Exploring the Hybridization of Traditional Printing and Digital Fabrication Processes to Expand Design Innovation in the Classroom

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Abstract

Design education has been institutionalized for several decades, but digital competencies have shifted the role of the "designer-author" to a "digital black-box operator". Computational Design and Media Literacy are directly related to the development of critical thinking. Promoting these literacies is a priority as they allow us to understand and operate a range or set of tools and processes of the wider media ecosystem today, and leverage these into future uses or developments. This paper aims to promote hybrid media literacies through the reporting of a design-led research and development process of an innovative DIY flatbed proof press – the XT-Press– a powerful tool for designers and students to learn more about history, purpose, graphic and algorithmic possibilities of combining computational and traditional processes and materials. Building upon previous digital fabrication and traditional printing experiences, we designed and conducted three custom experiences: one in refining the design and building the press. And two additional ones using the press with a small group of participants in a Graphic Design higher education informal context. Through these, we have learned that by being able to iterate back and forth between design and fabrication of the tools and processes, as well as design and printing of the "designer-author" compositions, we are successfully promoting the acquisition of these set of skills and the expansion of critical thinking. At the same time, providing insight into historical and technical production processes by achieving control and intervention in all stages of the design and production.

Keywords: Letterpress, Computational Letterpress, Post-Digital Design, Post-Digital Letterpress Printing, Computational Design, Computational Design Thinking, Design Literacy, Editorial Design, Design Education, Digital Fabrication, STEAM

Introduction

The universe of activity of Communication Design today is more diverse and complex than in its genesis in the 70s in Portugal. Digital media have propelled design into new territories of dynamic, interactive, application of new ways of thinking creatively. Traditional design elements such as branding, visualization, and editorial design are applied in new contexts such as the Web, Applications, and Games. This is a change seen in the professional market (e.g. North America) in recent years. Traditional areas such as identity or illustration have not experienced a significant decrease in demand (AIGA, 2020). But a growth in demand in digital areas such as UI and UX design, data visualization, programming, as well as their application in education.

Design in Portugal took a long time to become institutionalized. Until the 1950s, communication works were done by visual artists, architects, graphic artists, or typographers whose formal training was done in the workshop context of the printing houses or in the main artistic schools, such as the António Arroio Decorative Arts School (Durão, 2003; Almeida, 2009). From 1959, with the professional influence of the first designers like Sebastião Rodrigues, Daciano da Costa and Victor Palla, a change in education began to take place, and until 1971, Design education shifted to professional studios or schools. Between 1971 and 1974, the IADE, Ar.Co., the Fine Arts Schools of Lisbon (FBAUL), and Porto (FBAUP) began formal Design education programs. The practice-based learning model –still strongly linked to drawing– changed very little until the beginning of the 21st century, which accentuated the gap between academic activity and professional needs (Almeida, 2009).

The introduction of digital tools in the mid-1980s changed the professional practice of design. Lithographic and letterpress practices were in decline, to the detriment of photo composition. The introduction of the digital Desktop Publishing (DTP) workflow changed working methods profoundly and rapidly. A change that was quickly felt in the professional activity Portugal, radically changing processes within the industry in less than 10 years. In education, the change was slow to be felt, despite occasional changes in curricula. Having been institutionalized as an independent research and development practice for several decades, Graphic Design is still understood as a functional problem-solving activity that incorporates aesthetics within craft-based activities, mainly geared toward print media and artifacts. The digital transformation of the past three decades challenges this *status quo*, but institutions are still struggling to adapt their methods and curricula (Pettersson, 2015, pp. 8–13).

The first Portuguese Design programs that offered digital skills date back to the early 1990s, but it was not until the end of the decade that these changes became more evident at a national level (Morais, 2021, p. 86). In the first decade of 2000, programs were still very much focused on the classic project-based nature of Design. The Bologna curricular reform forced the introduction of new curricular units aimed at developing multimedia or computational design skills (Amado, Oliveira, & Morais, 2021).

As digital competencies have shifted the role of the "designer-author" to a "digital black-box [software] operator" (Maedche et al., 2019; Menges & Ahlquist, 2011), a paradigm shift long identified by John Maeda (2019; Ghoshal, B., & Erondu, J., 2017), life-long learning and professional skills update becomes a challenge for designers and students alike. They must master two out of the three current forms or design competencies: (a) Classical Design (or

project-based design, such as product, or graphic); (b) Systems Design (or Design Thinking); (c) Computational Design (or Digital Design).

