

11TH EUROPEAN ACADEMY OF  
DESIGN CONFERENCE

APRIL 22-24 2015

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## ABSTRACT

*This paper is based on studies conducted during the post-doctoral in Design which resulted in a hypermedia e-book titled "Design, Education and Technology"– the e-book content discusses theoretical concepts for hypermedia environments. The e-book ([www.design-educacao-tecnologia.com](http://www.design-educacao-tecnologia.com)) is a support for teaching Hypermedia Design, which constitutes a didactic material to support teaching and research activities for the Design area. The book will gather issues about Design, Education and technologies aimed at offering resources to enhance the use of multiple languages that converge in hypermedia environments, their applicability, techniques and methods in light of Design in Situations of Teaching-Learning. This work opens up for a discussion on issues related to design and contemporary languages in education, therefore, will be presented one of the topics that were covered in the hypermedia environment (e-book) mentioned above - the module Hypermedia Design - the issue regarding the concepts of multimedia in educational settings. The concept of media is related to the multiple ways that can be used in the representation of information (audio, video and animation). The need to use these resources in the educational contemporary context becomes increasingly growing, since images emerge as dialogic space and visual symbols often are used as a form of speech. It is considered that the design can work in the reflections on the joints of multiple media in teaching as a producer of image and language, however, still needs further studies on how the representations can affect people in the process of knowledge acquisition.*

*Keywords: Design, hypermedia, audio, video, animation*

## 1 INTRODUCTION

This paper presents an e-book in the form of a site with the title "Design, Education and Technology" – the e-book content discusses theoretical and static concepts for hypermedia projects by means of contemporary languages for which information is available in digital educational media.

This study stems from experience accumulated over many years of work with schools and universities of Rio de Janeiro, which resulted in several objects designed as support for didactic activities developed by teachers and students of planning, projects and development courses offered by Arts & Design Department - Pontifical Catholic University of Rio de Janeiro, Brazil. (DAD/PUC-Rio)

Further created in Interdisciplinary Laboratory of Design/Education –(DAD/PUC-Rio) as a result of experiences related to Design in Education - 'Design in Situations of Teaching-Learning' is a line of research preferably inserted in the

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academic field and that agglutinates works where there is designer participation in projects geared towards Education at any level - Nursery, Elementary, High School, Higher and Advanced - as well as for studies and research related to the teaching of Design in the extra-university, technical, extension, undergraduate and graduate ambits. Its basic principle is to enhance the knowledge acquisition process through artifacts, environments and analog and digital systems. In this perspective, each Design solution represents the search for equilibrium between interests and needs of the teacher and student, as well as of educational institutions.

To speak about information available in hypermedia environments, I start with the reflection pointed out by Takahasi (2000), where he considers that educating in an information society is to invest in creating sufficiently large skills in order to enable them to have an effective role in the production of goods and services, to take decisions based on knowledge, as well as creatively applying new media. It also means to train individuals to "learn how to learn" in order for them to be able to positively deal with the continuous and rapid transformation.

Faced with the above, therefore, a digital online book that allows interested parties to obtain information and tips about the process and tools available for creating hypermedia materials is an initiative that emerges as an opportunity to insert the study of design in this new information model: globalized, hypertextual and multimedia and in line with the contemporary digital technologies.

This e-book says Portugal (2013) comes as a possibility for further research about the subject of design and the issue regarding the concepts of multimedia in educational settings, both because it is an environment of hypermedia as well as by having theoretical and aesthetic concepts on design and hypermedia environments. The e-book enables the application of educational exercises and may contribute not only to provide information for planning hypermedia systems, but also to promote an improvement on teaching standards in order to make learning more productive and interactive.

This study aims at presenting some reflections about the multiple languages in hypermedia environments. In order to do that, this paper approaches discussions on issues related to design and contemporary digital languages in teaching, by means of a literature review a part of the study available in the book "Design, Education and Technology" will be presented in order to discuss about the use of multiple languages that converge in hypermedia environments and their importance to the teaching and learning process.

