

Aportaciones para el diseño de proyectos multimedia con inclusión de las tic en el ambito de la educación superior

Contributions to the design of multimedia projects including the ICT in the field of higher education

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Resumen

El presente trabajo tiene la intención de proponer tres atributos indispensables para elaborar proyectos multimedia como apoyo al proceso de enseñanza-aprendizaje en el nivel superior, sirviendo como guía para los docentes y estudiantes que aplican diversas herramientas informáticas al momento de elaborar diversos trabajos con diversas características tecnológicas. Los atributos que se presentan son: **Pedagógicos**, los cuáles hacen referencia a la selección minuciosa y pertinente del tema, el contenido curricular adecuado, incorporación de metodologías, estrategias y actividades de enseñanza-aprendizaje, elaboración del guión gráfico que incluirá los pasos a seguir y la ubicación del contenido, incorporar un vocabulario de términos técnicos, interactivo y reforzador de los contenidos y mensajes; **Tecnológicos**, son aquellos que sugieren la aplicación ordenada y pertinente de las herramientas tecnológicas, las cuales establecen normas y criterios para aplicar la tecnología en trabajos prácticos acordes a los niveles educativos en donde se implementará; y de **Evaluación**, cuya finalidad es determinar en qué medida el producto creado satisface las necesidades y el objetivo planteado en la delimitación del trabajo práctico, evaluando los aspectos Pedagógicos y Tecnológicos.

Dichos atributos, en el nivel superior se consideran relevantes al construir un proyecto multimedia aplicado a la educación, por lo que los anteriores requisitos deben ser cuidadosamente delineados, ya que la comparación que se establece entre la expectativa original y la realidad, son puntos claves para modificar o corregir los productos. Lo anterior requiere del apoyo de una guía o ficha de evaluación, siempre con intenciones de mejora para quién diseña y para quienes está dirigido.

Finalmente, se integran recomendaciones para fortalecer los futuros trabajos multimedia que sean desarrollados a nivel superior, tanto en su diseño de los medios interactivos como en la incorporación de indicadores de las guías de evaluación que faciliten la comunicación, la formación y el aprendizaje en determinados espacios educativos y sociales donde requieran utilizarse.

Palabras clave: Tecnologías de Información y Comunicación, Multimedia, Atributos, Interfaces, Interacción, Pedagógicos, Tecnológicos, Evaluación.

Abstract

This paper intends to propose three attributes indispensable to develop multimedia projects to support the teaching-learning process at the top level, serving as a guide for teachers and students to apply various tools when developing different jobs with different characteristics technology. The attributes that arise are: Pedagogical, which refer to the careful selection of the topic and relevant, appropriate curriculum content, incorporating methodologies, strategies and teaching-learning activities, storyboard development that will include steps and the content location, incorporating a vocabulary of technical terms and booster interactive content and messages; technology, are those who suggest the orderly and appropriate application of technological tools, which establish standards and criteria for applying technology in practical work commensurate with education levels where implemented, and Assessment, the purpose is to determine to what extent the product set meets the needs and the goal set in the delimitation of practical work, assessing pedagogical and technological aspects.

Key words: Information and Communication Technologies, Multimedia, Attributes, Interfaces, Interaction, Pedagogical, Technological, Evaluation.

Fecha recepción: Octubre 2010 **Fecha aceptación:** Noviembre 2010

Introduction

Taking into account that the advance in general of Information and Communication Technologies is made by leaps and bounds with respect to its incorporation in the field of education, it is common to hear or read, in various literature, concepts such as: new learning environments, hybrid learning spaces, e-learning, educational multimedia, didactic media, learning objects, among others.

Authors such as Peré Marques (1999), Sancho and Hernández, agree in pointing out that Information and Communication Technologies, in the educational field, should be considered technological tools that allow the teaching-learning process to be made more efficient; For its part, UNESCO, in its special report, published in Educational News No. 85, points out thatthe teacher should attract the attention of students to the real nature of technologies, which are instruments to help them in their learning and not an end in themselves, nor a substitute for social relationships, nor a simple replacement for traditional values and ways of learning (Nuevas Educativas, 1999:198).

