



# Designing for Children

- With focus on 'Play + Learn'

## Dilus - Electronic product of aid at the social interaction, entertainment and continuity of school activities at a distance.

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**Abstract:** This paper presents the development of a project whose subject is the social interaction and continuity of school activities for children through a ludic way. For this was developed a product based on bibliography research and a field research with focus at the pediatric oncology, because in this segment occur the long permanence time in the hospitals and consequently happen the distancing from their families and interruption of school activities.

Trying to reduce these factors and provide for the patients who require hospitalization and other people who need to abstain from social contact for some reason, was developed an electronic product called by Dilus that can help the individual to continue their school activities, this can be beneficial to the user improving their health, because when the patient has entertainment and forget their "problems" the body reacts and provides mechanisms to improve itself much faster than normal.

*Key words: pediatric oncology, industrial design, eletronic product.*

### 1. Introduction

The treatment of childhood cancer occur constantly in everyday life without our noticing such depth of subject, where many children can not resist the drugs used in this treatments and them come to death. Friedmann (1998) shows that such treatments have such a degradation of physical and psychological aspects of patients during the stages of treatment end up with damage to the rest of their lives like sleep problems, behavior, appetite, among others.

Few hospitals have the proposal to transform such an environment similar to the home of each patient, trying to reduce the image of fear, anxiety, insecurity, loneliness, among

other things. To mitigate these factors, it is believed that the inclusion of play in the hospital environment is a factor of bigger importance. Given this assumption was decided to investigate and seek propose the concept of a product that mediate this relationship.

Through these concepts began library research, field and market in order to collect data necessary for the completion of a product that met the real needs of the users limited to children in the process of treatment or that somehow have to abstain to school activities and social life. Aiming at further deepening of the points arising from the hospital research was focused primarily on the pediatric oncology treatment, in these cases the hospitalization period is longer and occurs the physical and psychological suffering by the patient.

Based on the data collected it was noted that the need for social interaction of the individuals is so intrinsic that them may suffer psychological trauma that can last for the rest of their lifes, if it the social interaction is stopped. In many cases of hospitalization the child has to give up their daily activities as well as their social life with friends, family, among others, due to the need to change the city for treatment as well as the long period of treatment will occur. Thus the interruption of school activities has bigger aggravation in early stage of intellectual growth and social human being.

Through this was developed an electronic product that would help the social interaction and continuity of school activities through high-tech components with the objective of providing its User not only an electronic product, but a different product in the middle of demand of its area.

## **2. Childhood cancer**

Baracat (2000) says that the notice of need of chemotherapy treatment comes with some impact and discomfort for the patients mind because it automatically creates the image of the impossibility of recovering his health and the fear of what the society will think about it, so in this moments occur the emotional upheavals. The stay of patients in the hospital for chemotherapy treatment occurs according to the degree of each patient cancer so that it is too hard for them return do the check-up because after some time the concept that the environment only will "hurt" is increasing along with the restriction of tasks imposed on them by the hospital, where they cannot play or study with the same frequency in a "normal" life out of the treatment.

Almeida (2005) reports that the child's concept of death is acquired naturally during the treatment when it occurs in a long time, along with various physical impairments that the patient suffers during the chemotherapy. It is necessary for this not occur the intervention process by ludic ways in entertainment through games and/or other products in the hospital, which can assist in transportation of patients, food, entertainment, social interaction, among others.

### **2.1. The ludic as treatment**

Kishimoto (1998) shows that the ludic is the way that an individual relates yourself in an environment or social environment, this is not related in the same way by all people, each person acquires its ludic interpretation to entertain themselves at any time in accordance with the existing culture in himself. Therefore, the ludic culture starts in many ways, for example, most children interact in serious situations through games, which for adults or children with his ludic culture repressed does not happen the same way.

The ludic isn't a escape way of the individual to an imaginary plane in order to reject what him is living in the moment, but a creative process of each individual who can facilitate your acceptance in certain situations that reduce significantly its traumas in some situations of fears or anger. Thus products as furniture, electronics, appliances, among others, may assist in the ludic culture of each patient, exploring him creative mind and offering well-being in the environment of hospitalization.

### **3. The school and the information revolution**

The industrial revolution was very important in changing the daily habits of human beings in their economic and even environmental media, the information revolution in this century has made great changes too. According to Druker (2008) The impact of this revolution to the children and the school has been relatively positive, as they have the ability to use a computer faster than adults even in the age of four years old. Based on these features some schools is using more the technological areas through distance learning or expanding their infrastructure to areas with the introduction of computers and other electronics as shown in the Interdidatica brazilian fair that expose various products of digital teaching (Figure 1) as a bus equipped with computers, a blackboard for the transmission of video lessons, among others.



