Abstract: This paper presents the first successfully applied educational and collaborative project on the preschool level in the history of the Red Escolar program in the Mexican public educative system. This project is directed to all children in preschool level. With it, the children have the opportunity to develop activities according to their level using the computer to enrich and bring an exchange of experiences during a normal day at school. The duration of the project was thirteen weeks, organized in 4 stages of interaction that are supported by an adult coordinator. This project was piloted during the spring of 2004 with 5 public schools that had recently acquired equipment, in 2 different cities of Sinaloa state. A total of 10 teachers and 208 students participate in this first step. This paper presents the conclusions of the pilot program and the problems that arose during its development and implementation.

Index Terms –Preschool Oriented Project, Internet for Preschool, Educational project.

INTRODUCTION

In recent years a series of efforts began to integrate multimedia technologies in the public educational system in Mexico. Those efforts have started many programs towards the use of technologies available, especially the computer. One of these programs is the Red Escolar program, deployed during the academic years 1996 and 1997 on a national scale. Under this program a huge number of projects have been developed and deployed on a national and regional scale for the different educational levels. Before the project we present in this paper, very few have been directed at the preschool level, so only a small number of the public schools of that level have been integrated into the Red Escolar program of equipment. Considering this, and with the help of the experience gathered with the creation and deployment of other projects at regional and national levels and the help of the teachers at the Hellen Keller Kindergarten, we designed the concept of “Red Escolar en Preescolar”, (Red Escolar at preschool) and the first project, named “Los Animales” to begin an effort to provide educational content for the preschool level, content that promotes collaborative work.

This project also demonstrates the effective application of the collaborative and educational project paradigm of the Red Escolar program at the preschool level, a paradigm that before was thought as inappropriate or hard to apply at this level. And it also may be useful in other countries where the preschool community perhaps was unwilling to apply email interaction and or web surfing for educational activities at this level. Finally, the experiences we gathered seem to indicate that previously accepted multimedia design assumptions (for this educational grade) are not that well favored by today’s preschool children. The design concepts tightly coupled with teachers’ educational expertise have better interaction properties. The concept of self contained educative units [1] as is used by our software development team had complete validation throughout this project.

JUSTIFICATION

Regarding the challenges that technology, economic and social changes of the XXI impose on the Mexican public educative system, education should be conceived as a pillar of the integral development of the country and the source of transformations to elevate the quality at all educational levels. The National Educative Program 2001-2006 (SEP 2001) proposed the development and expansion of the use of communication and information technologies at the basic educational level (preschool, primary school and secondary school) and to motivate the production and distribution of educational multimedia material congruent with the curriculum and promote its effective use in the classroom.

The Red Escolar program acquires relevance with this idea. Its fundamental purpose is to bring a technological model that can be applied to the particular needs of our children and provide actualized information to complement and enrich the theme in the current study plan at every school in the basic level.

Red Escolar had an important development in the past years mainly at the primary and secondary schools (up to K-12 level). The collaborative paradigm as applied by Red Escolar involves the interactive use of email, chat channels, discussion
The proposed activities in the context of the projects under this collaborative paradigm are the projects “Te lo cuento otra vez” for reading and speaking porpoises, “Conociendo la Basura” for teaching ecological-aware garbage management, and many others. All of these projects were not specifically designed for the preschool level, but can be applied with some major modifications, as some of the early efforts to bring Red Escolar to the preschool level have reported.

Taking these considerations into account, in Sinaloa we are sure that the Red Escolar program constitutes an important and interesting proposal of work for this level. It provides sufficient elements for the elaboration of the creation of the concept of Red Escolar at preschool. Coming from this concept is the project “Los Animales”, whose purpose is supporting the teachers in this educational level with activities that propose the use of computer technology in the classroom. The interaction is guided by a coordinator through e-mail and discussion forums. The interactive nature of this project does not need to obtain expensive hardware or software, as they only need freely available software (like Macromedia’s Flash player and Qualcomm Eudora email program) and a connection to the Internet, so tight budget institutions can make complete use of this project in their classrooms.

The proposed activities in the project seek to aid the process of socialization of the children, relate them to the nature, help exercise their psychomotility, favor mathematical notions and oral and written communication, with the experiences we propose such as digital drawings and audio files exchanged by e-mail, chat and discussion forums among coordinators, surfing the web and visiting electronic zoos, are collaborating with the purpose of the National Agreement for the Educational Modernization [2] that emphasizes a transformation of the national educational system to elevate the quality of education.

