

DIGITAL IMAGING AND ARTISTIC EDUCATION: A PEDAGOGICAL MODEL WITH FREE SOFTWARE GIMP [1].

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Abstract

This paper describes the results of the investigation “Digital Imaging and Artistic Education: A Pedagogical Model” developed by the research group Hipertrópico, Universidad de Antioquia, Colombia. The text contributes to the development of a pedagogy that not only integrates the teaching of digital art in secondary education by using the free software GIMP but also promotes digital literacy in the city of Medellín.

The text describes how the research methodology promotes the integration of practical work with conceptual reflections on the examination, testing and design of the multimedia tutorial *Líneas digitales: Una Introducción a la enseñanza y la creación gráfica digital con GIMP*.

Key words: digital art, free software, GIMP, digital literacy, multimedia *Líneas digitales*.



Fig. 1. Multimedia tutorial logo. (© Hipertrópico.)

Introduction

The use of Information Technology, IT, has become one of the most important strategies governments have implemented to improve education in many countries. In the specific context of the city of Medellín, Colombia, the integration of digital technologies in the public education system has resulted in infrastructure improvements rather than digital literacy.

In general, the integration of technology in secondary schools reveals major results in informatics teaching, and fewer results in the teaching of areas of social sciences and arts. In particular, the use of digital media in arts education in the city of Medellín has been extremely limited. Art teachers design their classes following a pedagogy based on the teaching of analogue media such as drawing, painting, photography, sculpture, among others. Secondary teachers' approach to integration seems to be aligned with the idea that “the world of education collects technological developments with some sort of suspicion” [2]. Although teachers have basic information regarding digital

art, they still need to have more capacity to understand the potential of this medium to configure new cultural, aesthetic and artistic possibilities in their classes. For this reason, teachers need to have dynamic training and material to empower them to use IT.

To contribute to the integration of technology in artistic curricula at a secondary level in Medellín's education system, Hipertrópico developed the research project: *Digital Imaging and Artistic Education: A Pedagogical Model*. Two precedential workshops, conducted by the research group with secondary students and teachers from public schools, provided the initial elements for selection of a qualitative methodology that allows researchers to consider the perceptions and personal experiences related to the use of technology in their academic communities [3]. By using this methodology, the group aims to understand the difficulties that impede real implementation of digital media in the artistic curriculum and the use of digital media as a form of creative expression and thinking. With these considerations the researchers selected the public institution *INEM José Felix de Restrepo*, a high school that offers degrees with an emphasis on visual art, as a case study that allows the group to work with two art teachers and their students to obtain the artistic and conceptual elements necessary to structure the multimedia tutorial *Líneas digitales: Una Introducción a la enseñanza y la creación gráfica digital con GIMP*.

This paper provides an account of the conceptual and experimental inquiries that comprise the framework for the development of the multimedia tutorial. To design *Líneas digitales*, the researcher group Hipertrópico considered the potential of using what Michael Joyce calls *hypertext environments* as “tools for working at traditional tasks which have the effect of changing the tasks themselves” [4]. *Líneas digitales* provides an interface that allows users to access content specifically related to the use of the free software GNU Image Manipulation Program (GIMP). Likewise, researchers used the metaphor of a traditional school of art as a way to design the user experience (teacher, students and amateurs interested in starting a creative process in graphic digital art) to bridge analogue and digital aesthetic possibilities.

By designing a conceptual and graphic interface that mimics the logic of a school of art, *Líneas digitales* aims to

provide not only introductory information about the use of GIMP but also examples of artistic exploration that can be done using GIMP. To move away from the arid methodologies of standardized tutorials, nine video tutorials were developed with local artists whose work depicts a diversity of poetic uses of digital media (such as: Reflections on the urban experience, identity, consumerism, abstraction, realism, and so on). The *Líneas digitales* tutorials aimed to depict an artistic appropriation of technology and to contribute to the development of a pedagogy that aligns with the idea that “the digital literacy should focus on teaching about technology and not be limited to teaching with or throughout technology” [5].

Defining a context: difficulties for teaching digital art in Medellín's classrooms.

