Kids in Action
Interface Concepts for Educational Experiences in Art Museums
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Interface Concepts for Educational Experiences in Art Museums

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Abstract

This project presents interface concepts for the educational experiences for children in art museums. Due to the aura involving the works of art, the art museums are still resistant to the use of interactives in their environments. Their main objective is to provide a pleasant aesthetic experience and foster observation and enjoyment of the works of art. In this context, technology and design can provide solutions that enhance the educational programs in the art museums and bridge the gaps between the viewer and the works of art, conveying context information and proposing activities for discussion and self-expression.

The main foundations of this project come from the analysis of traditional guided visits for children in museums, especially art museums. These visits usually are arranged by school groups, but many museums offer guided visits for free visitors with predefined schedule and themes. During the visits, the child is stimulated to observe the works or art in their details and receives also context information from the guide. The children are always encouraged to discuss and express their own opinions about what they see. And finally, at the end of the visit, the guide proposes a creative activity, usually a drawing. Other museums also propose collage or writing. The visits can be resumed in three main actions: seeing, listening and doing, which became the three main pillars for the development of the interface concepts for this project.

Furthermore, intense research was made in order to understand children and their behaviour in museums. Theories about education and development of the child were important sources to formulate a constructive pedagogic proposal. Once the richest learning experiences for children happen through their experiences, the solution proposed should consider the active participation of the child during the exhibitions.
The solution is presented in the form of two projects for the Chácara do Céu Museum in Rio de Janeiro, Brazil. The first one is a multimedia guide that presents the Raymundo’s Collection in the form of a game. Children are encouraged to accomplish a series of simple tasks related to the works of art and collect information to reach the main goal of the game. The tasks involve quiz games and creative activities, like digital drawing and painting. All the results are sent to the databank and uploaded to the Raymundo’s Collection website.

The website presents the Raymundo’s Collection through interactive storytelling, videos and information about the works of art, as well as simple games and creative activities. The results are also uploaded to the Gallery, which provides a quick overview of the collections, profile of the visitors and important feedback information for the future development of the museum’s educational program. A simulation of the project was tested with children and received a positive feedback.

Though the concepts presented in this thesis still were not tested in the real museum’s environment, they can be enrich the aesthetic experiences in art. The solution can thus be considered a good alternative to enhance educational program in art museums.
# Contents

## Introduction

One

### Design & Experiences

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>One. One</td>
<td>Experience Design or Design for Experiences?</td>
<td>10</td>
</tr>
<tr>
<td>One. Two</td>
<td>New fields, new disciplines, new terms, new approaches</td>
<td>11</td>
</tr>
<tr>
<td>One. Three</td>
<td>User Experience</td>
<td>12</td>
</tr>
<tr>
<td>One. Four</td>
<td>Information</td>
<td>15</td>
</tr>
<tr>
<td>One. Five</td>
<td>Cognitive models</td>
<td>16</td>
</tr>
<tr>
<td>One. Six</td>
<td>Metaphors</td>
<td>17</td>
</tr>
<tr>
<td>One. Seven</td>
<td>Storytelling</td>
<td>19</td>
</tr>
<tr>
<td>One. Eight</td>
<td>Usability</td>
<td>19</td>
</tr>
<tr>
<td>One. Nine</td>
<td>Interface</td>
<td>21</td>
</tr>
<tr>
<td>One. Ten</td>
<td>Visualization and Interactivity</td>
<td>22</td>
</tr>
<tr>
<td>One. Eleven</td>
<td>Playing the user</td>
<td>24</td>
</tr>
</tbody>
</table>

Two

### Children & Education

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two. One</td>
<td>Development and Theories</td>
<td>25</td>
</tr>
<tr>
<td>Two. Two</td>
<td>Ethics and Morality</td>
<td>28</td>
</tr>
<tr>
<td>Two. Three</td>
<td>Play</td>
<td>30</td>
</tr>
<tr>
<td>Two. Four</td>
<td>Children and Computers: Playful learning</td>
<td>31</td>
</tr>
<tr>
<td>Two. Five</td>
<td>Drawing</td>
<td>35</td>
</tr>
</tbody>
</table>
My first visit to the Chácara do Céu Museum, in Rio de Janeiro, was in 2000. I was looking for an internship in Graphic Design. The interview took place in a sunny afternoon, which provided me more than the opportunity to show my portfolio and talk about all the projects I would work on, and the Chácara do Céu Museum became one of my favourite museums. A few days later I started working there every afternoon after my classes, and after eight months I had acquired more than experience in Graphic Design projects, or about the museum’s art collection: I started to understand the connections between Art, Museums, Design and Education.

The first educational program for schools known took place at the Louvre Museum, in Paris, in the end of the 19th Century. Today museums are not considered spaces for the elite, and assumed an essentially educative role, which is translated in several initiatives to attract and captivate the public, to engage them in the exhibitions, and to make them co-authors in the construction of the collective knowledge. As sources of culture, museums strongly represent the basic concepts of Heritage Education, which proposes pedagogic methods to explore the concrete evidence of culture, or real objects, as the primary source of information about the social relations and historical context in which it was produced that carries a whole system of meanings of the society that created it. And in the Age of Information, the use of new media and technologies can be noticed in several museums’ environments in order to deliver information to the public and convey a pleasant experience.

The examples are many: science museums that simulate scientific experiences, technical museums that present content beside their objects in interactive displays that can explain

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processes, historical museums that use the potential of technologies in virtual presentations that put their objects into context and so forth. The exception is the art museum.

Art museums are usually resistant to the use of technology with the objective to support their exhibitions. This happens because of two main reasons: firstly the aura involving the works of art. The visitors are encouraged to contemplate the works and let them speak by themselves instead of getting involved with interactive experiences that can not replace the real works; secondly the subjectivity of the educational proposals of the art museums. As their main object – art – is still an open concept, the pedagogic activities aim to raise discussions, stimulate critical thinking and pose questions rather than providing closed answers to scientifically proved issues.

However, context information about the works and open discussions can provide elements that enrich the aesthetic experience. This is usually made through guided visits, where the educator has the function to connect visitor with the works in exhibition, delivering additional information related to the works and stimulating the critical thinking. Most of the children who visit the museums take part of these guided tours, where they learn about cultural and historical context while they observe the works, and participate of creative activities like drawing and collage.

But what happens when they don’t arrange a guided tour? Would the works alone be enough to engage children in contemplation and enjoyment of works of art? Can design and technology work as tools to nourish the aesthetic experience? Is there a way to use technology in art museums and complement these experiences in accordance to the museum’s objectives without shattering the aura of the works of art?

How can design and technology enhance the educational experiences in art museums in order to encourage contemplation and reflection about art?

This project aims to answer these questions and provide a solution that enhances these experiences, considering the particularities of the art museums and its collections and the features of children between eight and twelve years old as a main target group. This solution is presented as a project of a platform composed by two units: a multimedia guided tour to be used as hands-on activity in the museums, which delivers context information about the works of art in the forms of simple games and proposes creative
activities to engage children in the contemplation and enjoyment of the works; and the website, which presents background information about the museum and its collections to children in form of interactive storytelling and simple on-line games. The website also records the results of the activities in the museum and the virtual works produced on-line, providing feedback from the visitor to the museum, their basic profiles and the acceptance of the activities and collections.

The foundations for the development of this project come from the results of researches in the fields of education, art, design and technology.

*Designing & Experiences* presents the main design concepts, processes and terms involved in the development of any interactive project. Furthermore, it discusses the responsibility of designing user-focused projects that consider all the human dimensions when supporting experiences, no matter if they are technological or not.

*Children & Education* describes the main features of children’s development and education concepts, focused on the children’s drawings and the amusing experiences, which are considered two strong elements in the construction of children’s identity.

*Museums* discusses some concepts and definitions of art and the educational approach of art museums. It presents concepts of art-education and heritage education, examples of traditional educational programs offered by the art museums and argues about the presence of technology and its possible connections to the exhibitions in order to complement and enrich the aesthetic experience.

*Kids in Action* presents a solution proposal for the use of design and technology to enhance educational experiences in art museums. The practical project is here described from its main objectives and concepts to the final results and preliminary tests with children.

And finally, the *Conclusion* presents a resume of the thesis, the final results and proposals for further development.
One 

Design & Experiences

“One memory of earth that you will take away with you when you die proves that you were alive.”

Nathan Shedroff

One.

**Experience Design or Design for Experiences?**

When I started to research how can interaction design provide ways of enhancing educational experiences in Art museums, EXPERIENCE became the reference word every time I was researching about target groups, scenarios, objectives and design decisions. Nathan Shedroff\(^1\) says that “experiences are the foundation for all life events and form the core of what interactive media has to offer.” In fact he says that all experiences are important, in any kind of different media, in Internet or not, technological or not. Actually most of not-technological and not-on-line experiences we have in life are quite richer compared to those we have connected. As designers, we must understand the nature of those experiences, their boundaries and which different media they happen. In this context, I was introduced to the term Experience Design, defined by Shedroff as an approach, a combination of many previous disciplines. It involves not only new media itself, but also Graphic Design, Theatre, Storytelling, Game Design, On-line Design, Architecture, Psychology and so forth.

Fabio Sergio\(^2\) says that there is a difference between designing experiences and designing for experiences. In fact, I don’t think we can design other people’s experiences. Experiences are personal and each person will design and live them their own way. We can not design experiences for other people, but we can design in order to support and make their experiences richer and meaningful. Fabio Sergio also defines the term User Experience as “The rational and emotional interaction with an artifact in a given

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context of use that allows human beings to acquire knowledge and changes the way they think in/about that context.” This artifact does not need to be a computer-based interface, but having in mind that human will interact rationally and emotionally with any product designed has a big influence on the development of every project.

Shedroff also declares that the most engaging experiences are those that allow creativity, productivity, communication and other human motivations. This is particularly noticed in children’s experiences, especially with drawings, which are examples gather all at the same time, once children express feelings and show traces of their own identity through drawings.\(^3\)

One. Two

**New fields, new disciplines, new terms, new approaches**

The presence of new technologies brings also the need to adapt to them when designing new products. In this context, new fields, terms and approaches are created, especially those concerning the user – according to the Little Oxford Dictionary, “a person who uses something” – and the way they interact with new media products. User experience, interaction design, interface design and experience design are just some of them. Marc Retting says in his notes from the 1999 Santa Fe AIGA Advance Conference:

“We don’t have a name for this field yet. The terms interface and interaction design are too narrow to contain the scope of what needs to be addressed by new designers. Think of the hierarchy of contexts, from broad to narrow: experience, interaction, interface. While the useful-usable-desirable measure applies at all levels it is less adequate as you go up the hierarchy.”

In Design, “contributions from cognitive psychology, linguistics, theory of perception, learning theory, theory of signs (semiotics) and last no least visual design are integrated”\(^4\), in order to provide visualization that can enhance understanding in computer-based interaction. When we talk about users, we talk about humans, people who have all kinds of backgrounds, personalities, stories and previous experiences with all kinds

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of media, digital and non-digital. More than creating a new field that encompasses all these issues - if it is possible to do it -, it is important to take the responsibility of understanding human experiences before and during the development of any design project. And each new project will challenge us to go deeper and understand new experiences, related to new contexts. Children in museums can learn, create, have fun, explore and live different emotional and interactive experiences at an environment where they are under the influence of images, sound, space, other children, other people and their own previous knowledge.

One. Three

**User Experience**

The Doblin Group defines three stages that characterizes an experience:

1. **Attraction**: it calls to you
2. **Engagement**: you forget the time
3. **Conclusion**: you want to share it with others, you want to repeat it

Understanding experiences is an exercise that involves basically two stages: firstly the reflection about our own experiences. Why are they meaningful? What kind of knowledge do we make of them? How do they happen? What makes them important for us? First of all, we are also users like any one else; secondly, the observation and reflection about the experiences of other people. It is certainly more difficult to answer subjective questions about the meaning other people make of their experiences, but finding the right questions is as important as finding the right answers. During the development of this project, I was advised to observe children in parks or on the streets and, of course, in museums. Piaget’s theories were certainly very important to make me understand this world, but the richest knowledge I got from the children’s world was observing them, talking to them, everywhere, in different situations besides those related to computers and technological devices. These observations will be better explained in further chapters.

The first thing I concluded about experiences is that they can not be replaced. Even if there are parallels between computer-based interfaces and real life, an e-mail does not have the smell of a handwritten letter, an on-line chat is not a conversation and digital
photos will never replace the experience of opening a box of old printed photos and show them to a new friend. Each experience has its own particularities. This changes our approach when designing for experiences. First we observe, we learn how they happen, we understand them and make them a source of precious information about people. Than we define our role as designers: we can design solutions that complement and support these experiences, or we can transpose them to another media and provide a new experience.

A good example for the first approach is the audio guide in museums. Audio guides are technology complementing a non-technological experience. There is no effectiveness if you use them somewhere else, because they were made to complement the exhibition. You can buy a CD with the reproduction of the texts, but they can only make sense if you have visited the exhibition and use them as a tool to help you remember what you saw. In the other hand, exhibitions become richer and more meaningful if the objects are put into context, and that is what the audio guide does. The second approach can be exemplified by the same audio guide. It works as an alternative to the guided visits. It can not replace a person that walks around with you presenting the exhibition, and answering questions, but it translates this function somehow and becomes a new alternative to enhance an experience, although with different features.

Jesse Garrett⁵ defines a sequence of five elements of the user experience in the development of a website:

1. Strategy is where it all begins. What do we want to get out of the site? What do our users want?
2. Scope transforms strategy into requirements. What features will the site need to include?
3. Structure gives shape to scope. How will the pieces of the site be arranged and behave?
4. Skeleton makes structure concrete. What components will enable people to use the site?
5. Surface brings everything together visually. What will the finished product look like?

Although these definitions were mostly concerned about the design of sites, they apply also to other project situations. Garrett also put different fields and disciplines of design together under the same project context, which demonstrates a thin line that separates interaction design from interface design, or information architecture from information design.

The **Strategy** concerns about the user needs, and the objectives of the project. This is where all the researches about children and their behaviour have to be defined, as well as the objectives of the project. What can they learn? How can they learn? What kind of experience does the museum want to convey?

The **Scope** defines the functional specifications of the project, the tasks that are going to be accomplished. The content requirements are also defined here. How are the games and activities going to work? How will they deliver information?

The **Structure** is where information design provides solutions concerning the way the system behaves in response to the user when he accomplishes a task, and information architecture organizes the content to be presented in a consistent way. How will children access the information presented? Where and how will they find what they are looking for?

The **Skeleton** supports the presentation of the project, and is concerned with facilitating understanding. Information design and interface design together provide ways to make it possible. The decision about how the children will move through the information architecture - or Navigation - is defined here.

And finally, visual design will work on the **Surface** of the project. The concepts and more adequate visual language to children are defined here.

*1 The 5 Elements of User Experience*
One. Four

Information

Experiences are directly related with information. Nowadays we have access to information from all kinds of sources, in real time, in different media, as never before, and understanding information becomes a central issue and a challenge. In this context, a number of terms and disciplines are created in order to make information understandable.

In information technology there is a “progressivist linguistic chain — from ‘mere data’ to ‘processed data’ (information) to ‘verified information’ (knowledge) to, perhaps, ‘existentially validated information’ (wisdom?).”

First of all, Data is not Information. Information is Data inside a context with organization and presentation. It has value if we know how to decode it, if we can speak the language in which it has been encoded. Knowledge is defined by Shedroff as “(...) sufficiently generalized solutions gained through experience.” This is where an experience becomes more personal, and the information acquired is combined with previous experiences. In his studies about Genetic Epistemology, Piaget declares that knowledge is essentially active. To him, knowing is acting upon an object, more than copying it from reality. “Knowing reality means constructing systems of transformations that correspond, more or less adequately, to reality.” And finally Wisdom is the most personal part of this chain. You can evaluate it in other people, but you can only make it for yourself.

8 PIAGET. Epistemología Genética. 1968.
One. Five

**Cognitive models**

Information is the beginning of meaning, and making meaning from experiences is part of a learning process directly connected with our cognitive models. These are basically internal mental processes created to understand any experience. While interacting with anything, we make internal mental models of ourselves interacting with them. When executed or repeated from the beginning to the end, these mental models provide the foundations from what we can explain our interactions. These processes can be formed textually, visually, temporally and so on. “What an individual can learn and how he learns it depends on what models he has available.”

The cognitive psychology offers basic foundations to understand the human behaviour: cognition, perception, attention, memory, apprenticeship, information process and models.

**Cognition** can be defined as a group of rules and deductions, and cognitive process is the application of these rules to solve a specific problem.

**Perception** is the extraction of information from the external world through the senses, but it is also related to internal knowledge and expectations of each person.

**Attention** refers to mental direction. Logical structures to present information, visual highlights are examples of ways to catch and keep the user’s attention.

**Memory** are records of previous processes that can be activated at any time. All human activities involve memory, and that is a feature that should be used in any interface project.

**Apprenticeship process** requires an “active involvement” and quotes some strategies to reach it:

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9  SANTOS. Ergonomização da Interação Homem-Computador. 2000

10 PAPERT. Mindstorms - Children, computers and powerful ideas. 1980. Page 7
- **Learning by doing**: learning with the results of the own acts. This is a common process observed when children play some games, as LEGO. When children make constructions using bricks, they learn about balance and stability.