In this sense, ICTs offer a series of diverse elements in which society can learn and communicate synchronously and asynchronously, taking into account the various computer tools that are available to society. It should be noted that technological progress and the development of various web applications have resulted in a wide variety of learning objects that can be reused for the creation of various digitized products.

Among the products to be highlighted are, for example, multimedia or Multimedia, referring to the multiple combination of audio, video, sounds, images and animation through the computer or various electronic media. Another referent that contributes more elements to this concept is mentioned by Dr. Peré Marques, since he considers that multimedia “are materials that integrate various textual elements (sequential and hypertextual) and audiovisual elements (graphics, sound, video, animations...) and that can be useful in educational contexts” (Peré Marques: 1999).

The Multimedia application has become a very important and basic parameter for various subjects, since they produce various projects with varied themes inserted in different social fields.

The field of education is no exception, since this technology is being applied in an emerging space in order to contribute to the teaching-learning process. It is then when the term undergoes a slight change, being called Educational Multimedia, where they are combined by requiring a series of learning objects with an educational purpose, leading to a series of steps and elements, necessarily pedagogical, technological and evaluative that must be covered at the time of creating a project with educational characteristics.

It should be noted that at the higher level, various students, such as the case of the Faculty of Pedagogy, have ventured into the design of multimedia projects in order to present it in a special course, a final project or in the structure of a receptional project. .

However, and under the experience in the revision of some receptional works, it has been observed that the multimedia projects produced by some students lack several educational elements such as: planning, information organization, curricular foundation, bibliographic references, teaching activities. -learning, focusing exclusively on technological design.

For this reason, it is necessary to know that a variety of programs produced by multimedia have certain criteria for their design in the educational field, in this particular case, we only present two references that show this: Rexach and Asinstein (1999: 209) , point out that “pre-existing information must be organized in various formats: texts, graphics, sounds, animations, videos”. For his part, Peré Marques (1999) calls educational multimedia materials as “multimedia materials that are used for educational purposes”. It is from the aforementioned elements that the interest arises to rethink the general characteristics that the receptional document, in force, points out when building a practical work, suggesting the following pedagogical, technological and evaluation attributes.

Pedagogical Attributes:

Identify problems at various educational and social levels where the Pedagogue is allowed to intervene.

It is required that the authors of the multimedia projects previously identify the existing problem according to the educational level that will be worked on, carry out an analysis of the situation in order to propose alternatives through multimedia to contribute to learning. This first point should justify the reason for carrying out the project, suggesting considering the following questions:

- ¿What is the current problem of the educational level?
- ¿What didactic relevance does my multimedia project have in the face of said problem?
- ¿What will be my pedagogical contributions to solve this problem?
- ¿What scope and limits will my project have?

Detect the educational and social needs that require the intervention of the pedagogue with the use of innovative and technological materials.

Any application of a multimedia project must be accompanied by an educational need, reason for the design, that is, there must be a great educational need where various pedagogical solutions are provided through the application of a technology such as multimedia. It should be noted that the inclusion of technology, by itself, will not completely solve the educational need in its entirety.

On the other hand, it is relevant to take into account the central objectives of the project and analyze whether they provide important elements for its application; as well as, keep in mind the recipients: children, adolescents, adults, considering the degree of study and their intellectual level to achieve adequate and consistent interactivity with users.

Curriculum content according to the selected educational level, topics, subjects, educational experiences, among others.

The curricular content is undoubtedly the skeleton or base structure of any educational multimedia project, it is the theoretical information that will be broken down into various levels, divided into themes and sub-themes as well as teaching-learning activities. For this, the following elements are recommended that will allow distributing the contents according to the theme that will be addressed:

- Content management: it is necessary to have certain cognitive levels, experience and mastery of the subject to contribute and suggest various topics that provide feedback to the curricular content. If this point is not reached, a content expert should be sought to obtain adequate advice and not improvise the information.
- Didactic script: design a script in which the steps to be carried out are planned, that is, it will be a construction map, where the contents, learning objects and interfaces of the project will be accurately detailed.

- Interface design: referring to the screens and visual plane of navigation and communication with users, that is; it is the communication tool of everything that will be heard, observed and perceived.
- Multimedia Script: Storyboard design, scene-by-scene classification, in order to organize information, texts, learning objects (video, audio, images), hyperlinks, among others.

Develop teaching-learning activities integrated into practical work and that benefit users.

