

Molding Typography

The Exploration of Clay as a Typographic Tool

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Abstract

This study examines the intersection of typography and ceramics, focusing on material-driven design as a means to enhance creative processes. This research project took a cross methodology approach, including a literature review, hands-on experimentation, and qualitative research with semi-structured interviews. After experimentation, ceramic tiles offered a structured yet flexible approach to letterform creation. As the study progressed, the introduction of 3D-printed plastic cutouts improved precision and efficiency. By deconstructing letterforms into geometric components, modular tile systems emerged as a promising solution, blending traditional craftsmanship with contemporary design principles.

The study culminated in the development of Terra Type, a modular set of terracotta tiles inspired by zellige patterns, designed to facilitate typographic exploration. Findings underscore the relevance of analog techniques in contemporary design, encouraging cross-disciplinary collaboration between graphic designers and ceramic artists. This research contributes to the ongoing discourse on materiality in design and demonstrates how integrating ceramics into typographic practice can expand creative expression beyond digital tools.

Resumo

Neste estudo explora-se a intersecção entre a tipografia e a cerâmica, seguindo os princípios orientadores do MDD – Material Driven Design como meio de potenciar os processos criativos. Este projeto de investigação adoptou uma metodologia mista, incluindo revisão literária, experimentação prática e pesquisa qualitativa com entrevistas semi-estruturadas. Foram testadas várias abordagens no atelier de cerâmica, revelando que, embora alguns métodos colocassem desafios, os princípios geradores dos azulejos ofereciam uma abordagem estruturada, mas flexível, à criação de formas de letras. Ao desconstruir as formas das letras em componentes geométricos, o sistema modular, característico dos azulejos, surgiu como uma solução promissora, combinando o artesanato tradicional com princípios de design contemporâneos.

O estudo culminou no desenvolvimento do Terra Type, um conjunto modular de peças em terracota inspirado em padrões zellige, concebido para facilitar a exploração tipográfica. Os resultados sublinham a relevância das técnicas analógicas no design contemporâneo, incentivando a colaboração interdisciplinar entre designers gráficos e artistas cerâmicos. Esta investigação contribui para o atual discurso sobre a materialidade no design, e demonstra como a integração da cerâmica na prática tipográfica pode expandir a expressão criativa para além das ferramentas digitais.

Keywords:

Typography,
Graphic,
Modular,
Ceramics,
MDD (Material-Driven Design)

Palavras-chave:

Tipografia,
Gráfico,
Modular,
Cerâmica,
MDD (Material-Driven Design)

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Acronyms

3D: Three-dimensional

AI: Artificial Intelligence

B.C.: Before Christ

CNC: Computer Numerical Control

MDD: Materials Driven Design

NA: Not Applicable

PhD: Doctor of Philosophy

1. Introduction

1.2 Background

This research was conducted in Caldas da Rainha, Portugal, a city where ceramic craftsmanship plays a large role in its history. This study explores how ceramics can influence type design and be integrated into the digital landscape. The research is driven by the belief that current digital technologies have led to a homogenization of graphic design, impacting the ways messages are communicated. In an era where designers increasingly rely on digital tools, this study advocates for a reintroduction of analog approaches to design practice.

Otl Aicher's assertion that "At that time in Ulm we had to get back to matters, to things, to products, to the street, to the everyday, to people. We had to turn round. It was not about extending art into the everyday world... It was about counter-art, the work of civilization, the culture of civilization" (Aicher, *Die Welt Als Entwurf*, 1991), resonates with the current state of graphic design. In parallel, Steve Jobs emphasized that impactful designs must begin with the user experience and work backward, by "exposing yourself to the best things humans have done and then trying to bring the same things into what you are doing" (Jobs 1997, as cited in Schofield, 2011).

In line with these perspectives, this research explores how clay and ceramics can serve as a medium for human-centered type and graphic design, emphasizing tactile engagement and material-driven aesthetics. By connecting people with typography through the tactile nature of clay, and vice versa, the study seeks to bridge the gap between analog craftsmanship and digital innovation. As Ewan Clayton (2013) noted, "It is useful to hold past, present, and future in a creative tension. To avoid being too nostalgic for historical processes and to not be so eager to push forward exclusively with new technologies," this research embraces the balance between tradition and technology to explore new possibilities in typographic design.

Combining typography design with clay presents a captivating intersection of two distinct artistic realms, offering rich creative possibilities that warrant further exploration and research. This fusion not only offers a novel approach to typographic expression but also opens avenues for innovation, experimentation, and deeper understanding of both mediums. Here are several reasons why the combination of typography design with clay poses interesting outcomes and merits dedicated research:

- 1. Textural and tactile exploration:** Clay introduces a tangible dimension to typography, allowing designers to craft letters and words with depth, texture, and physicality. This tactile aspect adds layers of sensory engagement that transcend traditional typographic forms. Exploring how different clay types, techniques, and firing methods influence texture and tactility in typography offers a rich field for investigation.
- 2. Materiality and form:** Clay offers a malleable material with which to sculpt letters, enabling designers to explore diverse forms, shapes, and structures beyond the constraints of conventional typography. By experimenting with different clay-forming techniques such as pinching, coiling, or slab-building, designers can create bespoke typographic compositions that evoke unique visual and conceptual narratives.
- 3. Integration of craft and design:** The fusion of typography with clay bridges the gap between craft and design disciplines, merging traditional artisanal practices with contemporary typographic sensibilities. This integration not only celebrates the craftsmanship inherent in clay work but also enriches typographic design with a deeper appreciation for materiality, process, and artisanal skill.
- 4. Cross-Modal communication:** Typography design with clay has the potential to engage multiple senses simultaneously, offering a holistic and immersive communication experience. Beyond visual perception, the tactile qualities of clay typography invite touch, encouraging viewers to interact with and explore the text in a more intimate and embodied manner. Research in this area explores how multisensory experiences enhance communication effectiveness and emotional resonance (American Psychological Association, 2018).
- 5. Cross-disciplinary collaboration:** Researching typography design with clay encourages collaboration between typographers, ceramic artists, designers, and researchers from diverse backgrounds. This interdisciplinary approach fosters cross-pollination of ideas, techniques, and methodologies, enriching both fields and pushing the boundaries of creative expression.
- 6. Cultural and historical exploration:** Clay typography provides a platform for exploring cultural and historical narratives embedded in both typography and ceramic traditions. By incorporating motifs, symbols, or scripts from diverse cultural contexts, designers can create typographic compositions that celebrate heritage, identity, and linguistic diversity.

This is to say the blending of type design with clay holds exciting potential for creative expression, material exploration, and interdisciplinary collaboration. By examining the nuances of this hybrid practice through research, designers and scholars can unlock diverse insights, techniques, and applications that enrich the fields of typography, ceramics, and design.

1.3 Context and Objectives

Context

In the evolving landscape of graphic and type design, the relationship between analog and digital processes continues to be a subject of exploration. While digital tools dominate contemporary design workflows, there is a growing interest in revisiting tactile, material-based approaches to typography. Designers such as Taekyeom Lee, Laura Hilbert, Sarah Standel, Volclair Studio, Rawart Studio, and others referenced in this document promote analog approaches to graphic design. This research situates itself within this discourse by examining ceramics—specifically clay and tiles—as an unconventional yet viable medium for type and graphic design. The physicality of clay offers a unique contrast to digital precision, allowing designers to engage with letterforms through direct material manipulation. Furthermore, historical and architectural precedents, such as ceramic inscriptions and typographic tilework, highlight the enduring connection between ceramics and communication.

Objectives

This thesis aims to investigate the potential of ceramics as a tool for an analog approach to type and graphic design. By addressing the research questions, the study pursues the following objectives:

1. Exploring Clay as a Typographic Medium
 - Examine how clay can be shaped, imprinted, or carved to create letterforms.
 - Investigate how the material properties of clay influence the form of typography.
 - Analyze the interaction between ceramic processes (e.g., glazing, firing, and texture) and typographic design.
2. Developing Modular Typeface Systems with Tiles
 - Investigate the historical and contemporary use of tiles in graphic and typographic applications.
 - Explore how the modular nature of tiles can be leveraged to construct typefaces.

- Experiment with tile-based systems to create adaptable and scalable letterforms.
- 3. Bridging Analog and Digital Practices
 - Examine how digital tools (such as bitmapping, parametric design, or 3D scanning) can enhance analog ceramic typography.
 - Investigate the potential for hybrid workflows where physical letterforms are translated into digital-type systems.

Through this research, the study aims to expand the boundaries of graphic and type design, proposing new methodologies that integrate material-based craftsmanship with contemporary design thinking.



Figure 1. Laura Hilbert, Sarah Stendel: Hands On! (Copyright © Laura Hilbert, Sarah Stendel, 2021)

1.4 Research Questions

Can ceramics be a useful tool for an analog approach to graphic design and type design practices?

How can clay and ceramics be used as a tool for modular typeface designs?

1.5 Methodologies

This research methodology integrates bibliographic review, material driven design (MDD), experimentation, and a qualitative approach to research with semi-structured interviews to explore the intersection of ceramics and typography. By combining theoretical knowledge with practical application and user feedback, this approach seeks to foster innovation and interdisciplinary collaboration in the arts.

1.5.2 Bibliographic Research

A comprehensive bibliographic review in ceramics and typography provides foundational knowledge and insights into the historical context, techniques, and contemporary practices in all fields. This research delves into seminal works, academic studies, and artistic movements, identifying common themes, challenges, and opportunities for integration.

This research explores the history of ceramics in relation to communication with graphics, tracing its evolution from ancient civilizations to modern art movements. Key topics include ceramic materials, techniques (e.g., sculpting, hand building, glazing), and aesthetic principles. Additionally, it examines how ceramics intersect with communication and modular designs. It also investigates typography as a fundamental element of visual communication, encompassing type design, typography theory, and typographic applications across various media. It explores typography's role in branding, graphic design, and user experience, emphasizing its ability to convey meaning and evoke emotions.

1.5.3 Experimentation

Experimental research and Material Driven Design (MDD) (Karana, 2024) involves hands-on exploration and prototyping to merge typography and ceramics effectively. This phase includes:

- 1. Typographic Exploration:** Experimenting with different typefaces, letterforms, and typographic compositions to understand how typography can be translated into ceramic forms. Techniques such as carving, stamping, glazing, and molding are utilized to imprint typography onto clay and ceramic surfaces.

2. **Material Investigation:** Testing various clay bodies, glazes, and firing techniques to achieve desired visual and tactile qualities. Experimentation with texture, color, and surface finishes enhances the expressive potential of type design and ceramics.
3. **Iterative Design Process:** Iterative prototyping and refinement based on feedback and observations, allowing for iterative development and optimization of the final project.

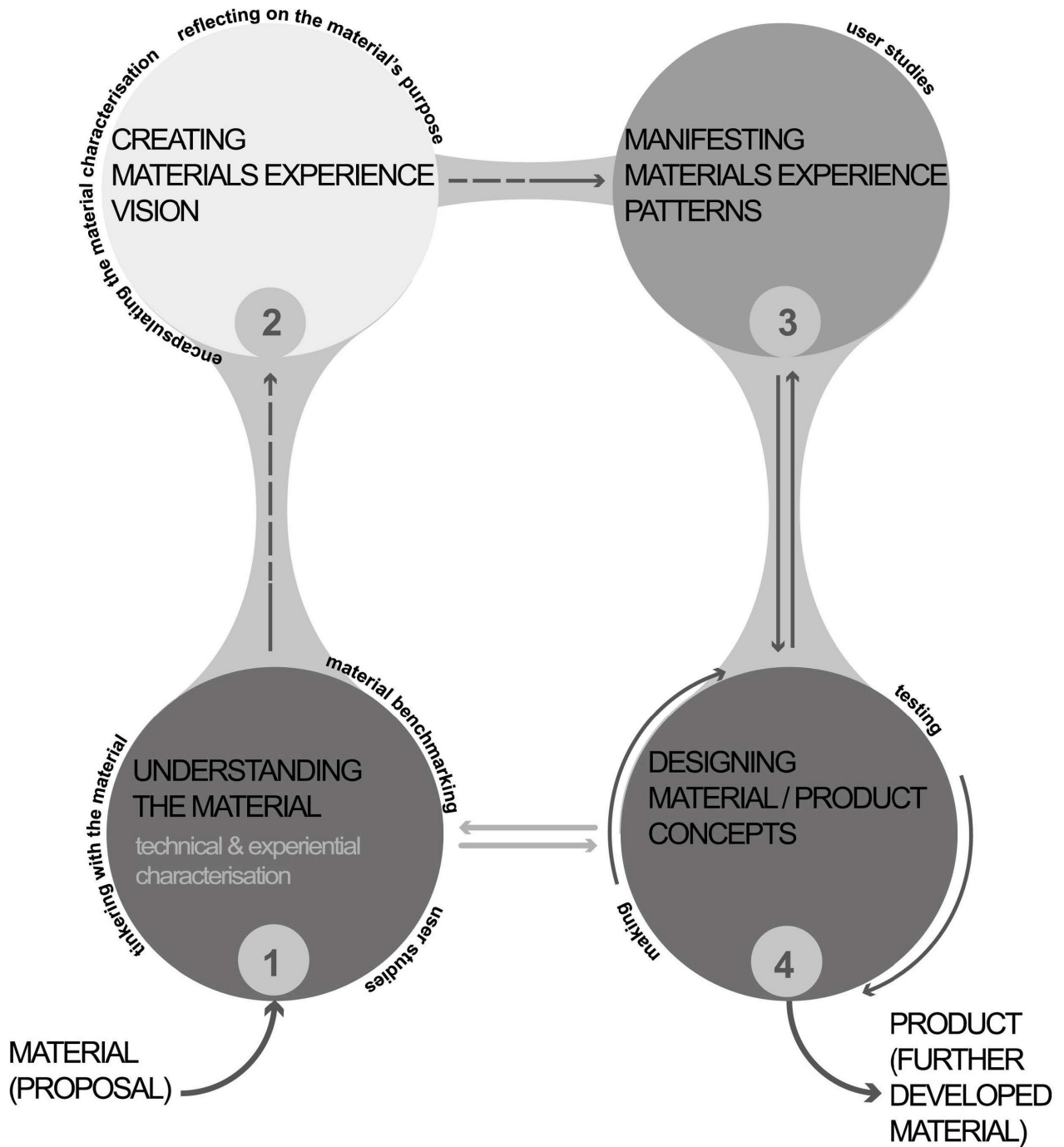


Figure 2. Material Driven Design of four main action steps in sequential order. (Karana, 2024).

