

Print media in digital age: creativity as e-learning tool

Gustavo Orlando Fudaba Curcio

Faculdade de Arquitetura e Urbanismo e de Design, Universidade de São Paulo, Departamento de Projeto, São Paulo, SP, Brasil
ORCID 0000-0003-0168-0901

Fernanda Sarmiento Barata

Faculdade de Arquitetura e Urbanismo e de Design, Universidade de São Paulo, Departamento de Projeto, São Paulo, SP, Brasil
ORCID 0000-0001-9278-3150

Claudia Dayé

Faculdade de Arquitetura e Urbanismo e de Design, Universidade de São Paulo, Departamento de Projeto, São Paulo, SP, Brasil
ORCID 0000-0001-9264-1240

Abstract

The Covid-19 pandemic has transformed the relationship between teachers and students. Consolidated and proven effective pedagogical strategies were adapted in a short time. This article describes the once-unlikely experience of teaching printing techniques to undergraduate graphic designers remotely. The experiment was conducted by two professors with consistent expertise in editorial printed design, Dr. Gustavo Curcio and Dr. Fernanda Sarmiento, and assisted by Claudia Dayé. A class of fifty-five students, organised into small groups of four to five students, performed a series of practical exercises monitored by the university's Modular Object-Oriented Dynamic Learning Environment (moodle). This paper describes the successful articulation of students' practice, technique and creative stimulation.

Key-words

Printed design; graphic design; printing techniques.

1. Introduction

The perfect finishing and printing of an editorial project depends on the fulfilment of mandatory steps. However, anyone who thinks that graphic production processes are restricted to pure technique, applied as a mathematical equation, is wrong. Mastering the technique empowers the graphic designer to their full creative potential. Knowing the limitations and possibilities in the graphic field enhances the use of resources by the graphic arts professional in an innovative, sustainable and economically viable way. As stated by Martins (2003), "The graphic project that you

developed at the highest professional level and presented to the client on your highly calibrated monitor is less than a half of the job" (p. 107).

Early careers designers often devote all their efforts in planning, concepting and creating while spending little care when considering the materialisation of the project, that means the printed version of the developed content. It is unfeasible, ultimately, to sell cookies without the proper printed packaging, or to distribute medicines without printed dosage instructions. Given this, it becomes impossible, even considering the digitization of interfaces, to predict the end of printed surfaces. Cardoso (2020) affirms that design is the method of giving form to matter and making it appear. "Design, like all cultural expressions, shows that content does not appear unless it is informed, and so, once informed, it begins to manifest (become a phenomenon)" (p. 26). That's the aim of printing these days: to transform intangible files and ideals into something tangible.

This paper describes the experience of teaching Printing Techniques, the last subject of the series of graphic design disciplines applied for students in the fourth semester of graduation in design. The course aims to present an overview of printing processes with an emphasis on offset and digital technologies. It highlights the relationship between design and graphic production. The plan was originally developed for face-to-face teaching and this paper presents the strategy of adapting these pedagogical methods to e-learning classes.

2. Teaching about tangible surfaces

Flusser (2017) argues that tangible surfaces are the main means of transporting information. "Image is message: it has a sender and it searches for a receiver. This search is a matter of transport. Images are surfaces. And how can they be transported? It depends on the base on whose surfaces the images will be transported" (p. 149).

The validity of producing printed information is questioned and this is not new today. The digitalization of the media did not make printed media disappear. Newspapers and magazines with suspended printed issues returned to circulation as fake

news took place on digital social networks. The executive editor of Taschen,¹ Julius Wiedemann, during the Institute of Asset Management Annual Conference in 2015, said that "more and more publishers are working with this idea that printed books are not just about content anymore — you have to sell them as objects." In this sense, printing methods are even more relevant with the advent of digital media. In practice, the process of choosing formats, colours, papers, printing and finishing techniques became more rigorous and careful precisely because of the importance of the objects that continue to be printed, such as coffee table books.

In the UK, according to the bookdata Nielson², more than 200 million print books were sold last year – that's the highest number in a year since 2012. The volume of print books sold is estimated to increase by 5.2% compared to 2019, worth a whopping \$2.4 billion. The question is not whether to print or not. As long as humanity consumes, there will be printing. It must be known, however, what kind of information can and should be printed and what content is too ephemeral to be printed these days.

According to Zumthor (2018), in Western culture, even today, education involves writing, which is a trace, drawn by a manual utensil (pen, pencil or machine). "The first transmission is made by a manuscript or by a printed surface, following the same codified logic that still exists, being ready to be absorbed by the reader" (p. 61). Lupton (2020) reinforces the importance of the senses of human perception for reading. "Multi-sensory design embodies the full range of the body's experience. We experience the world with all of our senses" (p. 142). Printing is stimulating this body's multi-sensory experience.

Although conducted remotely, the experience lived by the students during the Graphic Production course considered this multisensory strategy. It was based on optical stimulation for the development of editorial projects, considered limitations of purposely imposed printing methods and appropriated the tactile sense when proposing the investigation of materials to students.