- **Learning by active thought**: conclusions on how a system works.

- **Learning by objective and knowledge**: objectives are translated in actions.

- **Learning by analogy**: people compare a non-familiar system with a familiar one. This is commonly used in metaphors.

- **Learning with the own mistakes**: answers to mistakes help people to understand an activity.\textsuperscript{11}

### One. Six

**Metaphors**

Metaphors are mental models, one kind of the way to build cognitive models.\textsuperscript{12} In digital systems, everyday objects and classical processes are translated in order to provide a better understanding of its functions. Desktop, recycle bin, folders structure and buttons are some examples of metaphors commonly used in digital interfaces, which are already assimilated by most of the users as a cognitive model.

However, it is important to mention that even if the use of both text and its correspondent icon seem to be redundant, some users may not recognise each function provided by icons and symbols, especially if they are not commonly used or seen. This rule is applied especially when working with children or people who are not familiar to new technologies. The tests made with children during the development of this project showed that not everyone were familiar with symbols like the house as “home” to return the very beginning of the interface. Their library is still small, and their cognitive models are still in the beginning of their construction.

The Desktop is one of the most common and recognizable metaphors applied on digital interfaces. It translates the elements of a desktop to the screen, enhancing the understanding of different functions of the system. The familiarity to folders makes it easier to understand how to organise files, the recycle bin is directly connected with the action of throwing away.

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\textsuperscript{12} SHEDROFF. Experience Design. 2001. AVA Designing for Small Screens.
One. Seven

**Storytelling**

What are the ways that can be used to convert data into information? Storytelling is one of the oldest and most powerful experiences known, and it should be taken as a good example. Storytelling can organize information in a way that allows us to draw meaning and create knowledge. Successful stories are immersing, authentic and relevant to the audience, and they should have a beginning, a middle and a conclusion. “Stories can be used not just as entertainment but as a way to make difficult concepts, information or instructions more accessible.” SHR. It is explored in all kinds of media and for all kinds of public and purpose, because it facilitates the comprehension of complex issues.
Stories have been present in all cultures with the objectives of entertainment, education, preservation of culture and to instigate moral values. Every culture has stories and legends. They are characterized by the narrative point of view and the presence of characters.

The earliest forms of storytelling were oral, combined with gestures and expressions, and passed from generation to generation, surviving by memory. The technology brought innovations, especially concerning the media, that changed the way of stories are told. The writing, painting and acting made the register of stories possible, enabling new kinds of media such as books and film.

The National Storytelling Network defines Storytelling as “the interactive art of using words and actions to reveal the elements and images of a story while encouraging the listener’s imagination.” This definition contains important keywords for the development of successful interface projects for children: interactive, words, actions, images and imagination.

One. Eight

**Usability**

Peter Morville defines seven qualities of the user experience: useful, usable, desirable, findable, accessible, credible, and valuable. One of the main bases to reach this principle is Usability. Usability “measures the quality of a user’s experience when interacting with a product or system—whether a website, a software application, mobile technology, or any user-operated device.” According to the ISO 9241-11, “Usability refers to the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.”

Krug’s First Law of Usability: “Don’t make me think!” is a good definition of this term in one sentence. This law basically stands for the use of any application without having to think about how it works. All actions and tasks are accomplished intuitively.

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15 [MORVILLE - Semantic Studios](http://semanticstudios.com/publications/semantics/00002.php)
16 Usability.gov
and people can concentrate on the tasks instead of trying to find out where the contact information is, or if a specific image is a link or not. Usability Guidelines establish a sequence of procedures, from planning to testing, in order to design user friendly interfaces, which are easy to use.

Nielsen\(^{18}\) lists the following basic requirements in a system for a good usability in a system: easy to learn, efficient in use, easy to remember, few mistakes and subjective satisfaction. To him, these five elements compose the multidimensional nature of usability.

While Usability engineers are mainly concerned about the user, Bonsiepe, with whom I agree, says that a design approach also takes aesthetics in consideration: “A comprehensive design approach does not put aesthetics into quarantine, but explicitly addresses the concern for aesthetic quality, including the dimension of play.”\(^{19}\)

Especially when designing for children, play is a central issue to be considered. Playing attracts, challenges and engages children, providing an active experience that can be kept for a longer time. The qualitative dimension of Usability tests should also consider aesthetic decisions that will occur anyway. Of course a website should load fast, but more important is effectiveness of communication, and in some cases tools like motion pictures and sound are very effective ways to deliver a message, especially to children.

Creative activities, games and storytelling are just a few and extremely strong resources intrinsically connected to aesthetics that captivate them, but would probably fail to some classical usability criteria. But the main criteria that should be followed is to “watch users and see what they like, what they find easy, and where they stumble”\(^{20}\) and that is what designers do in their profession.

\(^{18}\) NIelsen. Designing Web Usability. 1993

\(^{19}\) BONSIEPE. Design as Tool for Cognitive Metabolism: From Knowledge Production to Knowledge Presentation. 2000

\(^{20}\) NIelsen. Designing Web Usability. 1993
One. Nine

**Interface**

Interface can be defined as:

“(…) a local or region, or a piece of an equipment where interaction occurs between two systems, organisations or persons. An interface is not simply a physical entity. It can include symbols, concepts or words. Interface is a media through which information is communicated. More specifically, it is used to communicate instructions, or to receive the results of implementation of the instructions.”

The project of interfaces must consider more than technology. Once a human being is involved in the process, interface design must consider the reciprocity of the system. Developing an interface should consider all the human senses, once people can complete tasks responding to more than one stimulus than just the sight. Sound and motion are powerful elements to engage user in an interface, touch should be mainly understood when dealing with the physical dimension of devices, as keyboards, touch-screens, or mobiles.

The **senses** are an important aspect to be considered when designing for experiences. The best example I found to understand how powerful our senses can be is a project called *Dialogue in the Dark* - an exhibition to discover the unseen (*Dialog im Dunkeln - eine Ausstellung zur Entdeckung des Unsichtbaren*, Hamburg, Germany). The concept is described in the exhibition’s website: “Visitors are lead by blind guides in small groups through specially constructed darkened rooms, in which scents, sounds, wind, temperatures and textures conveys the characteristics of daily environments, for example a park, a city or a bar. In the dark, the daily routine becomes a new experience. A reversion of roles is created: sighted people are torn out of their familiar environments; blind people provide them with security and a sense of orientation transmitting a world without pictures.”

My experience with this project was in 2005 during the congress “Science Centres: Breaking barriers, engaging citizens” - IV Science Centre World Congress, in Rio de

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21 SANTOS. Ergonomização da Interação Homem-Computador. 2000

22 SANTOS. Ergonomização da Interação Homem-Computador. 2000

23 Dialogue in the darkness <http://www.dialog-im-dunkeln.de/>
Janeiro, Brazil. I entered a big room, totally dark, where I could only trust on the guide and on my other senses. In beginning I felt extremely unsafe, but after a couple of minutes I started to notice how powerful other senses are, in such way that I had never experienced before. When the vision is missing, you “see” sounds, tastes, and smells of a park, and when I entered a bar, I could already trust on my senses enough to order a coffee, without worries of the possibility of burning myself in case I let the cup fall. As designers, we study and work on projects that are essentially visual, but is a good example of exhibition design with no visual elements at all.

One. Ten

Visualization and Interactivity

Visualization can be defined as a disposition made visible, generating understanding. Maps and diagrams are ways of visualization that work as a basic mental model and facilitate understanding. Gui Bonsiepe declares that “visualization means the transformation of generally invisible processes with the objective to facilitate and enhance understanding.”

Here we can group many examples of mapping, formulated to present complex categories of information and make them easier to understand. In this context, I refer to interactive digital media, the non-linear storytelling, the use of hyperlinks, sound, images, motion, programming and so on. Users can be active participants through the tools provided by interactivity. Interactivity is created by each person involved, but most of the time we don’t think about it. It is based on action and reaction.

Interactivity in digital media provides communication between users and devices. That means, action and reaction should be understood through feedback. That means a system should react to user’s actions in real time. “The ‘instant feedback’ provides the user with the feeling that they are directly manipulation and controlling the system.”

When no feedback is provided, the dialogue between user and device is interrupted, leading to frustration. The answers should be provided by signs for most of senses, like audible signs and visual changes on the selected item or menu. If this process requires time, it should provide some indication of delay.

24 BONSIEPE. Design as Tool for Cognitive Metabolism: From Knowledge Production to Knowledge Presentation. 2000.
"HistoryWired: A few of our favourite things" is an experimental website that introduces visitors to some of the three million objects held by the National Museum of American History, Behring Center. The objects are organized in categories and presented in an interactive interface that conveys a visual overview of the collection. HistoryWired is accessible at: http://historywired.si.edu
Playing the user

During the development of this thesis, I spent a lot of time researching and observing other issues not directly related to Design. When I say “not related”, I mean not the fields and disciplines usually taught to Design, none of those well established, but those that still don’t have a specific term to define them. Of course all Design disciplines, official or not, established or not, are important foundations for the development of any project, but if we understand the role of the designer as a “problem solver”, he will use all possible tools and knowledge to understand the problem, and most of these tools and knowledge certainly come from other sources but Design.

Designing for experiences involves the consciousness of this role in its deepest meaning and responsibilities. In this process, part of the basis for projecting comes from the comprehension of Design and the specific knowledge acquired during the project, which is directly related with the context and, above all, the user himself. This is why it was so important to study Pedagogy and Museology during this project.

Finally, designers will build the foundations of their projects also based on knowledge that can not be found in the established fields of the traditional design courses: those that bring their own experiences, non-professional experiences, the personal ones, the impressions, the memories, the observations, the “takeaways” and conclusions that raise from knowledge and feelings from previous experiences. In this sense, one of the best sources of information about the user is “playing the user”, being a kind of actor that goes beyond the researches about the features of a character when he stands on a stage and brings all these features to life, in first person. Designers should be actors and play users. By doing this, they realize that experiences are not made of separate elements. They are built upon different elements, such as the user’s previous knowledge and experiences - which changes all the time -, their relation with the objects, with the environment, and with other people. As designers, we have access to some of these elements, and we can indeed design some of them, especially when they are concerning objects, environment or interfaces. But we do not have access to the personal and unique background of each person, which will make each experience unique as well. That is why we can not design experiences. But we can - and we should - support them.
Two

Children & Education

“When children create pictures with finger paint, for example, they learn how colours mix together. When they build houses and castles with building blocks, they learn about structures and stability. When they make bracelets with coloured beads, they learn about symmetries and patterns.”

Mitchel Resnick

Two. One

Development and Theories

Despite the vertical model of education - where the teacher has the knowledge and transmits the information to the pupils, who receive them restricted way with ready answers, the learning process occurs through experience since the first stages of a child’s development. Since the first stages of children’s development, the learning happens through experience. Babies learn to recognize objects through the direct contact with them and young children learn by trying and experimenting. According to Piaget, the understanding of learning must be genetic, and children are the builders of their own intellectual structures.¹

The development of children must be understood as a continuous process where there is no absolute beginning, and what is unknown turns to be familiar in a gradual coordination and progressive differentiation. That means that children are builders of their own intellectual structures, based on experiences with objects around them.

Papert² defines the “Piagetian learning” as “learning without being taught”. On his research on genetic epistemology, Piaget demonstrates that the mind of the child process the perceptions in an active manner in order to make them meaningful and hence learn. He studied the transitions between lower levels of knowledge to a considered higher level of knowledge. “The nature of these transitions is a factual question. The

¹ PIAGET. Epistemología Genética. 1968.
² PAPERT. Mindstorms - Children, computers and powerful ideas. 1980
transitions are historical or psychological or sometimes even biological”

To him, the genetic epistemology has as first principle to take psychology seriously. That means that questions of psychological facts should be answered with psychological research instead of private speculation.

Piaget divided the children’s development in four stages: Sensori-motor, pre-operational, concrete-operational and formal-operational. The first stages of development are characterized by what we calls egocentrism, an early stage where children believe that they are the centre of the universe and everything rotates around them. In later stages, children are more conscious about themselves. Between approximately seven and eleven years old, they can think logically about objects and events. From eleven years on they can think logically about abstract propositions and test hypothesis systematically. This is the moment when they become concerned with the hypothetical, the future, and ideological problems.

It is in the relation with things that children develop the intelligence. Piaget describes the beginning of this process in the development of the sensori-motor intelligence in the two first years of the child’s life. At this stage, children establish a relation with objects around them as they were the centre of the universe. Between two and seven years old, the egocentrism remains in their thoughts and ideas. To Piaget, the children's thoughts are developed through two complementary processes of adaptation described as Assimilation and Accommodation, where the awareness of the external works is internalised. Both processes are dependent and can only happen together, even when at some stages one process may have more influence over the other. In assimilation, external perceptions are internalised without changing the internal world. However, external perceptions are changed in order to fit to this internal structures. In the accommodation process, the internal structures adapt to the external perceptions in order to adjust to them, which can be a more painful process. “From the social point of view, accommodation is nothing other than imitation and the totality of the operations enabling the individual to subordinate himself to the precepts and the demands of the group.”

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3 PIAGET. Epistemología Genética. 1968.
4 PIAGET. Epistemología Genética. 1968.
5 PIAGET. The Construction of Reality in the Child. 1955.
6 PIAGET. op. cit.
When Piaget empirically demonstrated that the children’s minds were not an empty place and processed actively the material and impressions received, as well as presented the concepts of assimilation and accommodation, he provided the starting point for the development of Constructivist learning theories. The Constructivism can be defined as a set of theories that presuppose the active participation of the learner in the construction of meaning. The role of the teacher is thus not to present knowledge that will be simply assimilated by the learner, but establish a dialogue where both learner and teacher work together in the construction of meaning.

Constructivism can be divided cognitive and social.

The cognitive constructivism theories are based on the way an individual learn in terms of stages of development – discussed by Piaget - and learning styles. The learning process in the development of children happens with the construction of successive cognitive models. According to Papert, “anything is easy if you can assimilate it to your collection of models. If you can’t, anything can be painfully difficult. (...) What an individual can learn and how he learns it depends of what models he has available.”

The social constructivism is based on studies of the growth of meaning and understanding that come from social encounters. This idea is mainly presented by Lev Vygotsky and his theory of the “Zone of Proximal Development” (ZPD). He observed that children were more successful in accomplishing tasks when in collaboration with an adult than when they were doing these tasks on their own. It does not mean that an adult had to teach the children how to accomplish the tasks, but the engagement with adult refined children’s thoughts and language, making their performance more effective. Hence the development of language and articulation of ideas play a central role in the learning process.

One field of constructivism also emphasizes the role of experience in education, described in the writings of John Dewey. Dewey defines experiences as things interacting in certain ways. To him, “the modern discovery of inner experience, of a realm of purely personal events that are always at the individual's command, is also a

7 PAPERT. Mindstorms - Children, computers and powerful ideas. 1980
great and liberating discovery. It implies a new worth and sense of dignity in human individuality. It is the counterpart of what distinguishes modern science, experimental, hypothetical; a logic of discovery.”

Papert emphasizes that all builders need material to build with. The learning process takes place in the relation with objects and environment, and “(...) to say that intellectual structures are built by the learner rather than taught by a teacher does not mean that they are built from nothing. On the contrary: like other builders, children appropriate to their own use materials they find about them, most saliently the models and metaphors suggested by the surrounding culture.”

Two. Two

**Ethics and Morality**

One of the most polemic issues considering to education is the learning of moral. After thousands years where morality and religion were linked, morality acquires a temporal character. Each society, each epoch and each group has its own morality, which is a result of social psychology.

In this context, Lev Vygotsky defines ethics as “a certain form of social behaviour that was established and evolved in the interests of the ruling class, and is different for different classes.” He also exemplifies morality with the school of Sparta:

“It is said that in the schools of ancient Sparta, children were forced to wait upon a common table while the adults had their meals. A child had to steal something from the table, and he would be punished only if he couldn’t do this, or only if he were caught red-handed. The moral lesson of this experiment was to steal and not get caught. Such an ideal was entirely conditioned by the Communist order of the closed aristocratic society of Sparta, in which concern for property did not constitute the standard of morality, in which stealing, therefore, was not considered a sin, but where force, craftiness, cunning, and composure constituted the ideal of all citizens of Sparta, and where the greatest sin was the inability to deceive someone else and to control one’s emotions.”

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10 PAPERT. Mindstorms - Children, computers and powerful ideas. 1980.
11 PAPERT. Mindstorms - Children, computers and powerful ideas. 1980
12 VYGOTSKY. Educational Psychology. 1926
Piaget affirms that “morality consists in a system of rules, and the essence of all morality is to be sought for in the respect which the individual acquires for these rules.”

Where there is a new society, there will be a new morality defined by rules, which are established by a certain group. Moral behaviour arises from the foundation of instinctive reactions, but it develops under the influence of the environment. Thus, moral behaviour can be taught by the environment like anything else. A society without morality is not possible, and the adaptation of the instincts to the world’s conditions is a basic condition of education.

To Vygotsky, morality is inseparable of Education as a whole. One who morally acts does not notice that he is acting morally. For this reason, morality can not be taught, but “entirely imperceptibly into all those general modes of behaviour that may be established and regulated by the social environment.”