**OBJECTIVES**

The project has the following objectives:

- Favoring activities with mathematical ideas.
- Developing creativity and imagination.
- Developing the sensibility of children through art.
- Awaking the sense of contribution and investigation.
- Favoring the use of the technology to enrich the language.
- Favoring the habit of reading and teamwork.
- Knowing animals in their own regions.
- Promoting the love and care of animals.
- Observing different animals beside those that the children are familiar with.

**METHODOLOGY**

The Educational project of “Los Animales”, is the first project created from the novel concept of Red Escolar in preschool. It proposes four stages of activities, organized in subjects that begin with the child’s own interests. Each stage consist of various activities that may be incorporated into to the teachers’ daily educational labor, This project is not an isolated effort but a group of didactic strategies that enrich educational tasks and permit the use of computer technology in the preschool classroom.

All of these make a multilevel approach toward learning, (borrowing and mixing constructivism, humanism and communication system concepts) as the Red Escolar program directs (see [6] and [1] for theoretical references about learning with technologies).

Also the development of the accompanying tools has the same theoretical background as the design concept of self contained educational units (see [1]).

For the advance of each stage the project mark tentative time periods, taking into account that the real times are determined by the children themselves. Each stage has been properly named, to give an idea to the teachers and to the children of the nature of that activity. This is tracked by an online radio program, email and discussion forums. Each kindergarten that wants to enter the project must form one or more teams consisting of a teacher (and maybe an auxiliary adult) and a group of children.

I. Some prerequisite that is important to take note of.

This project assumes that the teachers have some prior experience with sending personal email using commercial email and office packages like Qualcomm Eudora and/or MS Outlook. We discourage, (on this first attempt) the use of MS Outlook Express, because of software incompatibility. Also the teacher and or auxiliary adult must know basic computer knowledge (like how to turn on the computer, running MS Windows programs and connecting to the Internet).

In the following text we explain the benefits of each stage and the objectives of applying the proposed activities.

II. The First Stage: Inscription and some preparatory activities.

In this stage, named “La Mascota” (the pet), the teacher’s job is to motivate and introduce the children to the subject of animals. It is in this stage that the inscription form is filled with the kindergarten data that includes a name and mascot (or pet) for that school team. Also in this stage each team is introduced to online radio and listens to a short story developed by our creative team.
Although none of the activities proposed in this stage are tracked, they are carefully chosen to introduce the child to the subject (in this case animals) and give the teacher sufficient time to download the software needed to enrich the experience (which is the core of this project) and to address any difficulty (of hardware-software nature) that he/she may encounter.

III. The Second Stage

In this stage, called “Variedad de Animales” (A variety if Animals), the children are guided by their teacher to research animal diversity in groups, teams or alone, using CDROM’s and videos, and interactive content on the web page of the project, such as the flash application “Adivinanzas”. Also the activities propose the use of their creativity with electronic and freehand drawings and clay, collecting material to devise a model. The final activity proposed is an exposition to the whole school and the local educational community about what they already learned.

Those experiences are uploaded and exchanged with other kindergartens inscribed in the project in the form of discussion forums, where the experiences are written by the teacher or adult coordinator and presented by the children.

And exchange of some of the drawings is made through the “Animalitos” application and email. Each team can freely decide how they select the drawings they exchange with other teams.

IV. The Third Stage

In stage three, “Visitando los Animales” (visiting the animals), the knowledge of the children is enriched by visiting the local public library and making a poster or mural newspaper. The collaboration part is made through the “Animalitos” application, where the teams exchange sounds of the animals they learned about. The sounds are recorded by the children themselves.

V. Final Stage

The final stage is called “Viaje al Zoológico” (a trip to the Zoo), where the children surf on the Web to some links provided and then are encouraged to go to a nearby zoo or a nearby regional park, were the children may enter in contact with animals of their region. And also the children must be encouraged to use the “virtual Zoo”, on the web page of the project.

All the experiences collected are exchanged through the “Animalitos” applications and discussion forums.

The final activity is collective, where the teacher and their children organize a cultural festival in the school for the entire educational community to see their achievements.

At the end of the project a “teacher only” chat discussion where all the involved educational personnel exchange their impressions of the overall performance of the project and give their opinions for future improvements.

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**THE PROJECT WEB PAGE, WEB RADIO AND THE “LOS ANIMALITOS” COMPUTER TOOL**

As we discussed the different stages of this project, some of the tools that enrich the experience are only mentioned. We now briefly describe some of the tools that enrich the “Los Animalitos” experience.