1.5.4 Prototype Test with Semi-Structured Interview

The prototype test involves presenting the final typographic ceramic project to a target audience and observing their interactions and responses to the pieces. To identify patterns in approaches to shape selection and understand any challenges with the shapes provided.

A semi-structured interview occurs while the participants are prompted to design with the shapes. Recordings of answers and observations are recorded with a video as well as written notes. The verbal responses and behaviors noted are later gathered and organized into a spreadsheet in sequential order of the list of questions.

Key components of the prototype test include:

- 1. Participant Recruitment:** Selecting a specific group of participants, Master of Fine Arts Students, Graphic Designers, Master of Graphic Design Students, Bachelor of Graphic Design Students, Ceramic Artists and Educators, Type designers, professors from related fields of graphic design and ceramics, and bi-lingual designers to engage with the project.
- 2. Observational Study:** Documenting participants' reactions through video recording, behaviors, and interpretations as they interact with the provided ceramic shapes. This involves a semi-structured interview and observation to gather qualitative data. Semi-structured interviews allow the possibility for free-flowing conversations. It also provides the opportunity to dive deeper into responses to clarify responses and gain more knowledge and insight from the participant.
- 3. Analysis and Reflection:** Analyzing the data collected from the case study to evaluate the effectiveness of the interdisciplinary approach and identify insights for future projects. Reflection on the strengths, limitations, and implications of integrating ceramics and typography.

1.6 Challenges

There is a noticeable lack of academic research that systematically examines the integration of type design and clay and ceramics. Most existing bibliographic resources focus exclusively on one discipline or occasionally on artistic projects that combine both. Similarly, there are few practical guides or how-to books available for artists interested in merging type design with ceramic techniques, leaving resources largely siloed within each separate field.

Technological barriers also play a significant role. The tools and materials used in ceramics, such as clay, kilns, and

glazes, differ significantly from those used in type design, like software and fonts. Developing techniques that successfully integrate these disparate tools can be challenging. Additionally, the process of translating digital type designs into physical ceramic pieces involves understanding both digital design principles and the physical properties of ceramic materials.

The practical aspects of working with clay introduce further challenges. Clay is an inherently slow and labor-intensive material that requires significant time, skill, and patience. Unlike digital software, which allows for rapid iterations and adjustments, the ceramic process is time-consuming and involves numerous stages, including shaping, drying, firing, and glazing. These stages are subject to various contingencies, such as drying time and kiln schedules, which further extend the production timeline. For typographic design, which often demands precision and consistency, the life cycle of clay, particularly its shrinkage, texture, and response to firing, presents additional hurdles. As such, the slower, more deliberate nature of ceramic work contrasts sharply with the immediacy and flexibility afforded by digital design tools, making the integration of these two disciplines challenging.

Ultimately, the lack of academic research and practical resources, coupled with the technological and material barriers, underscores the need for further exploration of the relationship between type design and ceramics. Addressing these gaps would not only enrich the understanding of both fields but also open new possibilities for interdisciplinary practice, where the tactile, material qualities of ceramics can inform and enhance typographic design, and vice versa.

2. Bibliographic Research Review

2.2 History of Clay and Ceramics with Communication

Given the extensive body of research on cuneiform, hieroglyphics, and papyri, this study will not engage deeply with the intricate chronological development of written language. Instead, this bibliographic review focuses on specific instances where artisans utilized clay as a medium for written communication and constructing letterforms.

The interplay between clay and written communication has roots extending back approximately four millennia. Around 3000 B.C. in the Middle East, the cuneiform script was devised and inscribed onto wet clay tablets (Tomas, 2013). This technique and script persisted for over three millennia, spreading to regions including southern Iraq, Egypt, and central Anatolia (Tomas, 2013). Concurrently, around 3000 B.C., papyrus paper was developed in Egypt as a medium for script (Hayes, 2018). Papyrus was particularly suited for the arid climate of Egypt, which mitigated humidity-related damage. In contrast, clay and stone were more appropriate for public displays and regions with higher moisture levels. Despite the prolonged use of clay tablets, their prevalence eventually waned in favor of stone and paper (Bagnall, 2020).

During this period in the Ancient Near East, which encompassed regions from Iran and Mesopotamia to the west of the

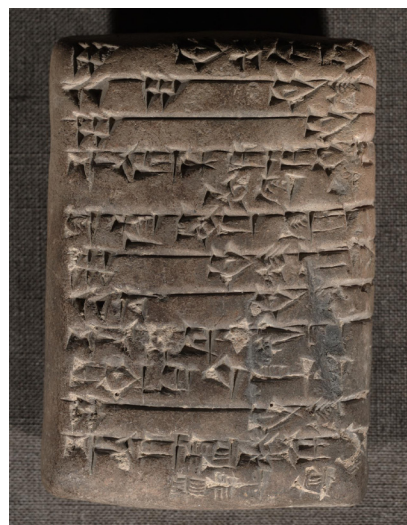


Figure 3. Minassian, K. & Kirkor Minassian Collection. (2047) Receipt of livestock, Cuneiform tablet no. 27. [B.C] [Image] Retrieved from the Library of Congress.



Figure 4. Cylinder seals made of garnet from Asia during the Neo-Assyrian period 720BC-700BC. © The Trustees of the British Museum.



Figure 5. Attributed to the Painter of the Woolly Satyrs (namepiece). Terracotta volute-krater (bowl for mixing wine and water), ca. 450 B.C. Greek, Classical, Attic. Terracotta, red-figure, H. 25 in. (63.5 cm). The Metropolitan Museum of Art, New York, Rogers Fund, 1907 (07.286.84).

Levant, Anatolia, and the eastern Mediterranean, the cylinder seal, an artifact associated with cuneiform writing, was invented (Brown, 2014). Cylinder seals were typically made of stone and used to create impressions on wet clay surfaces. The designs engraved on these seals often depicted narratives featuring characters and scenery.

By approximately 240 B.C. in Greece, evidence of terracotta volute-kraters reveals that these vessels served, purposes beyond their primary function of mixing wine and water (Sebesanu, 2017).

They also held the purpose of telling stories through painted scenes. Ancient Greek artists communicated through painting scenes on surfaces such as walls, vases, cups, and jars (Sebesanu, 2017). In figure 6, the krater depicts the myth of the battle between the Athenians and Amazons. The most common technique for illustrating on the clay surface was painting the surface (dipinti) or incised (graffiti).

This technique has also been seen on the earliest inscription of the Greek alphabet on pottery. Around mid-eighth century B.C. one can see traces of the first inscriptions of the Greek alphabet on a handle of a Heiron, Douris, and Nearchos Kantharos cups (University of Oxford, 2024).

Mosaics were still common and used to display ancient Greek writing in churches. The St. George Church is recorded as the oldest discovered church in the world. It contains ancient Greek writing made of mosaics on the floor dating back to the Roman period of AD 230. The inscription displays the month of Apsylions which today means March (Al-Hissan, 2022).



Figure 6. The Greek mosaic inscription of St. George Church. Source: Al-Hissan 2001.

By the end of the 9th century, with the popularization of paper, the use of ceramics as a medium for communication significantly declined and ceased to be the default method (Hayes, 2018). As languages, modes of communication, and technological advancements evolved, clay became an inefficient and impractical means of conveying information. Despite its waning popularity in favor of more advanced technologies, the role of ceramics in the evolution of written communication remains invaluable. The inception of written communication through clay laid the foundational groundwork for subsequent technological developments.

2.3 Existing Cases of Typography with Ceramics

The incorporation of script and ceramics, as well as the recreation of letters and numbers using clay, has a long and storied history. Techniques employed in this art form include mosaic characters, monograms, screen printing on ceramics, calligraphy, relief, sgraffito, carving with glaze, and sculpting. Research and documentation of ceramics and pottery reveal that painting with watercolors on glaze is the most prevalent method for applying letters and numbers. This technique affords potters greater precision and control over the letterforms, allowing for intricate detailing with various brushes and tools (Art Institute of Chicago, 2022). The widespread adoption and ease of this method contribute to its popularity.

2.3.2 Traditional Cases of Typography Meets Ceramics

In this section, “traditional” refers to ceramic practices that exclude the use of digital software. The examples provided focus on the analog approaches and techniques through which typography and ceramics have been historically combined. Documenting and analyzing these instances of interdisciplinary merging is essential to understanding the possibilities for evolution and re-envisioning in future practices. Additionally, examining the specific letterform designs employed on clay surfaces offers valuable insights into the artistic and functional integration of these two disciplines.

Starting with the most common practice of applying calligraphy with watercolors on glaze on a bisque fired piece. Figure (7) displays an example of a Dutch earthenware jug with hand painted coat of arms and poem in calligraphic style (M.S. Wiener, c.1672 - c.1678). This practice requires impeccable penmanship and calligraphic craft. The hand-painted glazing technique allows the calligrapher and painter to have more control over

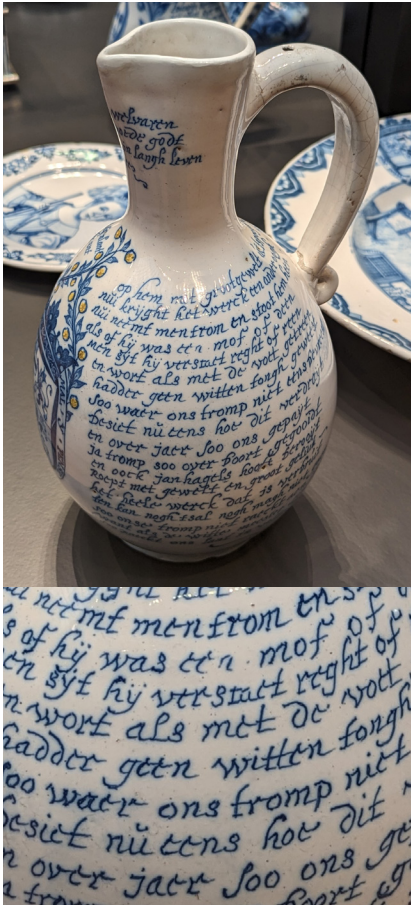


Figure 7. Jug with arms of William III, Delft, c. 1672-1678- tin-glazed earthenware (faïence) at the Rijksmuseum, Amsterdam, Netherlands. Photos from the author (2024).



Figure 8. Early 13th century Persia-Conical bowl with Persian Arabic inscription beginning at the rim. Photos from the author (2024).



Figure 9. Serigraphy and unpainted glaze plaque with initials. Pickman and Cia, (up to 1880). 39.9x48.5cm. Printed and illuminated. National Museum of Decorative Arts of Madrid. Photo from the author (2024).

the letterforms due to its similarity to paper and pen. Figures (9) and (10) illustrate techniques that enhance the artisan's control over the typographic outcome, employing brushes and carving tools to replicate the gestural qualities of penmanship on paper. In contrast, Figure (9) demonstrates from the late 1800's a more precise approach using serigraphy, a method that enables the reproduction of fine details and sharp lines with greater accuracy.

In Spain, the prevalence of typographic ceramic tiles on street corners serves as a distinctive communication strategy. These tiles consistently utilize a common typeface, demonstrating uniform design techniques across various locations. The accompanying photos illustrate street signage composed of tiles that adhere to these shared design principles.



Figure 10. Series of advertising panels and glazed tiles displaying various techniques. Cerámica Santa Ana (1940-1960) 147x259 cm. Municipal Collection. Seville City Council. Photo from the author (2024).