Incorporate teaching-learning activities according to the themes included in the project, in order to reinforce the learning and knowledge that is presented or intended to be acquired when applying educational multimedia in a didactic way.

Master an educational and technological language during the application of practical work in the educational and social field.

It is important to achieve or have a general command of those technical terms, so it is recommended to incorporate a glossary in order to clarify all concepts, words and their meaning for users. According to the level of application, a language that covers the entire population of interest should be used.

User guides. Include tutorials or navigation guides that allow users to adequately explain the content of the work and access to all the information included in the work, whether in digital, audio or video version.

Technological Attributes:

It is important to underline that every multimedia project, in any technological modality, incorporates various multimedia educational resources, which according to Peré Marqués (1999) "are materials that integrate various textual elements (sequential and hypertextual) and audiovisual elements (graphics, sounds, video, animations). ..." and that

can be useful in educational contexts". According to their importance, the following technological attributes are presented.

- Interactivity. Rexach and Asinsten (1999) point out that "interactivity is the ability of computer programs to respond to user actions". For this, there must be a minimum or maximum level of interaction of practical work with all users, achieved through the combination of video, graphics, sounds, texts, colors that are designed in a special computer program.
- Text. They are the processors that are used to adapt, build and design the texts, which will be integrated into the multimedia work.
- Graphics. Insert non-pixelated graphics or images, taking care of the color combination. Photographs, drawings, graphics, and other images must be converted into a format that the computer can manipulate and highlight. Some of the most common graphics are: Graphical Interchange Format (GIF), Bitmaps (BMP), (JPEG) and the most common vector graphics such as Flash (SWF).
- Sound. It refers to the use of sounds and the combination of various audio files, recognized as sound that includes three channels: background music, ambient sounds; specific noises and locution. It is important to indicate that the computer equipment where you work must have sound drivers installed, sound cards and various sound editors. The recommended standard format for multimedia work is: mp3, wav, midi.
- Animations. This is done with some specific programs that support various audio, video, text and graphics files to perform the animation. When making a general animation, it is recommended to insert a transition of images called Slide Show (slide-show).
- Video. Emphasize the use of video in a didactic way through various editors, requiring installed drivers and video cards for higher resolution, as well as working with files, avi, mpeg, among others. It is important to install programs that convert different video formats to ensure quality viewing.

- Navigation/Navigability. It is the possibility of freely exploring the environments that make up the world, domain or information structure presented in the practical work.
- Interface/Interface. According to the Training Master Plan (1999), “it is the contact surface between the learner and the computer; it is the screen with which the learner interacts; it is the way to capture the action and attention of the learner and to reflect the state and content of the system” (Training Master Plan, 8:1999)
- Learning objects. Apply appropriate computer tools and utilities using them in such a way that they enrich the design, presentation and interaction between users and practical work.
- Situational field of the multimedia project according to its modality and presentation. Referral to Websites (Personal Sites, Blogs); Educational Videos (videocast); Educational Radio (Podcast); Educational and Instructional Script Designs (for distance or online courses, educational capsules, educational radio and television scripts, podcasts, educational videos); Educational Multimedia (anthologies, encyclopedias, virtual libraries); Educational Software (Exercise, Tutorial, Simulation, Educational Game, Multimedia Reference Material, Edutainment, Stories and Tales, Editors, Hyperhistory, Construction, Programming Languages).

Evaluation Attributes:

Considering that the evaluation is intended to establish judgments in relation to the effectiveness of the designed product, it must account for whether it promotes a solution to the problem or need detected by it, it is considered pertinent, to carry out the evaluation process to the multimedia project, through instruments that integrate the following indicators that have been taken from authors who point out the importance of evaluating materials designed with various technological supports.