¹ Taschen is an art book publisher founded in 1980 by Benedikt Taschen in Cologne, Germany. The firm has publishing offices in Berlin, Cologne, London, Paris, Los Angeles, and Hong Kong.

² According to the latest figures by Nielsen, more than 200 million print books were sold in the UK last year – that's the most books in a 12-month period since 2012. Nielsen estimates that the volume of print books sold increased by 5.2% compared to 2019, which equates to 202 million books sold, worth a whopping \$2.4 billion. Source: <https://www.piworld.com/post/pandemic-drives-print-book-sales-to-highest-level-in-a-decade/>.

3. Theory and practice conducted remotely

The Printing Techniques discipline is the last of the sequence of four basic disciplines for the designer graduation curriculum at the University of São Paulo. The preceding sequence includes: first, Typography; second, Imaging Lab; third, Introduction to Visual Design (branding). The second discipline, Imaging Lab, had its didactic strategy of remote teaching presented at the Congresso Internacional Sobre la Enseñanza y Aplicación de las Matemáticas en la Universidad Nacional Autónoma de México by Dr. Curcio (2021). The full paper described the experience as the "application of two-dimensional metric geometry for students to understand the principles of visual syntax applied to Graphic Design" (p. 509).

Mastering the concepts of image generation and manipulation is essential for decisions for a particular printing technique. That was the importance of reporting the Imaging Lab experience at the Mexican international mathematics teaching congress in 2021. Ambrose and Harris (2009) show that "designers need to be aware of some considerations when producing an image" (p. 11). The authors list resolution (data or information of an electronic image), format and quality of the files as the main attention points to be considered before printing. Although printing an image requires some specific characteristics of resolution, not necessarily a file that features minimum numbers is ideal for printing. Each file must be carefully analysed before printing.

4. The pedagogical strategies

The Printing Techniques remote discipline adopted offset printing as a reference because it is used more frequently by designers. However, it addressed other more specific processes, such as rotogravure, digital printing, flexography and silk-screen. Processes that would be difficult to be explained on the screen were presented by the projection of selected films and made available in Moodle. The curation of this material by the teachers was essential.

As Villas-Boas (2010) points out, printing is transferring pigments from a matrix to a support in order to obtain copies. "The transfer process can be carried out in several ways, which are called printing processes" (p. 15). The course structure was

based on key-concepts defined by Villas-Boas (2020): creating and designing, that takes place in design studios; pre-press, that means processing of images and files; printing, which considers page imposition, engraving, plate proofing and printing; finishing, including folding, cutting, embossing, varnishing, coating, stapling, binding and packaging.

Following these steps, a sequence of exploratory exercises – originally created by Dr. Sarmento for the traditional face-to-face discipline before the pandemic – was developed and applied as described below. The main concept of the strategy developed by Dr. Sarmento was to combine creativity and printing methods. The main pedagogical strategy developed by Dr. Sarmento and Dr. Curcio, while adapting the curriculum to the e-learning methods, was to reinforce creativity as the most important tool for the engagement of students for learning printing methods. This strategy was discussed by Wu and Albanese (2013) considering imagination and creativity as an essential tool for education purposes. The authors argue that "creativity, as a possible vehicle for individual empowerment, a source for novel solutions to collective concerns and a prerequisite for the construction of new knowledge is by nature an educational objective" (p. 564).

Practical activities, the main challenge considering the e-learning context, were divided into four exercises that were precisely developed and aligned to creativity sprints. All the tasks, developed in groups of up to five students, were interspersed with theoretical content inputs in synchronous classes and also made available in screencasts.

The first exercise becomes challenging by inviting the student to creatively explore, within technical limitations, chromatic variations. Even being a technical subject, the proposal gains more strength by incorporating the creative potential. Digitally, the students' distraction rate tends to be higher compared to the classroom. This reinforces the importance of creative stimulation as an engagement strategy.

Table 1. Exercise 1: four-colour manipulation for printing

Main purpose	Tasks	Presentation
Creation of 8 variations of	<i>Image 1:</i> select a colour photo, with good contrast between colours; <i>Image 2:</i> Black and	Diagram the manipulated

<p>the same image with digital manipulation software (Adobe Photoshop) according to specific chromatic demands.</p>	<p>white (Converting photo to halftone/grayscale/grayscale enhancing contrast; <i>Image 3</i>: High Contrast (Converting photo to black and white, no halftones); <i>Image 4</i>: Black and white (halftone) with background colour (apply a 1 colour composed to the background); <i>Image 5</i>: Black and white toned image using 1 of the four-colour (CMYK); <i>Image 6</i>: Photo turned in 1 colour (monotone - use up to 2 colours CMYK); <i>Image 7</i>: Duotone (2 colours, the first being black - using up to 4 CMYK colours to compose the second colour); <i>Image 8</i>: High contrast and colours. Use only 2 CMYK colours, and their combinations (eg black and yellow, magenta and cyan, yellow and magenta).</p>	<p>images on 2 boards in A4 format and describe the chromatic treatment steps in each of them. Describe the CMYK colors used and their percentages, which were used in the image (front) and which were used in the background. Upload the files in PDF and JPG.</p>
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Source: Authors' database (2021) - <https://edisciplinas.usp.br/mod/assign/view.php?id=3805752>.