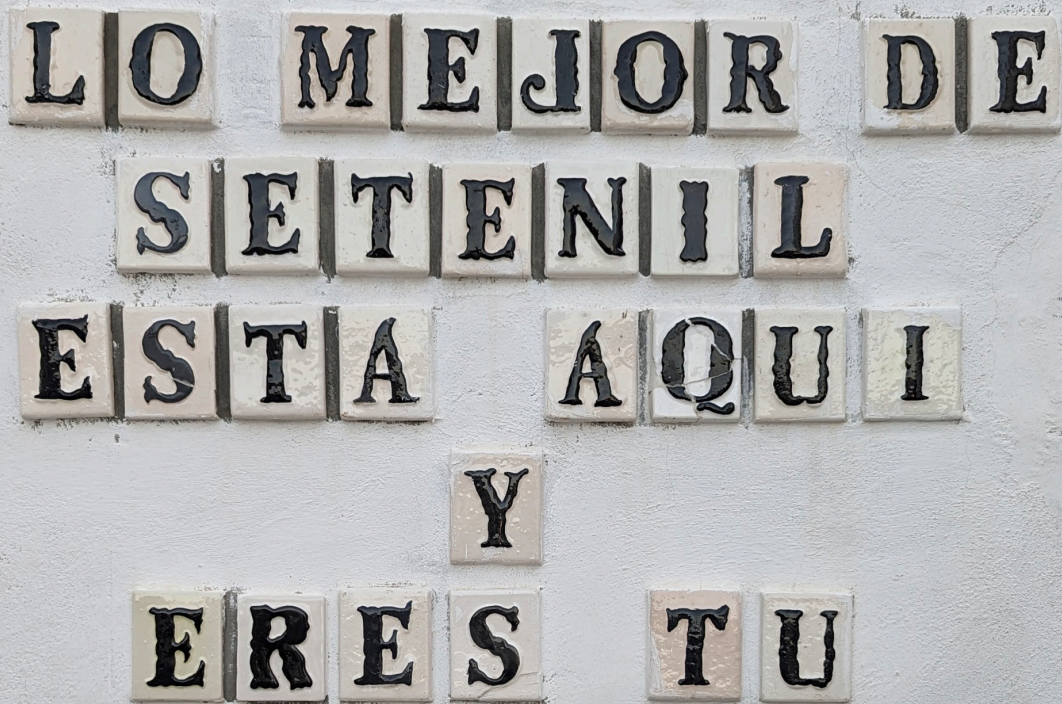


Figure 11. Setenil de Bodegas, Spain tiles with decorative display serif lettering. Photo from the author (2024).



Figure 12a, b, c. Ceramic relief tiles with decorative display serif lettering in Seville, Spain. 12b displays a lower contrast with a and high contrast. Photos from the author (2024).

A similar approach to ceramic signage can also be observed in Portugal. In the Iberian Peninsula, one can observe the synergy of typography and ceramics in the city's street signs. The streets are adorned with ceramic signs featuring hand-painted letters on tiles, plaster moldings, and cutouts, showcasing the artistic integration of typography with ceramics.



Figure 13. Painted tiles. Text painted with calligraphic Baroque style. Photo from the author (2024).



Figure 14. Display decorative letterforms in organic and semi-calligraphic styles (Art Nouveau). Photo from the author (2024).



Figures (11)–(16) are useful examples of how designers and artists have used typography and type design in history across the Iberian Peninsula. Ceramic artists often hand-painted letters with a brush and calligraphic style to ceramic surfaces, but figures (11) and (12a, 12b, 12c), display a similar approach to figures (14) and (15). The relief and molding technique provide clean and precise lettering outcomes.

Another unique and notable example of the intersection of typography and ceramics is the Bordallo Pinheiro factory store sign located in Caldas da Rainha, Portugal. Established in 1884, this factory store showcases innovative approaches to letterforms, all crafted from ceramics (Henriques, n.d.). The sign exemplifies a creative synthesis between typography and ceramics, showcasing how the functionality of ceramic materials can influence unconventional approaches to typographic design. It is useful to note the letterforms have been broken into portions and placed like pieces of a puzzle. The shapes are rather complex and would be fragile and prone to cracks and breaking if molded or cut in one piece. It displays how to accomplish complex typographic systems and contrasts with cutouts. While the letterforms diverge from traditional typographic principles according to Robert Bringhurst (1946-), particularly those concerning legibility for extended bodies of text, they present innovative methods of shaping and displaying letters at a large scale. The design suggests that the material properties of ceramics likely involve the use of molds or cutouts play a significant role in maintaining the consistency of proportions across the letterforms. This method ensures uniformity while allowing for the exploration of non-traditional shapes and forms.

Despite its limitations for use in lengthy text passages, this approach to letterform design proves effective in contexts where legibility is not paramount but where visual impact, brand identity, and distinctiveness are prioritized. The unique, material-driven forms create a compelling aesthetic that contributes to the brand's personality, offering a bespoke and memorable visual language. By emphasizing the tactile and sculptural qualities inherent in ceramic materials, the sign elevates typographic design beyond mere functionality, demonstrating the potential for ceramics to influence and enrich typographic practices in creative and unexpected ways.

Figure 15. Ceramic braided relief tile in a decorative display sans-serif lettering. Located in Óbidos, Portugal. Photo from the author (2024).

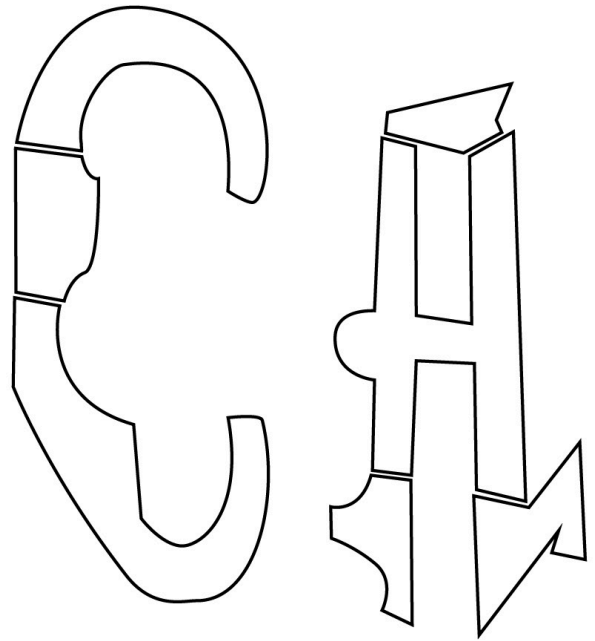


Figure 16. Ceramic Bordallo Pinheiro factory store sign with decorative lettering broken down into resistant sections, Caldas da Rainha, Portugal. Photo from the author (2024).



Figure 17. Ceramic Bordallo Pinheiro factory store sign with decorative lettering, Caldas da Rainha, Portugal. Photo from the author (2024).

A similar approach to the integration of ceramic signage and the influence of clay on letterform construction can be observed in the Algarve region of Portugal. In Salema, a home showcases an intriguing method of letterform design, where the materiality of clay has directly influenced the design choices for each letter. Through an analysis of the tile technique used in this signage, it becomes evident that the properties of clay necessitated specific design adaptations. Each letter has been strategically divided into segments to address areas of structural weakness, particularly where high-contrast shapes are present. These divisions ensure the durability and resilience of the letters against external elements. While the technique employed shares similarities with mosaic art, the letters in this signage are not fragmented into numerous small shapes; rather, they are reduced to two or three distinct sections. This approach maintains both the visual integrity of the letterforms and the structural stability required for outdoor display.

Ceramic mosaics also provide a compelling example of the intersection between type design and clay. This approach resonates strongly with the modern digital space, particularly through its use of grids and bitmaps. By deconstructing the anatomy of letterforms into small, modular squares, designers gain enhanced possibilities and greater control over the shapes and styles of the letters, allowing for more nuanced and creative typographic expressions within the medium of ceramics.

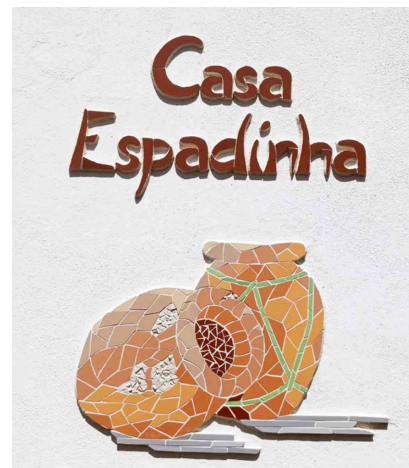


Figure 18. Casa Espadinha ceramic sign displaying mosaic decorative sans serif lettering with medium contrast. Salema, Portugal. Photo from Ricardo Santos (2024).



Figure 19. Mosaic on the floor designed with decorative blackletter script from 1903. Saints Peter and Paul Basilica, Prague, Czechia. Photo from the author (2024).



Figure 20. Collaboration: House Industries & Heath Ceramics of San Francisco. (2024).

2.3.3 Modern Cases of Typography Meets Ceramics

Type foundries and design studios who focus on graphic design in the digital space have yet to scratch the surface of using clay as an analog tool. House Industries is an American type foundry founded in 1993 and based in San Francisco, California. It is one of the very few foundries to have explored ceramics as a possibility. Their biography states “House Industries’ approach is rooted in drawing, painting, and lettering. These traditional techniques give our work a warmth and soul which comes through in everything we make, from simple children’s blocks to digital fonts that help the world communicate.” (House Industries, n.d.) Although their designs are initially digital in practice, they envision their designs with a multidisciplinary product. They mainly collaborate with experts in other fields to create unique products such as home furnishing goods, neon signs, metal work, and much more. Their works and collaborations also display the potential and possibilities of combining the two disciplines.

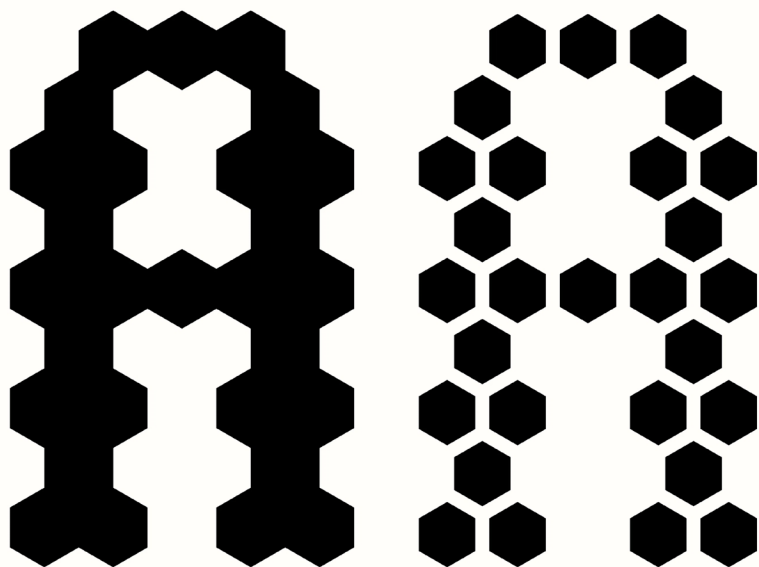


Figure 21. Collaboration: Tableware by House Industries & Monohara. (2024).



Figure 22. Collaboration: House Industries designs on salt-glazed pottery by Eldreth. (2024).

Other design studios include errorerror.studio (2020) who took to tiles to develop a typeface inspired by Mediterranean tiled floors. Errorerror.studio is a design studio based in Spain who created a display typeface named Rajola intended for poster design. The typefaces inception started with the design project with the studio to develop a typographic poster about Valencia. The two designers Paloma and Luisimi noted during their visual research that many homes have these specific tile flooring along the Mediterranean coast. The tiles fit well into a grid-like format along with fitting the theme of classic and traditional creating harmony with new and old.



Another notable example from 2023 of contemporary graphic design is work done by Laura Hilbert and Sarah Stendel. In their poster design for the annual group exhibition 23. Karlsruhe University of Arts and Design (HfG)-Rundgang (Hochschule für Gestaltung Karlsruhe, 1992), Laura Hilbert and Sarah Stendel introduce an innovative approach to using clay as an analog medium within the realm of graphic design. Their process exemplifies a departure from conventional digital practices by integrating clay into the design workflow, thereby engaging with the material's inherent physical properties. Specifically, the designers utilized screen printing to transfer a digital design onto the surface of wet clay. This method resulted in an outcome that stands apart from traditional print media due to the unique interaction between the digital and physical elements.

The use of clay as a substrate adds a dynamic, tactile dimension to the poster design, as the pliability of the wet clay allows for manual manipulation after the design has been printed.

Figure 23. Modular typeface inspired by Mediterranean tiled floors. errorerror.studio®: Rajola® (Copyright © errorerror.studio®, 2023).



This capability to physically alter the surface introduces a layer of unpredictability and organic variation, which is typically absent in digital or static print forms. The malleability of the clay permits the distortion of the graphic elements, resulting in a design that evolves as it is shaped, pressed, or stretched. This process underscores the transformative potential of clay as an analog tool, offering designers the opportunity to engage with form, texture, and materiality in ways that can significantly alter the visual outcome.

Hilbert and Stendel's work not only challenges the boundaries of graphic design by moving beyond the screen but also presents a case study in the creative potential of hybrid analog-digital methods. By incorporating the physical manipulation of clay into the design process, they highlight the significance of material experimentation in graphic design. Emphasizing how analog tools can enhance the creative process by introducing new forms of expression and variation that are impossible to achieve through digital means alone. Their poster design thus serves as a compelling example of how ceramics can be utilized as a medium for innovation in graphic design, bridging the gap between two traditionally distinct disciplines.



Figure 24. Laura Hilbert, Sarah Stendel: Hands On! (Copyright © Laura Hilbert, Sarah Stendel, 2021).