The first two are well established today and recognized as autonomous fields of study and practice. The third and most recent one –Computational Design– has emerged in the last decades within a border and more complex ecosystem of Design thinking and doing, supported by digital computational tools and processes (figure 1). As such, it is usually identified as computational or digital design. It builds upon the first two types of design – classical and systems– and, as a result, it requires the development of a unique skill set.
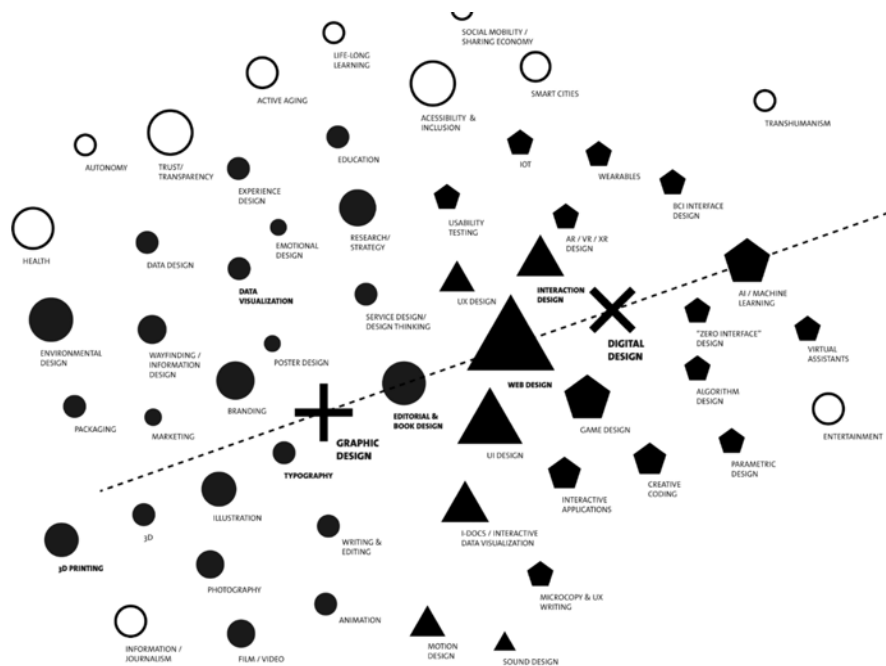

Figure 1: Diagram of the areas of Graphic and Digital [Computational] Design.
Source: Amado, Oliveira & Morais, 2021.

In Portugal, we still lack this specialization or update within Computation or Digital Design. Bachelors are mainly geared towards classical design. And Computational Design is still seen as a specific course(s), or group of skills to be acquired in the "Classical Design" context of academic programs.

According to Marco Neves (2022), currently, Portugal's Design Higher education system consists of 160 Programs at 55 Higher Education Institutions. We can further break down these numbers in:
- 55 3 to 4-year bachelor's degree programs, in a narrow scope of professional areas, and a broad scope of competencies, still very attached to the classical "artifact" project-based design;
- 70 2-year graduate master's programs, in a broad range of professional areas, mainly geared toward the specialization of the original fields of study and further consolidation of bases;
- 11 3-year post-graduate Ph.D. programs. Despite the opportunity for Ph.D. candidates to further specialize, current programs are supported by very broad and open-ended research units scattered throughout the national territory. The volume of post-graduate Design candidates is still very low, which generates a political and logistic conflict in opening narrow and specifically geared or niche Ph.D. programs that tailor to highly

specialized fields. Nevertheless, due to the increasing demand in Computational Design –and the increasing offer in other areas such as Sciences and Technologies of Communication– this is an underexplored field of opportunity.

And yet, as Neves mentions, Design Education is mainly geared toward an artifact creation base, instead of being aimed at problem-solving or experience-based education – these are the upcoming societal challenges. Systems and experiences. Not "things" (Neves, 2022).