In 2010 the Hipertrópico research group was selected to direct and provide training to 17 public school teachers in *La Escuela del Maestro, Alcaldía de Medellín*'s official institution that provides training in the use of IT to teachers of different disciplines. The training allowed the researchers to conduct a survey among the teachers to solicit information about their difficulties, fears and expectations regarding the use of digital technologies in their classes. Data collected through interviews reveals that technology is primarily used in the informatics area and less in social sciences or arts. Additionally, the survey shows that although the *Alcaldía de Medellín* has promoted the use of technology in primary and secondary education, the results are not as expected. Specifically, the use of technology in education at the secondary education level is centered on the use of the Internet as a tool for research and for broadcasting information. In particular, art teachers encounter three main problems with integrating technology in their classes. First, financial difficulties prevent them from obtaining the appropriate software for artistic digital creation. Second, the teachers are not trained to understand the potential of technology as a poetic and creative tool. Finally, there isn't enough training to develop a methodology that empowers art teachers to keep up with the fast pace of their students' capacity to absorb computer-related material.

Limited initiative to use technology in the educational system feeds the gap in the use of technology between leisure

time and school time for teenagers in Medellín. This is consistent with Buckingham's idea that "Nowadays, digital media - Internet, mobile phones, video games, interactive television - is an essential aspect of the experiences that children and teenagers have in their leisure time. The relation the young population has with digital technologies does not occur primarily in the educative context - as it used to happen in the 1980s, and part of the 1990s- but in the domain of popular culture" [6].

To reduce this gap between students' free time and academic time, the interviewed teachers prioritized strengthening training policies implemented by local authorities. Furthermore, they think that educational administrations have to define long range strategies that allow schools to improve on two different levels: infrastructure and digital literacy.

After analyzing teachers' responses to the research questions, it is possible to conclude that the necessary training has to provide enough elements to understand not only the technical use of the software and hardware, but also the potential of this media as a creative tool. To facilitate this goal, art teachers need to have innovative tools and training that empower them to build alternative methodologies in their classrooms. The survey results also indicate that inadequate digital training could make teachers doubt the importance of introducing IT in their classes and therefore discourage them from integrating these technologies in their classrooms.

In terms of infrastructure, the survey revealed that the majority of schools where the interviewed teachers worked had at least a computer lab with internet connection. Although the number of computers per student presents a barrier to permanent curriculum development in digital art, the most difficult problem in terms of infrastructure that schools face is the lack of appropriate software for artistic creation. Specifically, schools do not have enough resources to acquire software licenses for digital graphic creation such as Adobe Photoshop or Illustrator.

A pilot experience: exploring the free Software GIMP as a tool for teaching digital art.

The free software GIMP is an alternative for schools that face financial restrictions which prevent them from acquiring licensed programs for 2D imagery creation. Based on examples of successful

uses of GIMP to develop imagery, primarily for the design of virtual classes in Moodle (a free software platform used to design courses online) at Universidad de Antioquia, the Hipertrópico researchers developed a technical experiment with GIMP in 2008. This experimentation aimed to measure the potential of the software to create images with higher resolution and photographic quality than that required for internet use and to offer an appropriate platform to manipulate images. The artistic projects created as a result of this exploration demonstrated the potential of GIMP as a tool to develop 2D imagery in art.

The researchers of Hipertrópico utilized the results of their technical and artistic exploration with GIMP to identify the elements to design a pilot workshop to measure the viability of teaching graphic digital art in Medellín's public schools.



Fig. 2. CEFA's workshop. (© Hipertrópico)

In 2008 the first workshop was conducted in the public school *Institución Educativa Centro Formativo de Antioquia, CEFA*. This workshop was provided to a group of informatics students in the 11th grade level of secondary school. In a twelve hour workshop, the researchers were able to train participants in the management and use of the basic elements of GIMP. With this training, participants were able to develop digital imagery related to the given topic of digital ecologies in the contemporary world. Furthermore, the work completed and the ease of use demonstrated GIMP's potential as a tool to develop imagery that extends analogue media's uses and aesthetic strategies such as collaging, appropriation, drawing and painting to digital creation. Given that these aesthetic strategies were already well known by the students, utilizing GIMP demonstrated the importance of bridging new possibilities in digital media with analogue's possibilities in traditional media.