William James defends moral education based on the principles of good rather than the principle of evil. “See to it now, I beg you, that you make freemen of your pupils by habituating them to act, whenever possible, under the notion of a good. Get them habitually to tell the truth, not so much through showing them the wickedness of lying as by arousing their enthusiasm for honour and veracity... And in the lessons which you may be legally obliged to conduct upon the bad effects of alcohol, lay less stress than the books do on the drunkard’s stomach, kidneys, nerves, and social miseries, and more on the blessings of having an organism kept in lifelong possession of its full youthful elasticity by a sweet, sound blood, to which stimulants and narcotics are unknown, and to which the morning sun and air and dew will daily come as sufficiently powerful intoxicants.”

This pedagogic contradicts the religious morality, which is usually based on intimidation and threat. This kind of morality has three dangers: firstly it does not guarantee success, secondly the absence of freedom creates a false idea of human values and finally, the description of misdeed creates in the child the impulse to perform these deeds.

13 PIAGET. The moral judgement of the child. 1932.
14 VYGOTSKY. Educational Psychology. 1926.
15 JAMES. Talks to teachers. Page 113. VYGOTSKY. Educational Psychology. 1926.
Consequently, moral education is not based on punishment, but is a free choice of social behaviour. It is concerned with social education and with the development of adaptive reactions to the environment.

Two. Three

Play

Most of the moral rules a child follows are received from their parents. That means, these rules have been already well elaborated by earlier generations of adults between them instead of being elaborated in relation with the child.

However, the rules present in simple social games are developed by children alone. As a social group with particular characteristics, children develop their own morality, which can be observed in games. Piaget observed the morality among children and shown in the marble games, where older boys teach the younger who are beginning to play according to the rules of the games. “And in any case they aspire from their hearts to the virtue, supremely characteristic of human dignity, which consists of making a correct use of the customary practices of the game. As to the older ones, it is in their power to alter the rules. If this is not “morality”, then where does morality begin?”

Of course the first moral rules children follow come from their parents, but when it comes to playing, adult intervention is reduced to the minimum. These are the moral rules developed by children in collaboration with adults and among other children. Piaget also determines the rules that children obey in games such as inner self-restraint and self-determination. “I must do this” is different than “I can not do that”. When rules related to “don’t” are all equal, the own child’s rules are particular.

Vygotsky declares that nowhere is the child’s behaviour so regulated by rules as in play, and nowhere does it assume such a free and morally instructive form as in play. Nowhere in play do we find any patterns whatsoever that an adult might have prescribed and which the child only enact.” He also says that games are considered the foundations of future moral behaviour. The rules in games are obeyed by children, not because they are afraid of being punished or scared of failing or losing something. They observe rules because that grants them an inner

satisfaction that comes from playing, because he is part of a general enterprise formed by a group at play.\textsuperscript{17}

When children play imaginary situations, they create rules. A girl who plays to be the mother and pretends that the doll as her child automatically assumes the rules of mother’s behaviour. The formal games also represent imaginary situations, and propose rules. All games with imaginary situations are simultaneously games with rules, and vice-versa.

Children establish an affective relation with the act of play. “Thus, the essential attribute of play is a rule that has become an affect. To carry out the rule is a source of pleasure. The rule wins because it is the strongest impulse. Hence it follows that such a rule is an internal rule, i.e., a rule of inner self-restraint and self-determination, as Piaget says, and not a rule the child obeys as a physical law. In short, play gives the child a new form of desires, i.e., teaches him to desire by relating his desires to a fictitious “I” – to his role in the game and its rules. Therefore, a child’s greatest achievements are possible in play – achievements that tomorrow will become his average level of real action and his morality.”\textsuperscript{18}

### Two. Four

**Children and Computers: Playful learning**

Nowadays computers and digital interfaces are everywhere. If it is strongly present in our day-by-day, it could not be different with children. The new generations are growing up with digital television, mp3 players, digital cameras and mobile phones with all these functions along with talking and sending messages. In this context, it is not a surprise that games find their places in the digital world. Computer games are also part of the children’s lives in several forms, like desktop computer games, video games, mobile phone games and the portable computer games, such as Gameboy.

A variety of authors consider computer games real enemies of the healthy development, arguing for instance, physical effects - overstress of the thumbs, muscular problems and

17 VYGOTSKY. Educational Psychology. 1926
18 VYGOTSKY. Educational Psychology. 1926
radiation exposure, and some other physical problems are pointed by Lerchenmüller-Hilse (1995) und Dittler (1993), for example. Duda, in her article “Kinder und Computer” points some of those effects based on her researches, which are listed below:

**Corporal effects**
Computer games show positive tendencies in the sensori-motor development with proven record of success. Coordination and perception, thinking and manual abilities, fine coordination of hands and fingers, coordination between eyes and hands are trained. Children develop their sensori-motor abilities, which, according to Piaget, are the basis of the future cognitive development.

**Cognitive effects**
Computer games support cognitive development and enhance abilities that are important for the school and work. Distribution of visual attention, research learning, logical thinking, and the observance of integrated factors are trained. Concentration, perception and the coordination of complex information at the same time is supported.

**Emotional effects** of computer games are crucial to contribute to their attraction. Games provide challenging imaginary worlds, where the player has always the sensation to be able to solve problems every time they have a successful experience. These experiences are a positive influence for the self-esteem. Interviews with players demonstrated that positive experiences are the second reason for reduction of frustration. Computer games also support communication and solidarity among players. However, the level of stress observed while playing can lead to nervousness, low concentration and sleep disturbances.

**Social and ethic effects**
The isolation effect of computer games is disapproved in many studies. Nevertheless, many players play with friends instead of playing alone. Moreover, many computer games fan-clubs are raised in order to foster communication among players. Computers support the disposition for cooperation and the ability to work in groups.
Though we can imagine that computer games can legitimize prejudice, clichés, violence or war, these effects were not scientifically proved. It is possible that computer games boost prejudice and clichés, as well as television. Parents should thus worry about the choices of games.

Computer games can not solve social problems, but they can offer an imaginary world where these problems don’t play any role and support the development of long term solutions.

When designing games and educational multimedia, Edutainment was received as a new form of learning. Therefore, through the connection between entertainment and education, it is possible to have fun with learning, and turn this whole process easier. Edutainment has a high commitment with entertainment, as well as learning objectives. It is related to computer games and learning software for children.

However, it presents also disadvantages. Good computer games are highly dynamic and reach a high tension dramaturgy. In good learning software, the interactivity is mostly concerned about making the children find a way to a specific objective, and the tension dramaturgy is missing. Besides, when the main objective of learning is to motivate the acquisition of information, this is not reached if there are too many playful elements on screen that do not have a direct connection with the content. Children will concentrate only on the play.20

Resnick criticizes the term Edutainment declaring that the “edutainment products often miss the spirit of playful learning”21 and interpret learning as if it was an unpleasant experience. He argues that both terms—education and entertainment—are often related to services that are offered to you, and in those cases, you are viewed as a passive recipient. And the richest learning experiences are those where you are engaged as co-author rather than a passive participant. On the other hand, playful learning conveys a stronger participation perspective. Opposed to edutainment—things that others provide you—play and learn are concerned about things that you do.

20 DUDA. Kinder und Computer.
Unfortunately, most of the games still do not match the creative dimension of the learning process. Children have several opportunities to “interact” with technology through games or electronic storybooks, but they rarely have the opportunity to create. Researches have demonstrated that besides the interaction with materials, designing, creating and inventing with them can provide many of the best learning experiences children can have. In the process of designing, children try their ideas.

In the MIT Media Lab, new technologies are developed in accordance to this principle. Their Programmable Brick, for example, is an extension of the LEGO bricks. LEGO has a third generation of products to stimulate children’s creation called LEGO Mindstorms. With LEGO Mindstorms, children can build and program robots that can accomplish tasks. The Programmable Bricks are part of the LEGO Mindstorm Kit.

In the Computer Clubhouses, children can test these new technologies being actively engaged in designing with them, creating their own graphic animations, music compositions and robotic constructions. The Computer Clubhouses are a network of learning centers in economically disadvantaged communities, supported by The Massachusetts Institute of Technology (MIT) and the Boston Museum of Science. At these centers, young people become designers and creators using new digital technologies. Clubhouse members use leading-edge software to create their own artwork, animations, simulations, multimedia presentations, musical compositions, websites, and robotic constructions.

Resnick describes some examples of projects developed by children who used the Crickets, which is a kind of Programmable Brick designed for more artistic and expressive projects. “The Crickets can control not only motors but also multi-colored lights and musicsynthesis devices, so children can use Crickets to build their own musical instruments and light sculptures. The Crickets are also much smaller than previous Programmable Bricks, so they are well-suited for projects that need to be small and mobile, such as electronic jewelry.” Projects like the “marble-machine” or the “bird feeder” were designed by children and provided rich learning experience through experimentation. Through these projects, children developed better understanding and

23 RESNICK. Computer as Paintbrush: Technology, Play, and the Creative Society. Page 6
appreciation of the process of scientific investigation. They tested and came up always with new ideas based on the results. The “fun part” of the project was explained by Jenny, eleven years old, who worked on a bird feeder that should register when birds came to her bird feeder when she was not at home: “is knowing that you made it; my machine can take pictures of birds”.

Once playful learning and creative experiences are so powerful in education, it is our responsibility to create new approaches while designing for pedagogic experiences. Our main objective is not to design new creative interfaces, but interfaces that support experiences that enhance creative thinking and creative expression.

Two. Five

**Drawing**

Children get involved with paint and colour pencils since they are very young, even before they are able to speak. Actually they do speak through drawings. Scribbles, forms, colours and figures are usually an expression of their identity. Through drawings they can transfer conscious and unconscious feelings to a paper. Through drawing they can represent who they are and communicate aspects that they can not translate into words, by simply proudly presenting their productions together with the exclamation “look what I have done!” Once they are considered an extension of the play, they can carry several messages and have been undeniably recognized as a powerful way that children express themselves and are constantly linked to the expressions of personality and emotions.

Early studies of drawings and their meanings come from Psychology. Both psychologists Freud and Jung were interested in the connections between art expression, symbols and personality. Freud observed that images and forgotten memories rose in the form of art expressions. Jung was interested in psychological content of his own drawing and of those from his patients.

The growth of interest for children’s drawing happened in a parallel manner to the exploration of art produced by people with mental illness, and became object of study

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for Jung and Freud. Initial studies of children’s art considered both drawings and the way they were made. Cooke (1885) published an article about children’s artistic development and its importance in education.

Based on the idea that children project themselves in the drawings, projective drawings texts were created and consisted in the analysis of drawing of simple themes, such as houses, persons and trees. Those themes are quite familiar children and could reflect personalities, perceptions and attitudes that words can not. “As the belief that drawing could be projective took hold, various projective drawing tasks for the purpose of assessing personality increasingly appeared in psychological and psychiatric literature.”

Interpreting these drawings always provides a subjective result. Children can be influenced by several conditions, such as spontaneous or proposed drawings, presence of other people and the way they behave, environment and specially the context in which the drawing was made. Each drawing has a story to tell. Sometimes we know it, sometimes we don’t. But the themes children decide to draw and some composition characteristics provide some clues about their emotions, identity and behaviour tendencies.

Edith Kramer used art as therapy with children with psychological problems in a way that analysed not only the production of the children, but also the process that leaded them to their results. Children need movement to make a drawing take form on the paper. The form and the stroke direction will be defined by the movement of the arms and hands and also through the temperament and humour of the child. The child represents his personality features in this process. Velocity, rhythm, regularity and body movement will define what he represents on paper.

Di Leo presents his conclusions about observations of and analysis of drawings in his book *Interpreting Children’s Drawings*. He declares that the drawings were to him a rich fount of information that has immeasurable enhanced his understanding of individual children and of many adults. “Often, the anger, void and unhappiness repressed by the verbal expression are freely externalized in graphic activity well before the struggle for

containment may boy to the overpowering demands of adolescence.”

Arnheim affirms that children draw what they know, and not what they see. Early children’s drawings don’t present realistic appearance. Children use simple forms because they are easy to draw, but that does not explain why these forms are used to represent image projections.

According to the intellectualistic theory, the drawer makes a synthesis of all observations that he made from something known in the past. This drawing can be understood as a sign that comes from wisdom, but it cannot be an alternative to seeing.

The perceptual art was created by Europeans during and after the Renaissance, Pompeian muralists and Palaeolithic cavemen. In the perceptual art, they draw what they see. On the other hand, children’s drawings can be compared to Neolithic paintings, Indian and African origins in the sense that they are abstract and produce a conceptual art. In the conceptual art, they draw what they know. These simple drawings have all the features that a child needs to portray a picture. To make these drawings, children use simple forms and patterns. It does not represent an imitation, but a discovering. “Green” is understood as a pattern that represents all different tonalities of green that can be found in the nature and used for trees. Circles and round forms are used to represent a wide variety of elements, like heads and eyes. Children develop, this way, their own group of codes to represent what they know and what they are. Psychologists relate, for example, that children draw things that are important to them big.

Leo identified general characteristics in drawings and their possible meaning and interpretation. Themes like human figures are usually related to the child’s identity. Trees and houses portray the way they see the environment where they live. Ships and boats usually symbolize the mother, and sun represents the father. Besides these themes, Leo also describes characteristics of the drawings that reveal tendencies of personalities.

29 LEO. Interpreting children’s drawings.1983. Page 8
Elaborate Compositions vs. Simple Compositions
Definition of level of detail. More detailed and elaborate drawings can be associated with love and self-confidence, especially in human figures rich in details, like eyebrows or ears. Simple, or less-elaborated drawings, are possibly a sign or rejection, but this also depends on the child’s age.

Bold figures, centred on the page express self-confidence, optimism, perhaps narcissism. Tiny figures drawn on the bottom of well away from centre are probably an expression of inadequacy, insecurity, even depression.

Vivid fantasy vs. poor in content defines the imaginative elements in the drawings.

Well integrated compositions are a sign of self-confidence. Fragmented ones can express insecurity and depression.

Continuous lines are usually a sign of security and self-confidence. Broken and wavering lines can demonstrate insecurity and maybe depression.

“Artistic” shading vs. excessive shading.
Basically the “artistic” shading is made to provide volume, and the excessive shading are areas filled with black or dark colours, resulting in holes and bad-defined areas. Excessive shading generally expresses anxiety.

Dynamic vs. static
Notion of movement. Dynamic drawings can express joy, excitement, but sometimes also anger static is a feature for neutrality, sometimes serenity.

Orderly vs. chaotic are generally the transfer of the own life situation. Orderly drawings express orderly life, and vice-versa.

Of course these codes will have different interpretations and meanings according to cultures. There are differences between the western world and Eskimos children, between well born and rejected, between children from big cities and those who live a simple life in villages.
But even in this context, it is better to understand the similarities than the differences.32

Someone asked Matisse once if a tomato that he eats looks equal to the tomato that he paints. “No”, he answered “when I eat it, I see it like anybody else.”

When it comes to drawings it is important to recognize the difference between imitation and recognition, between drawing what you see and drawing what you know. The most important conclusion is that children’s “primitive” drawings should not be seen as negative or less important. “The visual form, when you let it grow undisturbed, according to the step by step development and that each step its own value, its own possibilities of representation and its own beauty has. Because these early steps are dependent of one another and contain the foundation for all the mature achievements, they must be accomplished without precipitation. This applies not only to children, but also to all future artists.”33

Drawings can identify tendencies and possible personality characteristics of children if we understand them as an alternative way they use to communicate, conscious or unconsciously. As they represent the projection of identity - and the construction of identity is one of the foundations of the educational process, drawings should be encouraged in all stages of the child’s development. Furthermore, not only children learn with their own experiences, but they also teach us that creativity is the basis of construction. A person engaged in repeating existing ideas and behaviours does not dominate himself. Those who keep the sincerity of a child have the potential to make the society improve.

Three Museums

“If there is something for what the life is worth, that is the contemplation of Beauty.”

Plato

Three. One

Art concepts

Usually I don’t have the illusion that I can visit a huge museum and see all its pictures at once. So I take a look at the map, choose some specific theme, collection or exhibition and concentrate on it. The first time I visited the Gemäldegalerie in Berlin, I decided to concentrate on the Dutch paintings, and there I saw one picture that remains on my mind as an example of how powerful art can be: The liberation of St. Peter, from Gerard van Honthorst. It illustrates the moment when an angel came to Peter when he was in jail and released him. Peter’s expression is a mixed of surprise, fear and joy, all at the same time. More than simply portraying a scene, it provokes in me a personal experience that no book could do.

Art can be observed from pre-history until today, and has received many different definitions, from perception art to the expression of feelings. The Palaeolithic cavemen, Pompeian muralists and Europeans during and after the Renaissance represented what they saw with their eyes; they created a “perception art”\(^1\). All through the Renaissance, art was directly connected to science, and the perception of art was related to the contemplation of the nature and its laws. In Da Vinci’s words, “the artist is a discoverer and interpreter between nature and human.”\(^2\)

Even the most mimetic art form can not represent true and absolute true. It will always carry the personality and impressions of the artist. Plato defines two kinds of

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artists: firstly the ones who create something, as a carpenter; secondly the ones who represent or imitate what is already restricted, as a painter or a poet. The first ones are closer to the true than the others. To him, the mimetic art can’t be more than “the shadow of a dream”. It is “experience of the beauty” that people aspire in the search for the true of the ideas. To Plato, the most beautiful is the idea of the Beauty itself, together with the Idea of Good, that represents the highest True.