Below are examples of evaluation instruments that allow amplifying the verification of the aforementioned attributes:

- **Evaluator Scheme of Galvis, Prieto and Hernández**
- **Reduced Evaluation Model**
- **Methodological Guide for the elaboration of Educational Multimedia**
- **Educational Software Evaluation Form**

I. I. Scheme of Galvis, Prieto and Hernández.

VARIABLES	INDICADORES Y CRITERIOS
1. <i>Objetivos del programa</i>	1.1. Prioritarios que apoya 1.2. Nivel de dificultad apropiada para la necesidad educativa detectada
2. <i>Función educativa que cumple</i>	2.1 No hay mejor medio de enseñanza aprendizaje 2.2. Permite subsanar las necesidades educativas detectadas
3. <i>Contenido o micromundo de base para descubrirlo</i>	3.1 Coherente y suficiente para los objetivos 3.2 Con vigencia. Claro. Conciso 3.3 Significativo para el discente
4. <i>Estrategia de instrucción</i> <i>Motivación y esfuerzo</i> <i>Secuencia y control</i> <i>Estilo de pensamiento</i>	4.1 Coherente con la función educativa que debe cumplir el material 4.2 Consistente con estructura de contenido y características del tema 4.3 Adecuada a las características del usuario
5. <i>Forma de presentación</i> <i>Diseño de pantallas</i> <i>Uso de gráficos y sonido</i>	5.1 Adecuada a los usuarios en cuanto mensajes e ilustraciones, así como en densidad de información 5.2 Uso adecuado de apoyos visuales y sonoros 5.3 Amena
6. Interfaz programa-usuario	6.1 Compleja. Sencilla 6.2 Ritmo y secuencia de avance controlable 6.3 Consistente a lo largo del programa 6.4 Posibilidad de abandono y reinicio 6.5 Claridad de mensajes

Table 1. Taken from "Methodology of the computer as a teaching resource". UNED, 1997

II. Reduced Models.

The following Guide or Evaluation Sheet is addressed to those who actually select the software for the educational establishments where they work:

Modelo Reducido. Considerar las siguientes cuestiones:
1.Requerimientos técnicos: 1.1. Si es posible utilizarlo con el equipamiento existente en la institución
2. Si el contenido curricular es correcto
3. Idioma 3.1 <i>En caso de no presentarlo en español, si existe una dificultad insalvable</i> 3.2 <i>En el caso de software producido en España, Cuba u otro país Latinoamericano (Caso frecuente de Argentina); si contiene modismos o expresiones idiomáticas que dificulten la comprensión de su contenido</i>
4. Si existe coherencia entre la propuesta y su implementación 4.1 <i>Si el tipo de actividades, los contenidos curriculares, el lenguaje utilizado, las gráficas, son coherentes</i> <i>Existe la posibilidad que los contenidos para una edad determinada se encuentren desarrollados con lenguaje para alumnos mayores, o que las gráficas correspondan a estudiantes de menor nivel educativo</i>
5. Si la metodología educativa implícita es acorde con los objetivos para los que se utilizará.
6. Si el planteo o desafío que involucra lo hace atractivo para los estudiantes a quienes está dirigido