A case study: working with the community of the school *Institución Educativa INEM José Félix de Restrepo*.

As part of the methodology, the members of Hipertrópico conducted a practical training program for two visual art teachers at the *Institución Educativa INEM José Félix de Restrepo*. Parallel to this work, the researchers conducted training for 9th and 11th grade students of the same institution. The main goal of this practical training was to provide enough information about GIMP and enough information about the aesthetic possibilities of digital media so they can begin to use it independently and apply it to their own teaching and learning. In addition, the training was personalized in a way that facilitated direct dialogue between researchers, teachers and students and provided the elements to design didactic tutorials for the multimedia *Líneas digitales*.

The two teacher participants used GIMP from different perspectives. The 11th grade teacher used the software as a tool for artistic creation and reflection about the concept of the circus and the city.

In contrast, the 9th grade teacher integrated the use of GIMP as a tool to translate some painting strategies to digital media. In this way the exploration focused more on the correlation between the tools of the software and analogue media.



Fig. 3. *Payaso*, 2010. Example of visual reflection about the circus and the city, made by one 11th grade student using GIMP. (© Sergio Giovanny Flórez).

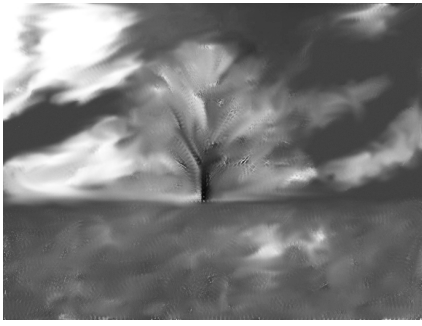


Fig.4. Example of painting explorations with GIMP to create connection between digital and analogue tools. (© Hipertrópico.)

From the analysis of these two experiences, it can be said that these perspectives both relate to two possibilities for the use and exploration of digital media established by Christiane Paul in her book *Digital Art*. In her book, Paul establishes a distinction “between art that uses digital technologies as a *tool* for the creation of traditional art objects – such as photograph, print, sculpture, or music – and art that employs these technologies as its very own *medium*, being produced, stored, and presented exclusively in the digital format and making use of its interactive or participatory features” [7]. Although both groups primarily used technology as a tool in their experimentations with GIMP, the work done under the conceptual idea of the city and the circus has a closer affinity with Paul’s idea of *digital technology as media*, while the digital paintings completed by the 9th grade participants fall closer within the parameters of Paul’s idea of *digital technology as a tool*.

Design process of the Multimedia *Líneas Digitales: una introducción a la enseñanza y a la creación gráfica digital con GIMP.*

Conceptually, the multimedia *Líneas digitales* was designed following parameters that align with Michael Joyce’s ideas about the exploratory and constructive uses of hypertexts. For Joyce “the authors and audience of hypertexts share a transforming interrelationship. They are, (...) co-learners. Even the most transparent exploratory hypertexts involve a shared process of mapping this interrelationship, while constructive hypertexts make the transparent mapping visible, active and personal” [8]. Addi-

tionally, the design of *Líneas digitales* aims to enable users to encounter dynamic information about the use of GIMP as a tool for developing 2D imagery that is both creative and useful. In this way, users are invited to explore the content inside the multimedia and to expand their exploration by reviewing references on the web and using the software to bridge the digital gap. *Líneas digitales* provides a dynamic structure for the content, and in this way the multimedia tries to go beyond the limits of traditional tutorials found on the web, which primarily focus on describing the technical aspects and possibilities of GIMP in a written or rigid audiovisual manner.