Although the “perception art” is a term often related to all artistic manifestations until the 20th century, art is has been also connected to feelings for a long time. To Plato, the objective of art is to provoke the passion and the senses of the viewer or listener, which means, to disrupt the rationality and order of the soul. The art, when it doesn't represent the True of the Ideas, must at least have an educational function: sculpting minds. Only the art that teaches people to control their passion, to live with virtue and to aspire toward the True approaches to some sense of value. According to Aristotle, the usefulness of art is not necessary, once it is enough when it brings joy and prepares humans for happiness.

Walter Benjamin points to the connection between art and ritual, intrinsically related to the aura. “An ancient statue of Venus, for example, stood in a different traditional context with the Greeks, who made it an object of veneration, than with the clerics of the Middle Ages, who viewed it as an ominous idol. Both of them, however, were equally confronted with its uniqueness, that is, its aura. Originally the contextual integration of art in tradition found its expression in the cult. We know that the earliest art works originated in the service of a ritual – first the magical, then the religious kind.”

The relation established between viewer and art are emotional and deeply personal.

According to Mario de Andrade, a Brazilian poet, novelist, musicologist, art historian and critic of the 20th century, “the four main elements of the art are, sublimation and social communion - as psycho grouped as feeling -, and technique and form - elements derived from material, which aim at the expression of the feeling. To him,
the value of art is mainly in the fact that it is at the same time work of feeling and expression.”

To Duarte art turns feelings in expressive forms, it has access to human dimensions that can not be rationally defined. The aesthetic experience leads to the construction of our emotional identity. Having knowledge of a specific fact is different of feeling it. In the aesthetic experience, the attention is concentrated on what you feel, and you live and experience apart of the logic of language, without trying to translate it into words. The feeling makes the experience personal and turns the knowledge into wisdom.

Should we than reduce the definition of art to the expression of feelings? In the 20th century, especially after the invention of photography, new definitions of art and its function have been discussed, in such way that art remains as an open concept under constant construction. More than expressing feelings, it invites the viewer to participate as co-author, posing questions instead of providing answers in a closed work. Jean Galard conveys the definition of work as a closed and finished work.

“The idea of work implies the idea of finished. The work is closed, isolated from its environment. Its limitations are clearly marked in space. According to time, the work exists when it’s concluded until its last details. We will talk about an “open” work to designate the undefined multiplicity of the interpretations we can make. But, because of its structure and form, discards the time to come. Finished, sufficient, it establishes itself outside time (…) it inhibits any try of action upon it. That’s why it keeps itself at a distance; offered only for contemplation much more than for use, it becomes free of external functions, intransitive.” (Jean Galard, 1999, quoted by Leite.)

For Jorge Coli, the sense of art is “an instrument of making cultural of copious richness”. The art in the contemporary age allows many meanings and interpretations beyond what is on display. Coli also declares that “works are always more than pretence definitions tell us.” Umberto Eco studied the relation between reader and the work of

7 DUARTE. Por que Arte-Educação? 1983. Page 65
art in his book “The Open Work”. To him, each reader brings his own background, which affects the way he will interpret a work of art. Each work of art can be considered a performance, once it will always receive new interpretations. \(^\text{10}\) “The open work offers the reader a field of open possibilities. They can choose their own viewpoint decide for themselves what is foreground and background and make their own connections between different parts of what they see.” \(^\text{11}\)

Leite defines art as “a particular form to see and express the world that acts as an emotional and conceptual reaction to life. (...) What remains today in Art is not only the sensible knowledge or even the beauty – it is the whole, the signification. It is a privileged field of the aesthetic experience.” \(^\text{12}\)

I would define Art as a storyteller, a witness of its time. Each work of art is capable of telling a different story, according to its temporal or cultural contexts. This story is constantly updated by the vision and reading of the contemporary viewer. Some contents and objectives that guided the artist when doing his work are even lost, once the codes for understanding change along the time. These stories can be interpreted in many ways, provoke many reactions, evoke different feelings. Some stories are quite descriptive, as those told by the Renaissance. Others can be even confusing sometimes. Those stories told by Art can create opportunities to connect viewers and artists, cultures and ages, rationally and emotionally, transcending the limits of time and geography.

Three. Two

**Museums and Heritage Education**

“Community resources put life into history. Localized history puts history into the life of the pupil. The materials are legion and of infinite variety; the possibilities are numberless; the horizons unlimited. And so to work.” Clifford Lord

Historically, the first museums were private collections of objects that belonged to

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wealthy persons, families and institutions. The access to the first “public” museums was restricted to the middle and upper classes. The first truly public museum was the Louvre Museum in Paris, which opened the doors for free to visitors from all classes in 1793.

Nowadays, the museums are strongly concerned with educational purposes. As sources of culture, their pedagogical proposals and practices should be supported by theories and concepts of human development, including the concept of Heritage Education.

Heritage Education can be defined as “permanent and systematic process of educational work focused on the cultural patrimony as a primary source of individual and collective knowledge and enrichment.” By the direct contact and experience with evidences of cultural manifestations, the heritage education work leads to knowing, appropriation and valorization of the cultural heritage. This educational process has the objective of leading pupils to use intellectual capabilities in order to acquire concepts and abilities and use them in the daily life.

Nothing can replace the real cultural object as a source of knowledge. The ability of interpret objects amplifies our ability to understand the world. Every object carries senses and meanings which form, content and expression should be read and decoded. The methodology of heritage education explores the capabilities of observation and direct analysis and defines a process of perception, analysis and interpretation in order to study the particularities of an object. The methodological steps of this process and their objectives are described as follows:

1. Observation: identification of the object, its function and significance as objective, as well as the development of the visual and symbolic perception;
2. Register: retention of acquired knowledge, deeper observations and critical analysis, memory development, logical, intuitive and operational thought;
3. Exploration: development of critical judgement and analysis, interpretation of evidences and meanings;

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Museums conserve material evidence of people, they present the object of study, the primary source of knowledge that heritage education methodologies explore. In this sense, they become sources of analysis and interpretation, and stimulate pupils to become co-authors in the educational process.

Three. Three

**Art Museums as a source of culture**

“A museum is a non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment.”

*International Council of Museums*

Art museums are a stage for all kinds of cultural manifestations, like drawing, cinema, theater, photography and historical objects. The visitors interact with the objects in a wide range of ways, walk around the different spaces, bring different experiences and backgrounds and enjoy their experiences in very different ways. It is in the dialogue with the other and with the culture that each one is constructed, deconstructed, reconstructed everyday. According to Angeli the first museums were created to attend the high society, with the argument that would be interested in culture and would not behave in museums. The first museum to rebuild the concept of relationship with the public was the Louvre, considered as “The People’s Museum”, where anyone could come in without paying entrance.

When considering the relationship with objects, it is important to remember that experiences can not be replaced. There is a big different between going to museums and visiting virtual exhibitions, as well as going to the cinema is not watching a DVD. You can read books visit websites. Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be. Virtual museums, CD-Roms and books present...
mechanical reproductions of works, and they have of course their function. But what mechanical reproductions do not keep from the real art works is their Aura. Aura is defined by Walter Benjamin (1936, p.19) as “the unique phenomenon of a distance, however close it may be. If, while resting on a summer afternoon, you follow with your eyes a mountain range on the horizon or a branch which casts its shadow over you, you experience the aura of those mountains, of that branch.” The Aura is related to inherent features of the work of art such as its known line of ownership, its restricted exhibition, its authenticity, its tradition or its cultural value. To Benjamin, mechanical reproducibility of art shatters its aura. The works are free from ritual and put under the control of mass audience. “Mechanical reproduction emancipates the work of art from its parasitical dependence on ritual.”

Leite affirms that all works of art represent some sort of social religious or political issues of their time, showing narratives of parties or religious contexts, or contending present institutions as the modern art. Works of art are a witness of their time, but when they are in a museum’s room, detached from their contexts and origins and put together side by side, their context change and the codes for their interpretation are no longer the same. The idea of museums as a public space for exhibition of works of art is a discussion that started in France, in the end of the 18th century. After the political government changed, the question was what should be done to the art pieces that portrayed the power: should they be destroyed or kept because of their artistic quality and neutralize them from their symbolic context?

According to Leite, each work of art has its own symbolic value, and providing different places to them changes the codes between viewers and works. Seeing a work on the street and in a museum’s room is not the same. Each person has its own way to see and understand a work of art. The environment, the context, and also the previous experiences and knowledge of each one will define several ways of seeing work of art. The environment itself is an element that leads the way to see a work, but our interpretations will bring the elements of our culture, context and experiences to make

17 BENJAMIN. Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit. 1936. Page 19
18 BENJAMIN. Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit. 1936. Page 23
a meaning of it. Humberto Eco studied the relation between work of art and reader in his book “The Open Work”. He assumes that “as readers, we receive a work of art as the end product of an intended message. (...) However, we know that the background of the reader affects the way that the message is reassembled.”

The role of art museums has been always a theme for discussion. It is criticized as a deposit of such wide range of works that they became incoherent, and were not accepted by many. Simultaneously, art museums are also criticized as a place that sacralizes their collections. Compared with temples or sanctuaries, it protects objects and makes them inaccessible. However, in the 20th century the role of museums started to be renovated. The public is invited to be active participants of the exhibitions, becoming co-responsible for their patrimony. The museum’s pedagogic dimension was thus reinforced.

Three. Four

Educational Activities in Art Museums: seeing, listening, doing

Since 1951 the International Council of Museums is concerned with the educational role of the museums. Once culture and education are intrinsically attached and considering the right to education for all citizens, the museums become an educational institution of the society, keeping its patrimony, responsible for its availability and publishing without disconnecting it of the critical dimension of knowledge.

Today, the museums offer all sorts of parallel activities organized by “educational departments” in order to engage children. Creation rooms, videos, theatre, games and other activities are promoted, many of them supported by high-tech elements. Science and technical museums make intensive use of technology to attract children, simulating scientific facts and events to enhance their comprehension, and are quite successful. Historical museums make use of interactive presentations, videos and installations among their objects that visually explain them, put them into historical and cultural context and provide information in a way it can be better understood.

The object in exhibition in science and historical museums can be characterized as objective facts and issues. The objects in art museums have a subjective nature, open to a wide variety of interpretations, which does not relay in concepts of “right” or “wrong”, except for background information provided by historical facts, biographical data or technical details. Due to the aura that involves the work of art and its subjective dimension, art museums were the last ones to receive the public. The first initiatives were focused on presenting the artists to the people, through complementary activities such as creative workshops, videos and dramatization.

Is it necessary to create specific strategies to attract children? Should we create special theatre and games, or should we let the works of art speak for themselves?

Leite defends the idea that it is not necessary to create a happening to attract children, but those who visit the museum should be interested and curious about the works, find pleasure in what they are contemplating, learn how to listen the questions and try to answer them in according to their own logic. To her, the construction of meaning by the reader – child or adult – is the basis of the aesthetic experience, and listening should be the foundation for this dialogue. In this context, other questions can be raised: are the legends high enough to be visible by the children? Are the guides and workers of the museums prepared to deal with them?

In informal interviews with curators, guides and museum’s workers, I asked about the main objective of the art museum. The answer was the same: contemplation and enjoyment of art. In observing we learn about context. Enjoyment deals with feelings. Feelings are an important dimension of education. It is basically through feelings that we develop our identity and individuality. And if the industrial society and traditional education shatters our feelings, replacing them with rational and logical objectives, art provides a field where they can be encouraged and developed.

Duarte presents the concept of art-education as an instrument for the formation of better humans. When, in the aesthetic experience, the feelings are connected with those expressed in the work, “my attention is focused on feelings, without trying
to translate them in words." In a society where ready, rational and logic concepts are relevant, reinforced in the schools, art provides a new way of “seeing the world” from a particular perspective. Education and development of feelings provide a better knowledge about us. While traditional education is focused on objective concepts and provides answers in order to form future professionals for the industrial society, art poses questions, challenges imagination and stimulates creativity. And creativity is the keyword to make dreamers, people who look for changes instead of simply accepting final solutions. Great personalities of world’s History were dreamers fighting for objectives considered utopias, which they would not defend if they were simply submitted to ready answers instead of posing questions.

As art is also intrinsically connected to historical and cultural context, it is also an instrument that teaches about feelings of other cultures and epochs. Duarte says that Art-education is focused on the creation process. In this process, the subject develops his own perceptions about the world that surrounds him. The final objective or art-education should be always the aesthetic consciousness, defined as more than art appreciation, but an attitude where feelings, imagination and reason are integrated.

The first permanent service for schools known was in 1880, at the Louvre, Paris. Today the art museums offer specific educational programs for children. Research at the Australian Museum has shown that visitors participate in active (doing) more than in passive (viewing) experiences.

After observing guided visits in different museums, the main conclusion was that most of them are based on intensive interaction. The visits are usually programmed according to specific themes, and guided linearly. Children are encouraged to observe the works in details while the guide explains about context and makes questions about the impressions the children have from what they see. After the tour, the children are engaged in creative activities like drawing and collages. The works they do are taken home with them.

24 DUARTE. Por que Arte-Educação? 1983. Page 65
25 DUARTE. Por que Arte-Educação? 1983.
26 KELLY. Use of Computer Interactives in Museum Exhibitions: Literature Review. 2000
In January 2007 I followed a free guided visit at the New National Gallery, in Berlin. Unfortunately only one eight-years-old girl participated of the tour, but it provided me some interesting insight about the kind of experiences children can have in an art museum, and the different ways they can interpret a work of art. The theme proposed “How do they look like? Pricked mouth, round nose and sharp head.” And the objective was to discuss the different ways to represent the human body. During the visit, the girl had the opportunity to know some works of the museum’s collection. (Max Ernst Capricorne and Die Erwählte des Bösen, Alberto Giacometti Schmale Frau ohne Arme, Wilhelm Lehmbruck Sinnende, Karl Schmidt Rottluff Selbstbildnis mit Einglas, Ernst Ludwig Kirchner Potsdamer Platz, Georges Braque Still life with newspaper and glass and Picasso Woman seated in an Armchair). The guide sat on the floor with her, in front of each piece, and explained about each one, talking about the author, his work, making a lot of questions to make the girl take some conclusions by herself and also answering the girl’s questions.

The relationship established between teacher and child is very interactive all the time. The girl also makes questions about other pieces in the museum sometimes, which are all answered even when they are not part of the programmed activity. After observing different sculptures and paintings, the teacher stops in front of a Picasso painting - Woman seated in an Armchair - and proposes the girl to make a drawing about what she saw.

She looks to another painting on the wall, just side by side with the Picasso, and recognizes some signs that take her to a curious question: is that painting Arabic? The painting (Georges Braque Still life with newspaper and glass) does not describe any human figure as the other ones she saw with the teacher. The teacher asks her why does that painting look like Arabic, but she doesn’t know exactly the answer. And she decides to draw an “Arabic woman”. She represents a woman with dark long hair and blue pullover. After drawing the head and hair, the girl hesitates a little before drawing the face. The guide tells her to look to a painting on the wall (Emil Nolde, Christus und die Sünderin) and, after observing the painting; she comes back and starts to draw a face for her woman.

It is difficult to conclude what kind of previous experiences the girl had that made her decide for the Arabic woman as a theme for her drawing. In fact, the influence of the environment and of the other pictures – specially the Braque’s one – were decisive
elements to her choice. But more than the pictures she saw, she brought her own impressions that, together with the pictures she saw, the comments she listened leaded her to the work she did. And seeing, listening and doing are the main pillars I observed in all guided visits in art museums.

Guided tours for children are offered by most of the museums as part of their educational program. They usually happen in two ways: the “free tours” for visitors who come spontaneously to the museum, and the tours for school, arranged according
to themes proposed by the museum or, in some cases, by the schools.

The Chácara do Céu Museum has eight collections that work as themes for guided visits, and printed educational material for each collection, that supports the visits providing information about the collection and proposing creative activities. Nevertheless, the following example was taken from a visit which theme was proposed by the school. This visit was arranged for a group of teenagers between twelve and fourteen years old of the seventh grade of a public school in Rio de Janeiro, in August 2006. The Mathematics teacher informed that they were learning about geometric forms. In that occasion, there was a temporary exhibition in the museum called *Meetings of Abstract Art* (*Encontros da Arte Abstrata*). During the guided visit, the group was presented to abstract pictures and encouraged to observe and recognize different geometric figures. Besides the observation and enjoyment of art, the museum worked under the context provided by the theme learned at school – Geometry – in order to insert the children in the artistic production, proposing the collage of geometric figures as activity.

![Collages made by children](image)

*9 Meetings of Abstract Art at Chácara do Céu Museum: collages made by children*

While in science or historical museums there the object is a fact and fits to concepts of “right” and “wrong”, it is important to ask ourselves if that is also a fact in art museums. Is there a right way to interpret art? Are the feelings the most important issue to be discussed in art? Or there a default code of feelings to be recognized by visitors – children and adults – in works of art?