This may be because computing, despite being seen as a tool that can aid creativity, is not usually seen as a creative or artistic discipline (McCormack & d'Inverno, 2012). In line with a hostile tradition towards emerging digital media or technologies, we see that if Computational Design and Thinking literacies are seen as different or competing ways to perform traditional processes, it is unlikely that university curricula will absorb computing subjects from a lifelong learning perspective, independent of the mere training in current commercial tools (Morais, 2021). Students and professionals need to be prepared for a constantly changing economic social and technological landscape, as they are constantly shaped by computing. As such, they need to learn to think algorithmically and computationally, to solve problems with varying levels of abstraction (Jacob & Warschauer, 2018). These computational thinking skills will not only allow them to adapt to these new and more complex systems and problems and will also leverage their previous classic design skills. Furthermore, it will facilitate additional literacy development. As Jacob & Warschauer mention, Computational [Design] Thinking is in itself a new form of literacy. A new and specific one that integrates traditional literacy, computational, and new media literacies. But, due to the social, interactive, and ubiquitous nature of computing, it also requires "[s]pecific social, cognitive, and material features"(Jacob & Warschauer, 2018).

There is still some resistance to developing a heutagogical approach in implementing a STEAM teaching-learning model oriented to the production of artifacts within Graphic and Computational Design, promoting a mismatch between training and professional needs in the short and medium term. As such, this paper argues that developing and promoting the use of experience-based projects such as the development and operation of computational-designed traditional presses in education promote systematic design and holistic experiences. More than oriented to the design and development of "things", these projects promote the experience in itself. Experiences that, when applied to specific social challenges such as cultural heritage preservation, or local human value promotion, enhance and promote the classical design skill set and prepare students and professionals for current societal challenges.

To present the argument for the promotion of hybrid computational and traditional design experiences in the classroom, this paper is structured in two sections. First, a review of the state-of-the-art initiatives ranging from traditional and provisional [digital fabricated] presses and workshops. These provide the current landscape in institutionalized and informal teaching of the traditional and the new design literacies while fostering the cultural and technological heritage promotion while using letterpress as a process and technology related to graphic and editorial design to develop these skills and competencies. Second, we present the process and results of designing, developing, and using our custom provisional press. Grounded on previous experiences and the state-of-the-art review, we designed and developed a provisional flatbed "Vandercook-style" self-inking cylinder press. The process of designing and building it in a DIY academic environment leveraged the classical design skill set of the students and teachers involved, as well as –in the last case we are reporting–

the promotion and development of algorithmic and computational design skills within the graphic and editorial design.

State-of-the-art review of current traditional and Post-Digital Letterpress Printing initiatives within Art & Design

Letterpress can be defined by the use of movable characters, to set compositions and print them with presses on assorted media such as posters or books (Amado, Silva & Quelhas, 2021). It has slowly been fading in the last 40 years, as the active population of traditional letterpress composers and printers decreases (a general international trend), and with scarcer materials to print with. However, this interest is resurgent – an analog design and production process revival.

As a technological process and craft-based activity, letterpress printing is an empowering and pedagogical process with multiple benefits not only for Art & Design education but also for authors and the general community. Today, it encompasses much more: as a process, it is useful to understand and expand the notion of physical and digital compositions as modular systems of rules. No longer a revolutionary phenomenon, Digital technology is a normal part of everyday life, where transitions from digital to analog are common in both directions, giving rise to new hybrid and valuable artifacts and processes (Ludovico, 2012). Currently, the development and use of traditional composition and printing techniques along with digital composition and fabrication of printing materials and presses are commonly called Post-Digital Letterpress Printing. As a post-digital design activity, it hybridizes analog and digital processes without a hierarchy bias. Explores the physical nature of its processes and materials with the digital and algorithmic nature of the digital realm. Contemporary designers and printers sample, remix, and mash-up these analog and digital techniques in innovative processes and creative experimental results. These are usually documented and shared online with the different communities of practice and with the broader audiences, promoting the practice and harnessing the collective wisdom of the audience.

Hence, today, "Letterpress", in its post-digital "incarnation" can be understood (1) as technology for cultural expression; (2) for use in educational contexts; (3) for the exploration of practices in a broad social international spectrum (e.g., printers, makers, designers, and educators, students, hobbyists, amateurs, professionals, old and new). Firstly, Letterpress, as a technology for cultural expression, is a rich field for social and historical research since it produces cultural artifacts that record social values, prejudices, forms of expression, and aesthetics, encapsulated over time. Secondly, as a technology that has been used in educational contexts over time, it is important to analyze and reflect on the different pedagogical approaches and benefits in the education of designers and artists. Thirdly, contemporary letterpress practices are explored by printers, makers, designers, and educators in their ongoing work, or pedagogical practices, contributing not only to the revival of Letterpress –maintaining its legacy– but most importantly sustaining its evolution.

Contemporary research & development initiatives

In recent years there have been a growing number of international initiatives that aim to discuss, present and further develop the education, practice, and research on letterpress printing in art and design education and practice.