## **2 THE E-BOOK DESIGN, EDUCATION AND TECHNOLOGY**

The book "Design, Education and Technology" in addition to the content in printed book format also features a digital format. Portugal (2014) says that the e-book ([www.design-educacao-tecnologia.com](http://www.design-educacao-tecnologia.com)) is a support for teaching hypermedia design, which constitutes a didactic material to support teaching and research activities for the design area. The e-book will gather issues about Design, Education and Hypermedia aimed at offering resources to enhance the use of multiple languages that converge in hypermedia environments, their applicability, techniques and methods in light of Design. The contents were divided into four themes, Information Design, Interaction Design, Hypermedia Design and Didactic Concepts.

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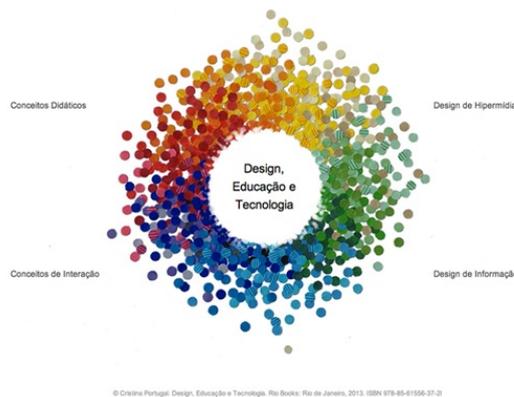
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The contents that compose this version of the e-book are presented in a non-linear way, bringing theoretical and esthetic reflections about the role of design in the development of Hypermedia environments. Several pictures and bibliographic references support the text present in the book. The item about information that complements the main texts must be highlighted. It offers a selection of books, sites, games, videos and apps that stimulate the book user to go deeper in each particular theme.

Figure 1 presented below, illustrates the home page of the digital book and the structure of the online digital book, whose content is directly related to the modules of the printed book, that comprises the entire project developed by Doctor Cristina Portugal in her postdoctoral research and originated this paper.



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Figure 1 The home screen of the e-book "Design, Education and Technology" (PORTUGAL, 2013) [www.design-educacao-tecnologia.com](http://www.design-educacao-tecnologia.com)



Figure 2 –The four themes addressed in the e-book, Information Design, Interaction Design, Hypermedia Design and Didactic Concepts, form the e-book. (PORTUGAL, 2013)

Portugal (2014) says that: the e-book content contemplates themes such as: color, typography, image, accessibility, usability, cognition, interaction, materiality, process, technology, reception. Those are some of the questions

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necessarily involved in the interface between human and physical reality. For Gamba Jr., this is where is founded the challenge and value of Design. The author Cristina Portugal faces this complexity with the systematization needed for keeping the projectual method. Today it is possible to really elaborate a knowledge that allows to coincide, overlap, or to put in dialogue knowledge areas normally set apart by culture, but generously amalgamated by Design. (PORTUGAL, 2014, p. 9).

The e-book comes from the concept of hypermedia environment, which is a part of the integration of two concepts: the hypertext is characterized as a matrix of texts that can be triggered in a nonlinear way, directing to other conceptually related texts. Multimedia comprises the set of resources that are used in the information representation, in other words, texts, images, sounds and videos. Consequently, given the correlation of all these elements, multimedia is configured as one of the most effective ways to present information, substantially broadening the understanding of a message.

Introduce the ideas of the Aedo (2014), to support the above:

Hypermedia appears to be the most widely accepted technique to support the learning process since non-linear information networks provide a good model for representing the human knowledge. Hypermedia learning systems are really efficient if their user interface has been developed taking into account their users' needs and the problems related to learning and hypermedia systems. (AEDO *et al.*, 2014, sp.)

The content of the e-book itself uses the hypermedia language as to give meaning to the texts presented. In the image below it is possible to see the layout version of the e-book with some on the technologies used (audio, video, animation), about the graphic elements created to guide user navigation, among others.