The Museum of Modern Art in New York emphasizes the critical focus in their visits,
where educators encourage students to develop critical thinking skills and foster an appreciation for works of art. Leite criticizes two observed visits in Brazil, where the guides provided ready answers to such questions, judging the children’s answers as “right” or “wrong” based on their own conclusions, sometimes even avoiding the dialogue by simply expressing their own opinions.

In one of his most famous experiments, Piaget asked children: “What makes the wind?” The dialogue follows:

Piaget: What makes the wind?
Julia (age 5): The trees.
Piaget: How do you know?
Julia: I saw them waving their arms.
Piaget: How does that make the wind?
Julia: Like this (waving her hand in front of Piaget’s face). Only they are bigger. And there are lots of trees.
Piaget: What makes the wind on the ocean?
Julia: It blows there from the land. No, it's the waves.

Although Julia’s answers were not correct according to adult criterion, Piaget recognized that they could not be classified as “incorrect”. They were a truly, and sensible answer, coherent to the child’s way of knowing. Classifying them as “true or false” misses the point and shows a lack of respect for the child.

Guided visits an essentially an opportunity for reflection and discussion. During the visit at the New National Gallery, I could notice that none of the girl’s answers to the questions the guide posed were considered “wrong”. Instead, they were a room for new questions and discussion. “Is that an Arabic woman? Why do you think it is an Arabic woman?”

27 MoMa www.moma.org
29 PAPERT, Papert on Piaget. 1999
Another example was observed during the simulation of the project developed for this thesis. When observing a picture from Debret portraying a scene where two slaves were carrying a heavy tray, the child had to select the words that could be related to the scene. The options were: sport, cinema, slaves, colony, quotidian and Jean Baptiste Debret. One seven-years-old boy selected all words except “cinema”, but justified only one of his choices: “sport is right, because they have to be good in sport to carry such a heavy tray.” I was still thinking of “facts” when I proposed this exercise and considered “cinema” and “sport” as “wrong” answers, but I changed my mind after this comment.

The idea of “right” and “wrong” is thus restricted to issues related to facts, as historical context, biographical information about the artist, dates, places or techniques that put the work of art into context and provide more elements for its understanding and interpretations. In other hand, reading a work of art must be free of preconceived ideas and established conclusions.

To Leite, the appreciation of art is not a native gift; we learn to see day-by-day and these possibilities of aesthetic experience are part of our cultural formation. In this process, ready-answers can inhibit imagination, while questions can release and challenge it.

And last, but not least, the creative activities, which I call “self-expression” activities, is where the children’s conclusions take form. If drawings are an example of how children express their feelings and assume their identity, and this is particularly valid in museum’s environment. As the reading of works of art results in many different interpretations, so are the drawings made by children: new works of art, expression of feelings, translation of impressions, communication of meanings in physical form, together with their main statement: “look what I have done!”

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30 See Chapter Four
32 See Chapter Two. Page 35
Three. Five

**Art museums and technology**

Due to the aura concerning the work of art, art museums are still resistant to the use of technology in their environments. Once their main objective is to encourage the observation and enjoyment of the work of art, the use of technologies becomes a delicate issue, once it can support the visits but also steal attention that should be directed to the works of art.

Almeida\(^{33}\) discusses the use of new technologies in museums affirming that they can improve many support language elements of the exhibitions, but it is necessary to consider important issues, such as:

- Research about previous related experiences
- Reflection about the objectives of the use of technologies
- Balance with the museum’s proposal
- Use technologies in order to expand the time visitors spend in the exhibition, which is an important element for enjoyment.

The limitations of technologies are also cited by Almeida:

- The fact that new technologies do not replace the human relation, that allows the interaction between visitor and museum’s educator. In this case, Almeida does not consider the relation between visitor and multimedia application as interaction, once interaction, to her, only occurs when two persons dialogue.
- The new technologies can not replace the affective relation between the visitor and the museum’s object.

Those issues can explain why art museums are still resistant and careful with the use of new technologies in their environments. In fact, technologies can not replace the human relations, but once it improves the support language elements of the exhibitions successfully, it becomes one more complementary way to enhance the aesthetic experience in museums. While art museums still do not use the advantages of technologies, science
museums are using them intensively. Though both contexts are different, or even opposite, the experiences in science museums provide important information about children and the way they behave when in contact with technologies.

In 2003, Hornecker and Stifter evaluated the interactive installations in the exhibition medien.welten at the Austrian Technical Museum Vienna, a long-term exhibition about media history. Their conclusions point to the disappointment of children with the fact the terminals in the media.matrix did not offer games, and the success of the hands-on activities. “We further note that stations allowing ‘real’ interactivity and creation of personal content (not just reading a given hypertext) were more intensely used than those with ‘flat’, predefined interaction.”

Linda Kelly points some important aspects concerning the use of computer interactives in museums, some of them are listed below:

Children will use Computer Interactives regardless of whether designed for them or not: an issue to consider in exhibition layout

Attractor screen cues:
- Children more likely to notice visual cues than adults
- Adults/teenagers more likely to respond to text cues

Age differences are important:
- Children have lower levels of existing knowledge and may find technical terms confusing
- Use of story, attractive colours, interesting graphics and music more likely to appeal to children
- Enjoyment and play are important motivates for learning

Computer Interactives enhance visitor experience and should be used in conjunction with, not instead of, contemplative displays.

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34 HORNECKER, STIFTER: Learning from Interactive Museum Installations About Interaction Design for Public Settings. 2006
35 KELLY. Use of Computer Interactives in Museum Exhibitions: Literature Review. 2000
Those are some reference about children’s behaviour in museums and how they deal with the new technologies. However, the context of art museums and its particularities should define a specific approach where the complementary function of interactives is even stronger than in science museums.

**Tate Modern and computer interactives**

I mentioned that art museums are still careful with the use of technologies. Most of them are restricted to the audio guide as an alternative that provides context information for the works of art. However, Tate Modern can be considered an exception. The museum offers a wide variety of interactives distributed in two floors, with different functions and approaches, as listed below:

**Film**
This specially commissioned film plays on a continuous thirty-minute loop in a purpose-built mini cinema. The film is divided into four sections, introducing the movements and themes represented by the four wings and adjacent displays. It introduces some of the core ideas behind the main movements of twentieth-century art, while also presenting a few contemporary artists to demonstrate how they have responded to the art of the past.

**Art in Focus**
Touch-screen interactives which offer a range of multimedia content about the art in the displays. Art in Focus explores four iconic works of art on display in the gallery and an art movement to which each work relates. The interactive begins with an animation that presents key issues about the work and movement in a fun and accessible way. Visitors can also access a wealth of information and games that help them engage more deeply with twentieth-century art history and works of art in the Tate collection and beyond.

**Meet the Artists**
Another bar of five touch-screens presents a selection of short film clips featuring artists from across the twentieth century talking about their ideas and working methods.

**Reading bar**
An area where visitors can sit down and browse through books about twentieth-century art and Tate Modern.
Art Experiment
Hands-on activities for adults and children that bring to life four aspects of twentieth-century art:

- Thinking (Conceptual art)
- Touching (Materials and process)
- Seeing (Representing the world)
- Speaking (Communication)

Activity sheets on each theme are to be taken into the gallery.

Interactive table
This exhibit is a touch screen, game-based interactive for up to six players. The interactive focuses on five different works of art, each of which has a range of games which aim to help people find out more about the artist and the work. Visitors compete against each other to gain the highest score. The interactive is quite fast-paced and is timed so that people all play the games at the same time, thus encouraging discussion between visitors. It is aimed at a younger audience, approximately eight to ten years and above.

Explore Tate Modern
On each level, four touch-screen computers allow visitors to access the Explore Tate Modern Collections database. Here you can search by artist to find out where an artists’ work is on display in the gallery.

Timeline
The handwritten timeline, by illustrator Sara Fanelli, features some of the major
movements and artists of the twentieth century. On Level 5, it is animated by a series of monitors showing archival film footage of corresponding historical events, providing a kind of ‘newsreel’ to convey the overall atmosphere of the era.

**Viewpoints**

An essential supplement to the timeline is the Viewpoints postcard response bar. Here, visitors can contribute their own information to a decade, whether it is personal information or history that they feel we have neglected. They are invited to post their cards in the slots, and we will select the most interesting to be shown in the display boards above.

**Video Viewpoints**

This is a bar of touch-screens where visitors can watch short videos made by other visitors who are commenting on aspects of their visit to Tate Modern and their thoughts about the art on display. Visitors are invited to make their own video messages on their mobile phones which they send to Tate via MMS (multimedia text messaging). The most creative messages are selected and displayed on the Video Viewpoints screens. The program can therefore be seen as a digital version of the popular Viewpoints postcard bar next to it. This is considered one of the most successful interactives at the Tate Modern.36

If in one hand the many interactive sources available at Tate provide all kinds of contextual information about art and the collections on display, it is important to reflect about the way it is done and the conformity to the museum’s objectives: the focus on the works of art. To make a distinction between the experiences with interactives and those with the works of art, both kinds of experiences take place separately. No interactive is in the rooms where the works are on display, but in a separate area that

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36 Gillian, Wilson sent a long description of the interactives at Tate Modern per e-mail, which many parts are reproduced here.
connects them. In other words, the technological experience is not directly integrated to the exhibitions, but is a totally independent one. The interactives are certainly engaging and interesting activities, but the question is: what do we want to encourage? The contemplation of the works of art, their cultural heritage, their context and their aura? Or should we feel happy when visitors spend most of their time occupied with technology? As I arrived at Tate, I wanted to look how the interactive works and went directly to the fifth floor where many of them are concentrated, including the interactive table. I tested each one of them quick enough just to know how they worked and still have time to look the real pictures. When I was there, a group of pupils was playing on the interactive table. I observed them for some time, walked around, saw the other interactives, the exhibitions, but I was all the time passing by the table and noticed that the same group was all the time there. Did they see the real Dalí? The real Miró?

Almeida\(^\text{37}\) poses the following question about the use of technologies in art museums: how can museum face the seduction of new technologies without changing the relation between the public and the material evidence of culture? How can we keep the museum’s attractiveness considering the seduction of the new technologies?\(^\text{38}\)

Tate Modern answers this question with a new proposal of guide: the multimedia tour. Among all computer interactive possibilities, this is the only one that connects visitors and works of art. It is used in conjunction with, not instead of, contemplative displays.\(^\text{38}\) Context information, interviews with artists, video footage of artists at work, opinion pools, and some interactive games are presented in a Pocket PC, or PDA, which can be taken to the rooms where the works are displayed. The presentation of different discourses encourages discussion and reflection. In one of the activities proposed for children in the family guide, it is possible to listen two different persons on debate about a picture, each one expressing his opinion and presenting two different possible ways of interpreting work of art.

The PDAs have been already used in successful situations as multimedia guides and are a subject for discussion since 2002. The Marwell Zoological Park in Winchester launched

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38 KELLY. Use of Computer Interactives in Museum Exhibitions: Literature Review. 2000
a multimedia guide in 2003 that provides additional information for all ages about the animals. Tate Modern was the first museum in UK to trial this kind of system and won the Bafta Award with the multimedia guide. Though the guide is not available for children, some parts of the “Family Guide” propose comments directed to them. The devices are discreet and allow each visitor to access information in their own pace, avoiding crowding associated with more conventional static computer terminals.

The multimedia tour can be considered a successful example of use of technology that enhances the experience in art museums, and has a great potential to provide a rich experience to children as well.

**Museums on-line**

Once Internet is already established as a platform for communication where all branches and sectors of society can be represented, art museums are not an exception. However, some of them go beyond the simple publishing of institutional information about the collection and events that take place in their environments, and aim to reach children with specific webpages that include simple games and interactive storytelling about art, as well as pages with photos and information about the proposed activities and their results.

These websites are usually subsessions of the museum’s website. Most of them are independent from the activities that take place in the museums, and have an informational function. Nevertheless, they also present simple games directed to children, providing information about their collections.

The Metropolitan Museum, in New York presents *How Van Gogh made his mark* and the *Cezanne’s astonishing apples* in two specific sessions that translate the experience of seeing, listening and doing that take place in guided visits. They are divided in pages where the visitor can see the artist’s work, listen to context information about it and finally take part of simple creative activities like drawing.


Tate Modern flyer
Some museums go further and present portals directed to children and teenagers. The **Red Studio** is the teen-portal powered by the Museum Of Modern Art in New York. Besides virtual drawings, collages and creative activities, it also informs about events in the museum, presents podcasts and interviews and proposes opinion polls.

Other museum’s websites propose drawing, collage and encourage children to create, but what happens to the virtual works they do? Once children create something, they want to take it, they want to keep it, they want to show it. And this is also true for on-line production. An evidence of this fact can be noticed in the Tate Kids page. One of the games of the Tate’s session for children is called *The imaginary city*. It consists basically of a virtual collage of elements that compose a city, from backgrounds to houses, bridges and streets that can be freely arranged. The success of the game can be noticed on the *Gallery of Cities*: there are 11812 cities made by children presented there today.

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13 How Van Gogh made his mark and Cezanne’s astonishing apples, on-line at the Metropolitan Museum’s website

41 Red Studio, MoMa: [http://redstudio.moma.org/](http://redstudio.moma.org/)
If the World Wide Web can be used to attract children and engage them with themes related to art, the questions is: does a website help to bring them to the museums? Are the activities connected to the exhibitions? Is it possible to get feedback from the children about their interests and profiles through the website? How can the museums use this platform to enhance their educational program?

It is obvious that a website can not replace the experience in the museum, but it can provide background information before and after a visit. This complements the experience. Furthermore, when children have the opportunity to upload their records, the museum has the chance to know their public, which is essential for the success of any educational program. The websites assume the function of building a bridge between museum and visitors, using the virtual world to enhance the real experiences.
Four. One

Raymundo's Collection

The Raymundo Ottoni de Castro Maya Foundation, created in 1963, was made of two houses: Chácara do Céu and Açude, in Rio de Janeiro. Both of them were donations and became museums, as well as their art collections, libraries and files. The Foundation was created to promote artistic and cultural activities, through museums and exhibitions, and also scholarships, contests and similar initiatives.

In 1983, the foundation was incorporated by the Federal Government, becoming part of the group of museums of IPHAN (Brazilian National Heritage Institute).

While Museu do Açude keeps most of the collection of furniture, ceramics, tiling of the building, sculpture and eastern art, the Chácara do Céu keeps the collections over paper, paintings, library and files. Both museums are concerned with the environment preservation, through the vegetation and nice gardens around.

Raymundo Ottoni de Castro Maya was a great art collector, and had an intense cultural and social life at his time. At
Chácara do Céu, a house in Santa Teresa surrounded by vegetation and with a nice view of Rio de Janeiro, he used to promote big parties and cultural events. Nowadays, both museums still promote cultural activities, such as permanent and temporary exhibitions, music events, and also publications like catalogues and multimedia.

The “Raymundo’s Collection”

An overview about the Chácara do Céu Museum’s collection.

The collections of the Chácara do Céu Museum are divided as follows:

**Brasíliana:** images of the city of Rio de Janeiro, represented by different 19th century European artists.

**Debret:** part of the Brasíliana collection, it embraces more than 500 drawings, and engravings of Jean Baptiste Debret, a French painter who came to Brazil in 1816 and registered Brazilian life and landscape. The pictures of Debret are commonly used to teach about Brazilian History, more precisely about the slavery and the quotidien life in the beginning of the 19th Century.

**European art:** Castro Maya acquired some famous works by modern artists like Matisse, Miró and Picasso, which are good references of Modern Art.

**Brazilian art:** paintings and sculptures by important modern Brazilian artists.
Portinari: a great Brazilian artist, and friend of Castro Maya, from whom he bought more than 200 pieces. Portinari made a series of illustrations for the book *El ingenioso hidalgo don Quijote de la Mancha* ("The Ingenious Hidalgo Don Quixote of La Mancha"), from Miguel de Cervantes. These drawings offer a good opportunity to build a bridge between art and literature.

Popular art: Brazilian popular art, especially little ceramic figurines are a good portrait of Brazilian culture.

Library: Rare illustrated books.

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18 European art: Maurice de Vlaminck. *Une Rue au Village*. Oil on canvas.


20 Candido Portinari. *D. Quixote atacando um rebanho de ovelhas*. Colour pencil on paper.

21 Popular art.
Four. Two

Problem description

The Chácara do Céu, defined as art museum, promotes educational activities through guided visits for schools, with emphasis in understanding art. The visits are planned to stimulate observation and are supported by printed material that provides short information about the collections and creative activities proposals. However, children who visit the museum with their family or friends find a lack of information about the works of art and the museum. Once children who visited the museum are dependent on the guides, and the guided visits are only arranged for school groups, information about the works are reduced to the legends beside them. If in most of the cases that is not enough for adult visitors, it is even more difficult when the visitors are children. The educational program is thus restricted to the guided visits and, therefore, it reaches only a small group of children.

While traditional guided visits for schools have the advantage of providing basic information about the visitors, the same does not happen to the “free visits”, which happen without the guide. Hence the museum loses the opportunity to know its visitor’s profile: who they are, how many they are, what are their preferences, why are they visiting the museum and so forth. This is a precious information, one of the foundations of a successful educational program. Moreover, when children take part of the guided visits, most of them take their works home, which means they take important feedback information too.

