Educational Curriculum Management on rural environment

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Abstract

This article shows the teacher’s needs in a rural environment at curricular level and basics competences. So, nowadays at the rural environment, geographically dispersed schools coexist with schools in rural centres grouped attending to other centres at cities in a determinate geographical scope. At these schools we can find students of primary education, who are separated in educational levels. But in this type of rural situation, a teacher must attend to several levels inside the same class. Moreover, the possibility, that a general teacher teaches subjects of specialist teachers like for example foreign language, exists. This system ensures the work of teachers in rural, developing emerging needs in education. This requires taking into account the geographical spread, communication between system users and interaction. It also guarantees the reinforcement of basic skills that students must achieve. This is achieved by establishing a continuing education system for students to accompany them from primary to high school.

Keywords: Education, Schools, Educative Centers, Students Curriculum, Rural Environments;

1. Introduction

This paper will attempt to provide a solution to the use of ICT in education in rural settings. In these cores are not available to higher bandwidths for ADSL 1MB. Students and teachers have the same technological means, which are provided for connecting other centres with high bandwidth, such as in the cities. With the target of guarantee the improvement at the teacher’s work condition and a quality education, it is described some aspects that we take into account, in this research work:

• The teacher must modify the curriculums and his session organization to attend to the students simultaneously, and for coordinate with the other specialists. Is here where TICS take importance in relation with collaborative work with interdisciplinary groups of different levels?

• At the educational environments like towns and villages, we must take attention to the families. There is a high level of illiteracy so it is possible to do a double labour forming to the student’s relatives through the student’s work.

• Taking into account that at the rural school the dropout rate is very high, following a formation process for the students through blended on-line courses would be a good option. Thus, we would take advantage of CRIE infrastructures. So, taking into account actual situation of crisis, teachers would give this type of formation such for ESO and for professional qualification levels at the rural scope at determinate centres.

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• The necessities of rural school won’t focus only at the primary education scope, but it also would go focused to adults and professional qualification programs of rural scope. All of this with the target of increases the educational level of every community member.

• It should be encouraged the collaborative and interdisciplinary work with other European environments of the same features, where familiar situations are similar and the students and their relatives feels equal. Thus, a nearby learning would be fomented. All of this makes of the school a neuralgic centre of the community, going forward with shared interests by its geographical location.

• Another thing to take into account is the promotion of the students training to the university world. For it is necessary a bridge course that helps to the students to overcome the out of home stance and to achieve the necessary level that, for the deficiencies of the system, it couldn’t get. Thus, the students with good motivation and a necessary qualification will be able to join to the university context of a less drastic form and which will be able to help to it with training classes in the summer period.

The implementation of this platform would be made in rural centres or nomadic populations, which are the two extremes that can be found. So in this way also includes such nomadic populations, along with the nuclei isolated and sparsely populated. The system must guarantee minimum bandwidth on the Internet connection via satellite communications or 4G, using light to optimize applications and communication system. It may be necessary to create educational materials in off-line version. Such materials could be developed for desktop applications where you would find all the presentation logic, leaving the rest of the servers work on the communication, thus reducing the size of requests and thereby improving the platform. As a conclusion, with this research work we pretend to resolve and give solution for the rural educative centres, focusing always in the students needs, improving his curriculum by means of collaborative work and centres attention. Taking into account the special needs that are in these environments, as well as communication among teachers to improve the curriculum for students. Within this section may include adult literacy through new technologies and student terminals as in rural areas are a major deficiency in infrastructure and resources. These studies and lessons learned could be useful for the implementation of an ERP system that takes into account the needs of rural environments for e-government, since the bandwidth is limited and administrative requirements are the same as in urban centres.

It is the job of the teacher to prepare lessons and ICT means that an adaptation using download managers to develop work in the local network, where there are no bandwidth issues and students and teachers can work comfortably. Given the economic situation in this country that is not going to allow departments to make an investment in areas where bandwidth is limited, and does not allow a connection 4G, Wimax, Satellite. The education department cannot meet the costs necessary to increase bandwidth to the centres or nuclei isolated population, leaving a large number of students with a very slow bandwidth. Taking advantage of all available infrastructures provided and creating a system that allows the cloud to work under low bandwidth aims to provide a technological solution, in which teachers can work on improving the curriculum adapted to rural settings, getting students can perform the work. This paper will study that seeks to achieve two objectives, assess technology needs to overcome the limitations of bandwidth, and provide the necessary tools for teachers to develop students track their activities and prepare independent width existing band.

2. State Of Art

At present, rural schoolteachers remain in the classroom or in a van traveling from centre to centre, as is the case of specialists. These teachers have many resources on the network; the problem is given by the distribution in the classroom, supplies of corrections and multimedia materials, which must be distributed to students. In addition, monitoring of curricula and students in the classroom is made difficult by the limited time and attention the ongoing work of students in rural schools. The teacher does most of the work on non-school hours at home, where she prepares activities, corrections and tracking students through a process of reflection throughout the day.