The content of the *Líneas digitales*

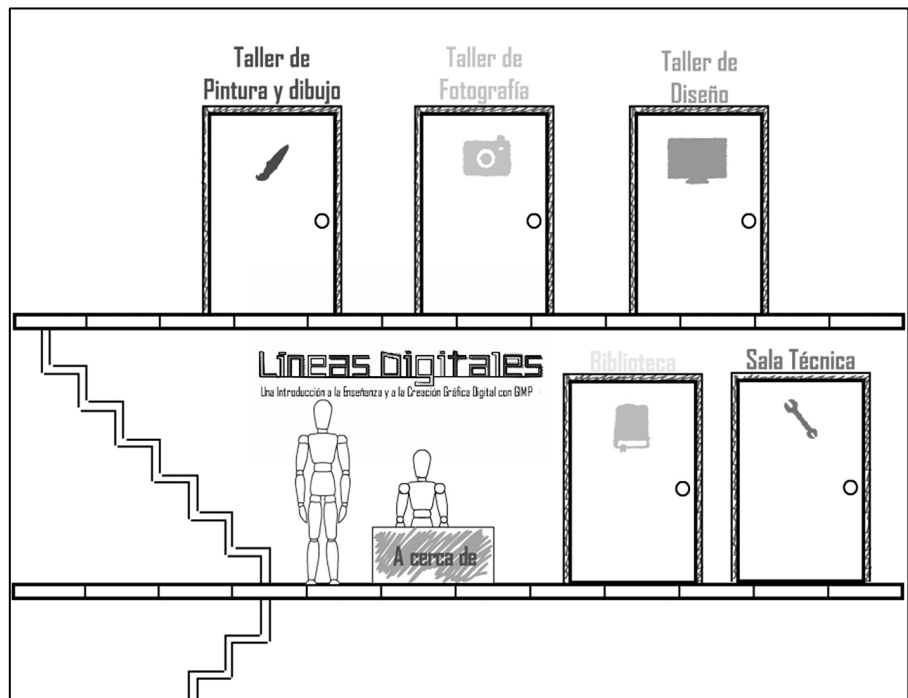


Fig. 5. *Líneas digitales*’ intro (© Hipertrópico.)

aims to empower teachers to use GIMP in their classes by highlighting the importance of using the software as a tool for artistic and creative expression and to bridge the digital divide between home and school. To accomplish this task the graphic and conceptual interface of *Líneas digitales* was conceived and developed under the metaphor of a school of art, combining in this way technical, conceptual and aesthetic content. All components of *Líneas digitales* were distributed in six different virtual spaces (outlined below) that mimic the logic of a traditional school of art, as a way to exemplify relations between analogue and digital media.

Incorporating analogue and digital media in *Líneas digitales* underlies the

importance of associative thinking and allows teachers to expand their former experience in analogue media via their experience with the software. For this reason, to develop the multimedia content, the Hipertrópico researchers payed more attention to the common syntaxes and semantics of visual imagery. The idea behind this strategy was to emphasize the strengths that users (teachers, students or amateurs) already have when they begin to use digital media as a tool to symbolize a vision of their worlds.

The structure of *Líneas digitales* works in the following way:

1. The initial visual interface of the multimedia offers users the

possibility of accessing information in the following spaces: three workshops (drawing and painting, photography and design), a library, a tool room and the information desk of a school of art.

2. The workshops: drawing and painting, photography and design. All the workshops have the same informational structure and begin with a written introduction to the workshop. Each workshop provides three video tutorials organized by their level of difficulty in terms of the tools that were used by the artists in the creation of their work.

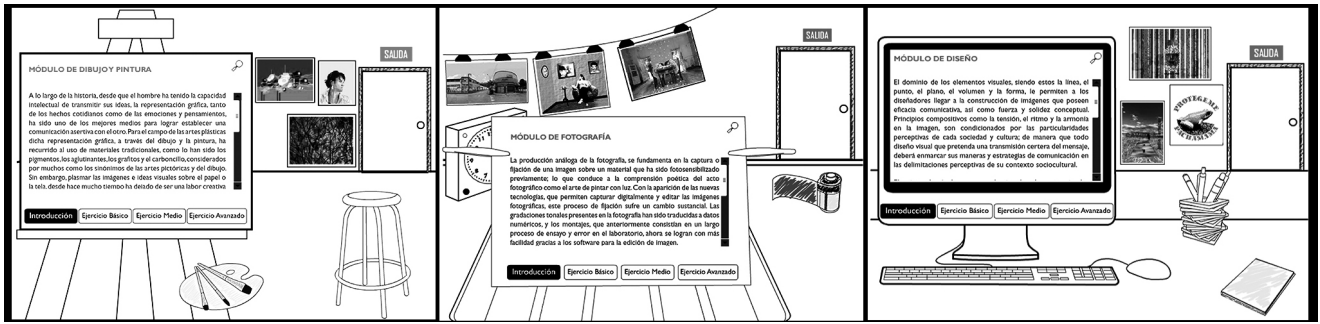


Fig. 6. Images of the screenshot of the drawing and painting, photography and graphic design workshop. (© Hipertrópico.)