Figure.1 Interdidática Brazilian Fair

Cortalezzo (2008) emphasizes that the computer network (Internet) is more effective for the distance education by having faster interaction than other media such as printed text, or audio and video. Oliveira and Seixas (2008) argue that the computer education helps in the exchange, inter-relationship and plurality of knowledge as well as enrich knowledge of both teachers and students in learning. In Brazil the government announced on 08/04/2008 the installation of broadband internet in all public schools in the country's urban by 2010, about 86% of Brazilian students may have Internet access. Along with this initiative follows the computerization of schools across the notebook's distribution (Figure 2).



Figure.2 Government laptop

Novaes (2008) points out that research shows that visual language is as important as verbal because the hemispheres of the brain are interactive. Working each activation of memory, creativity and language through the visual universal language with responsiveness of the

holistic verbal language the student can get a better reception of the learning process than just the verbal learning processes.

The introduction of information technology has the positive side of the best human access to information, as Costa (2003) cites that the technological dimensions offers possibilities of expanding the human knowledge its ability to store and manipulate information in various situations and moments.

### **3.1. Education at distance**

In this century the technology has allowed us to ease into our affairs, as well as new concepts in relation to education through distance learning. Borges (2008) shows four education systems/virtual education, the Global Campus Project, the Kidlink Project, Educ@r Project and School of the Future Project, where one can see that this method is increasingly being used in the contemporary world. Below are some descriptions of each project:

1. Global Campus Project: virtual room that had its foundation in 1997, where was taught courses in basic computing in which students participated in assessments using forms and exchanging e-mails where them was committed for their own learning.

2. Kidlink Project: Kidlink is an international association used by children and teachers from various countries with professionals working 24 hours a day allowing the exchange of information and materials to the users.

3. Educ@r Project: involving various educational agencies this project offers a "recycling" of knowledge of teachers, enables geographically activities distributed to students.

4. School of the Future Project: project developed by the interdisciplinary research laboratory at the University of Sao Paulo this project aims to assist in distance education research groups covering the areas of physics, mathematics, psychology, education and communication, among others, also has fronts of research in the areas of multimedia, science, humanities, video production and holography. Many of these systems use the video link for data transfer between teachers and students. The same author mentioned above says that video conferencing can be conceptualized as a combination of audio and video of scanned documents that provide interaction with users in real time through programs such as NetMeeting (Microsoft), CU-SeeMe (Compression Labs Inc.), among others.

It is based on these facts that the process of education in contemporary medium will have to quickly adapt to the existing computerization, because information now occurring so rapidly that it is possible that the teaching process on many of the schools becomes to be outdated.

#### 4. Technologies that will be part of education and entertainment in the future

##### 4.1. Nanotechnology used in products

Nanotechnology has gained great highlight in recent years because of the need to reduce environmental impacts and technological developments, it is used in products of areas like agriculture, education, health, among others. Vlasov, Green and Xia (2008) have as one of the results of this technological revolution the creation of chips that allow the exchange of information through optic switch, thus enabling a great improvement in computer data processing (Figure 3).

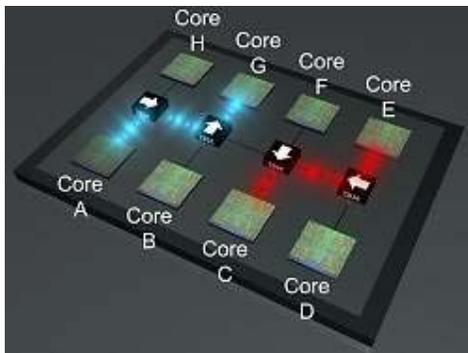


Figure.3 Optic chip

Therefore, as commented before beyond the need for rapid improvement in the current academic structures of engineering and design so that future generations have the necessary skills to deal with this technology will be important develop products with more carefully, preventing the use of components that could soon be considered outdated due to strong demand in the nanotechnology market.

##### 4.2. Holography, the future of displays

Garcia (2008) reports that since 1980 holography has been used constantly, which at the time was presented through film by the physical Vitor Calmon in a scene that a character in the movie was walking toward the audience, so the feeling of some people during this scene was that him walked across the stage at the cinema, walked through the crowd and got out of the cinema.