The main challenge of this project is to enhance the whole educational program, creating a system that supports an efficient and pleasant learning hands-on experience, providing basic information about the museum and the works in exhibition through a guided visit, including historical context, information about artists and artistic movements. Furthermore, children should be encouraged to contemplate the works of art, to look at them in details, to investigate and to question. After the visit, the system should also register a basic profile of the visitor, as well as his activities, in order to provide feedback for the museum. Hence the museum would have a formal register of its visitors’ profile - age, gender, how many -, as well as an overview of their most successful collections and activities.
Strategy

The strategy proposed to design a solution is based on the context analysis, which can be resumed by the answers of the following questions:

What?
The content for this project consists in context information about the works of art in exhibition, the works themselves and information about the museum.

For who?
The main target group is children between eight and twelve years old who visit the museum without a guided visit. Usually they can read, come in group with their families or school groups. Children at this age can think logically about objects and events, and from eleven years they can think logically about abstract propositions and test hypotheses systematically.¹

Why?
Children who visit the museum without the support of a guided visit do not have access to important context information about the works of art, which could convey a better aesthetic experience.

What for?
The main objective of this project is enhance educational programs in art museums, engaging children in pleasant visits where they can observe and enjoy art, and provide feedback from the visitors, in order to bridge the gap between museum and important information about the visitor’s profile and their main interests in the museum.

How?
Once the main objective of this project can be divided in two - engaging children in the visit and provide feedback to the museum -, so the system is also divided in two: the multimedia guide and the website.

¹ PIAGET. See Chapter Two, page 26.
The multimedia guide is defined as a hands-on system, takes place in the museum and is focused on the visit and the works of art in exhibition. It presents context information in the form of simple games and videos, and it is possible to create some works that are sent to The Gallery, a part of the website that presents the results of the visits and the museum’s collection in the Internet. The website also has simple games, videos and stories about the collection, and children have also the opportunity to make creative works on-line. These works are also uploaded to The Gallery.

Hands-on system: Multimedia guide

After observing and following traditional guided visits in art museums, the educational experience can be classified in three moments: seeing, listening and doing. This project intends to support these three kinds of experiences through small games, exercises and presentation of content in order to stimulate:

1. Observation
The child is encouraged to observe the picture deeply, looking for symbols, identifying colours, forms, techniques or characters. In a second moment, the child can also identify subjective elements, such as feelings or similarities with the real world. In this case there are no right or wrong answers, but an opportunity to “read” beyond the picture. This can be done through simple questions and parallel presentation of videos and sound files with interviews with artists and other people who manifest different opinions.
about a work of art, as well as videos showing the artist at work. Videos that put work into context are considered one of the most successful features of the Multimedia Guide of Tate Modern, and should be also used in projects with children.

2. Listening
This is basically where art tells a story. Through listening the child becomes information about the artist, context of the art piece, techniques, historical context, cultural parallels and so on. This is provided through what I call “Return”, in this case, a direct return to the answers given by children to the tasks proposed in the multimedia. This return varies according to the kind of activity. The most common kind or return is present in the answers to questions, or quiz games. Each posed question provides three options of answer: one right, one wrong and one absurdly wrong. No matter what answer the child chooses, he will receive a return, a comment that explains why the answer was right or wrong, providing content. This “why” is nothing else but the content or information considered important to be kept. It comes in form of sound and eventually with text support. The educational multimedia about Biosafety of the Museum of Life, in Rio de Janeiro works this way. It was observed that children who played the quiz game did it at least twice: firstly to answer all the questions correctly and secondly to answer all the questions wrong, choosing the absurd options for all of them to see what kind of return they would receive. That means they have listened to the same content at least twice while playing.

Listening to sound files or videos has more subjective effects. If quiz games are good tools to teach about issues where you have a clear definition of “right” or “wrong” which can be evaluated, subjective approaches are more complex to be proposed and evaluated. In these cases, games that with questions and options for answers can also be explored, but it should be clearly said that there are no right or wrong answers, or even providing more than one possible answer.

3. Self-expression
The child is now stimulated to express himself through creative activities such as virtual drawing, collage or painting. All the traditional guided tours in museums involve creative activities, and children are fascinated by the idea of participation, especially drawing.
In this case, they have the opportunity of expressing themselves and publishing what they do. Subjective issues related to art are here explored. The exhibition provides inspiration, poses questions, and challenges children to think. The self-expressions activities are the opportunity they have to be active participants instead of simply passive viewers.

Once in traditional visits their drawings and production are taken with them, here all creative works can be sent to the data-bank and published on-line.

The chosen media to support this part of the project is the PDA - Personal Digital Assistant, an electronic device which can include some of the functionality of a computer, a cellphone, a music player, and a camera.

PDAs are a good example of media that can successfully replace the terminals. All the content can be stored on a database and uploaded through a Standard 802.11b wireless network, which allow limitless information. The PDA can be taken everywhere in the environment, and offers different possibilities of tours with the same equipment. Each one of them can be recommended according to the objectives of the visit. Each child could have its own guide, thus avoiding too many kids around one terminal when the visit happens in groups.

The guide can be used in two ways:

1. Children can learn about individual works of art. In this case, each work presented in the activity has an indication on the legend beside it, which could be a symbol and a reference number, as well as it is traditionally made in audio guides in many museums.

2. The guide presents a specific linear tour, and a series works to be observed. During the visit, different activities are proposed by the device in short sessions, so that the visitor’s attention is always drawn back to the picture. All the content runs on server and is accessible by wireless-LAN. All activities and entries on the device are registered and sent to a data-bank. Before the child starts the tour, he has to enter basic information as part of a game that identify his gender and age. All creative activities, such as the digital drawings and paintings, are also sent to the data-bank under this profile. If the
child takes part on more than one tour, he keeps sending his entries until he exits the
tour. Once attention to exhibits decreases sharply after about half an hour\(^3\), the tour
should not longer than that.

**Second system: Raymundo’s collection website**

The primary objective of the second system is to provide feedback for the museum.
This is possible connecting the system with the data-bank that receives all the entries
from the visits at the museum. This information is presented in the form of an
interactive on-line platform, called The Gallery, which provides a visual overview of
the collections and how many entries they receive, the visitors and their basic profile.

The Gallery is part of a website - *Raymundo’s Collection* - which also contains a presentation
of the collections in the form of sub-sessions with basic information and interactive
games, according to the main concept of the visits: seeing, listening and doing. The
works children make on the website are also sent to the data-bank and to The Gallery,
which is also open to visitors.

The website presents also general information about the museum. The *News session*
presemtnew exhibitions and events in the museum, and the session *Information for
adults* presents detailed texts and eventually complementary educational material for
parents and teachers.

**Four. Four**

**Styleguides**

Once both systems are connected, the same visual language and identity elements
were defined as an unit in order to create consistency between them. Both interfaces
were constructed using the same colour palette and similar visual elements, such as
background images. Though this is a project for children, the visuals should emphasize
the works of art, which are already visually rich enough. Hence childish elements were
avoided.

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\(^3\) KELLY. What to people do when they visit a museum? 2002.
**Colour world**

The main colour is the institutional colour of the Museus Castro Maya:

![RGB: #336699](image)

Colour was one of the elements defined to identify the collections. Each collection has a basic palette, as follows:

- **#996666** Heritage
- **#FF9900** Library
- **#669966** Brazilian Art
- **#CCCC33** European Art
- **#CC6633** Debret
- **#990000** Portinari
- **#3399CC** Brasiliana
- **#996633** Popular Art

Criteria for the selection of the colours was: legibility, good contrast with text, good differentiation in order to identify the collections.

**Structure and Navigation**

The multimedia guide provides a linear navigation, in order to provide a kind of storytelling that leads to a conclusion.

In the website, the navigation is non-linear. The homepage provides two ways to reach the collections: the menu and the interactive elements on the main area. Links to *News*, *Information for Adults* and *The Gallery* are only available on the website. The sessions of the collections have characteristics of mini-sites, with their own internal navigation, in order to concentrate attention on the tasks.
Layout

The screen of the multimedia guide was basically divided in three areas: Header on top, content on the main central area, and main Navigation on the bottom. Secondary interactive elements related to each specific screen tend to be located on the lower half of the screen, so the visitor’s hand does not cover the display when he is interacting.  

The website has basically three kinds of pages: Homepage, Collections pages and The Gallery.
26 Raster: Collection Page (top) and The Gallery (bottom)
Background images

Both website and PDA use background images as an identifying element for the collections. The images are part of the pictures that belong to the collections, with soft focus, colour gradients and no strong focal points.¹

² Background images for the multimedia guide and for the website

¹ TIDWELL. Designing Interfaces. 2005.
Images world

Once the focus on the multimedia tour at the museum is to make children look at the art pieces, no reproduction was presented on screen, except a pseudo-reproduction on the “Three Differences” game. Parts of pictures and references that are not presented in the Exhibition were used instead.

In the other hand, the reproductions were presented on-line as reference, together with other visual references. Big visuals were used on the homepage of each collection, in order to catch attention to its content and also, together with colours, create identity. In these cases, the same image was used as background in the secondary pages of the session, as previously described.
Maps

Multimedia guide

Objective questions, three possible answers
Creative works, upload to The Gallery

Introduction
European art
Debret

Brasiliiana collection
Brazilian art
Portinari

Who was Raymundo?

Conclusion

Raymundo's Collection Website

Collections

News
Information for adults
The Gallery
**Scenario description**

**Multimedia Guide**

The goal of this guide is to make children learn about the person of Raymundo and his role as a maecenas. To reach this goal, children are challenged to accomplish a series of tasks and small games that provide hints, each one of them related to a specific art piece. Metaphors are used to create characters, scenarios and situations in order to provide the necessary elements of a storytelling and stimulate children’s imagination. During the tasks, they become information about the works and have the opportunity to learn with them and create their own small works digitally.

In this project, children are challenged to become detectives and solve a mystery: who was Raymundo?

The following pages are a description of a guided tour provided by the multimedia. The child becomes the guide on the reception of the museum and the first instructions on how to use it.

The first screen presents a short explanation about how the child can use the PDA. It is an image with a Welcome message and a button called “Start your mission”. Sound explains the main rules of the game:

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Welcome to the Chácara do Céu Museum. You are challenged to be a detective and your mission is to find out who was Raymundo.

To accomplish your mission, you have to collect hints through observations and tasks in this museum. These hints can be words or objects available in this equipment after some tasks. Take note of them using “my notes” link on the bottom. If you need any help to find a picture, look for its location on the map.

Click on “start your mission” when you’re ready.
To start your mission, you need a Detective ID. Please answer the following questions to get yours.

Are you...
A boy?
A girl?

Click on your option

How old are you?
Now you can choose a character that best fits to your ID.
Click on the arrows to see the options. When you find it, click on the “That’s me!”

Ready! Here is your ID!

Now look for the picture number 23 in the Library. Click on the map if you need help to find it.
Click on “I found it“ when you’re ready.
The child walks to the room where he finds the following picture:

31 Une Rue au Village. Maurice de Vlaminck. Oil on canvas

After clicking on “I found it!”, the following screen is appears:

The picture you see now is called “Une Rue au Village” was painted by Maurice de Vlaminck. Would you guess where Vlaminck was born? Click on the flag of his country.

Right: Correct! Maurice de Vlaminck was born in France in 1876, where he worked as painter, printmaker and author. He was one of the principal figures of the Fauve Movement, along with Henri Matisse and André Derain.

Wrong: Well… Actually he was born in the country beside this one. Maurice de Vlaminck was born in France in 1876, where he worked as painter, printmaker and author. He was one of the principal figures of the Fauve Movement, along with Henri Matisse and André Derain.
Now observe the picture carefully. Which of the following elements can you identify?

- Black and white
- Visible brush strokes
- Soccer players

Return to answers is given with sound as follows. During the return, the screen below is presented.

Right: Well done! The paintings of “Les Fauves”, or “the wild beasts”, were characterised by visible brush strokes and strident colours. Fauvism can be considered a mode of Expressionism. Other artists painted also like Vlaminck. You can see an example now on your display: “Portrait of Madame Matisse (the green line)”, from Henri Matisse. Raymundo acquired some examples of different European works of art, from different movements and artists.

Wrong 1: Sorry, but this is not right... The paintings of the Fauves were characterised by visible brush strokes and strident colours. Fauvism can be considered a mode of Expressionism. (…)

Wrong 2: No no no... The paintings of the Fauves were characterised by visible brush strokes and strident colours. Fauvism (…) artists. By the way, what about painting soccer players with vivid colours and really wild brush work someday?
Afterwards new screen presents the following self-expression activity:

“How do you see these trees? They are yellow. So, put in yellow; this shadow, rather blue, paint it with pure ultramarine; these red leaves? Put in vermillion.” Paul Gauguin

You can now choose new colours for the picture on your display. Pick up a colour clicking on it and then click on the area you want to paint.

Paul Gauguin’s quote stimulate kids to look for new interpretations of the picture.

When clicking on finished, the following screen appears:

Well done, detective. Now you can pick up some key words you might consider important to find out who is Raymundo, and keep them on your personal notes. You can choose more than one. Press “ok” when you finish.

Now go to the dining room and look for the picture number 25. Click on “I found it” when you get there.
Observe the picture. Which of the words below better represents the scene in the picture? You can click on more than one word. Click on "OK" when you finish.

- Slaves
- Cinema
- Colony
- Quotidian
- Sport
- Watercolor

Return to answers

Right: Very well! The picture represents a scene of the Brazilian quotidian in the beginning of the 19th century. In that time, there were slaves in Brazil, as you see in this picture.

Wrong: (...)The picture represents a scene of the Brazilian quotidian in the beginning of the 19th century. In that time, there were slaves in Brazil, as you see in this picture.

After the return to the questions, a video about Debret is presented, and shows other pictures of him. This picture is an example of art in historical context. Debret’s works are commonly used to show scenes of Brazilian quotidian in the first half of the 19th century and are considered an important historical documentation. With this picture, observation and self-expression tasks are proposed. Listening is provided by the video.
Jean-Baptiste Debret was a French painter that produced many pictures depicting the quotidian in Brazil. He was invited by the Emperor D. Joao VI and went to Brazil in 1816. He registered all kinds of quotidian things he has found there.

“In 1829, Debret organized the first arts exposition in Brazil, where he presented many of his works and of his disciples. He was also involved in the production of ornamental work for many of the public ceremonies and official festivities of the court.”

He was particularly interested in slavery of blacks and in the indigenous peoples in Brazil. Together with the German painter Johann Moritz Rugendas (1802-1858), his accurate work is to this day the most important graphical documentation of life in Brazil during the first half of the 19th century.

As a photographer or a journalist, Debret walked around in the city drawing all the news he could, and, after he went back to France, he published his monumental series of three volumes of engravings, titled *Voyage Pictoresque et Historique au Brésil, ou Séjour d’un Artiste Français au Brésil* (A Picturesque and Historic Voyage to Brazil, or the Sojourn of a French Artist in Brazil).

Raymundo has bought around 500 drawings, paintings and watercolours of Debret for the Brasiliana Collection.
Interface turns to a camera, a photo can be taken.

Register yourself a quotidian scene too. You can now make a photo of any scene in this environment you consider typical. You can go to the window and register some landscape from outside.

Now look for the picture number 23 in this room. Click on “I found it” when you stand in front of it.
In this example, observation tasks are proposed. The “three differences” game stimulate a deeper observation of the picture, and the following exercise stimulates observation through comparison between images of the same place in two different historical moments. The following screen is presented. For each difference found, the picture changes to look as the original. After finding the differences, sound provides a return about the context of the picture.

Click on the 3 differences between the picture of Dampier and the picture on your display.

Return when finished:
This oil painting is called “View of the entrance into the harbour of Rio with the Sugarloaf, Gloria Church”. It was painted by the English artist Robert Dampier and it is part of the Brasiliana collection. Brasiliana is the name of the works produced by artists who were in Brazil between the XVI and XIX centuries. Raymundo had one of the most important Brasiliana collections in Brazil. He was mostly interested in images of Rio de Janeiro, where he used to live. Through these images we can notice how the city changed.
Observe the pictures on display and compare them with the painting Robert Dampier. Which one of them show an actual view of the same place Dampier painted?

Well done, detective! If you compare both pictures, you will notice how the city has changed. Did you see that today there is no hill as there was in Dampier’s picture, and there is a land surface where there used to be more sea?
Well done, detective! Ready to collect references for your mission? Drag and drop them to your notes on the bottom.

Now look for the picture with a couple in this room.
Which of the colours below are present in the picture? You can click on more than one. Click on Ready when you finish.

Return
You have just noticed one of the characteristics of the modern paintings in Brazil. Observe the picture: strong colours on big areas, high contrasts, and flat figures... The painting represents also some elements of the Brazilian culture: the Brazilian flag, the picture of Jesus, the military uniform, and the bride’s dress. Raymundo started buying those paintings in 1930, but the works that the modern artists started to produce in 1920 in Brazil became appreciated by collectors in 1960.
Now click on the figure that does NOT belong to the picture.

Return to answers

Return 1: You are right; he is not in the picture. This is a picture of Raymundo Ottoni de Castro Maya, made by his friend Candido Portinari, a famous Brazilian artist.