Letterpress Workers International Summit

The "Letterpress Workers International Summit" (LPW)[1] was established in 2012 by Officina Tipografica Novepunti. It is a short-term collaborative artist residency where letterpress workers from Europe and the Americas work together to share knowledge, cultural approaches, and ways of thinking (not only about letterpress). Letterpress workers are Printers, typographers, graphic designers, calligraphers, stone carvers, educators in these areas, and artists of all kinds that share a love of letters, type, ink, and experimentation. In its ranks, the "workers" consist primarily of well-established printers, but with the participation of amateurs alike, from a wide range of international locations.

Letterpress Printing: Past, Present, Future

The University of Leeds organized and hosted the "Letterpress Printing: Past, Present, Future"[2], in 2018, "an AHRC-funded Research Network [event] that explores the survival of historical printing equipment and how it is used today" By hosting a conference aiming at the presentation of educational and artistic practices throughout the world, it brought together scholars, museum professionals, printers, scholars and other interested people to explore the legacy of historical presses and type.

TIPO: A Letterpress Printers Meeting

TIPO[3] brought together for the first time in Portugal practitioners and people interested in traditional typography to promote the diversity of approaches that it is currently subjected to.

Organized by the CADA, it took place in 2019 in the Azores and counted on the participation of practitioners, educators, and former national printing office managers from different nationalities. Despite its traditional approach, it encouraged the participation of all kinds of printers, designers, and artists with traditional or artistic approaches, showcasing their work in an international exhibition and catalog (Garcia & Diogo, 2022).

Post-Digital Letterpress Printing (PDLP)

The Post-Digital Letterpress Printing international conference[4] (PDLP) aimed to present and reflect on the status of letterpress practice and research, in Portugal but especially comparing it to the international revival of the letterpress scene. Hosted in 2020, at the Faculty of Fine Arts of the University of Porto (FBAUP) it was geared toward researchers, educators, and modern graphic and editorial designers, artists, printers, and typesetters. Keynotes counted with the participation of museum curators, professional type designers, educators, and researchers such as Richard Kegler and Amelia Fontanel (US), Catherine Dixon (UK), and Jorge dos Reis (PT). And mainly, several educational workshop experiences were shared – either in formal or informal contexts– from a wide international provenience ranging from the United States to Russia. The result from the presentations was further expanded and

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[1] More information about the Letterpress Workers International Summit (LPW) available online at: https://letterpressworkers.org/
[2] More information about the conference Letterpress Printing: Past, Present, Future available online at: https://letterpress.leeds.ac.uk
[3] More information about TIPO available online at: https://tipoumencontro.pt/
[4] More information about the Post-Digital Letterpress Printing international conference (PDLP) available online at: https://pdlp.fba.up.pt/

published in a final academic textbook (Amado, Silva, & Quelhas, 2021). Several workshops were held with national and international educators and practitioners. And focused on a wide range of materials tools and techniques ranging from Some –such as the VPRP computational design and traditional printing workshop– have been adapted and deployed in similar academic and cultural heritage promotion activities (Amado, Martins, 2021).

LEAD: Letterpress Educators of Art & Design

LEAD is an organization fostering a network of letterpress educators to facilitate sharing of knowledge and expand connections in the community[5]. Put together during 2020, it hopes to provide opportunities to inspire convivial discourse, advance research, and scholarship, and work to substantiate the value of letterpress education as an essential practice in contemporary learning, especially geared toward the educational contexts in higher education its founding members are mainly higher education professors, but also highly experienced and renowned printers – such as Erin Beckloff and David Wolske.

Hands—on Type: Learning from letterpress heritage

Hands-on Type[6] sought to explore and reflect on graphic design production with the use of letterpress today and the promotion of teaching methodologies based on available know-how. Held in 2021 at the ESAD – College of Art and Design, it consisted mainly of a set of practical workshops aiming at the promotion of traditional and experimental approaches to using letterpress printing for international students, hobbyists, and educators. The keynotes and workshop leads were Alan Kitching, Daffi Kuhne, and Rick Griffith, and a set of resulting texts reflecting on the event and these approaches are to be published soon.

Contemporary development of tools and processes

Current explorations of letterpress and other analog printing techniques within a post-digital or hybrid design process are far-reaching and encompass several realities. Usually within educational contexts – for example, the previously mentioned workshops at the ESAD, or pedagogical initiatives within formal academic contexts such as the ones held in Lusófona (Carvalho, 2021) –, or promoted by non-profit organizations or associations — like Oficina do Cego (Amado, Quelhas, & Silva, 2019).

