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ARTICLE

The school environment project and its connection with e-learning for pre-school children in Escuela Normal Superior La Hacienda de Barranquilla, Colombia

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Abstract

The aim of this research project is to use Information and Communication Technologies (ICTs) as an appropriate method for strengthening the learning processes of pre-school children. The experience was carried out in Escuela Normal Superior La Hacienda de Barranquilla in Colombia. The method in question is both fun and educational, enabling teaching-learning processes to be boosted and supported by means of a school environment project in e-learning mode.

A sample of 75 pre-school children and 10 pre-school teachers was selected to take part in the project. Before it began, the teachers in charge were surveyed in order to determine their knowledge of technology and to ascertain how useful they considered it to be. The results showed that the majority of teachers did not use technology in their teaching because of a lack of time and knowledge of it.

This research was conducted as part of master's degree programme in e-Learning, offered by the Autonomous University of Bucaramanga (UNAB), Colombia, in partnership with the Open University of Catalonia (UOC), Spain.

Keywords

ICTs, methodology, e-learning, environment project, pre-school

El proyecto ambiental escolar y su relación con el e-learning *en niños de preescolar de la Escuela Normal Superior La Hacienda de Barranquilla*

Resumen

El presente trabajo de investigación tiene como objetivo utilizar las TIC (tecnologías de la información y la comunicación) como metodología adecuada para fortalecer los procesos de aprendizaje en los niños de preescolar. La experiencia se realiza en la Escuela Normal Superior La Hacienda de Barranquilla. Se trata de una metodología de carácter lúdico-pedagógico que permite dinamizar y fortalecer los procesos de enseñanza y aprendizaje a través de un proyecto ambiental escolar, usando el recurso facilitado por el llamado e-learning *(educación y capacitación a través de internet).*

Para llevar a cabo el proyecto, se escogió una muestra de 75 niños y 10 profesoras del nivel preescolar. Previamente se realizaron encuestas a los docentes encargados de estos grados con el fin de determinar qué conocimientos tenían sobre tecnología y la utilidad que le atribuían. Los resultados permitieron saber que la mayoría de ellos no empleaba la tecnología en su quehacer pedagógico por falta de tiempo y poco conocimiento del tema.

Esta investigación se realiza para optar al título de magíster en E-learning, ofrecido dentro del convenio entre la Universidad Autónoma de Bucaramanga (UNAB), Colombia, y la Universitat Oberta de Catalunya (UOC), España

Palabras clave

TIC, metodología, e-learning, *proyecto ambiental, preescolar*

Introduction

A teacher's work must be aimed at addressing the present and preparing for the future. In training and practice, teachers must be equipped with the resources necessary to guarantee quality teaching. This means keeping up-to-date with advances in science and technology and being innovative in applying teaching methods, using resources that are capable of motivating and generating interest among children and young people. One approach is to use new information and communication technologies (ICTs), which provide an efficient tool for building and assimilating knowledge.

For this reason, Escuela Normal Superior La Hacienda de Barranquilla, Colombia, which was declared an Ecological and Educational Reserve by Barranquilla District Council[1], as it is regarded as the lungs of the city with a variety of flora and fauna, has become a natural living laboratory extending over 17 hectares. It is ideal for fostering and performing academic and sporting activities. Thus, considering that the use of this space should be maximised, it was concluded that one method of improving teaching would be to implement the use of ICTs that included fun activities to encourage and stimulate the teaching-learning process in topics relating to Natural Sciences and Environmental Education for pre-school pupils.

The use of ICTs makes it possible to reinforce the relationship between science and technology and to be at the vanguard of the advances demanded by today's society.

As this is a 'hands on' experiential learning method for Natural Sciences, particularly in relation to the environment, early-years pupils must find meaning in the subject with which they are presented. According to Piaget[2], children of this age are at a symbolic or pre-operational stage, characterised by their capacity to deal with the world by means of representations, that is to say, by imagining something instead of doing it. These representations come in the form of language, imitation, symbolic drawing, symbolic playing and mental images. In line with ideas expressed by Piaget, it is concluded that ICTs, on the one hand, offer a range of fun teaching strategies that suit the needs and interests of children of this age, and, on the other hand, boost and facilitate the teaching-learning process. e.

State of the question

Based on a literature review using ProQuest, existing research studies from around the world were found to support the idea mentioned previously.

According to the study *Propuesta de un material educativo computarizado para consolidar la noción de clasificación en el niño preescolar*[3] (Proposal for computer-based educational material to consolidate the notion of classification in pre-school children), such material is unsurpassable for consolidating and exercising the logical-mathematical process by means of classification, which must be achieved

1. Agreement 011 of 30 July 1999, Barranquilla District Council.
2. J. Piaget (1981), Psicología de la inteligencia, published by Editorial Psique.
3. Torres León (2007), University of the Andes (ULA), Mérida Venezuela.

through fun activities. Computer-based educational material enables teachers to guide the learning process, which is demonstrated when they design, create and evaluate their projects.