Return 2: Sorry, but this guy is not in the picture. This is a picture of Raymundo Ottoni de Castro Maya, made by his friend Candido Portinari, a famous Brazilian artist.
You can now change the scenario and draw a new background for the couple. Use your fingers to pick up the colour you want, resize the couple and draw.

When you click on “Finished” your drawing will be sent to our databank and you can see it in the Raymundo’s Collection website.

Now you can make your notes. Is there any object here that contains information about Raymundo? So take them!

Now look for the picture 67 and click on “I found it” when you get it.
Raymundo collected a lot of works of the Brazilian painter Candido Portinari. They used to be good friends, and one of the most interesting works of Portinari was a series of drawings made with coloured pencils for the story of Don Quixote and Sancho Pança, written by Miguel de Cervantes in two volumes: the first in 1605, and the second in 1614. This is one of these illustrations.

How would you call it?

- Don Quixote fighting against the windmills
- The adventure of the giants
- Fly not, cowards and vile beings!

35 Don Quixote fighting against the windmills.
Candido Portinari.
Coloured pencil on paper
The original name of this picture is “Don Quixote fighting against the windmills”, but it’s ok if you want to call it something else.

“At this point they came in sight of thirty forty windmills that there are on plain, and as soon as Don Quixote saw them he said to his squire, “Fortune is arranging matters for us better than we could have shaped our desires ourselves, for look there, friend Sancho Panza, where thirty or more monstrous giants present themselves, all of whom I mean to engage in battle and slay, and with whose spoils we shall begin to make our fortunes; for this is righteous warfare, and it is God’s good service to sweep so evil a breed from off the face of the earth.”

“What giants?” said Sancho Panza.

“Those thou seest there,” answered his master, “with the long arms, and some have them nearly two leagues long.”

“Look, your worship,” said Sancho; “what we see there are not giants but windmills, and what seem to be their arms are the sails that turned by the wind make the millstone go.”

“It is easy to see,” replied Don Quixote, “that thou art not used to this business of adventures; those are giants; and if thou art afraid, away with thee out of this and betake thyself to prayer while I engage them in fierce and unequal combat.”

So saying, he gave the spur to his steed Rocinante, heedless of the cries his squire Sancho sent after him, warning him that most certainly they were windmills and not giants he was going to attack. He, however, was so positive they were giants that he neither heard the cries of Sancho, nor perceived, near as he was, what they were, but made at them shouting, “Fly not, cowards and vile beings, for a single knight attacks you.”

A slight breeze at this moment sprang up, and the great sails began to move, seeing which Don Quixote exclaimed, “Though ye flourish more arms than the giant Briareus, ye have to reckon with me.”

So saying, and commending himself with all his heart to his lady Dulcinea, imploring her to support him in such a peril, with lance in rest and covered by his buckler, he charged at Rocinante’s fullest gallop and fell upon the first mill that stood in front of him; but as he drove his lance–point into the sail the wind whirled it round with such force that it shivered the lance to pieces, sweeping with it horse and rider, who went rolling over on the plain, in a sorry condition. Sancho hastened to his assistance as fast as his ass could go, and when he came up found him unable to move, with such a shock had Rocinante fallen with him.”
Ready to take your notes and go on with your investigation, detective?

Drag and drop the elements you consider important to your notes below.

After all tasks related to the works of art are accomplished, the child is invited to show what he found out about Raymundo during the visit. The following tasks are presented in a form of a Quiz game, and the child can score points answering to them. At anytime the notes made during the visit can be consulted.

Now it’s time to solve the mystery!

You probably know a lot about Raymundo now. Answer the questions that follow to show what you have found out. You can take a look at your notes anytime you want.
Where was Raymundo born?

Italy
China
France

R: No, he was born in France.
R: No, he was born in France.
R: That’s right, detective! He was born in France.

2. Where did he live during most of his life?

Rio de Janeiro
New York
Mars

R: Correct. He used to live in Rio de Janeiro.
R: A little too far… He used to live in Rio de Janeiro.
R: Mars? No no… He used to live in Rio de Janeiro.

3. What kind of collection did he make?

Kites
Art
Shoes

R: Well, not really… Raymundo used to collect different kinds of art works. They are divided in collections, like European art, Brasiliana, Debret, and Brazilian art. And you have just seen some examples of them.

R: Correct. Raymundo used to collect different kinds of art works. They are divided in collections, like European art, Brasiliana, Debret, and Brazilian art. And you have just seen some examples of them.

R: He probably had a lot of shoes, but they are not a museum’s collection… Raymundo used to collect different kinds of art works. They are divided in collections, like European art, Brasiliana, Debret, and Brazilian art. And you have just seen some examples of them.

4. Where did he keep his collection?

The other six questions about Raymundo are listed below.
In his two houses
In a locker
Somewhere deep in the ocean

R: That's right. Raymundo had two houses in Rio where he used to keep his collections. After he died, his houses became museums where visitors can see his works of art and objects in exhibition.

R2: A locker? That's probably a very big locker!!! Raymundo had two houses in Rio where he used to keep his collections. After he died, his houses became museums where visitors can see his art works and objects in exhibition.

R3: Well, I think such a nice treasure would not resist in the ocean, don't you think? Raymundo had two houses in Rio where he used to keep his collections. After he died, his houses became museums where visitors can see his art works and objects in exhibition.

5. How was the name of the artist who was Raymundo's friend?

Maurice de Vlaminck
Candido Portinari
Tarzan

6. What was Raymundo's complete name?

Raymundo de Oliveira
Raymundo Ottoni de Castro Maya
Raymundo Picasso

7. So... who was Raymundo?

A Maecenas, who used to live in this house before it became a museum and collect works of art.
A writer and artist who painted the Brazilian quotidian.
A Brazilian Emperor.

R1: That's right. Maecenes is a Latin word for patron of literature or Arts. Raymundo learned to collect Art with his father. He also encouraged new modern artists, and got engaged in specific programs, such as Engraver's Friends (Amigos da Gravura) and Os 100 Bibliófilos, which was the production of books with illustrations of famous artists.

R2: I think you confused him with Debret or Vlaminck... He was a Maecenas and art collector. Maecenes is a Latin word for patron of literature or Arts. Raymundo learned to collect art with his father. He also encouraged new modern artists, and got engaged in specific programs, such as Engraver's Friends (Amigos da Gravura) and Os 100 Bibliófilos, which was the production of books with illustrations of famous artists.

R3: No, he was a Maecenas who used to live in this house before it became a museum and collect works of art. Maecenes is a Latin word for patron of literature or Arts. Raymundo learned to collect Art with his father. (....)
After answering the questions, the child scores points and receives a final comment about his performance as detective.

0-2 correct answers:
Well done detective! But I would encourage you to look around again, make more notes and look for hints more carefully. You can certainly find out more about Raymundo and his collections. If you prefer, you can also start a new mission and solve another mystery.

3-5 correct answers:
Well done, detective! Maybe you missed just a couple of notes or details, but you certainly can present something about Raymundo to your family and friends. Anyway, you can start a new investigation whenever if you want, or start a new mission and solve another mystery.

6-7 correct answers:
Bravo! You can now present Raymundo and his collections! Now you can accomplish another mission or start a new investigation for this one whenever you want.

At the end of the visit, when the child delivers the guide, he receives a card that contains a web-address to the website of Raymundo’s Collections, to be visited at home.
Scenario description
Raymundo’s Collection Website

The main objectives of the website can be described as:

1. Provide feedback from the visits to the museum’s team.
2. Provide basic information about the museum’s collection through simple online activities that can attract and engage children.
3. Provide information about the museum to adults, teachers and schools interested in planning visits.
4. Provide a connection between the museum with the Internet, working as an online information and advertising tool, presenting its collections and educational programs to the public who might be interested.

The target groups for the website are:

1. Children
2. Teachers and parents who look for information about the collections and educational programs.
3. The museum’s team who look for feedback from the visitors who visit the exhibitions and the website.

In order to attend to the different target groups, the content of the website was thus divided in three main parts:

1. The collections.
The eight Raymundo’s Collections are presented in eight subsessions, each one of them presenting basic information in videos, hyperlinks or texts. Furthermore, simple games encourage children to participate of the collections through creative tasks, such as drawing or writing.

2. The Gallery
This session is specifically directed to the museum’s team, who might be interested in having a feedback from the visitors. The Gallery publishes all the works made by children, on-line and in the museum, which are divided according to the collections
they are related with. This conveys a visualization of the most successful collections, as well as a the minimum profile of children who visit the museum - such as age and gender. Although the main objective of the Gallery is to provide information to the museum’s team, its interface is open to all visitors, including children who want to see their works on-line.

3. Information pages
These sessions provide information about news, events at the museum and educational material to teachers.

Homepage
Here the collections are presented in the main area. Interactive elements that belong to the pictures of each collection work as characters that link to the pages. The names of the collections were used rather than names of games, in order to surprise about the content of each page.

The collections are also accessible through the main menu on the top as alternative, which will also be present in the sub-sessions.

Links to the Gallery, News and Events and Information for adults are also on the homepage. However, when navigating through the collections and the Gallery, these links are no longer available. Gallery and collections are almost mini-sites within the website, and are focused on their own particular content. Any other link not directly related to them is not presented and is only accessible from the homepage.
Collections

Each collection has its own homepage and presents two or three sessions about a theme, in this case, a picture. This pages are created according to the principles of seeing, listening and doing, presented in traditional guided visits. These principles are represented by:

1. An information page that presents context information about the collection through videos, sound files, quiz or interactive storytelling.

2. Observation games. These are games that encourage children to look deeper in the pictures, looking for details, recognizing forms and colours. One of the favourite
games of many children is also in virtual version represented: the puzzle. When joining pieces to compose a picture, the child is forced to investigate the picture in its details. “Find the three differences” and “which of the figures does not belong to the picture” are also good exercises for this purpose. Eventually, small quiz games can also relate the picture with a local culture or especial context.

3. Creative activities. Digital drawing, collage, colouring and writing are some examples of activities proposed. Eventually the child will be encouraged to print some material at home, like coloured books and instructions for works with paper, for example.

37 Homepage of the European art session, which presents video about Picasso, the “Modern questions” and a creative activity.
European Art - modern questions

The modern questions are an example of subjective activity where there is no right or wrong, and the child must be free to answer whatever he wants. When thinking about subjective questions and expressing an opinion about it, children can develop critical thinking and have their creativity fostered. In this example, they can choose which question they want to answer, as well as how many.

European art: Modern Questions
Raymundo’s collection

Each collection has two or three sessions that present context information and propose simple games and creative activities. The sessions are described as follows:

**Library**
- *100 Bibliófilos?* This session presents a collection of rare books and information about the 100 Bibliófilos, a project that supported the special edition of rare books with illustrations of famous artists.
- *Illustrate* - Children can print different stories and make an illustration for them
- *Make your book* - Instructions for the creation of a book made by the illustrated stories children make.

**Brazilian art**
- *Brazilian culture* - quiz game
- *Guignard video* - information about Guignard
- *Guignard Puzzle*

**European art**
- *Modern questions*
- *Who was Picasso?* - interactive storytelling about Pablo Picasso
- *Be an artist* - children can make a drawing and send to The Gallery

*The Raymundo’s Collection: Library, Brazilian art and European art*
Debret
- *Who was Debret?* - video with information about Debret
- *History quiz* - historical facts associated with Debret’s paintings in form of a Quiz
- *Your quotidian* - children are encouraged to make photos of their quotidian and upload them to the Gallery.

Portinari
- *Who was Portinari?* - interactive storytelling about Portinari
- *Don Quixote* - Video about the story of Don Quixote
- *Make the contrary* - children are encouraged to write a story for Portinari’s illustration. The story is uploaded to The Gallery and can be written collectively.

Brasiliana
- *Brazilian landscape* - video explaining how different European artists portrayed Brazil.
- *The three differences* - find the three differences between the pictures.
- *Past & Present* - paintings of different places are presented and compared with photos of the same places today. The visitor is encouraged to upload new photos made by them of the same places.
Popular art

- *Mestre Vitalino* - video about Mestre Vitalino and Popular art.
- *Be a sculptor* - encourages children to make their own clay sculptures.

The Gallery

The Gallery consists of an overview of the works made by visitors in the museum and in the website. The interface is constructed in order to convey a quick overview about the amount of works that have been done and a basic profile of the authors. The works are organized according to the collections, and each point on the interface represents a creative work, which can be a drawing, a collage or a story. Their colours - gray and blue - are a code that indicates where the work was made, if in the museum or on-line. The Gallery provides also information about how many children have produced works, their age and gender, as well as statistics about the visits. With these information, it is possible to evaluate which collections are more successful in attracting visitors, and determine their basic profile.

The works can also be seen in detail. When a point is clicked, it opens a window with a detailed view of the work, and offers the possibility of making comments about it. In the case of stories, some of them are written collectively, i.e., one starts the story and invites others to write further. Unfinished stories are indicated by a dark gray colour and can be written at anytime.
Kids in Action: Interface Concepts for Educational Experiences in Art Museums
Four. Three

**Project tests**

**Paper prototype**

After the development of layouts for the website and multimedia guide interfaces, it was necessary to make tests with children in order to evaluate:

1. Acceptance of the project
2. Understanding of the interface
3. Usability
4. Attention and engagement

Tests were made using paper prototypes and simulating the museum’s environment through printed reproductions of the pictures. Nine kids, boys and girls between seven and thirteen years old participated of the tests, which were divided in three moments:

1. Simulation of a visit using the multimedia guide;
2. Simulation of a visit to the website;
3. Questionnaire about the activities and general questions.

**Procedure**

The kids received the first instructions about the test. Some pictures of the museum were presented in order to provide context for the simulation. Only three kids were familiar to the PDA, represented by a card, but all kids could easily understand that interaction would happen on screen, which was demonstrated during the simulation.

The simulation for the multimedia guide was made with cards, each one representing a screen. The children were told to pay attention to the “audio”, simulated by an oral reading of texts, in order to get the necessary instructions to accomplish the tasks appropriately. At each action or command, a new card was shown with the new task to be accomplished.
After starting the simulation, the children’s actions were observed and notes were taken. After finishing the tour, the kids received the card with a web-address and were asked if they would be interested in visiting the website at home afterwards. Children who answered yes - seven of the nine - were presented to the paper prototype of the website and could freely test and navigate through it until they decided by themselves when they wanted to stop.

And finally, the questions of the questionnaire were answered, followed in most of the times by an informal conversation about the whole experience, which also provided important feedback about their impressions and results. Two kind of questions were made: general questions in order to determine a basic profile of the children: age, gender, how often they access the Internet, what do they do on-line, and how often do the visit museums; and questions about the tasks. Website and multimedia tour received grades in graphics and difficulty level, from 1 to 5, where 1 is positive and 5 is negative evaluation. Children were also asked if they would recommend the website, as well as their opinion about the best and worst part of the whole experience.

Influences of the museum’s environment could not be evaluated.
**General results**

**Profile of interviewed children**
Most of the kids interviewed - six of nine - access the Internet only once or twice a week, especially the younger. Two of them - ten and eleven years old - are everyday connected, and were the most familiarized with the website interface.

![Pie chart showing children's access to Internet]

Seven children mentioned the games as their favourite activity on-line. The kind of games varies from Puzzles and Playmobil to Action Games. Most of children mentioned games portals as their favourite, and declared to play various of them. Some games mentioned were: Spele.nl and Tivi (game portals), Spiderman and Runescape (action games) and puzzle. Half of them declare they prefer to play alone rather than with other children.

![Pie chart showing children's activities on line]

Four children connect the Internet also to do their homework and make researches. Two answered “others” as their activity on-line (e-mails, reading etc).

When asked about how often they visit museums, the answers were equally distributed between “sometimes” and “rarely”. Most of the children don’t feel very comfortable
to talk about visits to art museums, and some of them said they don’t like it because “it is difficult to understand” or “it is boring”. However, visits to Science museums are quoted as good experiences. A seven-year-old boy made a long report about his visit to the Technik Museum in Berlin, telling about airplanes and ships he saw. Another ten-years-old boy mentioned the Spectrum as fun. Why? “They have games, toys, and you can experiment everything by yourself.”

1. Attention and engagement
All kids were concentrated on tasks proposed by the multimedia guide, from the beginning to the end. None of them proposed to stop at any moment. The audio was well understood. After asked about the “audio” texts, if it was too long or too short, all children answered that the audio was long enough and felt comfortable to it. Though the screen presented text, the audio was enough and they just read titles, key-words or options for the answers to the tasks.

The attention dedicated to the website was lower, especially by the younger kids, between seven and eight years old. These have restricted access to the Internet and are not so familiar to websites. When connected, they navigate a little through the collections, always looking for the games, especially the puzzle. Videos and information pages did not attract them. Nine-years-old children and older explored the website more carefully, especially the girls. They looked for information about the collections before playing. Two children, both ten years old, were interested in writing a story, one of them visited the page and decided to come back later. Only one ten-years-old girl explored the whole website, including information pages, like News and Information for adults.

2. Acceptance of the project
Both interfaces received grades, reaching the following average results:

<table>
<thead>
<tr>
<th>Website and Multimedia guide: average grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website - graphics</td>
</tr>
<tr>
<td>Website - difficulty level</td>
</tr>
<tr>
<td>Multimedia guide - graphics</td>
</tr>
<tr>
<td>Multimedia guide - difficulty level</td>
</tr>
</tbody>
</table>

n= 9  1= best grade
In other words, the website tend to be more difficult to be understood and to catch children’s concentration, except when they find the games.