There are, nonetheless, other initiatives that seek to provide a way for individuals and institutions that do not have the financial or environmental means to accommodate this kind of investment in printing equipment. These initiatives focus on the digital fabrication of manual proof presses that can be assembled using currently available fabrication tools such as 3D printers, or laser cutters. This section focuses on identifying and analyzing some of these projects or initiatives and their creations: the provisional proof presses.

Open Press

The Open Press[7] is a 3D-printed printing press. Designed to make printmaking accessible. Created in 2018 by Martin Schneider and Dominik Schmitz, two designers from Cologne, Germany. It is very small, can be 3D printed, and is affordable. The print plans can be

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[5] More information about LEAD available online at: https://letterpresseducators.com
[6] More information about Hands-on Type available online at: https://handsontype.esadidea.pt/
[7] More information about the Open Press available online at: https://openpressproject.com

downloaded for free, or the printer can be bought ready to use for whatever the buyer wants to give. Open Press' biggest inspirations for XT Press are the idea of autonomously producing a printer at an affordable value, and that through the free download of 3D printing plans can be assembled anywhere in the world and by anyone, but mainly among the student community.

Provisional Press

The Provisional Press[8] is a letterpress printer sold in kit form or already assembled, it was created by Steve Garst and his wife Liz in 2020. The print kits are manufactured in America by a small team. During the pandemic, the original Provisional Press was redesigned – in conjunction with Scott Moore of Moore Wood Type – so that it could be marketed in kits to meet the needs of universities and their students forced to deal with the social lockdown. The kit is centered on the creation of an affordable printing press, made with high-quality parts that will last for thousands of prints if used correctly.

Provisional Press is perhaps the biggest reference for the XT-Press due to its design and because it consists of parts that can then be assembled. The biggest difference is that to build the XT-Press, users still must manufacture the parts based on instructions they can download online.

People Powered Press

Built in 2019 by JKN OilTools in Batley, the People Powered Press[9] is the largest [metal] letterpress printer of its kind in the world. Designed by design studio Split, the People Powered Press was made last year as part of their project and book These Northern Types. It is used by various groups of people, through writing and printing workshops, to make large format prints – to amplify the voices and words of local community groups – which are then displayed locally in both indoor and outdoor spaces.

Like People Powered Press, XT-Press aims to create dynamic engagements with the local community, enabling local people to create, print, and disseminate their messages.

F-Press

In 2019 Tom Boulton in Sussex created the Franken-Press (predecessor to the F-Press)[10] named so because it was made from bits of scrap metal. In 2020 Covid 19 came along and with it the impossibility of running face-to-face workshops. For this reason and personal issues, the motivation arose to create a new version of the Franken-Press that people could use at home.

The XT-Press, just like the F-Press, is a desktop printer accessible to everyone. The main difference is that the XT-Press plans, as with the original Provisional Press, are open and available for free online.

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[8] More information about the Provisional Press available online at: https://www.provisionalpress.com
[9] More information about the People Powered Press available online at: https://www.split.co.uk/work/the-people-powered-press/
[10] More information about the F-Press available online at: http://typetom.com/f-press/

TIMOS

TIMOS[11] is a project developed by the Portuguese master's student Angelo Gonçalves in the context of the Master in Design at the School of Media Arts and Design of the Polytechnic Institute of Porto, under the supervision of Prof. Dr. Vítor Quelhas. Design education and research initiative consisting of a modular set of digitally fabricated letterpress sorts, a modified provisional press, and a stencil ruler that were designed and developed to be used together within formal or informal educational or recreational contexts. Tried and tested, the various iterations of these tools and processes aim at using [post-digital] letterpress printing process to contribute to new literacies by promoting the cultural and artistic heritage, practitioners help and nurture each other, supported by digital platforms.

With Timos, XT-Press shares the fact that it is inspired by the provisional press and promotes media literacy on a hybrid basis, i.e. based on the cultural heritage of printing techniques and the digital medium as a platform for the creation and dissemination of knowledge.

Developing and assessing the XT-Press

Previous educational workshop experiences such as the VPRP Workshop (Amado & Silva, 2021), informed us that being able to iterate back and forth between design, fabrication, and composition with our own (custom) tools and processes provides better and more comprehensive graphic design skills, as well as a more comprehensive media literacy. Also, having full control and intervention in all stages of the design and production, and distribution process greatly enhanced the participant's perception of the graphic and editorial design process in a holistic way (figure 2).