The tutorials can be accessed by the user by selecting the picture or by selecting the exercise level. For the tutorial, nine artists in Medellín were invited to produce original work for *Líneas digitales* that exemplify their artistic interests [9].

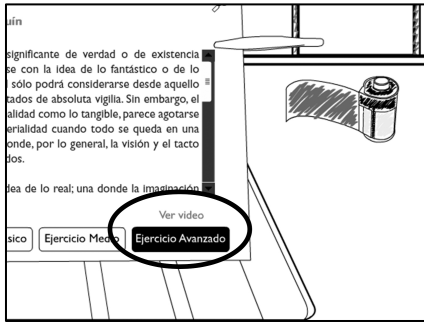


Fig. 7. Accessing the video tutorials. (© Hipertrópico.)

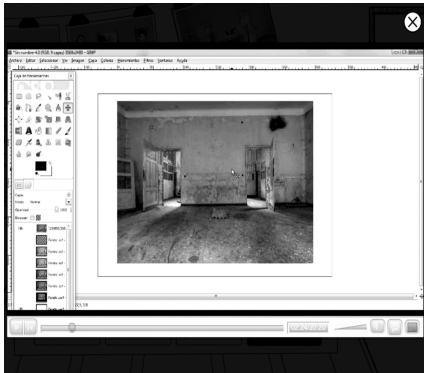


Fig. 8. Example of one frame of Lindy María Marquéz's video tutorial. (© Hipertrópico.)

In this way the videos depict a diversity of aesthetic approaches developed using GIMP. Some of the artists had previous experience with digital media and others were trained in the use of GIMP by the Hipertrópico researchers in order to develop their piece.

The process of developing the videos had two stages. First, researchers recorded the process of creation by the invited artist. Second, researchers organized the recordings that each artist provided in relation to his/her artistic work and the experience of using GIMP as the main tool.



Fig. 9. Producing the video tutorials. (© Hipertrópico.)

All the tutorials have an introductory text that addresses the artistic searches of the artists and indicates artistic references, artistic concepts and the tools that were used. Complementary information can be accessed in the tool icon (extended information about the artist, artistic concepts, and a digital glossary). The way to exit each workshop is clearly specified in red at the main door (*Salida*).



Fig. 10. Complementary information about the artist Alejandro Vázquez Salinas. (© Hipertrópico.)

3. The library provides access to the bibliography that was used for the research and development of *Líneas digitales*, the artistic concepts that were addressed in the tutorial, and the links to web pages with reference information for the artists mentioned in the video tutorials.

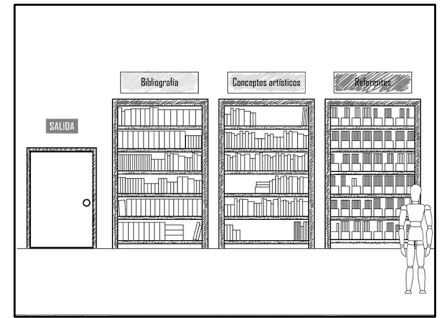


Fig. 11. Image of the library. (© Hipertrópico.)

4. The technical room offers three set of tools. First, a blackboard with access to short videos that depict the performance and use of GIMP tools, information about the layers, channels and paths window, and the working space. Second, a blackboard that offers introductory information about digital concepts for beginners on the use of digital media.

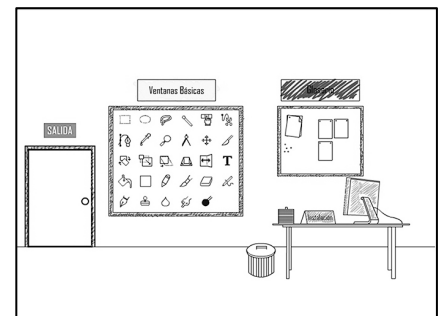


Fig. 12. Image of the technical room. (© Hipertrópico.)

