Interactive multimedia computer system and training aimed at training children in early education, using anaglyphs resources and 3D vision.

Marlon CEVALLOS1
1 Ingeniería en Sistemas Career, Técnica del Norte University, Av. 17 de Julio 5-21, Ibarra, Imbabura
marlon_mcg@yahoo.es

Summary. The main purpose of this research is part of the inclusion of ICTs in education through a multimedia tool that illustrates the issues of early childhood education in an educational and entertaining, using resources Anaglyphs2 and 3D Vision, same as it is designed for Educational Unit "Cahuasqui". The images of the anaglyph resources were created with PHOTOSHOP CS5 while the videos were made with FREE 3D VIDEO MAKER, which were previously captured in their respective angles (left - right). All resources became interactive multimedia thanks to FLASH CS5. For creating multimedia product DESED methodology which guides the development of educational software was used.

Keywords
Vision 3D, anaglyphs, Methodology DESED, early education, Software Multimedia.

1. Introduction
The development of information of technology is advancing by leaps undoubtedly all aspects of life revolve around it that is why is necessary to apply to various fields, being initial education the subject of this investigation. In the last 20 years, this has not been very attractive and dynamic for learners: there are activities that capture more to the child than television, video games, movies and other, helping the academic development, turning so the best multimedia support in expressing and illustrate an event, or an event and in this case to impart knowledge.

The objective of this research is the use and application of stereoscopy better known as 3D vision, which gives the final product an added value due to handling three-dimensional interfaces using both anaglyph images and videos that serve to illustrate the student of early education on topics defined as abstract, integrated into an application of multiplatform; under the guidance of the DESED methodology, which considers aspects of Software Engineering, Education, Teaching and Graphic Design, among others. (Camarena, 2006). (Camarena, 2006)

Stereoscopy or also called binocular vision is responsible for collecting three-dimensional visual information and cause the illusion of depth in a photograph, film, or other two-dimensional image, which is created by presenting a slightly different image to each eye, as in our habitual way of seeing.

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1 ICT: Information and communications technology.
2 Anaglyphs: Two - dimensional images that can cause a three - dimensional effect.
2. Materials and Methods

2.1 Material

For the project development we use tools of image editing, with private and open source \(^3\) to create anaglyph images code as well as Adobe Photoshop CS5 was used for its wide range of editing options, control levels Picture, Control channels, management layers and creating images from zero.

For the preparation of videos and anaglyph 3D conversion also required the use of Free 3D Video Maker: Conversion, Vegas 11: Editing; In addition we use the JClic\(^4\) this tool is for building multimedia educational activities besides audio editors.

Through Adobe Flash CS5 docked and turned around the anaglyph interactive multimedia material, it becoming the main platform of the project. The combination of all these design tools allowed to create a new novel, friendly and innovative interactive software.

2.2 Methodology.

To prepare the project we used the DESED methodology, which focuses on determining the

\(^3\) Open Source: It is the expression that is known to software freely distributed and developed.

\(^4\) JClick: It is an environment for the creation, implementation and evaluation of multimedia educational activities, developed in the Java programming language.
needs for ES\(^5\), analyzes and defines the subject, also defines the end user and choose the type of software that was being developed, and allows an assessment to the environment development.

The methodology will consists of 4 major stages therefore containing some steps in each, these stages are: Analysis, Design, Implementation, Testing-Launch Product.

The Analysis stage identifies and analyzes the following contents for application development

<table>
<thead>
<tr>
<th>Referential features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools for creating anaglyph resources</td>
<td>For creating anaglyph 3D images and videos.</td>
</tr>
<tr>
<td>Determination user</td>
<td>Children of first year of basic, between 4 and 5 years. Education Level: Beginning of academic life. Level of Intelligence: Suitable for everyone.</td>
</tr>
<tr>
<td>Study skills</td>
<td>Activities that improve the level of understanding of the events that they need to learn.</td>
</tr>
<tr>
<td>Necessities</td>
<td>Implement the multimedia software needs 3D Anaglyph with materials according to available resources.</td>
</tr>
</tbody>
</table>

Table 1: Analysis stage  
Source: Own

In the Design segment we define all the generalities of Software to obtained, as follows:

<table>
<thead>
<tr>
<th>Preliminary designs and environments</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice of software.</td>
<td>It is part of Eduentretención category that integrates elements of education and entertainment, interactive by excellence because the variety of resources used.</td>
</tr>
</tbody>
</table>

Table 2: Preliminary designs and environments  
Source: Own

At this stage the structure of the screens and configuration of the scene is also defined.

In the Implementation stage, we take into account product construction, features an overview and the most important of the research is the generation of multimedia resources anaglyph 3D.
Product Features.

Ease to use.
With student and teacher profile.
Interactive.

Construction of multimedia resources anaglyph.

Image capture from two slightly different viewpoints.
Option 1:

Option 2:

Table 3: Implementation
Source: Own

Building resources in 3D anaglyph several tests were performed with the two options shown in Table 4 to capture images and videos, the two options are feasible, however the second one provides a better outcome in exchange for increased costs.

The 3D camera having two objectives in its structure that the catch is made simultaneously to achieve the two slightly different images that is based not only anaglyph 3D; while capturing two cameras requires that they are of the same features and the shot must have a high degree of accuracy.

Table 3: Implementation
Source: Own

<table>
<thead>
<tr>
<th>Left Image</th>
<th>Right Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level Red color for left Image.</td>
<td>Level Cyan color for Right Image</td>
</tr>
</tbody>
</table>

With the fusion of the two images preserving the difference between them, was achieved the 3D anaglyph image.

Table 4: Process to create an anaglyph
Source: Own

To put in practice the software in children we observed an awesome affinity with the product, both guided by the teacher, as the activities for the student.

In terms of methodology DESED proved to be of great help to the research stages of development, taking into account that serves to build educational software.

The content created in the application shown in the following table:

<table>
<thead>
<tr>
<th>Module</th>
<th>Initial Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td></td>
</tr>
</tbody>
</table>
3. Conclusions

The 3D anaglyph is one of the most economical marketing techniques and provides the viewer with an augmented reality almost 90%.

The 3D anaglyph generates a reduction in the intensity and color saturation due to Red and Cyan color that serve to create stereoscopy.

The use of a specialized camera for capturing images and videos is the best choice when it comes to capturing the material to design anaglyphs.

The ICT’s in education are undoubtedly a tool that marks a before and after in the schools, and multimedia resources the best allies when presenting information.

The use of ADOBE Flash CS5 tool requires machines with stable performance, since the use of the same causes that consumption of hardware and software resources is high.

The use of JClic package for proper display is necessary to have an internet connection because in the execution complements the official site of JClic are downloaded.

Bibliographic References


Marlon CEVALLOS was born in the city of Puyo - Pastaza on July 4, 1989, at 6 months of age he moved to the city of Ibarra - Imbabura. He did his primary education at the Catholic school La Merced and the Technological Institute José Tobar Tobar, the High School made at the Instituto Técnico Superior 17 de Julio in the specialty of Electricity. Its superior study was conducted at the Tecnica del Norte University, Ingenieria en Ciencias Aplicadas Faculty, Ingenieria en Sistemas Computacionales Career.