Figure 2: Different views from the sequential stages from procedural digital programming to modular letterpress printing.

Due to the lack of materials and bureaucratic constraints of our institutions, and to research for a better and more responsive process to deploy the use of a similar initiative in the current [Portuguese] higher educational formal contexts, we've decided to build our press and

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[11] More information about TIMOS available online at: https://recipp.ipp.pt/handle/10400.22/18247

modular printing sorts (Amado, Ferreira, & Woloszyn, 2022). Currently, denominated the XT-Press, it's being developed within the Experimental Type and Image Media Research Project (XTIM) in the i2ADS research unit.[12]

Harnessing some main findings from the state-of-the-art previously described, this research project aims to conceptualize, design, develop [iteratively] and test a custom "Vandercook-style" (self-inking) flat-bed cylinder provisional proof press in the context of editorial or graphic design. Meaning that the equipment has to fulfill the graphic and editorial design target audiences' needs and expectations. But mainly, within this process, it was expected for the participants to learn and acquire new skills such as 3D Modeling, classical fabrication, and understanding of traditional printing processes — and although predictable but unexpected, one of them was motivated to self-learn creative coding to produce her custom printing modules.

It should feature a self-inking "Vandercook-style" mechanism to improve ink distribution speed and allow it to be easy and simple enough to be used during time-limited classes. Also, it should be large enough to be able to print small impositions within an editorial design context. Which meant developing a printer with a minimum of an A3 printing bed area. This means it can use the maximum area of a digital laser print. And also, to be able to impose a small "work-and-tumble" imposition, allowing to bind small A5 edition booklets. As such, it will allow using it to develop and promote full classical editorial design skills with graphic design students and thus focusing on the speed of reproduction of multiples.

To be able to transfer this knowledge and for it to be used in other institutions or by individuals, it should be built with low-cost and "over-the-counter" available materials. Mainly sourced in local material and hardware stores. And requires simple tools to build such as a Power drill and a set of drill bits to punch holes, glue or bolts to hold the wood together (and Phillips screwdriver), and a wood and metal hacksaw.

Its design implied the research ad adaptation of the Vandercook printing head design, by adapting its principles and features and mashing them up with the provisional press simplicity (figure 3)

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[12] More information about the XTIM artistic research project available online at:
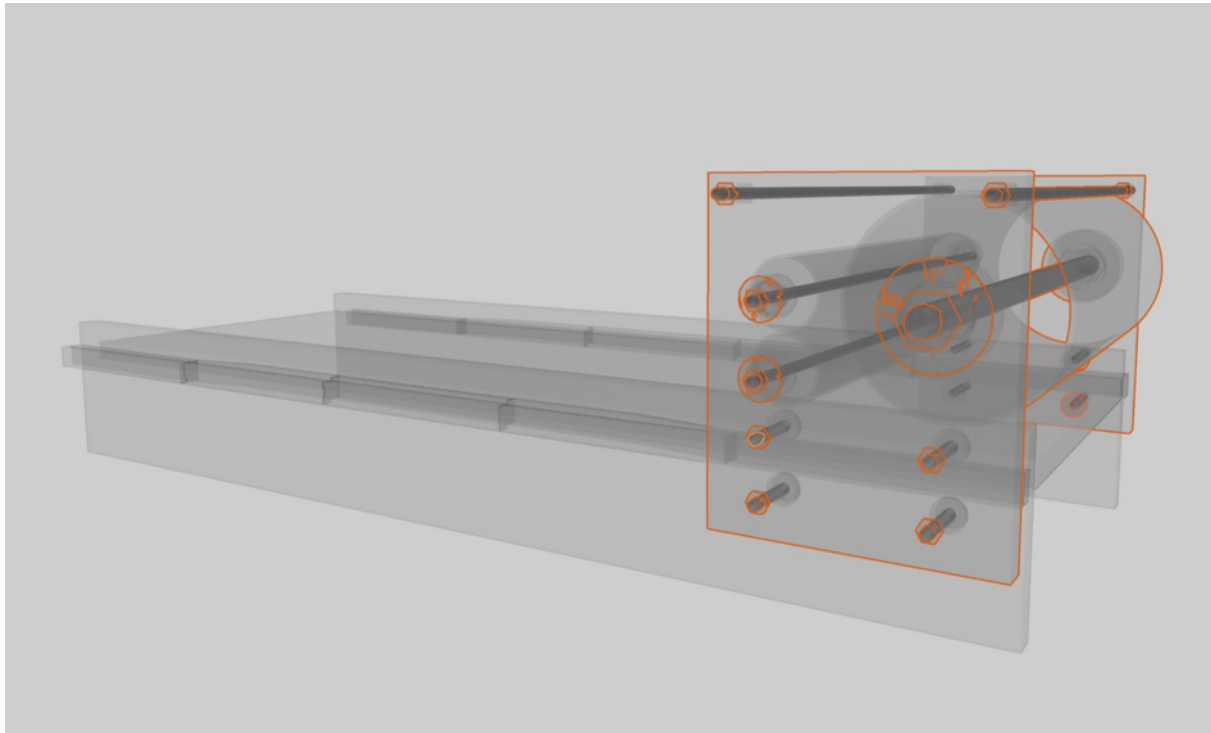https://i2ads.up.pt/projetos/xtim/