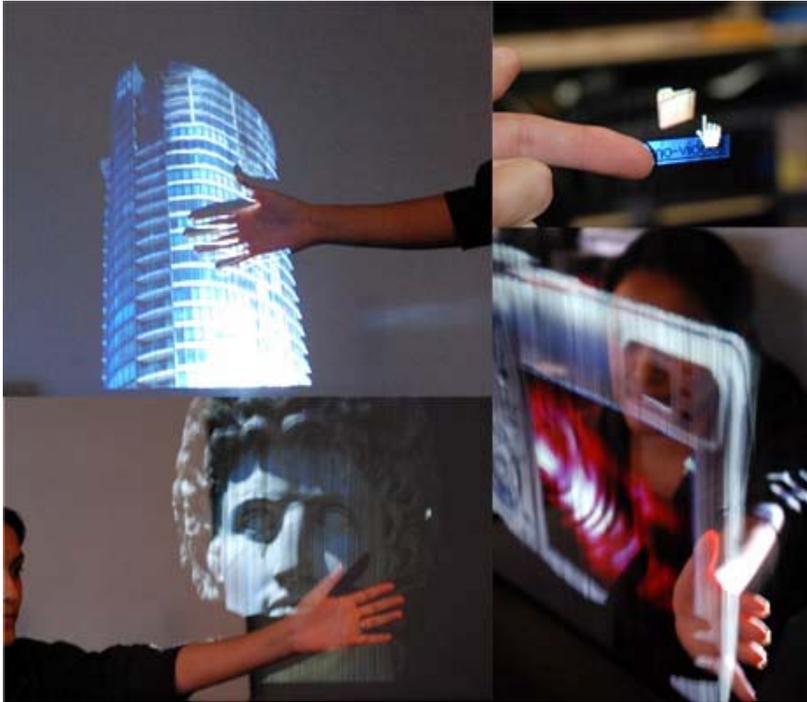


Figure.4 Holographic display

The holographic system can be of great benefit to the educational environment, as it cites Fávoro (2004), when studying a historical event, for example, students could experience the what they was studing in that moment so the interest of them would be higher like as previously cited about the visual language that encourages the user and thereby facilitates understanding of verbal language. The author states that the holographic system will soon have wide application in electronics area, because the visual reality that the users will has is much closer to a real scene than any other electronics with only an LCD screen. Gobé (2002) underscores this statement to report that research shows that during 2010 there will be glasses equipped with earphones that will eliminate the stimulus of the outside world as well as holography will be very used in electronics and other products to enable more information and entertainment

##### 5. The Dilus product

The application of semiotics in the form of bear has as objective charisma and receptivity for the User making it not just another product, but a companion/friend (Figure 5). The product has lines of the Toy Art movement that has as characteristic the unusual forms of the body of characters but also to customize option of their color according to user preferences. Dilus can also be customized by the download of new skins or through the

creation made by graphical programs due to the conductor polymer (the same material used in flexible displays, ChLCD) applied over the cover/skin in PA6 that reproduce the skins exchange electronically (Figure 6), thus providing a more sustainable product that will not be necessary its cover/skin change reducing waste of materials during their manufacture process. The manufacturing process of these polymers are injection molding (for PA6) where the nylon is melted and injected into molds and roll to roll (conductor polymer) where goes through a process similar to that of a print to be applied its components.



Figure.5 Dilus



Figure.6 Skin change

The product has 17 cm high and 8 wide/diameter has also attractive its holographic display of 2D and 3D images that differentiates itself of the demand of electronics in the same area and provides more interaction and image quality for the user (Figure 7).



Figure.7 Holographic Display

According to researchers this holographic display will be a strong tendency in the next few years as its technology has been developed quite successfully and applied experimentally in some concept products. The navigation of the hologram is performed by a motion and location sensor used in robots that maps predetermined areas and responds to touch (in air) made by the user to select navigation options of the product where the user can use chat, internet, video games, watching movies, among others, and connect to other electronics via bluetooth and virtual keyboard, computers, among others, for greater interaction and use of the product. Other components are used in nanotechnology product for high performance as the microphone, touchscreen button on/off, flash-memory, processor and battery.

Ergonomically the product has positive features, providing continuous usability on a daily basis because the holographic display of 18 cm height is limited to the field of vision established by universal measures (Figure 8), its on/off button is in a specific area where it reduces the risk of involuntary touch, LEDs in your head and feet that indicate whether the product is on/off and that provide technological aspect and anatomical forms of the product allow the user to hold it without difficulty. Dilus aims the objective to be a differentiated product among other electronic products enabling the user to use high-

tech components attached to a product with unusual forms fleeing feature of any computer, palm top, among others, and follow the trend of customization and display images on a display more realistic and provide the aid to distance education, social interaction and entertainment for users who somehow have to abstain from these activities.



Figure.8 Ergonomic test with percentiles 5% and 95%

## 6. Discussion

In many situations where the patient is away from your everyday because some disease or other kind of limitation after some time it starts a process of disparaging their living this moment due your disease. The role of product designer is to improve the state of human life from the psychological to the ergonomic factor becomes crucial in such situations because it can help by developing a product which promotes the reduction of the negative aspects caused by a hospitalization or any form of distancing from the usual activities of an "normal" life, allowing the user a better quality of life in the environment that is at that moment.

Aiming to improve day by day for the children which is in these situations was developed Dilus to aid in social interaction and continuity of school activities at a distance, this product has a goal to be an differential product on its demand, enabling the user acquire not only an electronic but a differential in its class that shows the future trends for electronic products as well as changes in the educational process that needs urgent updating.

## Acknowledgements

This project was developed by designer Bruno Oro owner of the company Design O'Clock - Management and Development. Special thanks to Igor Gabay that so much helped in this research project and without their reports this project could not be the same, Daniel

Kreutz for all their support during the development of prototype and Bianka Frisoni the knowledge and advice given.

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