In the study *Uso del computador como estrategia pedagógica y su aporte al aprendizaje en el preescolar*[4] (Computer use as a pedagogical strategy, and its contribution to pre-school learning), computer use in different settings was compared, as was its contribution to pre-school learning. It also showed how the interactive learning process developed between the child and the computer, and how teachers handled classroom situations in order to achieve the objectives set. The study presented theoretical standpoints on the use and influence of computers at pre-school stage, and addressed behaviourist and constructivist development theories.

The study *Análisis de las características y uso de los software educativos para niños en edad inicial*[5] (Analysis of the characteristics and use of educational software for young children) was carried out by means of interviews with pre-school teachers to determine the teaching methods that they used in classrooms, their acceptance of them and their effectiveness. The conclusion reached was that educational software in pre-school education had begun to be used outside of ICT classes, and that they had the effect of awakening children's interest in using them.

The study *Las TIC en educación preescolar portuguesa: actitudes, medios y prácticas de educadores de infancia y de los niños*[6] (ICTs in pre-school education in Portugal: infant teachers' and children's attitudes, means and practices) cleared up questions about whether educators and children use ICTs, use computers, consider their introduction into pre-school education important, the kind of activities carried out and their advantages. This research was carried out by sending out questionnaires by e-mail to various infant schools across the country, and a diagnosis was made at a workshop that was held with the teachers.

The study *Una aproximación interpretativa a la comprensión de cómo las ciencias naturales están representadas en el modelo Reggio Emilia inspirado en aula de preescolar*[7] (An interpretative approach to understanding how Natural Sciences are represented in the Reggio Emilia-inspired model in the pre-school classroom) is an in-depth study of the topic of Natural Sciences in the classroom. This research was carried out by using ethnographic data collection techniques. When the data were analysed from an interpretative perspective, they indicated that the Reggio Emilia model was indeed able to awaken the interest of children. When applied to the pre-school classroom, it exceeded the pre-school standards for Natural Sciences. The results demonstrated that this teaching method, based on investigation, was compatible with the objectives of a scientific education and confirmed the ideas held about the influence of ICTs on Natural Sciences and Environmental Education.

The study *Algunas implicaciones de la integración de la ciencia y la tecnología en el diseño curricular del preescolar*[8] (Some implications of integrating science and technology in the design of the pre-school curriculum) provided us with information about the historical background of pre-school

4. Calicchia & Moron (2005), Andrés Bello Catholic University (UCAB), Venezuela.
5. M. Sánchez (2006), Andrés Bello Catholic University (UCAB), Venezuela.
6. Fernández (2010), University of Malaga, Spain.
7. H. Iman (2007).
8. Gil & Maldonado (2009), Pontifical Xaverian University, Bogotá, Colombia

education in Colombia with regard to different laws and decrees concerning the obligation of pre-school education and the protection of children in early childhood. The point at which the development of infants in a social and educational context gains importance is described. Elements are identified that make up the curriculum, such as the basic tools that enable a child to explore and discover autonomously as he/she learns. Objectives are devised for Environmental Education for pre-school children. This provided very useful information for knowing when to select tools and teachers to suit to our purposes.

In the study *Análisis de los distintos factores que influyen en la utilización o no de las herramientas que ofrece el currículo de educación preescolar para trabajar la educación ambiental*[9] (Analysis of the different factors influencing the use or non-use of tools on offer in the pre-school education curriculum for working on Environmental Education), the valuable point of raising awareness of the importance of Environmental Education in pre-school children from early childhood was made.

The final study *Efectividad de las estrategias de enseñanza utilizadas por el docente en educación inicial en el uso del computador en el aula de preescolar*10 (The effectiveness of teaching strategies used by teachers for computer use by pre-school children) provided an observation and description of this phenomenon and underscored the importance of using ICTs in the pre-school classroom.

Description of the experience

The type of research conducted in this work, with an emphasis on the quality of the activities and processes carried out inside the classroom, allows for a narrative description and interpretation of the situations. The instrument used for collecting data was a survey, the results of which would be used to help teachers strengthen the process with pre-school children by means of various interactive activities using ICTs.

The study population comprised 150 children in 6 groups of 25. The sample group comprised 75 pre-school children aged 4-5 years, in 3 groups of 25, and their 10 pre-school teachers.

On discovering the lack of emphasis on the topics of Natural Sciences and Environmental Education at the school, a decision was taken to introduce ICTs into this area and work on a school environment project to facilitate the processes and motivate the children, especially the pre-school children. The pre-school teachers were surveyed to determine what knowledge they possessed regarding systems and using ICTs. Once the results were available, the objectives were set and a schedule of activities was devised to improve the image of the subject of Technology. First, web hosting was arranged, and then a domain entitled 'Interactúa con las TIC' (Interact with ICTs) and a subdomain entitled 'Pequeños ecológicos' (Little Ecologists) were created for the experience.