Figure 3: Printing head and proof press bed and railing system design adaptation from existing Provisional Presses.

The PVC-based cylinder design was maintained from the Provisional Press, despite the design being simplified and position guaranteed by nuts, and the cylinder diameter increased to be able to print the large A3 impositions. The squaring of the islets of the print head was simplified by the use of simple threaded rods similar to the F-Press.

An original system of side-sliding rails was designed by Pedro Amado – one of the authors and participants of this research – to easily set the trip and inking and print position of the rollers (figure 4). And a cylinder and simplified self-inking mechanism. Using two equal-diameter PVC-rollers, a design adapted from the original Vandercook. We later concluded that it's better to use different size diameters in the rollers to improve ink distribution and to coat the bottom roller in a 0.7 mm PVC surface to improve its contact with the form.
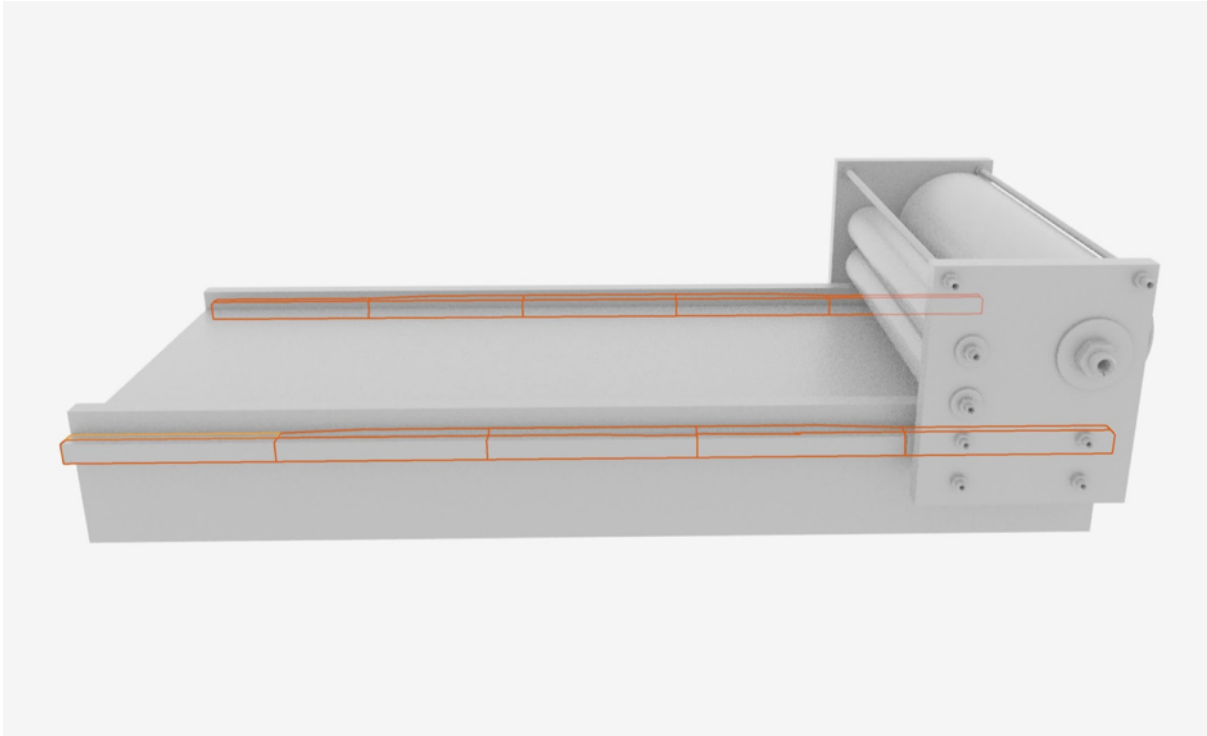
Figure 4: The adaptation of the Vandercook self-inking design into an original side-sliding custom rail system.