Figure 1. Exercise 1, developed by the students Alice Kafrune, Lika Tomita, Victoria Janostiac, Giulia Paladino and Heitor Massola. Available in: <https://sites.google.com/usp.br/aup2330/home>

After the image manipulation exercise, the students were instructed to pick up a set of papers at the Printing Lab at the university. Each group was asked to create a 32-page book mockup in proportion that allows reasonable use of paper (as little waste as possible). Matsushita (2011) argues that planning carefully measures is essential. The physical support carries the soul of the work. "The book is constituted by the set of a certain number of sets of paper sewn or glued, which together make up the body of the product" (p. 236).

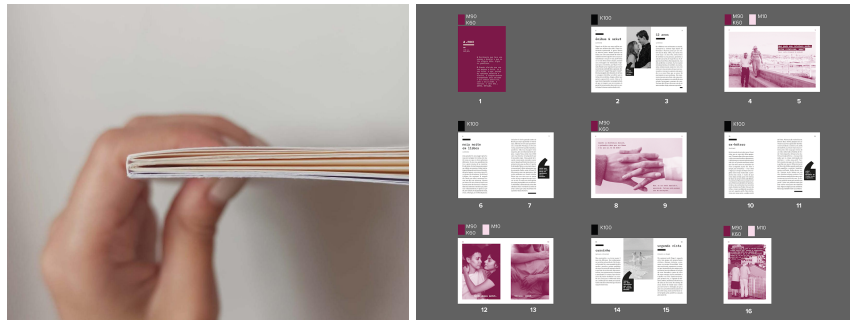
Although this first task for Exercise 2 considers understanding technique information about signatures and correct use of paper, it was up to the student's to decide about the appearance of the final product. The use of different paper for each signature was also worked from a creative perspective. Students defined the order of the signatures according to a hypothetical type of publication. They also defined the proportions and measures of the publication considering the best use of the surface of the sheets of paper.

Table 2. Exercise 2: measures, signatures and colour scheme

Main purpose	Tasks	Presentation
<i>Task 1:</i> Shape and format planning, colour printing scheme..	<i>Task 1:</i> Create a book mockup with 32 pages with dimensions considering minimal waste. The book must consist of a cover, a 16 pages signature and two 8 pages signatures, using 3 different types of paper.	Complete report describing the development of both tasks, including the reasons for the group's creative choice considering colour schemes and signature order.
<i>Task 2:</i> Creative stimulus and application of chromatic manipulation concepts.	<i>Task 2:</i> Choose a signature from the book and create a layout using a four-colour scheme (black, cyan, magenta and yellow). Consider only 1 colour on one side of the paper sheet and 2 colours on the back side. For this job, knowledge of editorial design acquired in the previous semester was essential.	Moodle upload files (PDF and JPG).

Source: Authors' database (2021) - <https://edisciplinas.usp.br/mod/assign/view.php?id=3805752>.

The second task was to create a graphic design for one of the notebooks. It purposely presented limitations for creative work. Students should work with a single colour on one side of the sheet of paper and a combination of only two colours on the reverse side. Layouts should include text and images. It is important to note that students would not have achieved such successful results without the practice and understanding of Exercise 1.



Figures 2 and 3. Exercise 2, developed by the students Amanda Harumi, Isabela Braga, Luiza Yoshimura, Pedro Henrique Dare and Alessandra Nishiyama. Available in:
<https://sites.google.com/usp.br/aup2330/home>



Figure 4 and 5. Exercise 2, developed by the students Amanda Harumi, Isabela Braga, Luiza Yoshimura, Pedro Henrique Dare and Alessandra Nishiyama. Available in:
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Describing print finishes without students being able to touch the different types of printing methods was unprecedented for Dr. Sarmiento and Dr. Curcio. For those who are not used to the vocabulary of finishes, it is very difficult to make tangible terms such as laminates, UV coating, varnishes or spot colours. In order to produce effective material for lectures, Dr. Sarmiento carried out a series of photographic tests. The photos simulated visual effects in a real context of those finishes exposed to different luminosities.

Exercise 3 was one of the challenges facing e-learning restrictions. As a practical task, the students searched their own homes for printed products with different finishes. They produced reports and discussed the examples privately with teachers via Google Meet. After discussing the correct description of print finishes, each student made a report on the chosen product. Once again, individuality was respected in an exploratory task. Each student was free to choose the type of printing they analysed.

The fourth exercise gathered all the knowledge accumulated during the course. More than that, it was a simulation of a real situation. Each group created a technical specification for requesting a quote from a graphic supplier. They described the technical characteristics of the chosen book and proposed a quote request as is done in design offices.

Conclusion

As stated by Matsushita (2011), "creating and producing a project is not enough. The graphic designer needs to act with ethics and defined parameters. Knowledge of professional practice, such as calculating prices, drawing up contracts or mastering tax codes are indispensable" (p. 297). When these concepts are articulated to an experience that enhances students' creativity, the entire chain is improved and innovation emerges.

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