Once the website had been set up, the next step was to develop educational software that would be a fun tool for pre-school children to use, and that would serve as support material for the subject

9. Astudillo, Castillo & Chanchamire (2002), Andrés Bello Catholic University (UCAB), Venezuela.
10. Fernández & Gómez (2006), Universidad Católica Andrés Bello, Caracas, Venezuela.

of Natural Sciences and Environmental Education. The process would be strengthened by a variety of activities (games such as pairs, fill the gaps, multiple choice and puzzles). The software was based on programmed activities for pre-school children, and other fun activities and exercises were created to support the content covered. Work was done on the following topics:

'I recognise my environment': the children followed a route around the school grounds naming the different creatures or elements of nature, and then went back to the classroom and drew pictures of what had caught their attention. Those pictures were uploaded onto the website where their parents could see them.

'The animals at my school': after observing the most common animals on the school grounds, the children went back to the classroom and looked at picture cards of the animals and identified their names and characteristics. The children then coloured in the cards and these pictures were also uploaded onto the website.

'Let's enjoy our environment': the children explored the environment of the school by going for a walk around the gardens. Back in the classroom and with the help of a teacher, they shared their experiences. The children then worked on the same topics with software activities, which built on the concepts taught earlier.

The children's ideas were taken as a basis for creating fun activities (educational software) to be used with the children in the Natural Sciences class, enriching the environment project, as it deals with conserving the existing flora and fauna. In order to ensure proper progress of the project, the collaboration of the pre-school teachers was essential. They presented the website and conveyed the importance of e-learning in education. All the pre-school teachers were pleased with the activities carried out and showed interest in continuing with the project, taking part actively and giving feedback from their classes. They also expressed their willingness to receive ICT training, especially regarding software use. The idea came about to create a website specifically for pre-school children, under the guidance of the teacher in charge of the project.

As a result of how well the teachers received the project, the first training session entitled 'The website: an ideal place to share my experiences', was held. First, they analysed and compared the structure of websites of several different institutions. Second, they answered some questions. At the following meetings, they addressed topics such as the definition, use and creation of a website. The importance of informing the parents about the activities that the children had carried out was highlighted, so that they too could appreciate them. One of the advantages offered by a website is that it can be freely accessed by everybody. For this reason, all the children's families were informed about the website and how it worked, and they were invited to make suggestions.

Results

Web hosting and a domain were arranged in order to set up the subdomain 'Pequeños ecológicos' (Little Ecologists) using website software. The following aspects were taken into account:

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Table 1. Creating the website

STEP	PROCESS
PLANNING	This step involved deciding on the target users of the website and who was going to take part in creating it. The latter were the teachers collaborating in all the proposed activities.
DESIGNING AND DEVELOPING CONTENT	A site map was created for each of the links on the website, and the structure of the website was designed. The guidelines were created for each of the links on the website (see annex). The program WebSite X5 (version 8) was used.
DEVELOPING THE EDUCATIONAL SOFTWARE	Open source software, Constructor Atenex, was used to create educational software in the form of tutorial-style exercises, taking into account the guidelines.
MAINTENANCE	The website was continually updated with comments and activities

Image 1. Steps and processes for the website 'Pequeños ecológicos' (Little Ecologists).

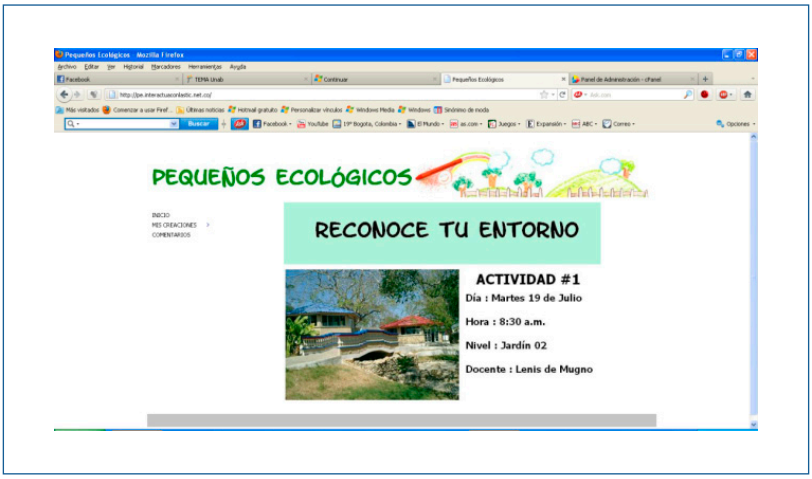

Image 1 is a screenshot of the website 'Pequeños ecológicos' (Little Ecologists).