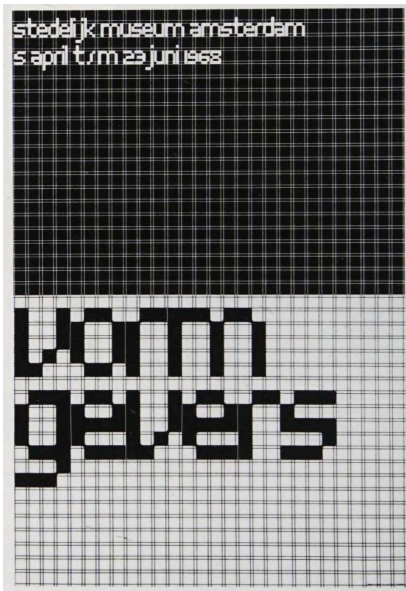
2.4 Experimental and *Avant-Garde* Typography Methods

Experimental and *avant-garde* typography serve as crucial elements in the evolution of graphic design, offering a departure from traditional type practices, allowing designers to challenge the norms of readability and form. Rooted in the early 20th century modernist movements, *avant-garde* typography was initially influenced by artists and designers seeking to explore new methods of visual communication that were radically different from the past. The *avant-garde* movement, championed by figures such as El Lissitzky (1890-1941), Bauhaus school emphasized minimalism, geometric abstraction, and the disruption of conventional layout structures. Thus, laying the groundwork for modern experimental typography.

In contemporary graphic design, experimental typography transcends mere aesthetics; it plays a pivotal role in creativity, serving as a medium through which designers can convey complex emotions, concepts, and narratives. Unlike traditional typography, where legibility and readability are paramount, experimental typography often prioritizes expression over clarity. It manipulates letterforms, spacing, and layout to create visual impact, engaging the viewer in ways that challenge their understanding of written language. For more recent examples, designers like Edward Fella (1938-) and David Carson's (1955-) work from the 1990's have famously disrupted typographic conventions, incorporating disordered, fractured, and overlapping letterforms that invite viewers to interact with the text on a visual and emotional level before engaging with its literal meaning.

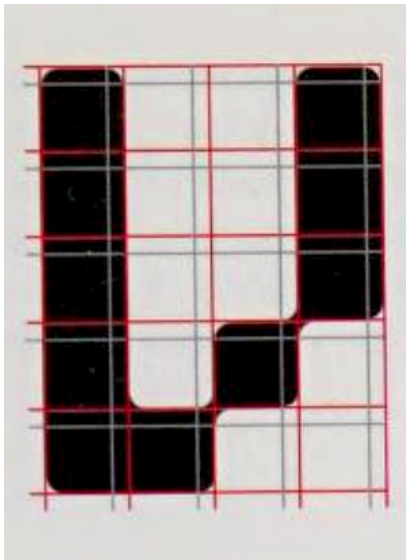
The significance of *avant-garde* and experimental typography extends beyond the designer's creative process, it profoundly influences how viewers receive and interpret graphic work. By pushing the boundaries of typographic form, designers encourage viewers to see typography not merely as a vehicle for conveying information, but as an active participant in the communication process. These non-traditional approaches to letterforms can evoke specific moods, create tension, or provoke thought in ways that conventional typography might not. This innovative reconceptualization of letterforms enhances the communicative power of graphic design, inviting viewers to engage with the message on both a visual and intellectual level.

Additionally, experimental typography plays a key role in expanding the possibilities of legibility and readability. Though these experiments often deviate from conventional typographic rules, they nonetheless contribute to our understanding of how



type functions. Designers, through a process of trial and error, continuously redefine the boundaries of what makes a letter recognizable and readable, even when distorted or abstracted. This balance between expression and functionality is essential for modern graphic designers, as it encourages them to think critically about how viewers interact with type and how the form of the letters themselves can contribute to the overall message of the design.

Based on the contributions of designers such as Taekyeom Lee, Ewan Clayton, Edward Fella, Kimberly Reynolds, Kiros Chu, Peter Balik, Am Tm Mitsuko, Jennifer Stucker, and Robert Bolesta, the field of type design continues to evolve and become markedly more expressive and experimental. These designers are actively challenging conventional limits of typographic design, thereby fostering innovative reconceptualization of letterforms and advancing our understanding of legibility.



Wim Crouwel's (1928-2019) *Vormgevers* poster, designed in 1968, exemplifies the intersection of analog and digital design principles, evoking the aesthetics of computer processing despite being created through analog methods. This poster was produced as an offset lithograph using a grid structure as its foundational design system (Crouwel, 2019). Crouwel's work offers a visionary glimpse into the future of typography, anticipating the technological advancements that would soon transform the design industry. The poster serves as a striking example of how analog methodologies have significantly influenced digital design, illustrating the extent to which analog practices have shaped, rather than been superseded by, digital technology. Crouwel's passion for geometric typefaces and grid systems earned him the nickname "Mr. Gridnik," a tribute to his systematic approach to design (Dawson, 2014).

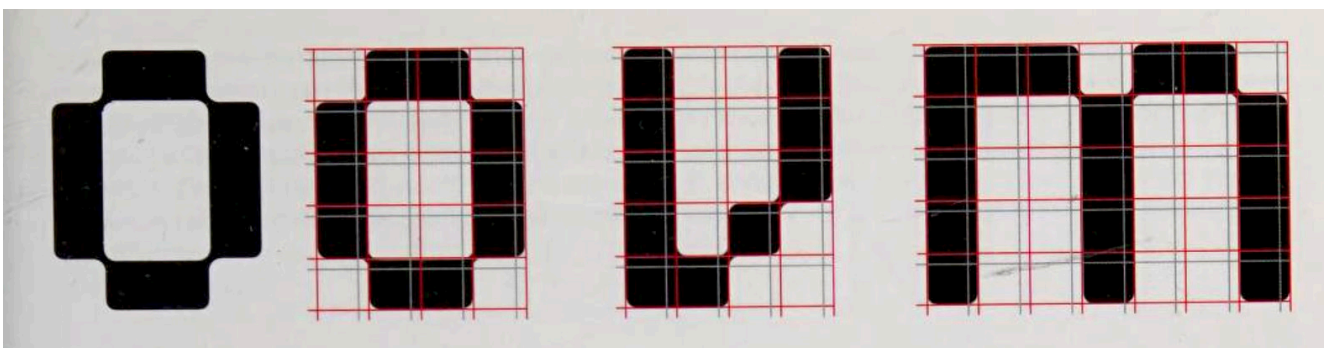


Figure 25. *Vormgevers* Poster, Win Crouwel (1968) – Geometry of design: studies in proportion and composition by Kimberly Elam (2001).

Continuing the exploration of bitmap typography and grid-based design, Ellen Lupton (2014), in her book *Thinking with Type: A Critical Guide for Designers, Writers, Editors, & Students*, introduces an exercise aimed at recreating a bitmap typeface. This exercise prompts designers to construct a grid of squares or dots, replacing curves and diagonals with rectilinear elements. Lupton's exercise draws on *avant-garde* practices that emphasize experimental and geometrical typefaces, reinforcing the concept that typefaces are modular systems composed of distinct, interconnected elements.

Similarly, Bruce Willen and Nolen Strals (2009) offer another approach to modular typography through their exercise in designing a bitmap alphabet. They set constraints requiring designers to create a small set of basic geometric shapes using a grid system that can be reductive, expansive, or fall somewhere in between. Their specific challenge involves designing the letters (H), (O), (M), (R), (A), or (n), (o), (b), (a), (v), with a focus on consistency across the letterforms. This iterative process encourages designers to experiment, identify flaws, and test various word combinations, all in pursuit of refining their typographic designs. Through these exercises, both Lupton and Willen and Strals underscore the importance of grids and modularity in developing coherent and innovative typographic systems.

When examining modular and *avant-garde* type design, it is essential to consider the seminal contributions of Bauhaus design. In 1925, Josef Albers (1888-1976), a German-born designer, introduced a revolutionary approach to typography through the development of stencil letters based on three fundamental geometric shapes: the square, triangle, and quadrant. Albers' typographic system combined these shapes, adjusting their proportions to maintain consistent x-height and cap-height measurements across the typeface. This system not only exemplified the Bauhaus ethos of simplicity and functionality but also set a foundational precedent for future explorations in modular type design. Typefaces created and inspired by Albers' work are Futura Black by Paul Renner (1878-1956) and the Bauer design office, and P22 Albers by Richard Kegler (1965-). Others include Futura Black (Bitstream), originally designed in 1929 by Paul Renner, with Bitstream's digitization likely released in the late 20th century. This is followed by Architype Albers (Freda Sack and David Quay of The Foundry, 1997), then Gridiot (Peter Bain, 2003–2011), and Tp Floral (Two Points, 2006). Several typefaces emerged in 2009, including Sessions (John Skelton, at Afrojet), Slink (Gene Buban), Albers (Crissov), and Modernist Stencil (Keith Bates, at K-Type). The year 2010 saw the release of Rigid (Marta Cerdà Alimbau), Idiom (Mike Jarboe, at Reserves), and Alber New (Chris



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Figure 26. Futura Black by Paul Renner and the Bauer Design Office. Modular typeface design inspired by Josef Albers. (1929).

Dickinson, at Moretype). In 2011, Plaster (Eben Sorkin) and Concreta (Tony de Marco and Niko Fernandez, at Just in Type) were released. This was followed by Little Tittle (Michael Blair, 2012), ThM Architype Albers (Thijs Mertens, 2013), and Bauhaus Typography Experiment (Jonathan Kevin William Holburn, 2014). In 2015, Albers Numerals (Tomek Zastawny), Decade (Robert Holmkvist), and Modular Alphabet (Isa Lloret) were released. Finally, Modular Alphabet (Luc Devroye, 2024) appears as the most recent entry, likely referencing a curated or updated version. Typefaces with unclear release dates include P22 Albers (P22), Duo (Omer Chafai), and Albers Moiré (Nick Shea).

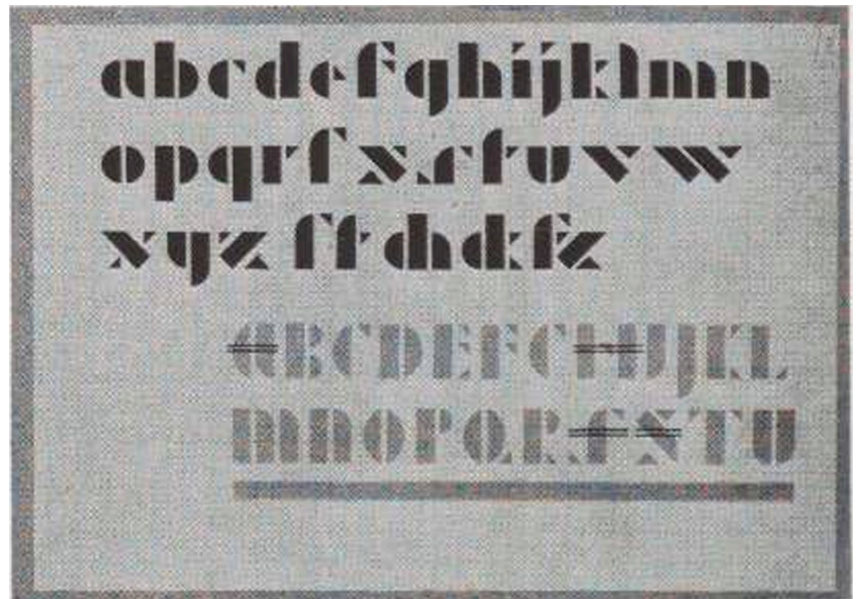


Figure 27. Josef Albers: Stencil Letters. Design based on three fundamental shapes. (1925).

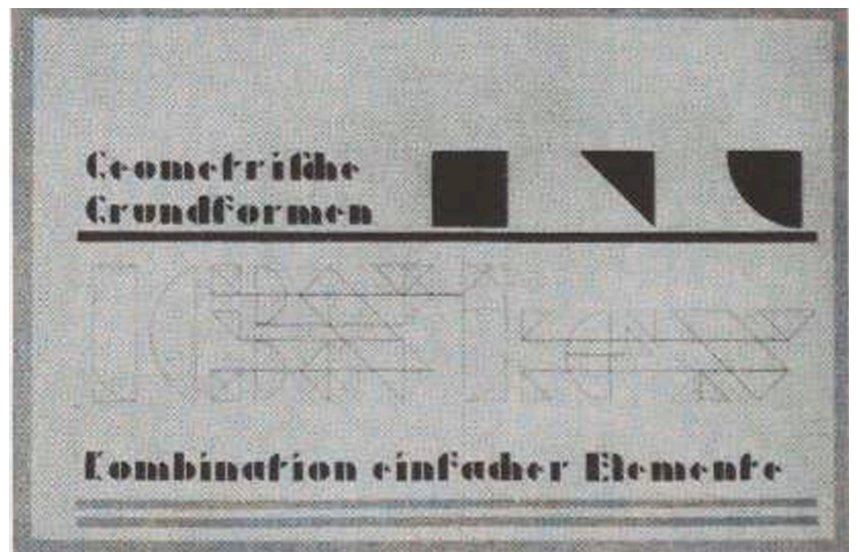


Figure 28. Josef Albers: Stencil Letters. Basic elements from which the letters are built up. (1925).

Works were also recorded from the Bauhaus school of design; an anonymous designer developed nine different composition layouts using only squares of equal size. The compositions demonstrate designs using a grid with equal spacing, and how one can break the grid rules still using shapes of equal proportions.