I. The Project Web Page and its included tools

The Web page designed is shown on FIGURE 1(a), the interface was intended for both the teachers and the children to have access to all the stages and important information for the project.

I.1. The “Adivinanzas” Game

The “Adivinanzas” (riddle) game, shown on FIGURE 1(b) was developed with the purpose of providing preschool children with a popular game of riddles where they have to guess which animal is hidden inside the speech phrase. This tool was designed in Flash and follows the model of a self contained educative unit with constraints (SCEUwC) [1].

In basic terms, the model SCEUwC explains that the development phase of software for educational purposes begins with the selection of the subject according to the educational programs or with a theme that we want to reinforce. Also the design and development of the unit must get complete feedback from an educator in the corresponding educational level. It must also be simple and compress all the information in a minimum group of windows or pages or any other design unit based on the development tool.

I.2 The Web Radio,

One of the multimedia tools that we introduce here for the first time in a Red Escolar oriented project was a Internet Radio interaction, both in real time and scheduled form, using Microsoft Stream Media software. The children listens to a short story in one of the stages and through the entire project they learn to follow real time instructions that appear on predefined days about the current activity they are involved in.

II. The “Animalitos” Computer Tool

The other basic tool for the complete interaction between the different teams enrolled in the project is the “Animalitos” application. On FIGURE 2 we see the interface of this application. On the following lines we describe the design of this application, the selected development tool and some deployment issues we encounter at each school.

II.1 Basic design concepts

As with the web page modules in flash (aside from the virtual zoo) the “Los Animalitos” interactive tool was designed with the model of self contained educative unit with constraints using Click2Learn ToolBook v.8.1. The tool provides a way of sending email between the teams. The child selects an Icon that represents another team using the friend selection buttons and clicks on the paw with the animated mail box to tell the email program to send the message to that team.
In this first version the program automatically fills the corresponding data in order to send the email and send it automatically. The interaction button is used for the corresponding activity during the project.

During the sound interchange phase the button displays a dancing microphone. If the drawing phase is currently on schedule the button icon changes to a painting easel animation. In the drawing phase the application redirects the children to the MSPaint program session embedded in the tool with a predefined file that is used for the interchange. The entire application interface has sounds to accomplish a relationship between written characters and corresponding spoken sound, that it can be used to that goal.

II.2 Deployment issues

The biggest issue encountered in the deployment of this application in the test environment was the availability of the email software within the school’s computer laboratory. This tells us that future versions of the application must use automatic email creation and not rely on third party application software that doesn’t come with the equipment, because of aggregated complexity of training the personnel. Another issue encountered and resolved was the manner that the teams acquire the information of other teams enrolled in the project. First, we restrict the number of animals, in the context of this pilot phase, (with 13 teams enrolled) with great results. This constrain make possible a rapid deployment and maintain an icon oriented nature to the tool. In the context of the national phase carried out now, with five time more teams we did an adjustment that augmented the teacher participation due to a text oriented selection list modification. In the follow up seasons of the project it is proposed to turn back to the icon type interface combining animal and team location information to preserve the software in its original solution and make it possible to have a huge number of teams and to provide grouping capabilities to the tool that can be manipulated by the children themselves using regional grouping notions.

TEACHING EXPERIENCES

I. Introduction

We gathered some of the experiences that the teachers gave us at the end of this effort, comments about the complete success of this breakthrough effort toward inclusion of preschool on Red Escolar program and demonstration of the effective use of email and computer interaction on this level.

First of all it is common knowledge in the educational software development community that the virtual model is the most appropriate to educational levels like preschool. The virtual model is where the child is free to move in a controlled environment and take some actions that gave them some sort of educational feedback, like self-learning environments [7]. Many of the preschool software on the market are made with this in mind.

We are very surprised that in our case this was completely different, and the computational tool that appealed more to the children was the “Animalitos” application and the educational game “Adivinanzas” at the web page. The activity with less interest was the one where they use the virtual zoo, although they can freely travel and use the computer with it.

This is important because both preferred tools were developed using the paradigm of self contained educative units with constraints [1] and some feedback of preschool teachers, whereas the other tool was external developed by a computer design student and had limited or null contact with the deployment environment.

We propose that the virtual zoo go through a series of modifications using the feedback we gathered, changing its development phase to a SCEUwC or possibly to a SCEU model with no constraints that use local information of regional animals to change its behavior.
II. The environment

The project was deployed on five public kindergartens, resumed on Table 1.