Tabla 2 Tomado de “Metodología del ordenador como recurso didáctico”. UNED, 1997

II. Methodological Guide for the elaboration of Multimedia.

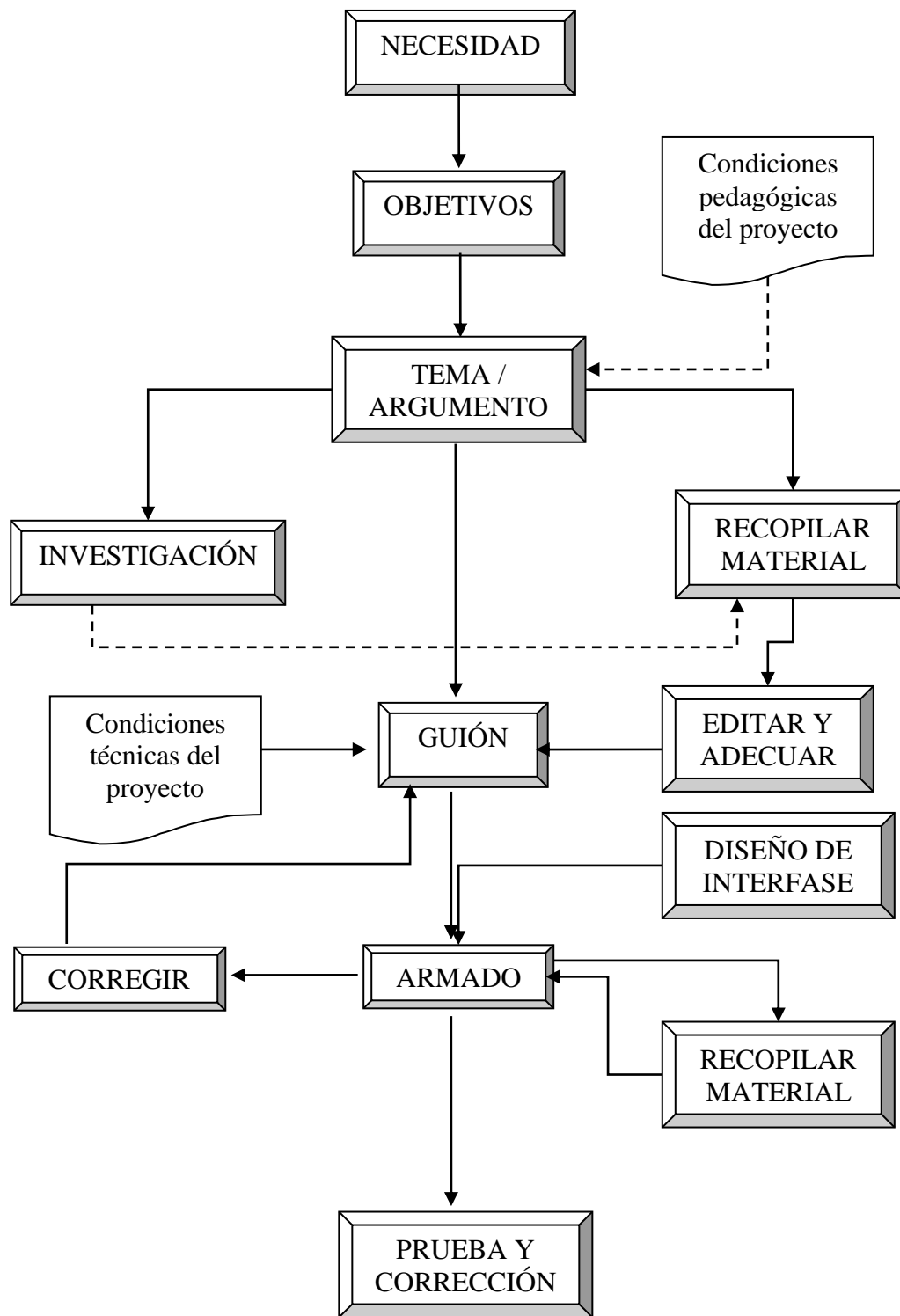


Figure 1. Taken from: "Going from chalk to the Mouse" (1999) Rexach Vera and Asinsten Juan C. Edit. Educational news P. 213

IV. Vera and Asinstein Educational Software Evaluation Sheet.

<input type="radio"/> Evaluación conceptual
Aplicación del programa en el proceso de enseñanza-aprendizaje:
<input type="radio"/> Información <input type="radio"/> Enseñanza de un contenido nuevo <input type="radio"/> Actividad disparadora
<input type="radio"/> ejercitación de contenidos <input type="radio"/> Exploración <input type="radio"/> Evaluación

Table 3. Taken from "Going from chalk to mouse". (1999) Rexach Vera and Asinsten Juan C. Ed. Novedades Educ. P. 200

Conclusions

In order to enrich the multimedia projects carried out by higher level students, where the inclusion of ICT is present, we believe it is pertinent to mention some relevant points, such as the updating of terminology, proper use of computer tools, product evaluation instruments designed, which will allow to account for the advancement of technology itself, in the educational space, which can be stopped:

- It is necessary to have an advisor on the subject of the curriculum to review the multimedia project and make the pertinent corrections in the pedagogical and technological fields.
- Design and apply the evaluation through an evaluation guide that includes Pedagogical, Technological and Evaluation attributes.
- After making the observations and adjustments pertinent to the multimedia project, consider the possibility of taking into account other teachers integrated into the area of new technologies in education for their final review, as far as the technological attributes are concerned.
- Deliver to the beneficiary Institution the product designed for its application and pertinent evaluation, with the intention of verifying the quality of the product presented as well as initiating the linking activities between institutions.

- It is essential to use various bibliographic managers such as: APA, Chicago, Vancouver or Harvard, in order to formalize the multimedia project and organize all the bibliographic sources consulted.

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