The multimedia guide received grade 1 in graphics from all the children.

Eight children wanted to visit the website after the multimedia tour. Six of the seven children who visited the website would recommend it.

Although children were more concentrated in the tasks provided by the multimedia guide, or the “cards game” as some of them called it, considering their involvement and answers to the questionnaire, we can say that both website and multimedia guide were well accepted. All children were particularly happy with the graphics, even if it does not look childish. Besides the results of the simulation, the best feedback to this fact can be resumed in the comment of a thirteen-years-old girl: “I don’t need it to be infantile to like it, and even when I was eight, I didn’t have to see any baby-looking pictures to like something.”

The difficulty level on the PDA is considered low, not only because it was demonstrated through the grades and answers to the questionnaire, but also because it was observed during the simulation. The most difficult task was the “Find the three differences game”. Eight children felt challenged by the game and kept trying until they got it. Five of them asked for hints, which were later provided by a new button on the interface. When clicked, it provides audible clues of location or kind of elements to look for in the picture. In average, the children took about three minutes to find the three differences. Only one child gave up.

Since most of the names of artists are not known by the child, keeping them was also mentioned as a difficulty. Children mixed contexts and persons often, except when they recognized a name that they had already heard before: Pablo Picasso.

In average, children answered five of the seven final questions about Raymundo correctly.

The website had a lower acceptance than the guide, especially by children around seven years old. Two boys did not want to visit the website. However, the children who explored it got involved and had fun.
The best features of the whole project quoted by the children are:

- Games
- Tasks
- Puzzle
- Making notes
- Making drawings, photos and new colours for a painting.

When asked about the worst features, two children pointed the difficulty in keeping names and the one mentioned the website.

And finally, when asked if they would like to visit the museum, all children answered “yes”.

3. Understanding of the interfaces

The kids did not have difficulty to understand and accomplish the tasks on the PDA, except in the first screen: after listening to the introduction text with rules and presentation, they should press “Start your mission” to go on playing, but no one recognised it at first. This was corrected with a clearly audible instruction. (“Click on ‘Start your mission’ when you’re ready.”).

Afterwards, two children had difficulty to understand the photo camera. The solution was to make the instruction clearer in audio and on screen.

The first time the children had to collect objects for their notes was not immediately understood. Sound instruction was provided to make it clearer, and as the action was repeated in other moments, there was no more difficulty.

The website was considered easy to understand. Once children received the homepage, all of them started clicking on the collections represented in the main area. The upper menu was not understood in the paper prototype, once it was not possible to represent the motion of mouse-over effects. However, the children did not find difficulty to click on “Back to the collections” to go back to the homepage and decide what else they wanted to see.
The Gallery could not be appropriately evaluated on paper. Mouse-over and on-click effects had to be explained, so the children could understand where the works are and how they could get to them. Nevertheless, interest was demonstrated through comments and further questions.

4. Usability
Most of the design decisions concerning Usability were successful, except for the following:

Main navigation on the PDA was not clear enough, as well as the “My notes” button. A new main navigation was provided, with buttons clearly defined and positioned on the bottom of the screen.

Colours on the sequence of European Art had a low contrast between white text and background, making the legibility difficult. White text was replaced by dark gray text.

Buttons of the drawing activities were too small and too close to one another. They were resized and positioned with more space between them, which resulted in a fewer colours to make the layout fit on the display.

Conclusion
Although the multimedia guide simulation still is not an ideal simulation of the experience it proposes to support in a museum, it reveals that focus is one of the main instruments that must be provided to engage children in such an experience. Once they have a clearly defined objective, they can concentrate on it, and the road that leads to this objective is where they can find information, create, have fun, and experience a closer understanding to art.

Once the website does not provide a clear objective to the children, but lets them free to explore the content as they want, it will than cause a different approach. In the other hand, the website has different objectives and different target groups, as already mentioned. That means each one will be attracted by a specific area, according to their profile and interests.
Conclusion

“...we are moving toward the Creative Society.”
Mitchel Resnick

Playful learning in art museums

When the particularity of the use of technology in art museums was pointed in the early stages of development of this project, provide a new solution to enhance their educational programs became a challenge, once it was difficult to find references of interactives in art museums. In the Age of Technology and Information, the main inspiration and source of solutions came fundamentally from the aesthetic experiences in museums provide in guided visits for children.

Despite the objectiveness of science and historical museums, art museums are the environment for subjective and open experiences. Art deals with feelings, not only those expressed by the artist, as also those provoked in the viewer. It touches the personal dimension of the construction of identity. Especially in modern art, the viewer is invited to be co-author, and each one will interpret a work of art differently. In this construction of meaning, the codes used by the viewer change along the time, and involves not only the first impressions and context information he receives in the museum, as also his background and previous experiences that will make him connect what he sees to what he already knows.

The guided visits in art museums support a rich aesthetic experience to children. The observation of works of art is encouraged by the support of historical and cultural context information. Discussion is stimulated and creative activities are proposed in order to foster the self-expression. Self-expression is one of the foundations of the construction of identity in the child. Through drawing, painting and sculpting, children communicate their feelings and impressions.
But what happens when no guided visit is planned and children come to the museum with their family or friends? When I was researching about guided visits for children in art museums, I found a program in Internet called “Seeing-Listening-Doing: The Game of the Colours and Forms – Mosaic in the Bode Museum Berlin” (Sehen-Hören-Mitmachen, Das Spiel der Farben und Formen - Mosaikkunst im Bode-Museum). These three words – seeing, listening and doing – became the three main pillars that led the development of the project. Seeing, listening and doing are more than the name of a guided visit in Berlin. They were observed in all guided visits for children in art museums, and resume the three main actions that, connected, embrace the constructive dimensions of learning and support a pleasant aesthetic experience.

Although science museums present a different kind of content and experience to children, their educational programs were an important source of information about the way they use technology and how children behave in their environments. Researches based on experiments and tests show that children are particularly attracted by games and hands-on activities. This is one of the practical demonstrations of theories on education that defend the constructive learning, where children are active co-authors of their own construction of knowledge. According to Piaget, Vygotsky, Papert and Resnick, the learning process is active, and children learn mostly with their own experiences. In this context, Resnick defends the importance of playful learning in the development of children. Playful learning should thus be fostered in any educational program, not only in art museums, but also in schools, or even at home.

**Technology in art museums**

Art museums have as their main objective to foster the observations and enjoyment of art. The work of art itself has its own aura, and the experience of visiting can not be replaced by reproductions. Children should be encouraged to contemplate the work of art itself, and this defined one of the main necessary features for the development

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2  See Chapter Three, page 56
3  See Chapter Two
4  RESNICK. Computer as Paintbrush: Technology, Play, and the Creative Society. Page 6
of this project: any technological device used to enhance the pedagogy in art museums should be designed to complement the experience, and not to replace it. In order to reach this goal, no reproduction should be presented, and any activity should drive the eyes of the viewer to the works on display. The interactives can thus provide context information about the works and propose activities, in order to foster a deeper observation of them and discussion.

To demonstrate these and other concepts related to educational experiences in art museums, a project was developed for the Chácara do Céu Museum, in Rio de Janeiro, Brazil. The museum has an educational program for schools, but there is no support for children who visit the museum without a guided visit. Besides that, it is difficult to have a feedback from visitors who did not arrange a visit with the museum’s team. How can the museum know their visitors? How is it possible to have a basic profile of the children who take part of the activities proposed?

This project should thus provide a pleasant aesthetic experience for the children that visit the museum and provide feedback from the visits, with basic information about the profile of the visitors and their results. This information is precious for the development of the program and leads to more adequate proposals to their public.

The solution proposed is based in two platforms: a multimedia guide for the visits in the museum, and a website that presents results of the visits and the museum’s collections to children.

The guide works as a linear guided tour, presenting the Raymundo’s Collection through a game. Children are encouraged to accomplish a mission as detectives, and during their investigation, they receive information about the works of art, participate on small games, create digital drawings and paintings and make photos. The sequence of the game was carefully developed in order to keep their attention concentrated on the works on display. No task can be accomplished without the observation of the pictures. All the results of the creative activities – drawings and photos – are uploaded to the museum’s databank and presented on the website. Hence the museum’s team receives a visual overview that presents their most successful activities and the basic profile of the visitors.
The Raymundo’s Collection website also presents the collection to children through games that also foster creativity of the children and their active engagement.

Both projects – multimedia guide and website – were tested with nine children between seven and thirteen years old, using a paper prototype of the layouts. The feedback was very positive. In general, the children evaluated the project with very high average grades, although they found some difficulties, especially in the website. Features like tasks, games and the creative activities were quoted as the best parts of the whole experience. All the children declared that would recommend the website, and that would visit the museums if they have a chance.

The main difficulty was keeping names of artists and characters. Some children confused names and works, which can be considered normal once they were not familiar with them.

Further development

**New concepts, new technologies**

No simulation was made in the environment of the museum. However, it is possible to foresee some possible differences concerning especially the concentration and involvement with the activities proposed by the multimedia guide.

Researches show that even if you try to force the visitor to follow a predefined path, they tend to visit the museum and look the objects at their own way. In other words, when children are in the museum’s environment, they are under the influence of several elements, like the environment, other children, other people and other works of art that are not on the proposed tour. This was also observed in the guided visit at the Neue National Galerie, in Berlin. Although there was a predefined tour presented by the guide, the girl interrupted her sometimes to make questions about other works that were not in the program.

Though the clear definition of a final objective is a factor that stimulates children to

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5 KELLY. What to people do when they visit a museum? 2002.
accomplish all the tasks of a game, alternatives should be provided for the cases when they lose concentration and eventually abandon the activity without concluding it. In the project developed for the Chácara do Céu Museum, the tour could be split in several small series of activities related to the works of art individually. Each picture would have sign and a number beside it, which would indicate that tasks related to it are available on the multimedia guide. The guide would present three or four options of tasks that children could choose on display. Children could also freely score points as they accomplish different tasks and be rewarded at the end of the visit.

Researches also demonstrate that most of people visit museums in groups. Piaget also discussed the importance of games and activities in groups during the development of the moral judgement of the child. The multimedia guide was developed for one child playing alone. Nonetheless, it is perfectly possible to use it in groups or combined with traditional guided visits. As discussed in chapter one, the different elements of an experience can complement each other, and all experiences are important.

And finally, during the project, I needed a lot of time to decide what kind of media would be ideal to support this kind of experience. The PDA is discreet and provides the necessary mobility for a successful solution. Nevertheless, I confess that I still look forward other display devices, which are not yet commercially available. I can imagine children using flexible displays with touch screens, light and easier to carry around, to make their notes and register their records like they were using real paper. And that would be just one of the many possibilities of further development for this project in the future.

**The Creative Society**

The human History shows the different stages of development of the society, based on how people created new knowledge and technologies and, especially, how they used to deal with these new discoveries.

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6 KELLY. What to people do when they visit a museum? 2002.
7 See chapter Two.
In the 1980s, people were concerned with the transitions from the Industrial Society to the Information Society. The 1990s became the years of the Knowledge Society. To Resnick, today and in the near future, knowledge will not be enough. The success for individuals and for the society in the future “will be based not on what we know or how much we know, but on our ability to think and act creatively. In the 21st century, we are moving toward the Creative Society.” As fast as technology develops and information is shared, it challenges us to be creative in all aspects of our lives. Moreover, technology can also provide ways to enhance creative thinking. This can be fostered not only in museums, but in all possible environments.

I believe that creativity is one of the main tools that make a society grow. In this context, children are the future of the Creative Society, and the creativity in the childhood should be thus enhanced through new approaches to education. Furthermore, children are also a reference for adults. Once they are living one of the most creative moments of their lives, observing them should inspire us to look forward creative solutions and always invent new possibilities for all sorts of situations of our lives.

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8 RESNICK. Computer as Paintbrush: Technology, Play, and the Creative Society.
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Schirn Kunsthalle Frankfurt am Main - Download of Educational Material

Steve Psomas. The Five Competencies of User Experience Design

Welie.com: Patterns in Interaction Design
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Storytelling at Wikipedia
http://en.wikipedia.org/wiki/Storytelling

The National Storytelling Network
http://www.storynet.org/Resources/KnowledgeBank/whatisstorytelling.html
## List of Illustrations

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The 5 Elements of User Experience</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>From Data to Wisdom</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Mac OS screenshot</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.sunrisepage.com/macosx/images/osxdesktop.jpg">http://www.sunrisepage.com/macosx/images/osxdesktop.jpg</a></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>HistoryWired screenshot</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td><a href="http://historywired.si.edu/">http://historywired.si.edu/</a></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pablo Picasso, Woman seated in an armchair</td>
<td>51</td>
</tr>
<tr>
<td>6</td>
<td>Charles Braque, Still life with newspaper and glas</td>
<td>51</td>
</tr>
<tr>
<td>7</td>
<td>Emile Nold, Christus und die Sünderin</td>
<td>51</td>
</tr>
<tr>
<td>8</td>
<td>The girl and her “Arabic woman”. Personal archive.</td>
<td>51</td>
</tr>
<tr>
<td>9</td>
<td>Meetings of Abstract Art at Chácara do Céu Museum: collages</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Chácara do Céu Museum Archive</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Interactive Table. Personal Archive.</td>
<td>58</td>
</tr>
<tr>
<td>11</td>
<td>Timeline. Personal Archive.</td>
<td>58</td>
</tr>
<tr>
<td>12</td>
<td>Timeline, Interactive Table and Art Experiment at Tate Modern Personal Archive.</td>
<td>59</td>
</tr>
<tr>
<td>13</td>
<td>How Van Gogh made his mark and Cezanne’s astonishing apples</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.metmuseum.org/explore/museumkids.htm">http://www.metmuseum.org/explore/museumkids.htm</a></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>The Chácara do Céu Museum and its Library.</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Chácara do Céu Museum archive.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Brasiliana: Robert Dampier.</td>
<td>65</td>
</tr>
<tr>
<td>17</td>
<td>Debret: Banha de Cabellos bem cheirosa. Jean-Baptiste Debret. Watercolour.</td>
<td>65</td>
</tr>
<tr>
<td>18</td>
<td>European art: Maurice de Vlaminek. Une Rue au Village. Oil on canvas.</td>
<td>66</td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>19</td>
<td>Brazilian art: Alberto da Veiga Guignard. Os Noivos. Oil on wood.</td>
<td>66</td>
</tr>
<tr>
<td>20</td>
<td>Candido Portinari. D. Quixote atacando um rebanho de ovelhas.</td>
<td>66</td>
</tr>
<tr>
<td>21</td>
<td>Popular art.</td>
<td>66</td>
</tr>
<tr>
<td>22</td>
<td>The Gallery</td>
<td>69</td>
</tr>
<tr>
<td>23</td>
<td>Raster multimedia guide</td>
<td>74</td>
</tr>
<tr>
<td>24</td>
<td>Secondary navigation tend to be located on the lower half of the screen</td>
<td>74</td>
</tr>
<tr>
<td>25</td>
<td>Raster homepage</td>
<td>75</td>
</tr>
<tr>
<td>26</td>
<td>Raster: Collection Page (top) and The Gallery (bottom)</td>
<td>76</td>
</tr>
<tr>
<td>27</td>
<td>Background images for the multimedia guide and for the website</td>
<td>77</td>
</tr>
<tr>
<td>28</td>
<td>Foto of the Sugar loaf, Rio de Janeiro.</td>
<td>78</td>
</tr>
<tr>
<td>29</td>
<td>Matisse. Portrait of Madame Matisse. Oil on canvas.</td>
<td>78</td>
</tr>
<tr>
<td>30</td>
<td>Vlaminck to be coloured</td>
<td>83</td>
</tr>
<tr>
<td>31</td>
<td>Une Rue au Village. Maurice de Vlaminck. Oil on canvas.</td>
<td>83</td>
</tr>
<tr>
<td>32</td>
<td>Banha de Cabellos bem cheirosa. Jean-Baptiste Debret. Watercolour.</td>
<td>86</td>
</tr>
<tr>
<td>33</td>
<td>Robert Dampier</td>
<td>89</td>
</tr>
<tr>
<td>34</td>
<td>Os Noivos. Alberto da Veiga Guignard</td>
<td>92</td>
</tr>
<tr>
<td>35</td>
<td>Don Quixote fighting against the windmills. Candido Portinari.</td>
<td>95</td>
</tr>
<tr>
<td>36</td>
<td>Raymundo’s Collection - homepage</td>
<td>103</td>
</tr>
<tr>
<td>37</td>
<td>Homepage of the European art session</td>
<td>104</td>
</tr>
<tr>
<td>38</td>
<td>“Be an artist”: example of creative activity, in the European art collection.</td>
<td>105</td>
</tr>
<tr>
<td>39</td>
<td>European art: Modern Questions</td>
<td>105</td>
</tr>
<tr>
<td>40</td>
<td>Cards used to simulate the multimedia guide</td>
<td>112</td>
</tr>
</tbody>
</table>
Here I declare that I made this project by myself and didn’t use any other source or quotations besides those here mentioned.

Jane Pitrowsky
April 2008