<table>
<thead>
<tr>
<th>KINDERGARTEN</th>
<th>Number of Teams</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hellen Keller</td>
<td>5</td>
<td>Culiacán, Sinaloa</td>
</tr>
<tr>
<td>Maria Montessori</td>
<td>3</td>
<td>Culiacán, Sinaloa</td>
</tr>
<tr>
<td>Juan de Dios Bátiz Paredes</td>
<td>1</td>
<td>Culiacán, Sinaloa</td>
</tr>
<tr>
<td>Siglo XXI</td>
<td>1</td>
<td>Culiacán, Sinaloa</td>
</tr>
<tr>
<td>Estefanía Castañeda</td>
<td>3</td>
<td>Guamuchil, Sinaloa</td>
</tr>
</tbody>
</table>

The total amount of personnel and students involved was 10 teachers and 208 students, which formed 13 teams that participated in all the stages of the project during Spring 2004.

The technology environment present on all 5 schools was a small computer laboratory with 5 computers that share a low bandwidth connection to the Internet (Dial-up connection). All five schools had a public email account at the popular Hotmail website.

For the development of the project we had a workshop for the training of the personnel and directives involved that had no prior computer instruction, This was necessary due to the requisites that the Red Escolar national equipment program gives us for the assignment of hardware resources and is not mandatory for the project if the personnel has sufficient experience using computers. Overall in the 3 weeks prior to the inscription phase we trained 31 personnel.

III. The feedback.

We gathered the feedback provided by all the teachers involved on the project on the last chat session that take place on March 31, 2004. Some key points mentioned by the teachers are the following:

- The contents presented in the project were well related with study curricula. The developers adequate the learning objectives for our level with the novelty of technology. The students’ fun was assured and we also encountered new information that enriched and encouraged both teachers and children to study more.
- The children found a space that not only gave them a play environment with the computer, but also provided them with interesting information in a novel way. One thing that the students like the most was the fact the other children like them were doing the same things and that they could send to them drawings, and sounds.
- The children showed enormous interest when they have to choose the name of the team that they will use for the development of their project.
- The children showed enormous capacity of participation, principally with the “adivinanzas” on line activity, and with these new media in general.
- The activities that the children like the most were the choosing the name activity and the on-line “adivinanzas”.
- With this project our fears are conquered in relation with the use of these tools. We as preschool teachers learned a lot with this project, most of all we probe the capacity that preschool children had to acquire new knowledge when they do something they like.
- The preferred activity for the children was “The Mascot”, the interchange tool and the “La Casita” activity. The activity that produces less interest to them was the “Virtual Zoo”.

CONCLUSION

We presented the first project in the novel concept of Red Escolar at preschool. The project “Los Animales” demonstrate a successful application of Internet interaction and collaboration at early educational levels that were previously not included due to preconceived barriers.

Previous efforts don’t bring the email interchange on preschool level as this project does, providing the children with tools that minimize the teacher’s involvement in the process of truly sending a message to other kids. In this way this project pavement the way to a newer development route of remote interchange tools for this level, which we already started so far.
This project also goes beyond simple Internet surfing as previous efforts, providing preschool teachers with an easy to follow scheme that blends computer interaction, the internet (in the form of the email interchange and internet games and pages) and normal educational practice in an ordered and theoretically founded way, the same way that Red Escolar paradigm does with other levels.

So, the educational practices at the preschool level on the pilot program’s groups were improved with the interchange of information and an increase in the children’s knowledge of new things to them, far beyond was possible before. It enriched their learning experience, extending the motivation to work, improving interpersonal relations, promoting values of tolerance and respect, because it probe to the kids that they can do collaborative work with others in other places at the same time.

Now the project begins with nationwide coverage from October 2004 to December 2004. Teams from 8 states are enrolled forming 62 groups and a total of 1,628 students are involved. Results for this nationwide effort will be gathered and reported next year but as the project advances through its different phases we project that the same results will be obtained.

One of the biggest achievements in the development of this project was the integration of the use of new technologies in support of preschool curricula, in a way that has no precedent in the educational field. It also gave us a positive validation of the software design model, so we can continue the development effort of better learning tools for the public educational system.

THE LINKS

The project web page can be found at: http://www.tecedusin.gob.mx/animales/prin.html.
The Red Escolar main web page where more educational projects for different levels can be accessed is located at: http://redescolar.ilce.edu.mx

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