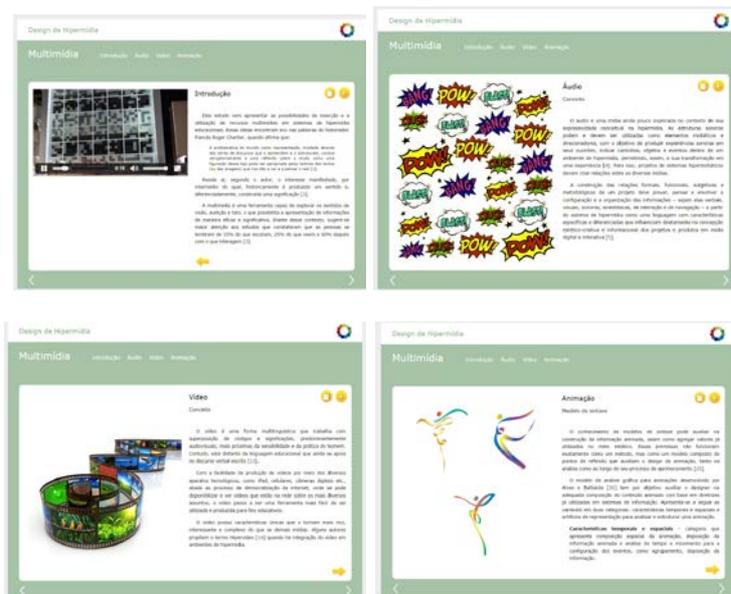


Figure 3 –Screens from the e-book - the module multimedia - audio, video, animation

## Design education and hypermedia

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In addition to the e-book production, a Fan page on Facebook - <https://www.facebook.com/DesignEducacaoETecnologia> - was also created in order to not only publicize the e-book and the release of modules, but also to create an environment to give continuity to researches conducted by posting several links to websites, videos, products and technologies releases, conferences, news, etc. All related to the topics covered in the e-book.

Thus, through the social network it is possible to provide content to multiple users in a dynamic and interactive way, in different media and in real time, creating a chain of contacts and information constantly changing and renewing.

In addition, the page opens a communication channel between the author, Cristina Portugal, and those who follow the Design, Education and Technology on Facebook, promoting exchanges, comments and sharing.



Figure 4 –Fan page on Facebook - <https://www.facebook.com/DesignEducacaoETecnologia>

It was considered that hypermedia is a tool capable of exploring the senses of sight, hearing and touch, which allows the presentation of information in an affective and meaningful way. Thus, in order to discuss issues relating to contemporary language, I here quote Moura (2003), when she finds that hypermedia is configured as a language because it has constituent elements, such as: static images, moving images, sounds, texts and hypertexts. These also have relations between them, generating characteristics of hybridization, interaction, navigation, multiplicity and nonlinearity.

### 3 CONVERGENCES OF LANGUAGES IN HYPERMEDIA ENVIRONMENTS

At least four defining traits of hypermedia can be pointed out by the interaction between data, texts, images (photographs, animations and video), that enable the convergence of languages in hypermedia environments: the first trait refers to its quality as a hybrid language, being described by Santaella (2004), as: in languages hybridization, sign processes, codes and media that hypermedia enables and, consequently, in the mixture of receivers' senses, in overall sensory, reverberating kinesthesia that it is able of producing, in the same way that the immersive receiver or reader interacts with it, cooperating on its realization.

The second trait of hypermedia language refers to the organization capacity of information flows in hypertextual structures, which allows that stored information become countless virtual versions, from the reader's interaction, who now assumes the role of co-author of the hypermedia content.

The third trait refers to hypermedia making navigation tools available within its content such as buttons, labels and nodes, in order to guide the user during the interaction. These tools determine the degree of user interactions and must comply with the hypermedia and the objectives of its target audience.

Finally, the fourth trait of hypermedia is constituted by its eminently interactive capability. It is the interactive quality that enables a truly dialogic interaction with its users, who come to exercise an active role in this process. The suitability of the navigation in an hypermedia system makes the user feeling safe and, therefore, makes the teaching-learning process more intuitive and enjoyable.

The use of multiple media to deliver content in hypermedia environments, such as text, image, audio and video; according to Fahy (2004) has several advantages:

- Promotes the development of skills and the formation of concepts;
- Allows multiple modes of learning;
- Increases the interactivity and provides individuality;
- Facilitates learning through charts, tables and frames;
- Helps in learning, through animation and audible narration.