Building the press took the team to the school workshops, interacting and learning with professors, technicians, and by themselves. Encouraged digital 3D modeling, manual drawing, working, and assembling in a trial-by-error method (figures 5 & 6).

Figure 5: MDF boards and steel rods were cut by hand and holes were drilled with machines or by hand.

Figure 6: Figuring out the little tweaks need to operate the printer more efficiently.

We discovered the need to 3-D print alternative and additional bolts and washers to get the print head islets clearance to the railing system. And the height was fine-tuned – as with traditional printers trucks and beds – with paper tape. For the second print run, we used an original type – wood letterpress characters – and an image – a laser-printed black and white edited digital photograph from one of the participants – in a frisket-masked imposition (figures 7 and 8).

Figure 7: Planning and designing the type and image composition by hand.

Figure 8: A sample of the resulting experimental type and image composition.

Operating the XT-Press took its toll on the MDF rail system. The wear and tear of using to produce around 50 copies and the lack of continuity in the inking system have been revealed to be problematic but were simply addressed by using paper masking tape to protect or to increase the height of the rollers or friction. An additional issue was found as we needed to fix the axes' rims and spoke system as they move with the rotation for prolonged print runs — thus revealing the need to add simple PVC tube sections as long spacers to keep the spoked rims in place (as implemented by Steve Garst in the Provisional Press). Also, a tricky human use[r] operating issue was found, as the size of the press is too unwieldy for a single-person operation — as one has to stretch his or her body over the press to operate the full A3 bed size. Thus, a smaller size should be considered for individual use, especially within the class context of use. Most of these are still being addressed, but the technological and aesthetic results were very satisfactory, considering the result from a low-cost provisional press.

Conclusion

Post-Digital Letterpress and Design can be seen as the use of traditional typographic and classic design know-how, equipment, and printing technologies combined with, or converging in contemporary digital design, computation, and fabrication processes. Crossing the natural physical and digital realms, between the atoms and bits that naturally extend the design practices into new hybrid fields of research and development of not only artifacts but especially of new hybrid experiences. These have been "so conceptually integrated with the aesthetics of letterpress — as it has become embodied in digital platforms" (Drucker, 2021)

Post-Digital Letterpress and Design can be seen as a mash-up of processes and technologies, making use of classical as well as digital design and fabrication. These transform the analog to digital barrier into a continuum space of free exploration giving rise to new hybrid experiences to be shared. Merging the classical and computational processes are seen throughout this article as a means to an end, and not an end by themselves. Using these processes and approaches in the formal or informal learning context promotes a more inclusive and nurturing path and the acquisition of a comprehensive set of Classical and Computational Design literacies in a holistic way.

As we discovered by witnessing the research and development path of one of the master students participating in this research project team, she voluntarily and independently discovered a process to develop custom-made computation design patterns to be digitally fabricated and printed by different designers in an editorial design context. This highlights the importance of understanding the relationship between analog and digital systems in an integrated and interconnected way, not just as parts that are added together in isolation, but rather that interact and combine with each other. Adding this final "anecdotal" evidence to the already accumulating experience of that team and the state-of-the-art survey analysis, we can safely assume that using a post-digital approach to pursue a cultural or user-centered objective such as the one we have shown, encourages and nurtures the acquisition and development of important Classical and Computational Design literacies socially and holistically. And, as Dafi Kühne also promotes in his courses and workshops, this approach is singular and new, by considering it as "Analog & Digital" working together instead of using "Analog or digital" approaches to complement each other.

There are several steps still to do. We still need to iterate and tune the design and build of the proof press, especially the faulty inking system – as the print cylinder has proved to be more than efficient –, as well as the robustness of the mechanics — especially the railing system. The full specification and build plan will soon be made available (Amado, Ferreira, & Woloszyn, 2022) and we expect to continue to experiment with the XT-Press, widening the sample of practitioners and hopefully engage with active participants of more than or network of design students and move it from an informal to a formal classroom context of use.

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