Design, User-Experience and Teaching-Learning

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Abstract. This paper has a reflection about how to design digital environments that offer quality of experience to the user. It assumes that the user experience is the set of sensations, values and conclusions that the user gets from using equipment. The values coming from this interaction are not product of the functional experience, but also of the esthetical experience. The quality of this experience may be found in the result of the user goals, of the cultural variables and of the interface design. This article presents a brief discussion about the concept of user experience and after that presents the use of a hypermedia e-book as a pedagogical tool in a graduation course in Design and observations about this digital environment.

Keywords: Design, Hypermedia, User experience, Teaching-learning.

1 Introduction

This paper is part of a research project called "Contemporaneous Design: systems, objects and culture", that is being developed in the Post-Phd graduate program. – it is born from the experience gained in the research work developed during the Post-Phd internship supported by National Council of Scientific and Technological Development (CNPq), an agency of Brazil's Ministry of Science, Technology and Innovation (MCTI). (2010-2012), which resulted in a teaching material called "Design, Education and Technology", which received the "Aid for Publishing" (APQ 3) – 2012.2 - Faperj , constituted by two complementary parts which proposed the experiencing of languages as approached from the printed book, and from the digital book (e-book).(http://www.design-educacao-tecnologia.com/). For Gamba Jr.[1], the author, when devoted to the relations of Design with Learning, makes this study almost a meta language of contemporaneous knowledge, where new media, informational and cognitive models propose an innovative learning perspective.

The characteristics brought by contemporaneous digital technologies create a "new way to conceive and produce design". This study aims to create solutions to reduce this problem and to give interdisciplinary theoretical knowledge which supports discussions about the digital technologies applied to Design learning focused in the user experience aiming the educational, technological development and the innovation with the proposal of helping the propagation and the deepening of this knowledge area.

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This paper has a reflection about how to design digital environments that offer quality of experience to the user. It assumes that the user experience is the set of sensations, values and conclusions that the user gets from using an equipment. The values coming from this interaction are not products of the functional experience, but also of the esthetical experience. The quality of this experience may be found in the result of the user goals, of the cultural variables and of the interface design.

However, it becomes hard to have an understanding about concepts which fulfill the study about user experience. At first because user experience is associated to a wide range of diffuse and dynamical concepts, including emotional and affective variables, hedonic as esthetical experiences. Besides, the unity of analysis for the user experience is very malleable, ranging from a single aspect of the individual interaction of the final user with an independent application, up to all aspects of the multiple interactions of end users with the company, and its range of services from multiple disciplines. And, finally, the research panorama in user experience is fragmented and complicated by several theoretical models with different foci, such as: pragmatism, emotion, affection, experience, value, pleasure, beauty, hedonic quality, etc. [2].

The goal of this paper is to bring a reflection about the elements which characterize the user experience, what usability criteria could ease the obtention of positive experiences in users and what characteristics must have a good UX designer.

This discussion is justified, because today there is available a large amount and diversity of literature about usability for software, games, sites, etc. However there are insufficient data determining guidelines for a joint line of work between Design and the several areas which must collaborate in the construction of multimedia systems for Learning which consider the user experience in the teaching-learning process.

This shows the fragility of a conduct lacking criteria in development and utilization of contemporaneous digital technologies in education and the direct consequences of this shortage is an expressive distance between the regular teaching in schools and universities and the possibilities of teaching-learning made available by the new media. This fact becomes more serious in the teaching and formation in design, since a designer must be a translator of signs and languages and, therefore, must be ready to understand and act with the contemporaneous technologies, present and disseminated by the systems and digital languages related to information and communication. If the teaching and formation in design does not allow the access, involvement and knowledge of those technologies in its primary base, which professionals and researchers are we forming for the next future?

This article presents a brief discussion about the concept of user experience and after that presents the use of a hypermedia e-book as a pedagogical tool in a graduation course in Design and observations about this digital environment.

2 Concept of User Experience

The concept of user experience is associated to the before, during and after the interaction and may be understood as a subjective quality of users with regards to a product or service.

In this sense, user experience includes all emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and realizations of the user that happen before, during and after the course.

The user experience is a consequence that happens through the brand image, presentation, functionality, system performance, interactive behavior and assistive capabilities of the interactive system, internal and physical state of user resulting from previous experiences, aptitudes, abilities and personality and use context.