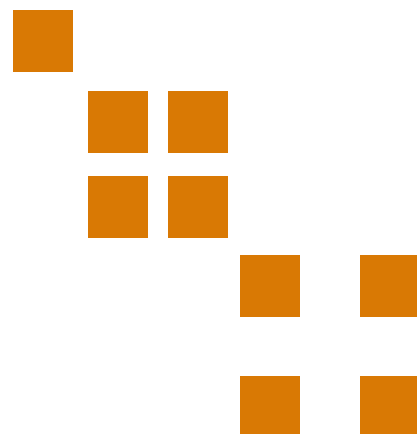
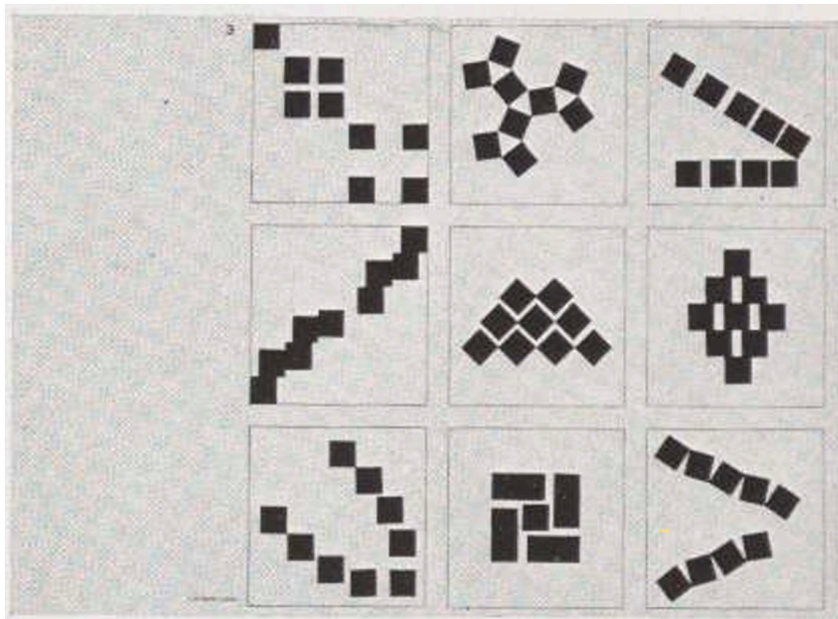


Figure 29. Work by anonymous at Bauhaus: Studies in composition given nine squares of equal size. (1925).

Modular typefaces continue to be an area of active exploration and innovation among contemporary type designers. Craig Ward, a designer, creative director, and author from 2021, has investigated the potential of analog modular type design using LEGO bricks as a medium. Ward emphasizes “creativity thrives on restriction, and the LEGO building system is a testament to that. Very few things have yet to be created in LEGO in some way, but the nuances of type design tend to be compromised” (Ward, 2021). This observation highlights the inherent challenges in creating type within constrained systems, where design limitations can offshoot creative problem-solving while simultaneously presenting structural compromises.

Ward’s exploration with LEGO mirrors the broader challenges faced in analog approaches to experimental type design. Analog methods, whether through physical modular systems or traditional hand-crafting techniques, impose material and structural restrictions that digital tools often mitigate. Yet, these restrictions can also foster innovation by driving designers to engage deeply with the physicality and form of letter construction. The LEGO

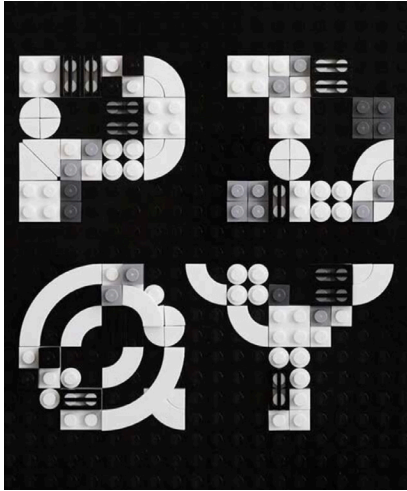


Figure 30. 'Play' modular type design composed with LEGO bricks by Craig Ward (2021).



Figure 31. Volclair Studio. Decorative organic lettering as Sterling Silver Earrings made in France for Ripperz (2021).

system, much like other modular approaches, exemplifies how limitation becomes a source of creativity, compelling designers to rethink traditional typographic structures. In this context, modular typefaces serve as a unique intersection between form, function, and play, making them a fruitful ground for experimental type design.

Ward's work is relevant to the ongoing discourse on analog and modular typography. It underscores the value of experimenting with physical systems in design, challenging traditional practices, and expanding the boundaries of what is possible within the realm of type design. He has taken the concept stemming from Josef Albers stencil letters and has explored the potential. This approach not only enriches the creative process but also offers a tactile engagement with design, where materiality plays a critical role in shaping typographic outcomes.

Among the previous design innovators, a more contemporary designer, Rémi Volclair from 2020, approaches typography as a graphic element, experimenting with letterforms that approach the threshold of illegibility. His display typefaces exemplify the extent to which the boundaries of typographic design can be expanded while still maintaining an underlying system and internal consistency across the alphabet. Volclair's work not only explores the manipulation of letterforms within the digital space but also extends into the physical realm through mixed-media applications. This multidisciplinary approach underscores the potential for typography to function as both a communicative tool and an expressive visual medium, merging digital experimentation with tangible design outputs.

2.5 Fundamentals of letterform construction

To effectively challenge and break the established conventions of type design, it is first essential to have a comprehensive understanding of the foundational rules governing typography. These rules encompass principles such as legibility, readability, alignment, proportion, and spacing. Comprehension of these conventions allows designers to make informed decisions when deviating from standard practices, ensuring that any alterations or innovations serve a deliberate purpose rather than compromising functionality.

By understanding the rules, such as maintaining consistent x-height, appropriate kerning, and proper weight distribution, designers can explore creative possibilities that push the boundaries of traditional type design. This knowledge enables them to manipulate letterforms, spacing, and structure in ways

that might defy convention yet still communicate effectively. Breaking the rules intentionally can lead to novel typographic expressions, fostering unique visual languages that challenge perceptions of form or function while retaining core purposes of typography; to communicate clearly and meaningfully.

Once designers understand their letterform origins, outcomes have more meaning and intention. It is easier to push the boundaries of legibility once there is an understanding of the boundaries that exist.

The current critical foundation of letterform terminology as of 2025 is as listed:

Apex	Aperture
Bowl	Loop
Serif	Link
Horizontal stroke/crossbar	Tail
Bracket	Stem/vertical stroke
Diagonal stroke	Axis/stress
Spine	Contrast
Arm	Ascender/Extender
Eye	Cap height
Counter	Descender/Extender
Ear	Width
Terminal	x-height
Leg	Baseline

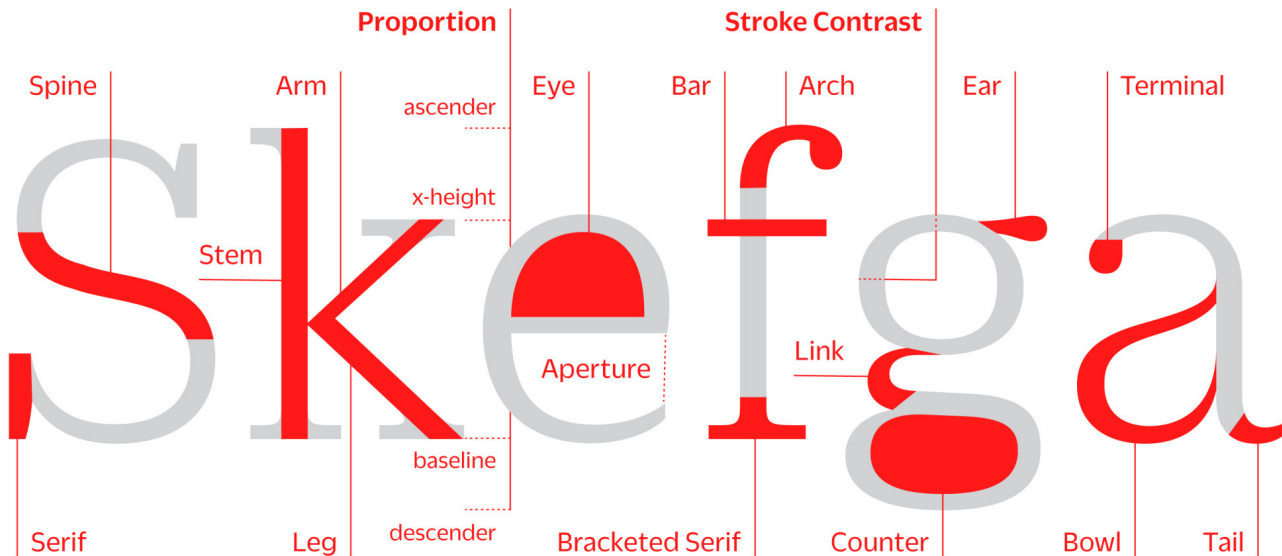


Figure 32. Diagram of letterform terminology. Image by Stephen Coles (2021).

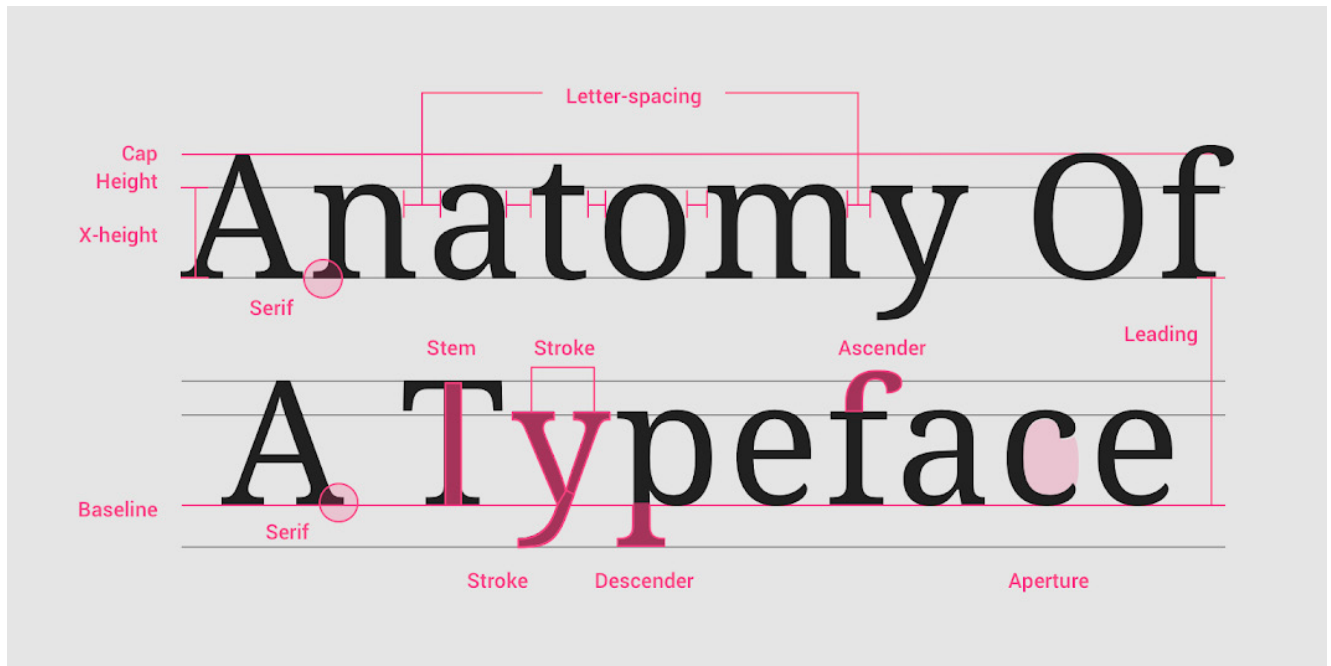


Figure 33. Noto Serif (Letterform parts terminology). Image from Material System (2024).

Alternatively, the anatomy of sans-serif letterforms is characterized by a reduction of decorative details, emphasizing clarity and simplicity. When considering a more minimalistic approach to the Latin alphabet, letterforms can be deconstructed into their most fundamental shapes. This process highlights the inherent structure of type by stripping letters down to their essential components.

For example, an analysis of Eina 01 Semibold Sans-Serif and Futura Medium reveals that these typefaces exhibit minimal contrast and adhere to a geometric construction. Futura is known for its reliance on basic geometric forms, such as circles, triangles, and rectangles, which contribute to its modern and functional aesthetic. This geometric approach reflects a rationalized design philosophy, where each stroke is carefully considered to maintain visual balance and structural integrity. Similarly, Eina 01 Semibold embraces a simplified letterform structure, reinforcing the idea that sans-serif typefaces prioritize legibility and efficiency by eliminating unnecessary embellishments.

By reducing letterforms to their geometric foundations, sans-serif typefaces create a sense of uniformity and order, making them highly versatile for contemporary design applications. This simplification also facilitates adaptability across various media, as the absence of intricate details ensures clarity at different sizes and resolutions.



Figure 34. Anatomy of a Character Terminology Diagram. Image from Ilene Strizver (2012).

AHandgloves

Figure 35. Identifying patterns of letterforms with sans-serif typeface Eina 01 semibold. Image from the author (2024).

AHandgloves

Figure 36. Identifying patterns of letterforms with sans-serif typeface Futura Medium. Image from the author (2024).