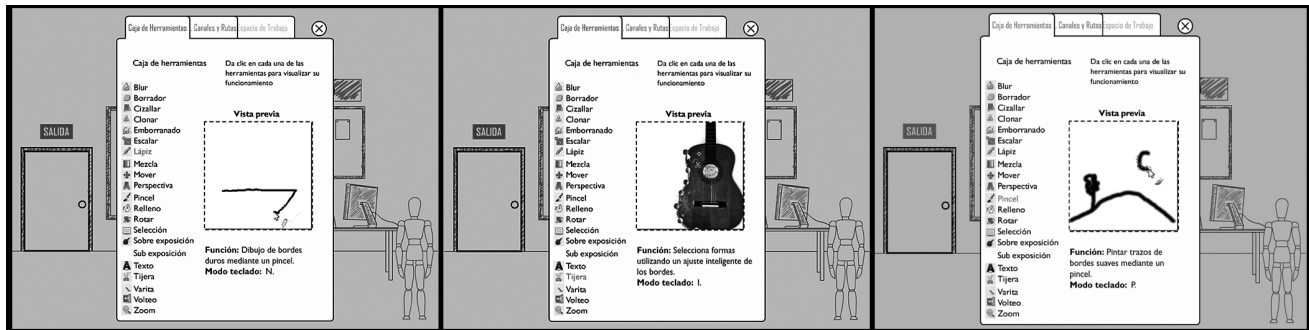


Fig. 13. Example of the pen, scissors and brush tools. (© Hipertrópico)

Finally, the computer on the desk provides directions on how to download the program for Windows and Linux. The information can be downloaded to the users' desktops as a PDF file.

5. The front desk of the digital school provides information about the Hipertrópico researchers, the resulting articles and the credits.

Testing the multimedia tutorial

The multimedia tutorial *Líneas Digitales* was released for testing purposes as a DVD in 2011. At this point, the multimedia has been used at Universidad de Antioquia with students obtaining their credentials to teach art, and with students that have introductory classes in digital media. A second venue for testing the multimedia has been academic fairs that are open to general audiences. An example includes: *Expouniversidad 2011, Innovación: un encuentro con la creatividad y la ciencia*, an academic fair that highlighted research from Universidad de Antioquia and advocated the innovative use of technology that contributed to the development of local cultural uses.



Fig. 14. *Líneas Digitales, Expouniversidad*. (© Hipertrópico Copyright Holder.)

The culmination of these experiences with the use of the *Líneas digitales* has allowed the researchers in Hipertrópico to measure the potential impact of using GIMP to create a set of multimedia tools. In particular, the users of *Líneas digitales* have expressed their interest in the artistic and narrative approaches in the video tutorials. In general, they validate more the potential of navigating the content through video components based on the ease of this medium to grasp the information. Two important suggestions from users have been addressed by the researchers. The first one relates to the importance of releasing the material on the internet, and the second is based on the potential of developing more video tutorials emphasizing the artistic appropriation of the software. Both suggestions will be integrated into the proposal for the second step of this research to enhance validity and make the tutorials even more user friendly.

Conclusions

In Colombia the government has expressed a willingness to support emerging technologies, as tools for improving education. In particular, Medellín's local administration has put effort into improving the technological infrastructure and training teachers in digital literacy. However, these efforts have had more impact on informatics education and less on social or artistic teaching. From this initial analysis, it can be said that more research needs to be done to develop projects that contribute to the integration of technology in Medellín's secondary school course curriculum. Additionally, in order to integrate digital media in the artistic curriculum, it is necessary to overcome the lack of appropriate software.

This integration can be achieved through the development of many projects that can be completed through the use of free software. In particular, based on the conclusion of this research, it can

be said the free software GIMP offers a viable, realistic opportunity to help teachers overcome financial difficulties and to enhance their curriculum through conceptual and experimental research.

Líneas Digitales has been demonstrated to support digital literacy in Medellín because it not only provides examples and information to create graphic digital art with GIMP, but also motivates users to continue their own experimentation and training in digital media.

References and Notes

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