Discussions about user satisfaction in face of his experiences have been studied and we may mention the author Mihaly Csikszentmihaly[3], which investigates, by psychology, how to have a happy life; for this, the author finds that the attention of the person must be focused in things that do good to him – things that make him feel the flow, in other words, the person feels immersed, focused in the momentary activity, ignoring external stimuli. Generally, people become apathetic when the perception and the cognitive system have no incentives. However, when overloaded, they become stressed and frustrated.

Some elements which characterize the flow theory are listed below, but it is still unknown which ones of those elements must be present for the flow to exist.

- Challenges that may be overcome;
- Attention focus without significant distraction;
- Clear and defined goals;
- Immediate answer with rewards for actions and overall performance;
- Loss of consciousness about daily worries and frustrations;
- Sense of control over actions, activities and environment;
- Loss of concern about itself, such as hunger and thirst;
- Different sense of time.

For the development of projects focused in the human being it is appropriate that all responsible by planning the project consider the importance about human/ergonomic factors considering [4]:

- how usability is related with the object and use of the product, system or service (for instance, size, number of users, relation with other systems, personal safety or health problems, accessibility, specific application, extreme environments;
- the levels of different kinds of risk that may result from bad usability (in other words, financial, low differentiation of products, personal safety, required level of usability, acceptation);
- the nature of the development environment (in other words, project dimension, marketing team, range of technologies, internal or external project, type of contract).

The International Organization for Standardization (ISO) is a world federation composed by national standardization organizations.

The User Experience Wheel by Magnus Revang [5], it is a model that tries to explain "what is user experience?"

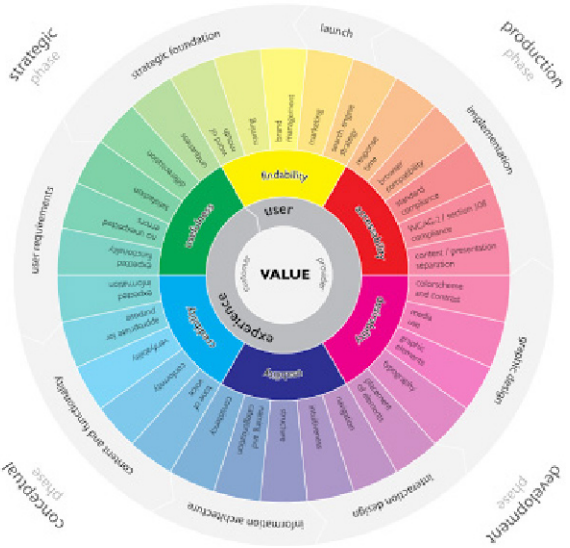

Fig. 1. The User Experience Wheel by Magnus Revang (2007)

According to ISO 9241-11, usability is about the capacity of a product to be used by specific users to reach specific goals with efficacy, efficiency and satisfaction in a specific user context. Efficacy refers to the precision and completeness for specific users to reach specific goals in particular environments. Efficiency is about resources spent with regards to accuracy and integrity of the goals reached. Finally, satisfaction is related to comfort and acceptance of the work system by its users and other people affected by its use. In face of that, the e-book Design, Education and Technology, object of this study, comes from the concern of the author, Cristina Portugal, with the development, understanding, use and efficacy of object systems in the different relations of Design in Situations of Teaching-Learning, having as the main focus the development of hypermedia systems that reinforce the interaction of its praxis with teaching and society where it is inserted.

Aiming to evaluate this e-book, a group of students from the third period of the course of graduation in Design was selected for, during one school year, testing the digital environment Design, Teaching and Technology. Those students were appointed to develop tasks in the system so that data can be collected in order to, latter, analyze and implement the due fixes or changes in the system so that it reaches a better usability and quality rate of user experience.

3 The Digital Environment and the Teaching-Learning Process

The use of the digital environment (e-book) Design, Education and Technology during the teaching and formation in design, gives for Design students an hypermedia tool aiming to collaborate in the teaching-learning process. The contents which 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. The texts present in the book are supported by several pictures and bibliographic references. The item about information that complements the main texts must be highlighted. It offers a selection of books, sites, games, videos and apps which stimulate the book user to go deeper in each particular theme. 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 necessarily involved in the interface between human and physical reality. For Gamba Jr. [1], 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. Thus, in order to analyze the use of this e-book as a contemporaneous pedagogical tool in the area of Design, workshops about the theme were developed in seven classes of the third period of the graduation course in Design. Each class went through three stages during the e-book evaluation, which will be presented below. In the first stage the e-book was presented as a supporting tool to Design teaching with the updated content of the class using the e-book – Module Color – a video was played with basic concepts about color and theoretical concepts about hue, value, saturation using the digital environment Design, Education and Technology.