Faria and Moura (2010) found that the expansion of ideas and ways of thinking resulting from contemporary technologies promoted, through dematerialization, the loss of matter, the convergence to the digital environment, the hybridization of various forms of information, flexibility of information systems and their functions.

The notion of media education according to Belloni (1999) refers to the "pedagogical mediation" concept, with the proposed formation of an active, critical and creative user regarding information and communication technologies. In this sense, an active and creative appropriation of media by teachers and

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students would create the possibility of embracing the complexity of this issue. For this, media needs to be integrated in its double dimension: as a pedagogical tool (in instrumental and conceptual terms) and as a study object (in aesthetic and ethical terms). It has essential characteristics – simulation, virtuality, accessibility, abundance and extreme diversity of information – are the ones of the new era, and require different methodological conceptions from those ones of traditional teaching methods based on a linear, cartesian and positivist scientific discourse. Their use for educational purposes requires radical changes in the way that we understand didactic teaching.

According to Bonsiepe:

There is probably a consensus that design education, in particular graphic design education, is not in its best shape today and needs some drastic overhauling. Recently a group of young media designers found hard words for our educational system characterising it as dequalification mills. Why this provocative statement? I suppose that it results from the recognition that in the field of New Media professional practice is advancing so fast that the courses in design departments simply cannot cope with the rate of innovation and are already obsolete from the moment that they are inaugurated. (BONSIEPE, 1997 p. 612)

#### 4 FINAL THOUGHTS

It can be said that contemporary digital languages are presented as the different design disciplines which are getting more and more involved in projects requiring a set of skills in order to train designers, not only related with ability and capacity to design objects but also through the way of approaching problems or working methods which usually lead to innovation.

A new profile that is formed from the experience of working in interdisciplinary teams, with actors as diverse in knowledge, attitudes and culture, while extending the field of action of design, requires reflection on the features that define it in several changing cultures.

Thus, it becomes essential for the field of Design and Education, according to Portugal (2013) to reflect about the links between these multiple means of text (including figures, tables, etc.), image (photography, icon, 3D image etc.), video (image in movement), sound (music, human voice, sounds with special effects), animation (cartoon, gifts, etc.) and graphical, giving meaning to the content that will be available, which gives the possibility of creating dynamic, engaging and relevant information.

This discussion leads us to a question from Bonsiepe in 1997, that is pertinent to the present day, regardless of the speed of technological change. He asked and answered:

What are the new competences required from the graphic designer today? Though the term interactivity is exposed to overuse, I quote it as the central issue of New Media. Of course, a book, too, is an interactive device, and a brilliant one at that. But interactivity in hypermedia goes beyond the degree of interactivity as it is materialised in books or printed works. Interactivity in digital documents means that the user can choose his own path through a non-linear structure made up of text in visual form, text in audio form, images, video sequences, animations, music and

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sound. And not only choose her or his path, but also choose between different levels of complexity. To write a book for different publics is counterintuitive, but in digital documents this is possible and mandatory. That is new and exceeds the boundaries of traditional graphic design, and of film-making and writing. It touches issues of user scenarios (in that aspect similar to theatre play and film), and the handling of perceptual and aesthetic variables other than letter form, composition, printed colour – though nobody would deny their importance and sophistication. (Bonsiepe (1997 p. 713).

This study shows the value of design research by presented the possibilities of insertion and use of contemporary digital technologies in teaching design. These ideas are echoed in the words of the French historian, Chartier (2001), when he states that: the problems of the world as representation, framed through a series of speeches that perceive and structure it, necessarily lead to a reflection on how a figuration of this type may be appropriate for readers of texts (or images) that enable us to see and to think the real.

According to the author, there lies the manifest, through which, historically, is produced a sense and, differentially, built a meaning.

In its turn, design can collaborate in reflections on the articulations of multiple teaching medias as an image and language producer, however, it still requires profound studies on how representations can affect people in the process of knowledge acquisition.

### **Acknowledgement**

CNPq, Faperj, and Interdisciplinary Laboratory of Design/Education – (LIDE/PUC-Rio)

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