The project was then presented to the pre-school teachers at Escuela Normal Superior La Hacienda de Barranquilla. Various classroom and fieldwork activities were carried out in order to provide feedback for the website 'Pequeños ecológicos' (Little Ecologists).

Educational software, based on exercises, was created within the website.

The parents were informed about the website and were invited to make comments about it. The comments received were positive and enriching for the school and the website.

Image 2. Working with the software.

The transition pupils were motivated throughout the activities; they demonstrated good computer skills and were able to solve the exercises. This was also a dynamic reinforcement of the topics covered in class.

Image 3. Teachers preparing a worksheet.

Following the first training session, and after studying some websites, the teachers considered that it was important and productive to publish a website so that they could share the children's activities with the educational community, and also as an efficient means of communicating with parents, since they would be the main visitors to the website. Most of the teachers offered to collaborate on creating the website.

The training that was carried out for teachers was productive and met their expectations. It also highlighted the fact that the teachers needed to acquire more knowledge and achieve the project objective, namely creating a website for pre-school children.

Image 4. Website training.

Conclusions and recommendations

The following conclusions can be drawn from this research project:

- The project gained the approval and support of the teachers, pupils, student teachers and parents who stated that their children were interested and enjoyed going to school to learn every day.
- The website has provided the school with greater projection. Contributions made by the parents have further strengthened the education process.
- Pre-school teachers were willing to use ICTs and showed an interest in the activities carried out and agreed with the comments received.
- The activities carried out with the pupils were appropriate; they suited the age and interests of the children, and laid the groundwork for creating the educational software that will provide valuable didactic material for pre-school pupils.
- The transition pupils displayed a positive attitude towards the class. The learning process was demonstrated by how the pupils recognised the environment and the characteristics of the living creatures. They gained valuable skills by taking part in a variety of interactive activities that the software offered, notably good mouse skills. However, what is so significant about the use of ICTs in the cognitive dimension of Natural Sciences and Environmental Education for pre-school children?
- These aspects can be appreciated in how the work was carried out, the appropriation and application of technology by the pre-school teachers, training on using the website and creating the educational software.

The following three recommendations were made following this research project:

That training courses should be held for the teachers on topics such as using ICTs in the classroom, navigating and creating websites, and creating educational software.

That pre-school children should have access to a computer room and that ICT should be included as a subject in their curriculum.

That 'schools for parents' should be organised to offer training on how to use the Internet .

References

ASTUDILLO, L.; CASTILLO, I.; CHANCHAMIRE, D. (2002). *Análisis de los distintos factores que influyen en la utilización o no de las herramientas que ofrece el currículo de educación preescolar para trabajar la educación ambiental*. Universidad Católica Andrés Bello, Caracas, Venezuela.

CALICCHIA, A.; MORÁN, M. (2005). *Uso del computador como estrategia pedagógica y su aporte al aprendizaje en el preescolar*. Universidad Católica Andrés Bello, Caracas, Venezuela.

CONCEJO DISTRITAL DE BARRANQUILLA (1999). Declaratoria de la Escuela Normal Superior La Hacienda como Reserva Ecológica y Educativa mediante acuerdo 011 del 30 de junio de 1999. Colombia.

GIL, J.; MALDONADO, H. (2009). *Algunas implicaciones de la integración de la ciencia y la tecnología en el diseño curricular del preescolar*. Pontificia Universidad Javeriana, Bogotá, Colombia.

FERNÁNDEZ, D.; GÓMEZ, R. (2006). *Efectividad de las estrategias de enseñanza utilizadas por el docente en educación inicial en el uso del computador en el aula de preescolar*. Universidad Católica Andrés Bello, Caracas, Venezuela.

FERNÁNDEZ, R. (2010). *Las TIC en educación preescolar portuguesa: actitudes, medios y prácticas de educadores de infancia y de los niños*. Universidad de Málaga, Spain.

HERNÁNDEZ, A. (2011). "Pequeños ecológicos". [Accessed: 25 October 2011]. <http://pe.interactuaconlastic.net.com

INAN, H. (2007). *Una aproximación interpretativa a la comprensión de cómo las ciencias naturales están representadas en el modelo Reggio Emilia inspirado en aula de preescolar*. University of Ohio.

LEÓN, M.; TORRES (2007). *Propuesta de un material educativo computarizado para consolidar la noción de clasificación en el niño preescolar*. Universidad de Los Andes, Facultad de Humanidades y Educación, Escuela de Educación, Mérida, Venezuela.

PIAGET, J. (1981). *Psicología de la inteligencia*. Editorial Psique.

SÁNCHEZ, M. (2006). *Análisis de las características y uso de los software educativos para niños en edad inicial*. Universidad Católica Andrés Bello, Venezuela.

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