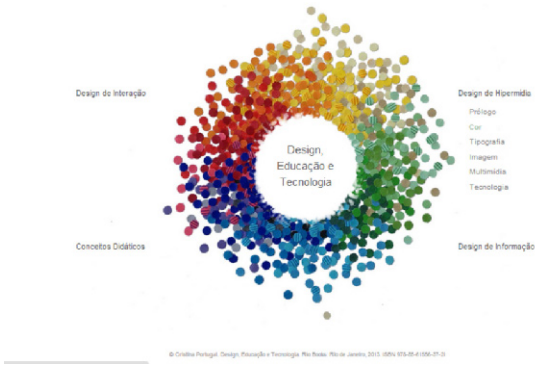

Fig. 2. Home page of the e0book Design, Education, and Technology by Portugal [6]

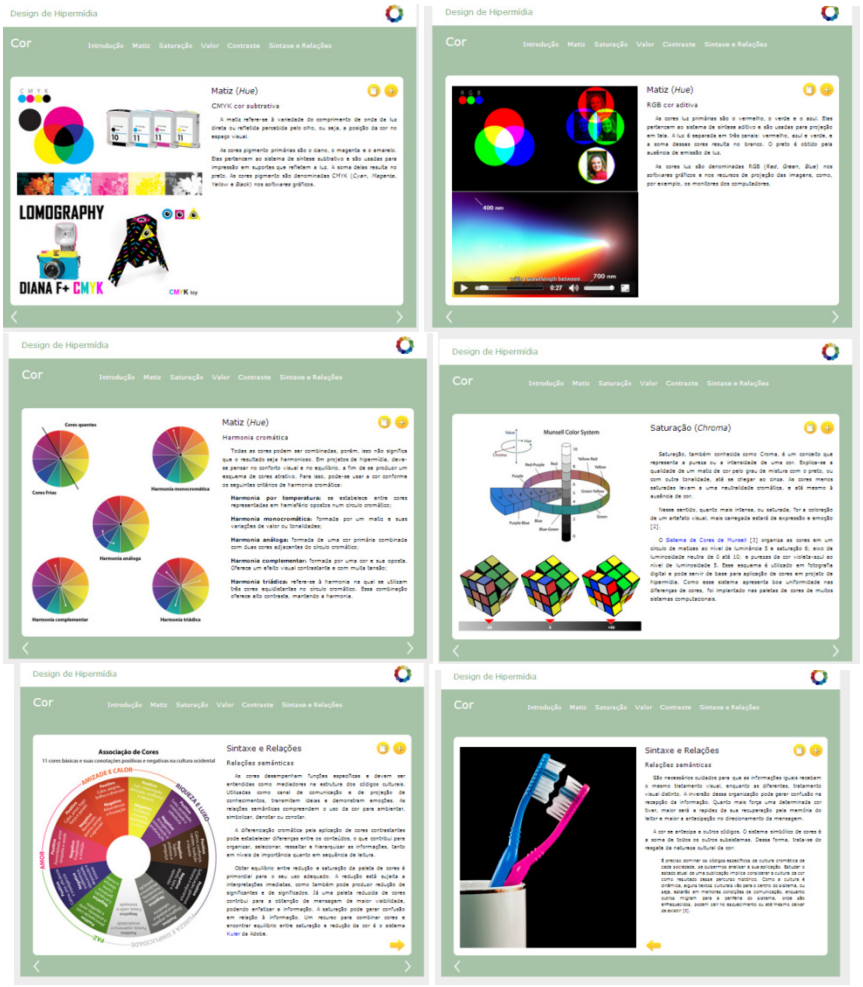

Fig. 3. Screns from hte e0book Design, Education, and Technology by Portugal [6]

The activity of this class was based in content learned by the students, they had to create a line of products (chocolate truffles). Each student in a group should develop a truffle respecting the Design style determined by the group, and the shape and colors should be in accordance with the goal and target group of the project.

For development of the line of truffles the students had to relate color with – flavor – aspect/shape – goal/target public – project resources. Each student should create a truffle using modeling clay according to criteria defined by the group. The access to contents in the e-book were open for research or for solving questions. At the end, the truffles developed by each student should be adequate in order to create a truffle line.

Fig. 4. Results of the students activities

In the second stage the e-book Design, Education and Technology of Cristina Portugal – Module Color – is presented, aiming to make available for the student a material for theoretical study and strategies to allow the access to several experiences in the use of color. For development of activities, the stages followed were:

1. Expository class with visual resources about color theory.
2. Experiences with chromatic harmonies from primary colors.
3. Formation of groups - Brainstorm with the goal of representing, by chromatic harmony criteria, the theme defined by the students.
4. Selection of one criteria of chromatic harmony and creation of a color palette communicating the project theme (objective and target public).