3. Project: Stage One Experimentation

3.2 Strategy

The first approach to discovering how clay can benefit typography and vice versa is to determine and explore all the different existing design methods. The first task was to determine the methods worth implementing and document in a field guide of sorts what proved effective and ineffective. The list below was determined by ceramic experts Carla Lobo and Rita Frutuoso from Politécnico de Leiria, ESAD.CR in Caldas da Rainha (Portugal), and Canan Salman a PhD student of Eskisehir Osmangazi University of Art and Design (Turkey), at ESAD.CR.

1. Nerikomi technique
2. Carving with Engobe
3. Vinyl/Screen Print
4. Stencils
5. Cutouts
6. Sgraffito
7. Relief
8. 3D Printing
9. Sculpture
10. AI

After trial and error of experimenting with the methods, one method is chosen as the best suited for this research in creating a cross-modal learning tool for type design. Each method has one commonality, and it is the physical display of negative and positive space. However, all but one method benefits from a letterform designed beforehand and then implemented. Below is a detailed record of the pros and cons of each method. These recordings were kept in a journal during each process.

The Nerikomi Method

In Japanese language roots, “neri” is defined in English as “to mix,” and “komi” means “to press into” (Hoadley, 2024). The Nerikomi method consists of long individual coils, extrusions, or blocks of colored clay. Then, to are stacked on each other and then cut through, revealing the colored pattern (Rahill, 2012). The pigments used are typically engobes mixed into clay.



Figure 37. Process of making colored stoneware clay and engobes. ESAD.cr, Caldas da Rainha. Photos from the author (2024).



Figure 38. Process of making clay coils for the Nerikomi technique. ESAD. cr, Caldas da Rainha. Photo from the author (2024).

To color clay with the engobe, one must first measure the weight of the clay to determine how much engobe powder to add. In this case, the clay was white earthenware, so 10% of the engobe powder was weighed out. The colors chosen were red, dark teal, and pink, from using less of the red. 10% dark teal engobe, 10% red engobe, and 5% red engobe. Once the powder and clay were measured out, the clay was broken up into small pieces and placed in a bowl with water and engobe. Mix it up and then place it on plaster slabs to dry until a leather-hard consistency. Once it has dried, scrape the clay off the plaster and knead the clay until well mixed and back to the solid clay consistency it was before.

This method proved highly challenging in constructing and preserving letterforms but intriguing. There is a great opportunity and possibility for typographers to think about letterforms in a new way by designing with coils and depth. For this experiment, simple letters like (O) and (K) were chosen due to their simplicity and easy construction with coils. If designers want to create more precise letters for Nerikomi, it would be best to design an extruder or small cutouts and layer them to create letter coils for this method.

Carving with Glaze and Engobe

Another technique of applying designs to clay is by adding a base layer of engobe to leather hard clay. Engobes are made from natural raw materials such as clays, quartz, and feldspars and synthetic raw materials such as frits (Marcelo Dal Bó, 2014). This experiment used a dark teal and red engobe mixed with white stoneware clay.



Figure 39. White stoneware clay at wet stage with dark teal engobe paste. The engobe paste is applied to the wet clay to be folded in layers then wedged for an even color. ESAD.cr, Caldas da Rainha. Photo from the author (2024).

Unlike colored clay, engobe can also be combined with water and made into a watery paste and painted onto clay before bisque firing. Once the engobe has been painted onto the wet clay, let it dry to a leather-hard state. Using a scraping tool or needle, one can carve away at the engobe to reveal the clay color underneath. This technique allows the designer to have more control with letterforms and evokes drawing on paper or letter carving.



Figure 40. Carving tools and result of carving engobe on leather-hard red clay. ESAD.cr, Caldas da Rainha. Photo from the author (2024).

Screen printing

Designers can effectively transfer their digital designs using the screen-printing technique, ensuring a seamless translation from digital to physical mediums. This process necessitates the use of 100% black in the areas designated for color application. The design should be printed on printer-compatible transparent sheets, which are then placed onto a silkscreen for the printing process. Screen printing can be applied at various stages of the clay's development. However, one of the primary challenges is identifying a glaze or engobe that is sufficiently thin to pass through the mesh screen. Additionally, access to the necessary tools for creating silk screens is essential in this research; such tools were not readily available. Despite these challenges, the successful outcome demonstrates the screen-printing technique's value as a practical tool for both graphic designers and potters.



Figure 41. Process of screen-printing ink on stoneware clay. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

Stencils

Designers and potters may also use the stencil method. A stencil is a sheet of durable material perforated with a design, allowing substances such as ink or paint to fill the cut-out spaces (Merriam-Webster, 2024). For this research, a CNC machine was used to cut an ampersand symbol (&) from a plastic sheet.



Figure 42. CNC machine cutout of ampersand on plexiglass. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

Another stencil option is a vinyl cutter machine. The vinyl sheet is durable, even for fine details. The image below demonstrates the level of detail and can be handled without care to remove the design and maintain structure without tearing.

However, the use of vinyl stencils presents certain challenges. The adhesive backing on vinyl sheets can make it difficult to reposition the design on a surface. Despite this limitation, the approach can be optimized by placing the vinyl design on a backing that is cut simultaneously with the vinyl, allowing the stencil to be reused. Conversely, the adhesive backing offers significant benefits: it allows the vinyl to adhere securely to curved surfaces, preventing slippage, and ensures the creation of crisp, clean lines when applying glaze.



Figure 43. Process of vinyl sticker cutout used as a stencil to apply clay slip on bisque fired tile. Organized from top left to bottom right. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

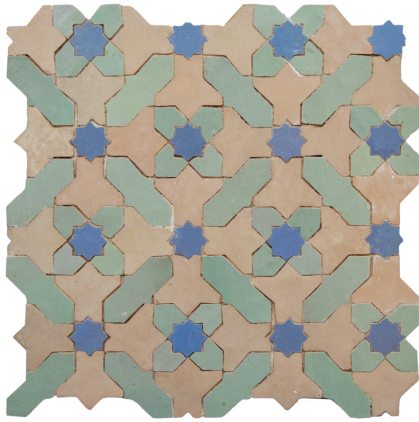


Figure 44. Moroccan zellige handmade tiles. Photo from the Cemento Collection, Englewood, New Jersey, USA (2024).

Cutouts

This exploration culminated in the conceptual development of a modular typeface comprised of geometric tiles that are both manageable in size and designed to interlock, forming a variety of letterforms. Drawing inspiration from traditional North African and Middle Eastern tilework such as zellige tile, the geometric nature of these tiles offers a wide range of possibilities for creating diverse patterns and combinations. The modularity of the design allows for significant flexibility in the construction of letterforms, as each tile serves as a building block that can be rearranged to produce different stylistic variations, encouraging both creativity and practical application.



Figure 45. Moroccan Zellige mosaics with geometric pattern tiles. Located at the Ben Youssef Madrasa in Marrakech, Morocco. Photo from Carla Tracy/ Alamy Stock Photo (2024).

The integration of glazes, textures, or various types of clay further enhances the individuality and identity of each ceramic piece. These elements not only contribute to the tactile and visual qualities of the tiles but also allow users to experiment with color and surface finish, enriching the aesthetic experience. This approach fosters imaginative engagement, particularly among adult users who can explore the interaction between the modular forms and the ceramic medium in a hands-on manner.

Moreover, this technique facilitates the manipulation of both positive and negative spaces within the letterforms. The intentional design of negative spaces between the tiles opens possibilities for entirely new typographic expressions. The shapes that emerge from these negative spaces, whether symmetrical or abstract, hold the potential to inspire the development of novel typeface designs. This exploration of space challenges conventional approaches to typography, offering a dynamic way to think about letterform construction and spatial relationships in type design. Ultimately, this method bridges traditional ceramic craft with contemporary typographic practices, creating a fertile ground for future innovations in both fields.

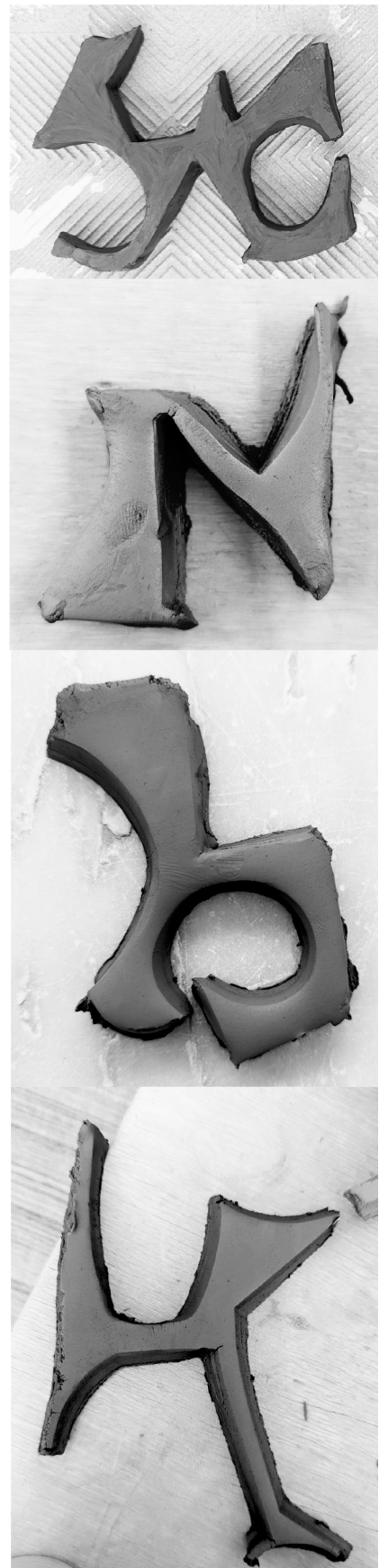


Figure 46. Clay scraps isolating the negative space of letterform carvings. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

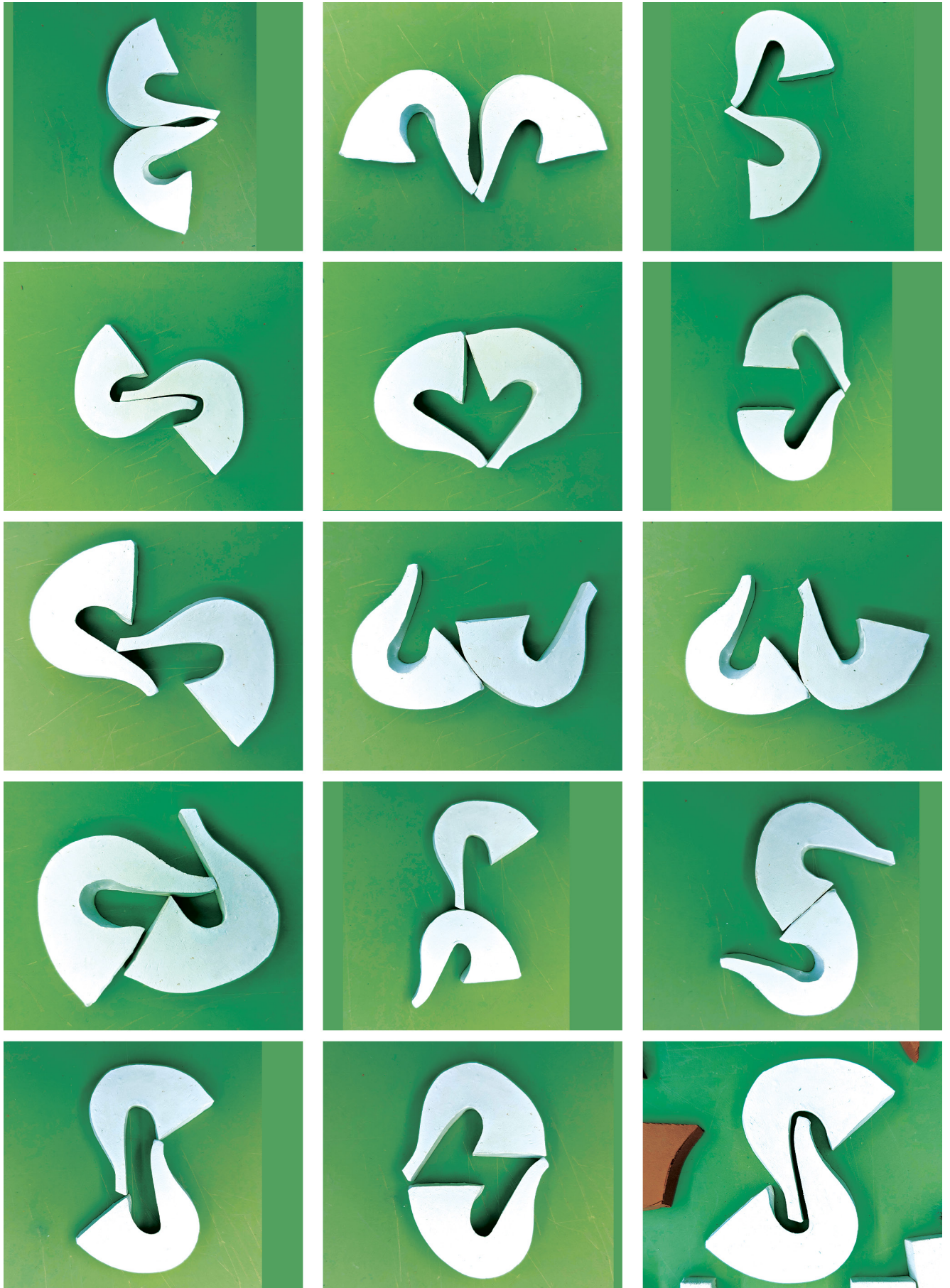


Figure 47. Freehand cutouts from white stoneware clay slabs. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

Additionally, the relief method aligns with the formal conventions of traditional type design, where the distinction between foreground (letterform) and background (the substrate) is paramount. This technique provides a reliable framework for exploring classical typographic elements while also allowing for the integration of the material properties of clay. For instance, the malleability of clay makes it possible to incorporate more fluid or gestural aspects of calligraphy, offering a dynamic interplay between traditional hand-lettering techniques and the physicality of the ceramic medium.

