

Feijoo.net: An Approach to Personalized E-learning Using Learning Styles

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Abstract. This paper proposes a model of adaptation called Feijoo.net. Feijoo.net is a system which adapts contents and the presentation of these contents to the learning style of each student. In this model, contents are separated from their presentation on the Web. Feijoo.net is focused on university students. The main goal is to get an adaptation model of the learning of each student following the directives proposed by the cognitive psychology and pedagogy.

1 FEIJOO.NET

One of the major obstacles in Educational Web Sites is the imitation of the traditional way of teaching based in the master class of a teacher due overcrowding in universities. In these circumstances, the teacher cannot do a full adaptation to the learning style of each student because there are a lot of students in the classroom and it is impossible to do it. So, Internet can be an adequate resource to do this adaptation because it is a mass media and the content of individual dynamic pages can be adapted to each learning style.

Nowadays, the Educational Web Sites do not show different contents and presentations of the contents to be selected by the students. In the design of Educational Web Sites it is very important to have prepared the objectives of learning, the motivations, the previous knowledge and the preferences of each student. It is evidence the first step towards the design of high quality courses is the user classification.

Feijoo.net uses the test of CHAEA [1] to classify the user. This test returns the learning style of the student. The cognitive styles are the way of thinking, processing information, and learning of each individual student.

This test returns the preferences of the student at the time of learning. There are four styles in this classification: Theorists, Activists, Reflectors and Pragmatists. Each style has its own characteristics and particularities.

Actually, Feijoo.net is adapting the learning styles : Theorists and Activists, because they are the base of the adaptation for the rest of styles. The goal is to adapt the content and the presentation of these contents in a course to students belonging to the cognitive style : Theorists and Activists. This adaptation will increment the quality and the usability of Educational Web Sites. The usability is a subjective factor and it is difficult to measure it, but when a user is comfortable with the site, the usability will increment [2].

Feijoo.net has three main components: the University Student , the professor and the Adaptation Core is how to link and organize the adapted contents.

In the following sections, we are going to explain the particularities of each agent.

2 University Student

In our model the principal agent is the university student. The Test of CHAEA returns the cognitive style of the student, therefore, preferences contribute to their learning.

The student will be registered in one or several subjects. The first time the students enters the system, FEIJOO.NET will request him to do the test of CHAEA, so, the system will know his/her cognitive style. Following times, the student has not to do the test because his/her cognitive style will be stored in database.

The student will select the subject of the course and the Adaptation Core will get its content and the presentation according to the cognitive style of this individual student.

3 The Professor

The professor has to do a planning of the subject. In fact, the professor has to do a didactic programming. This programming consists of a temporary programming, where he/she has to decide the didactic resources, lessons, duration of the lessons, etc.

Previously the professor had had to think the general learning objectives the student has to reach at the end of the course. This general learning objectives have to match with specific learning objectives the student has to reach in each lesson.

When the professor knows the general and specific learning objectives, he has to create the content of each lesson adapted to each cognitive style.

The student will see the contents when he had registered in one subject. The student will see too another complementary information as the teacher's telephone number, the office's number, email, etc.

4 Adaptation Core

The Adaptation Core is how to link and how to organize the information.

In this part, FEIJOO.NET has three parts:

1. POL: PrOgrammed Learning management (Web Platform)
2. IOWA: Intuitive-use Oriented Webtool for the creation of Adapted contents (in a e-learning environment).
3. VIC: Visualization of Contents.

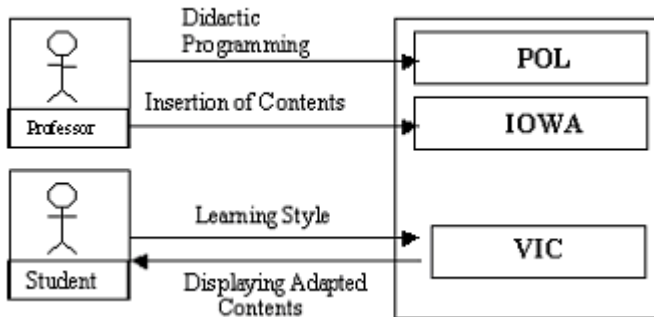


Fig. 1. Relations between agents.

4.1 POL (PrOgrammed Learning Management (Web Platform))

POL will help the teacher to elaborate and organize his work on a Web platform, adjusting contents to a flexible and recognizable structure, showing the way he should carry out the educational management.

Normally, begging to distribute a subject, the teachers make a planning about how they are going to carry out that work. POL tries to automate this work, so it is made of a more systematic way, rational and reflective.

The teacher is going to do the didactic programming with POL; so, he/she teacher has to decide the general and specific learning objectives of each didactic unit. The general learning objectives will be reached when the specific objectives did.

The system will warn the teacher when general objectives aren't fulfilled or when specific objectives from each didactic unit do not fit into general one.

POL has three types of users: Administrator, Professor and Student. Each kind of user has different privileges, can make different functions and has access to the information in different ways. Each user has a login and a password to access the system.

POL has different benefits and shows different contents according to the type of the user. To get this personalization, the system has XML templates and XSLT Styles sheets.

4.2 IOWA Intuitive-Use Oriented Webtool for the Creation of Adapted Contents (in a E-learning Environment)

When the teacher finishes inserting the didactic programming, then he will add the contents of the didactic unit or lesson.

IOWA, is the part of the system that allows the teacher to add contents adapted to cognitive style of each student content. It is designed with a very intuitive interface. It is thought to be used by a teacher who doesn't know anything about computers or he/she has user-level knowledge.

IOWA has two main functions :

1. Helping the teacher : IOWA guides the teacher in the task of creating adapted to the cognitive style the teacher is working with contents.
2. Contents will be shown according to the type of the individual student. To get this goal, IOWA will have a template editor. We will use templates to define how we want contents to be displayed . The editor will be a wizard-like one, so we can guide the teacher easily through the process. Every Learning Style will have a template associate to it each course.

The information is organized as tree. Feijoo.net uses the concept of "context" proposed in the methodology OOHDM[3]. The traversing of the tree depends on the learning style.

4.3 VIC (Visualization of Contents)

The main functions of VIC are:

1. Knowing the learning style of the student with the test of CHAEA.
2. Showing the user the adapted content according to her/his cognitive style.

With the first function, VIC implements the test of CHAEA.. The student has to answer all of them. VIC uses a subsystem that uses fuzzy logic to know the cognitive style. With the second function, VIC gets the learning style of the student from the database and the core of the VIC shows the adapted content .

5 Conclusions

In this paper we presented an Adaptive System Hypermedia. The adaptation is cognitive. This adaptation will increment the usability of Educational Web Sites, because, the Web Site adapts itself to the student , not, the opposite way.

Actually, there is not any Web Tool [4] that it had the characteristics of Feijoo.net.

References

1. Alonso Catalina M., Gallego Domingo, J., Honey Peter, "Los estilos de aprendizaje: procedimientos de diagnóstico y mejora". 5a ed. Bilbao, Mensajero, ISBN: 8427119143, 2002
2. "Designing Web Usability". Jakob Nielsen. <http://www.useit.com>.
3. Rossi, Gustavo. Gustavo Rossi's Home Page. <http://www-lifia.info.unlp.edu.ar/~gustavo/oohdm.html>
4. "Multi-model, Metadata Driven Approach to Adaptive Hypermedia Services for Personalized eLearning". Owen Conlan, Vicent Wade, Catherine Bruen and Mark Gargan. Adaptive Hypermedia and Adaptive Web-Based Systems. Springer Verlag. ISBN 0302-9743. 2002