5. Development of layouts of a color composition representing the project theme of each group. The composition created should be brought in the next class, specifying contents learned during the class and which resources of the e-book were used for deepening the theme.

Fig. 5. Students doing the activities

In the third stage the e-book Design, Education and Technology of Cristina Portugal [6] – Module Color – is presented, aiming to work with the students the taxonomic and semantic relations. In this class were discussed the taxonomic relations about the use of color to organize, prioritize and highlight information, also enabling other applications, such as creating perception plans, directing and/or masking the reading, as well as treating the semantic relations of color which comprise its use for acclimatize, symbolize, denote or connote.

The digital resources available in the e-book during the class were video (Beau Lotto: Optical illusions show how we see), images and links for deepening the theme. As an activity for this class a brainstorm was performed aiming to represent, by taxonomic and/or semantic relationships of color with project theme. The proposed activity was to develop a poster about the project theme that the students should have been developing in the discipline “project 3”, considering that the color may be considered an information every time that its application is responsible by organizing and prioritizing data or when it can attribute some meaning, in other words, acting

individually or integrated and dependent of other elements. The result expected from this exercise is the possibility of communication by color and other graphical resources of each group's project theme.

Fig. 6. Results of Student Work

Fig. 7. Results of Student Work

Fig. 8. Results of Student Work

4 Conclusions

Main questions observed in interviews with students during observations collected from students of the graduation course in Design about using the e-book Design, Education and Technology of Cristina Portugal as a teaching resource for the teaching-learning of Design.

4.1 Main Questions Observed

About Number of Accesses. Most of students accessed hypermedia from 0 until several times;

Generally, the accesses were related with three factors: performing active ties, individual learning process and ease of access during class.

Availability of Information. The Wi-Fi network available, in classrooms, collaborated both during presenting the content of e-book Design, Education and Technology as well as during the development of activities, because the students with their laptops, tablets and smartphones could use the available resources such as videos, links, e-book sites easing the search of contents needed for development of tasks.

Among the mostly mentioned contents were the ones related to the development of activities; such as developing the color palette for building the boards for presenting the works.

Some students identified that the videos played in classroom and then posted on Facebook contributed for the learning about color content. It was observed that videos posted in Facebook were viewed by a large majority of students in each class.

About Readability. Almost all students considered the e-book text as readable in their personal computers; however when exposed via data-show in classroom it was necessary to magnify them, so that the students could read.

Association between readability and amount of text was a favorable item, because the students considered the contents as knowledge pills that could be deepened in the e-book itself, as well as in references made available on the field "Learn more".

Content Organization. A large part of students understood the organization of color contents. They considered that the e-book content, as a whole, eased the development of tasks, since the e-book offered theoretical and aesthetic concepts about the Design field as a whole.

Text Language Used. Consistent information. The volume of text on screen was considered large for some students. Considered to be adequate to the use context;

Good receptivity from students to the use of images as examples of content and, specially, videos.

Features Found While Navigating. Students considered easy to navigate the system and find the links on the landing page; some have difficulty in finding the link for the landing page.

The menu and advance/return buttons were mentioned as easier to use navigation tools.

Association between Media Resources. Generally, perceived as adequate by students;

The most celebrated association by students was between text and video, image and text, perceived as fundamental for understanding the context.

Navigation Path and Completeness of Search Results. Some students have difficulty identifying the navigation tools; such as the icon for bibliography and the one for "Learn more".

Generally, opening modules in new tabs caused confusion in students;

The field "Learn more" was considered as important by students for deepening the content, however many did not use it by lack of time.

Generally the e-book content highlight was the clarity in organization and presentation of contents, simplicity and easiness of navigation, consistent presentation of information.

To finish, when analyzing a hypermedia pedagogical tool it was verified that regarding usability, the experience is normally defined considering the ease of use. However, the experience encompasses more than only function and flow, but the understanding compiled through all senses. For Shedroff [7],, the user experience is about the global, general or specific experience that a user, customer or member of the public has with a product, service or event.

According to Couto [8], in today's society, full of changes, the need of reevaluating teaching practices is pressing, leaving aside traditional methodologies. In order to that, the new trends and the use of innovative material must be considered. In this sense, the e-book of Cristina Portugal constitutes an invaluable source of research.

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