By offering both structural stability and flexibility in execution, the relief approach serves as a bridge between traditional type design and ceramic practices. It allows for the precise rendering of letterforms while still accommodating the expressive potential of clay, thereby fostering a dialogue between material and form. This approach invites designers to explore the intersection of typography and ceramics in a way that respects the formal rigor of traditional letter design while also embracing the unique material properties of clay to expand the possibilities for creative expression.



Figure 49. El Greco serif and brackets as relief tiles. Photos from the author (2024).

3D Printing

The use of 3D printing in ceramics has introduced innovative methods, particularly through the extrusion of soft clay into vertical layers to construct three-dimensional forms. This layering process enables the precise creation of intricate designs, which would be challenging to achieve using traditional techniques like hand-building or wheel-throwing. It offers greater control and repeatability in producing ceramic works.

Beyond directly extruding clay, 3D printers are also used to create plastic templates or cutouts, which serve as tools for shaping and perforating clay. This research focused on the use of the plastic cutters to produce uniform and accurate forms. These tools allow for the reproduction of detailed shapes with consistent precision, reducing the irregularities often found in hand-crafted pieces. The clean, well-defined forms achieved using these cutters improve both the visual and functional aspects of the ceramics.



Figure 50. 3D printed plastic cut-outs to perforate clay. ESAD.cr, Caldas da Rainha. Photos from the author (2024).



Figure 51. 3D printed plastic cut-out bowl with punch-out piece. ESAD.cr, Caldas da Rainha. Photos from the author (2024).



Figure 52. 3D printed letter “e” out of clay by Taekyeom Lee. Photo by Annika Carter.

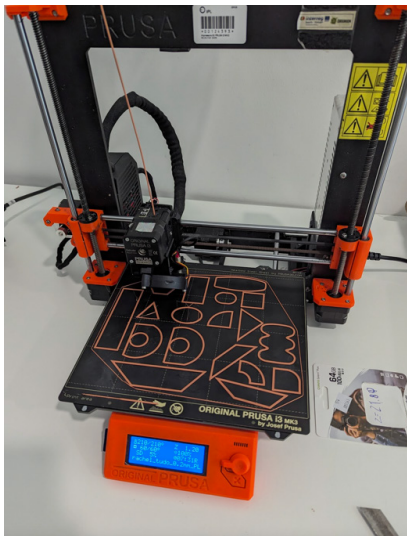


Figure 53. 3D printed plastic cutouts with terracotta colored plastic and orange punch-out. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

However, producing these plastic cutouts is time-intensive and requires specialized equipment. Designing, modeling, and printing them necessitate proficiency in digital modeling software as well as access to 3D printing technology. Additionally, refining these tools to meet specific requirements further increases the overall time commitment. For example, to successfully release clay from plastic cutouts, the clay must be sufficiently stiff to slide out without bending or smudging.

Two methods have been effective in achieving clean clay removal. The first method involves perforating the wet clay slab, removing excess material around the edges, and placing it on a porous surface such as plaster. To accelerate the drying process, the pieces can be exposed to sunlight or placed in a ceramic drying oven, which reduces humidity and removes excess moisture from the clay. The second method involves designing and 3D printing a “punch-out” tool. This tool applies even pressure across the clay, preserving its structure and eliminating the need to wait for the clay to reach the ideal consistency before removal.

Despite these challenges, the precision and consistency provided by 3D-printed cutters make them valuable tools, allowing for the easy replication of complex forms that would otherwise be difficult or time-consuming to produce using traditional methods.

The application of 3D printing in ceramics marks a notable progression in blending digital fabrication with traditional craft techniques. By using digital technology to enhance accuracy and repeatability, ceramicists can explore new creative and functional possibilities. Incorporating 3D-printed cutters into ceramic processes highlights how digital and manual methods can work together, expanding the creative potential of ceramics without replacing traditional techniques. This research underscores the growing role of digital tools in craft practices, suggesting that they can complement and enrich traditional processes rather than supplant them, leading to a more integrated approach to ceramic design.

Sculpture

Designers can mold clay into three-dimensional sculptures through various methods. These methods include hand-building techniques, such as shaping clay slabs to form structures, sculpting solid clay forms, which are then hollowed out, or creating vessels using a potter's wheel. This research focused on exploring hand-building techniques and integrating letter designs into these sculptural forms. For instance, a ceramic vase was created with three handles, symbolizing the arm, tie, and horizontal bar of a letterform.

While this approach yields innovative results and offers numerous creative possibilities, it is useful to note that the outcomes are more aligned with ceramic arts than with the core principles of graphic design and type design.



Figure 54. Earthenware vase with handles evoking crossbars for the letter (E). ESAD.CR, Caldas da Rainha. Photo from the author (2024).



Figure 55. Letter (E) is used to create the structure of a bowl. ESAD.CR, Caldas da Rainha. Photos from the author (2024).

AI

As part of an exploratory experiment, artificial intelligence (AI) was utilized to generate images that merge the disciplines of typography and ceramics. The initial prompt, “clay typography,” resulted in images produced by Freepik, which presented a range of topics and observations for analysis. The AI-generated images predominantly feature red clay as the primary material, with instances of terracotta combined with what appears to be a blue engobe or glaze in Figure (60), and possibly stoneware clay in conjunction with red clay in Figure (61). These designs evoke influences from indigenous ceramic art, reminiscent of ancient Mayan pottery and Egyptian hieroglyphs. The letterforms depicted are particularly noteworthy; while they exhibit a sequence and structural resemblance to traditional letterforms, they do not correspond to the Latin alphabet. This blend of



Figure 56. Mayan ceramic vessel with embossed Pseudo-glyph from the classical period. 250-900 AD. Yucatan Mexico Palaciode Canton Museum Photograph by Adriana Rosas/Alamy Stock Photo (2019).

traditional and experimental elements in the typographic design offers a unique perspective on the integration of materiality and form.



Figure 58. Arabic Script in Alhambra. Granada, Spain. Photo from Jochem Wijnands and Horizons WWP/Alamy Stock Photo (2024).



Figure 57. Egyptian Hieroglyphs - Tomb of Ramesses IX, Valley of the Kings. Photo from the Egypt Museum (2024).



Figure 59. Freepik AI generated photos of clay typography. ESAD.cr, Caldas da Rainha. Photos from the author (2024).



Figure 60. Freepik AI generated photos of clay typography. ESAD.cr, Caldas da Rainha. Photos from the author (2024).



Figure 61. Freepik AI generated photos of clay typography. ESAD.cr, Caldas da Rainha. Photo from the author (2024).



Figure 62. Freepik AI generated photos of clay typography. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

By analyzing the AI-generated outcomes, various physical execution methods can be employed. One approach involves sculpting a clay slab, shaping the overall form, and then carving the relief details manually. Another method entails 3D printing the design, which can then be used to create a plaster mold. This mold can subsequently be filled with a mixture of clay slip and silica. The use of a mold ensures greater precision and more refined lines compared to the inherent limitations of manual carving, which depends on the precision of the human hand. As illustrated in Figure (62), three out of the four designs could be 3D printed, either using clay directly or by constructing the forms through the careful layering of clay coils.

3.3 Decisions

One of the first approaches to equip the ceramic toolset is to identify all the necessary parts of the Latin alphabet. It is pertinent to make a list of the anatomy of letters and ensure they are all represented in the toolset. Using Stephen Coles' book *The Anatomy of Type: A Graphic Guide to 100 Typefaces: Examining Shoulders, Spines, and Tails in Detail* to identify proper terminology consistent within the discipline.



Figure 63. Identifying patterns of letterforms with sans-serif typeface EINA 01 semibold (Iñigo Jerez). Image from the author (2024).

Once the most recent typographic terminology and pedagogy have been identified, the shapes can be cut from clay. Two approaches can be used to implement the shapes: The first approach is to use a ceramic knife or X-Acto knife and a ruler. The other involves applying a print-out design, tracing it with a dull pencil or ball stylus, and leaving an indentation on the clay's surface to cut along. Both approaches require a clay slab and a cutting utensil.

The early stages of the process started with a thin razor or X-Acto knife to achieve thin and precise cuts. Using a ruler, 3cm, (1.18 in) in width of the vertical stroke options across all shapes is useful to maintain consistency. The strategy and challenge of this was to ensure consistency of stroke thicknesses across all shapes for a well-designed anatomy. This approach proved challenging for cutting perpendicular lines due to a lack of practice and experience.

An alternative approach involves designing consistent shapes digitally using Adobe Illustrator, which is then printed and applied to clay. After printing the character set onto paper, a plastic wrap was placed over the clay slab to protect it from moisture, followed by the printed paper for tracing with a ball stylus. The plastic wrap not only prevents the paper from absorbing moisture from the clay but also allows for multiple tracings from a single sheet. Once the imprint is made, the plastic and paper are removed from the slab, and the traced shape is cut along the imprint to create consistent forms.

Both methods yielded effective results, depending on the desired outcome. However, achieving precise and flawless shapes in this research was crucial, and the previously described techniques did not fully meet these criteria. For greater accuracy, tools were required to produce sharp and precise lines in the clay. This necessity led to the exploration of 3D-printed cutouts to press into the clay, ensuring vertical cuts and uniform lines.

After extensive trial and error, a modular approach to letterform design emerged as the most effective for preserving the structural integrity of the clay. By working with smaller shapes of even thickness, the clay maintained its durability and strength, even when subjected to manual handling. This method provided a balance between the aesthetic qualities of the type design and the practical demands of working with the clay medium.



Figure 64. Wet clay that was traced with paper and ball stylus of a sans-serif (C), then cut with an X-Acto knife. Image from the author (2024).

3.4 Materials

When working with clay, many materials are necessary for the process of creating particular shapes. Through this experiment, it became evident that some tools are more necessary than others. For example, smoothing the surface of clay by hand rather than using a metal scraper or modeling tools, but the tools add a refined effect that the hands are not able to achieve. Modeling tools make it possible to smooth and preserve the small edges that a finger cannot. The decision to refine and smooth the clay depends on the artist's desires and artistic practice.

Materials:

Clay: Stoneware, porcelain, and earthenware	Sponge
Metal scraper	Ball stylus
Wooden modeling tools	Pencil
Paper	Plastic wrap
Newspaper	X-Acto knife
Bowl	Water
Towel	Rolling Pin
Large wooden board/Ware board	Two small boards with same thickness
Wire clay cutter	Paint Brush
Ribbon tool	Ceramic Needle
Printer	Computer
Adobe Illustrator	Engobe and Glazes
Pizza Cutter	Ruler

3.5 Exploration and Experimentation

The process of hand-cutting letterforms from a clay slab offers a unique and insightful approach to typographic design. This method not only emphasizes the creation of letterforms but also brings attention to the significance of the negative space surrounding these forms. By cutting out letters from a clay slab, designers are simultaneously cutting out the negative space, which allows for a comprehensive evaluation of both the space around the letter and the structural composition of the letter itself. As Cyrus Highsmith shared in his workshop *Thinking with Your Hands*, the negative space around a letter is just as, if not more, important than the letter itself (Highsmith 2024). Clay, as a medium, offers a distinctive opportunity to assess and manipulate this negative space, enabling designers to refine their work by molding and adjusting these areas for further enhancement.

The initial phase of this research involved segmenting individual components of a character or letter, employing a stencil-based approach to letterform design. This method facilitated the separation of areas of high contrast to explore modularity while ensuring the structural integrity of the design and preventing damage to delicate elements. The process included experimentation with various techniques for shaping vertical stems, bowls, crossbars, and serifs. Approaches ranged from freehand cutting to the use of printed templates, each providing distinct insights into the relationship between the letterform and its surrounding negative space.



Figure 66. Exploration of free-hand carving letterforms and shapes. Using a ceramic knife on wet and leather-hard clay to determine the best consistency for carving and clean edges. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

One specific experiment focused on the letter (A), utilizing a typeface revival named *El Greco* designed by the author. A design characterized by its serifs and moderate contrast within the vertical stems. The letter (A) was chosen simply because it had enough challenges to test and explore the boundaries of what details could be cut out. *El Greco* was selected for this study because the letterforms were personally revived by the researcher, ensuring that the experiment was conducted using a typeface entirely of the researcher's own creation and interpretation, rather than relying on the work of another designer. It was also chosen due to its complex forms with contrast and wide serifs. The dimensions of the letter were enlarged to fit on a 12.7cm/5inch square tile to follow relief tiles found in Spain and Portugal.



Figure 67. An Example of molded tiles as a reference for creating a relief tile. From Seville, Spain. Photo from the author (2024).

The challenge of cutting out the thin strokes of this typeface by hand required considerable precision and patience. This experiment revealed that clay, as a medium, does not easily accommodate high-contrast elements unless supported by a stable background, such as a tile. The letterforms were prone to cracking during handling or warping due to uneven drying times at the wet stage.



