chat function), to do interactive auto-evaluation exercises and to submit evaluation and works to his teachers.

1.1.2. Professor mode : Professor benefits of a complete set of tools for content creation. It allows him to integrate any kind of material (text, image, video, flash animation, Java applets...) and hyper links to internal pages of the course or to extern Web sites. Those tools allow an easy production of high quality pedagogical material. In fact, the system doesn't need any HTML or programming knowledge. In addition, this mode offers to the teacher a complete set of tools for communication (e-mail, chat, forum, calendar), tutoring and evaluation of his students.

1.1.3. Administrator mode : the task of the administrator is the management of the system users : students and teachers. He defines for each one his access rights and accords to him authentication login and password. He has to manage on-line registration of students in addition of the administration and the control of course sites that teachers realized.

The advantage of Waheeb, among others, is its richness of functionality for the three modes, its simplicity of use and its uniform environment presentation of courses. Finally, Waheeb gives more importance to social contacts of virtual class: students are allowed to edit and consult their profiles and personal pages.

1.2. Pilot experience

In order to explore the different aspects of this new mode of teaching and to analyze how it can be efficiently realized, the e-learning team proceeded to realize a pilot innovative experience of e-learning in Tunisia. It developed two courses of MS-Word and MS-Excel and started teaching a group of 130 students of the first year of computer science bachelor. The courses were developed by teachers with the help of two specialists in multimedia to treat images, audio and video sequences and to prepare flash animation and Java applets.

The group of the 130 students was divided into 8 groups of 16 students. All students received 8 hours training in operating system and 2 hours training in the use of the platform Waheeb.

Indeed, the team had to choose between the two platforms Waheeb and Theorix. The choice was Waheeb platform for many reasons. The most important of them were :

- **Simplicity using :** Waheeb offers an interface which can be easily used and based on three modes : student, professor and administrator whereas Theorix is based on five modes : system administrator, client administrator, author, facilitator and student.
- **Uniformity :** Waheeb presents all courses in an uniform way based on standard template with navigation tools and communication and customized functions.
- **Richness of functionality :** Waheeb is a three-language platform : Arabic, French and English, it has its own communication tools (e-mail, chat, forum, ...). At any moment, a student can be able to know who from his colleagues is connected and can, then, contact him.

- **Richness of the evaluation tools:** Teachers can produce exercises in multimedia format and can interface them with any software related to the course.

- **Inter-operability (import/export tools) :** Waheeb can host contents created with standard HTML editors or other platforms. The contents created with Waheeb LCS can be, also, exported in HTML format and hosted in other platforms.

Finally, disposing of the source program of the platform was also an other reason to choose Waheeb system. In fact, thanks to this, we have the possibility to obtain all kind of data related to the use of the platform (i.e. time connection to a course, last date of connection, number of tentative before a right answer, ...). This data is used therefore by the team for both pedagogic strategies and research.

1.3. Evaluation of the experience

We note at first, that the experience, started at the beginning of November, is not yet concluded (it will be ended in the few forthcoming days). To evaluate this experience, we plan to perform two kinds of analysis :

- Statistical analysis of data delivered by the platform : our object here is to know the rate of the use of tools and resources and to constitute eventually relations between the relevant criteria and aspects of e-learning such as the use of a particular tool and time of connection or number of visits...

- Analysis of users appreciation : questionnaires will be distributed to both students and teachers in order to obtain their appreciation about different aspects. For students, questionnaires will focus, particularly, on the facility of using the platform, course's structuration, communication, ... Whereas, for teachers, the questionnaires will concern two points of view: the pedagogic strategies and quantification of efforts required for this new learning and teaching mode, such as time of content creation, time spent to communicate with students (respond to e-mails, Chat, forum animation) and time needed to correct assessments.

Even if the experience is not yet fulfilled, we can enumerate some positive points :

- Elimination of psychological barrier : students can ask questions and do pretests without the hesitation and the inconvenience of classical situations.

- Discrete contacts : student can freely communicate with his teachers or colleagues via e-mail or chat.

- Personal annotation : indeed courses are available, students can take annotations and remarks which they find pertinent.

- Possibility of feedback : students can review all notions at any time.

- Respect of individual rate : every student can learn at his appropriate rate.

- Amelioration of pedagogical methods : teachers benefit of environment providing sophisticated LCS to produce contents of high quality.

- Permanent availability of courses : teachers invest once in course production, furthermore they concentrate in their main task (i.e. teaching, helping and tutoring students.)

- Flexibility of teaching schedule : the constraints of scheduling traditional teaching and training are eliminated.

2. Research aspect :

To our knowledge, actual platforms are systems that benefit and exploit new opportunities of Web technology and networks becoming more and more efficient and performant. Those systems are focused on pedagogic aspect of training and teaching (creation and diffusion of courses, preparation of exercises, ...) and the use of communication tools to teach or assist students. However, those systems are unable to detect the level of students, their weakness

and difficulties they meet. Furthermore, they are unable to react with students and to propose to them solutions to fix their problems. This is certainly due to the evaluation systems used in most e-learning platform which just permit the student to do interactive exercises of kind QCM or associations or, in the best case, open questions that he has to do and submit to the teacher.

In fact, we believe that efficient use of new technologies of information and communication for learning and teaching needs more than a performant system which gives its users technological tools [DL00]. It needs intelligence to be adapted to the new situations of learning. In this context, the object of the works of the team is the design of techniques, approaches and tools able to grief intelligence in e-learning systems to guaranty their best results. Particularly, the reflections are focused on these points:

- Automatic detection student level (before e-formation)
- Detection of particular student weakness (during the e-formation) after the analysis of his answers to exercises and pretests and eventually the possibility to propose to him an adequate performance program.
- Individualization of student formation program.

Our vision of such system is mainly based on the elaboration of dynamic questionnaire generator to compute student level. This generator performs calls, at any step, to an intelligent analyzer of answers to decide the next question to propose. The level computed will lead afterward to generate automatically, for every student, an appropriate training program. This vision affects the course design and requires a new approach for structuring formation.

Conclusion

In this abstract, we have presented works done by the team of e-learning of the ESSTT. Those works concern both pedagogy and research. Particularly, we have described the pilot experience of e-learning and our reflections about intelligent e-learning system. In the full paper we will give the detailed description of the evaluation of the experience.

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