Different educational levels attend these teachers make the number of students to evaluate whether high, like the difficulty of carrying out monitoring of the learning process, leading to a heterogeneous environment and health education at various levels [1]. Teachers are versatile because his specialty is not determined by the areas they dominate, as they are of a general nature and teach almost all subjects are given that specialist teachers. At present is
performed by purely economic reasons. Because migration and low birth rate, the rural school today goes through its worst moments. Schools have been reduced (the CRAS) proposed as a solution to rural school by the MEC, leading to a tendency to disappear and return to schools in multi-grade classrooms, where one or two teachers in charge of all students. Many studies and demographic trends on the rural school indicate the disappearance over time of rural schools, passing a large number of grade schools (the new CRAS - Grouped Rural Centres). Today is increasing the minimum number of students enrolled to keep a school open and we all know what happens to the birth in time of crisis like that live. There are a multitude of educational platforms installed on servers with such resources. All regions of the Spanish state offer these resources with a cataloguing system for regular content teachers work with students in the classroom. These servers are not designed to allow teachers to develop their function comfortably in the choice of materials or the distribution of these in schools. It is thus one of the major impediments that the material has been distributed hardware that can be used within the school project 2.0, as the bandwidth needs of the centres has increased with the use of the same and was not expected width band for rural schools.

3. Architecture

The architecture is determined by the current methodology of work developed by teachers in rural schools and bearing in mind the idea that the teacher's laptop computer can be a server for rural school students. In developing the architecture for this system is platform file synchronization between the teacher's computer and central servers, which should be performed when the teachers are in their rest periods. The idea is to create a bridge between the servers and computers for teachers. The teachers in preparing their activities on the central server “download" them in your notebook. In this way resources are available the next morning in a hidden way. Depending on whether the students have Internet in the family home and if your bandwidth is sufficient, evening classes be synchronized on the computers of students in order to expedite the work sessions and avoid problems unloading of materials.

They are two working modes of the application itself extracted from the real situation. On one hand the teacher can prepare lessons at home and sitting in a hidden way to your local computer, together with annotations that make the day before, thus maintaining an updated database in the cloud and on the local computer. On the other hand there is the possibility of installing a "micro cloud" at school so that the teacher can update data from their house, so also would ensure that the center had all the resources needed to work the next day. The educational departments may go up activities planned for students and teachers, thereby maintaining synchronized system resources overnight. This would ensure that students and rural schoolteachers have at their disposal the resources to use ICTs.

Figure 1. System’s architecture
The performance of this architecture is simple and only requires the installation of an FTP server in the centers or on tablets of teachers. Previous research has developed a system that includes all these needs. Also there was a set of features that the application should be available at that location is easily configurable. The architecture in the cloud for a system like this involves creating a GRID FTP for quick synchronization of files and that teachers and students can update automatically by pressing a button. Keep in mind that the moment you start the synchronization process, the equipment connected to the server and consume bandwidth, so you should be aware that the process is associated with a slower computer.

In the figure above you can see how all the parts interact, then describing each.

• A cluster GridFTP, where the contents are hosted on the central server.
• The cloud CTabletnet, which contains the business logic of the system between servers and core teachers.
• The microCloud, the tablet represents the teacher at school and will contain the files for the students. This is the place where students actually work in the classroom.
• It creates a layer for business logic via WebServices to input data that will be files and XML data files to process.

4. Tests.

Empirical tests have been performed the information processing in a system of this kind, it is followed by an architecture with desktop client web consisting of the parts shown in the following diagram.
As one test was parsing the data entered in a table of 31,000 records. It has followed a trace of memory and time consumed since the user making the request until the client to display the data on screen has processed the XML. This XML parsing was performed using SAX and DOM to determine the best system to create the implementation, with the following representative data taken on the client and watching the memory consumption and time it takes to execute a request from onset until end.

Analyzing the data shows that times are achieved very similar, having more influence memory consumption, which is the SAX stream as it arrives and DOM first performs a DOM tree construction to proceed with the extraction of the data sent in a serialized stream with XML. To carry out these tests has been used and eLearniXML [4] [5] [6], and Tabletnet [7] applications, which have all the features that the rural school teachers need. So they have developed usability test for which several papers have been written. Below are some screenshots of these applications. First shown in TableNet main menu, which consists of all the options available to the teacher. Secondly there is the version of eLearniXML dedicated to working with curricula and curricular programs.

Figure 4. Parser data with SAX

Figure 5. Parser data with DOM
5. Conclusions

This system ensures the smooth operation and the work of teachers in the classroom-to-classroom education in primary and secondary education. It should also be noted that the application has undergone continuous testing centers as well as its implementation in various congresses exposure to advance their needs develop and validate collected by teachers. The working methodology is based on prototypes exposed and then validated in both schools as experts, which has achieved good results because the system has increased its functionality, making it a system where teachers raise their needs concrete. The technological base is sufficiently tested and that is widely used for many applications, and most importantly, according to the bandwidth needs found in rural centres. This is because in many cases the development of sophisticated Web designs necessitates a bandwidth much higher than such centres have.

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