Figure 68a. An Example of molded tiles as a reference for creating a relief tile. From Seville, Spain. Photo from the author (2024).

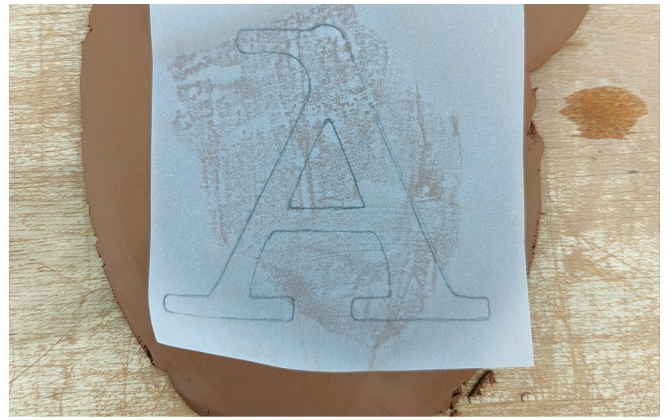
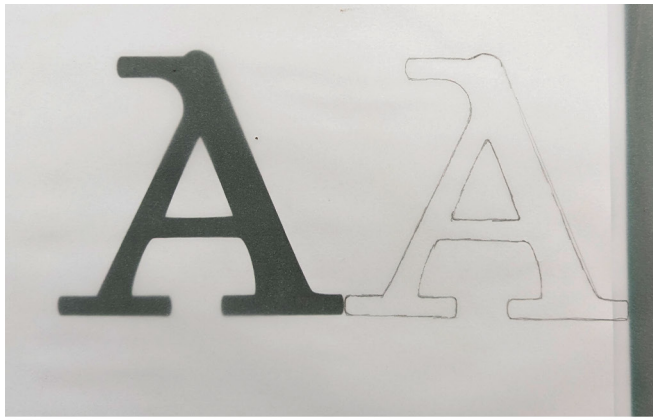


Figure 68b. Sequential ordered a series of carving the letter A from the typeface revival of El Greco. ESAD.cr, Caldas da Rainha. Photos from the author (2024).

Findings marked a significant turning point in the research, directing attention toward how the inherent properties of clay such as its structural support requirements and durability could inform the design process. This shift highlighted the necessity of aligning typographic design with the material constraints of clay, ultimately resulting in a more modular and resilient product. The outcomes of this phase underscore the critical importance of understanding and embracing the unique material characteristics of clay in typographic design, particularly in managing contrast, ensuring durability, and considering negative space.

Once a clearer direction for the project was established, the research progressed with the creation of shape prototypes using paper cutouts. Paper was chosen for its efficiency in quickly assessing the dimensions and tactile qualities of the shapes, as well as how they interacted and fit together. This iterative process facilitated the refinement of optimal dimensions, and once the ideal sizes were confirmed, the paper templates were used to produce the final cutouts. The development process involved numerous adjustments through trial and error, ensuring that the shapes met the desired criteria for functionality and ergonomics in handling.



Figure 69. On the left: first shapes made from porcelain. On the right: Paper prototype to determine specifications for sizing of shapes. Photo from the author (2024).

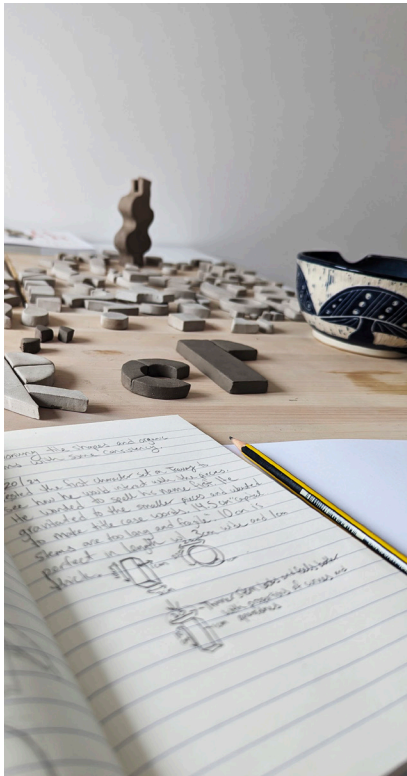


Figure 70. Notebook documenting ideal measurements for shapes. Photo from the author (2024).

During this phase of experimentation, geometric and organic shapes were explored. Trial and error led to the determination of ideal shapes, ease of handling, and sizing potential. It was evident in the paper template and shapes figure (72), were too large for handling and not as versatile as the smaller shapes. The benefits of having smaller shapes were that they can be combined to construct the larger shape if desired by the user. In this case, the decision to set one larger shape and break it down into smaller shapes would test the proportions and compatibility. Figure (71) displays shape (16) as the largest shape and determining the possible smaller shapes to fit within the area of shape (16).

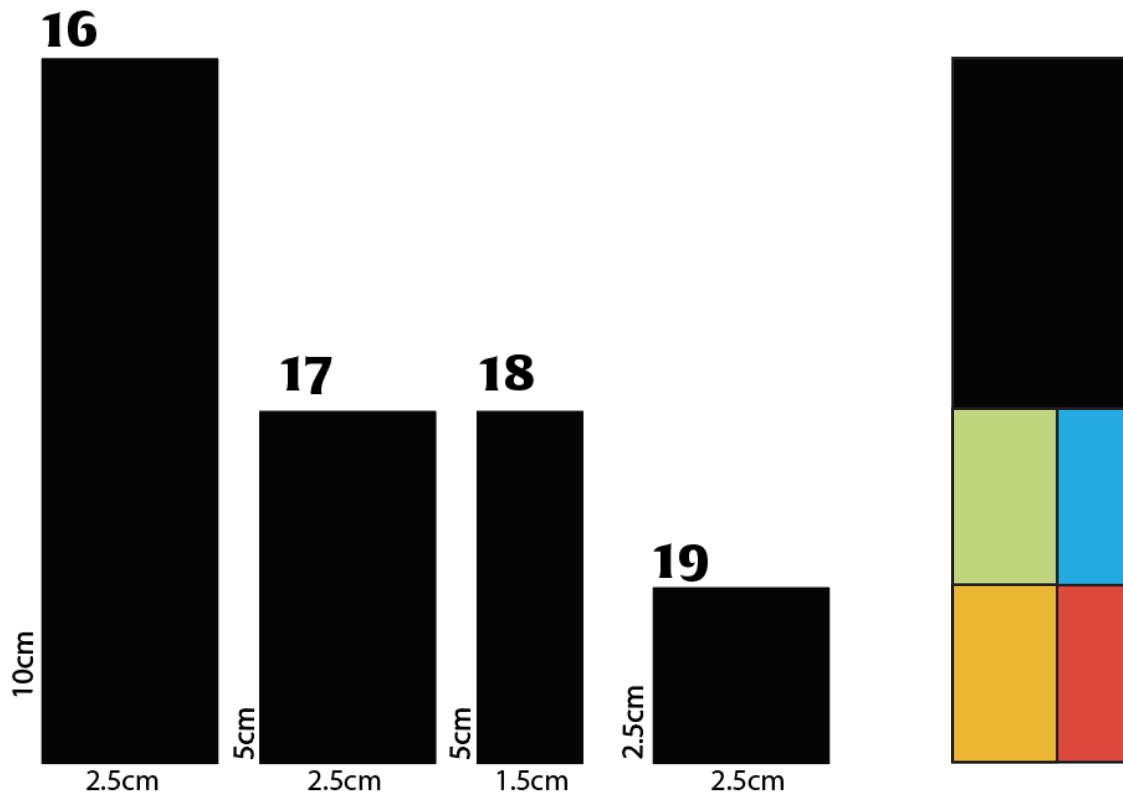


Figure 71. Final project shapes with dimensions and a diagram of all shapes overlapping to determine proportions. Photo from the author (2024).



Figure 72. Series of photos displaying all shapes considered for final tile set. Photos from the author (2024).

A Handgloves

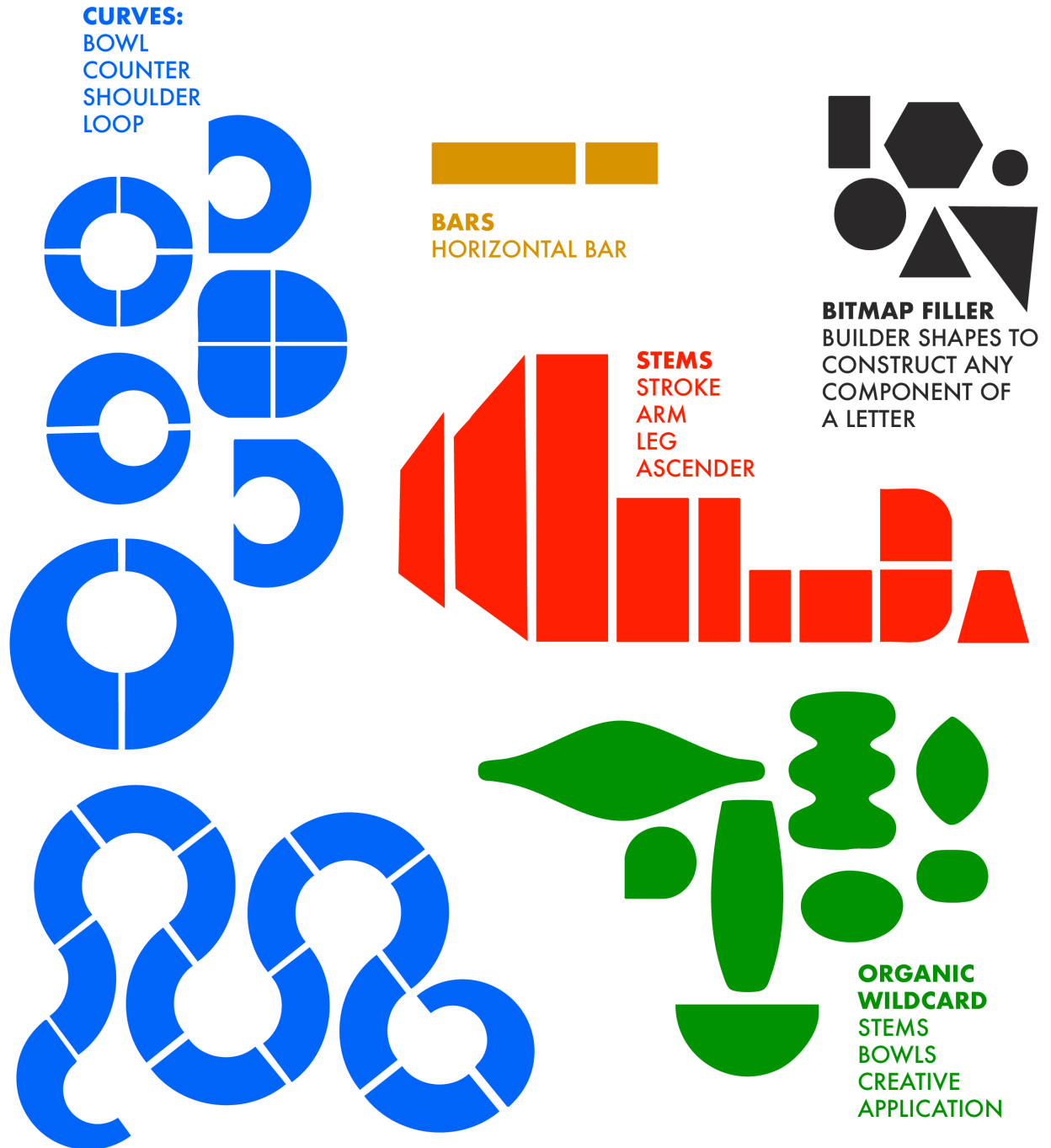


Figure 73. Futura medium font used as a guide for determining critical shapes and additional shapes added to prompt creativity and problem-solving. Image from the author (2024).

At a certain stage in the research, the sheer number of available shapes became overwhelming and replicating each one would have required significant time and effort. In addition, trying to establish a typographic system, the variety would pose a greater challenge to systematize while considering legibility. Drawing inspiration from zellige tiles and mosaics, a strategic decision was made to focus on geometric shapes, as this approach was deemed the most practical. By breaking the shapes into smaller, modular components, the potential for creative possibilities expanded considerably, allowing for greater flexibility in the design process while providing tighter typographic systems. This shift toward geometric forms enabled a more efficient exploration of the material while maximizing the range of typographic and compositional outcomes. Three organic shapes were introduced into the set of geometric shapes, to see how they could interact with each other by having participants test the pieces.

This process led to the need to seek alternative methods for cleaner and more refined edges during the wet clay stage. Figure 74 displays the first shapes desired for the experiment, but due to the high demand of the 3D printer, there was only time to print 18 of the shapes. These shapes were considered more useful than the others and were the priority. The grayed-out shapes indicate the shapes determined as less critical than others. The reasoning is that shapes (1) and (1b) evoke the same function as (3) and (3b) but (1) and (1b) fit the requirements for bowls with the flattened bottoms and tops, theoretically helping the participant problem-solve the function and purpose of the shapes.

The standard geometric shapes remained a priority to establish if the cutouts would work and represent the foundation of bitmap and geometric modular tiles. Out of the organic shapes, (2) and (25) were chosen for their potential for vertical stems and posed as a challenge and spontaneity for participants. Both organic shapes evoke ceramics and clay vessels. The other shapes were a bonus and would go on to be 3D printed later to bring more variety to combinations.

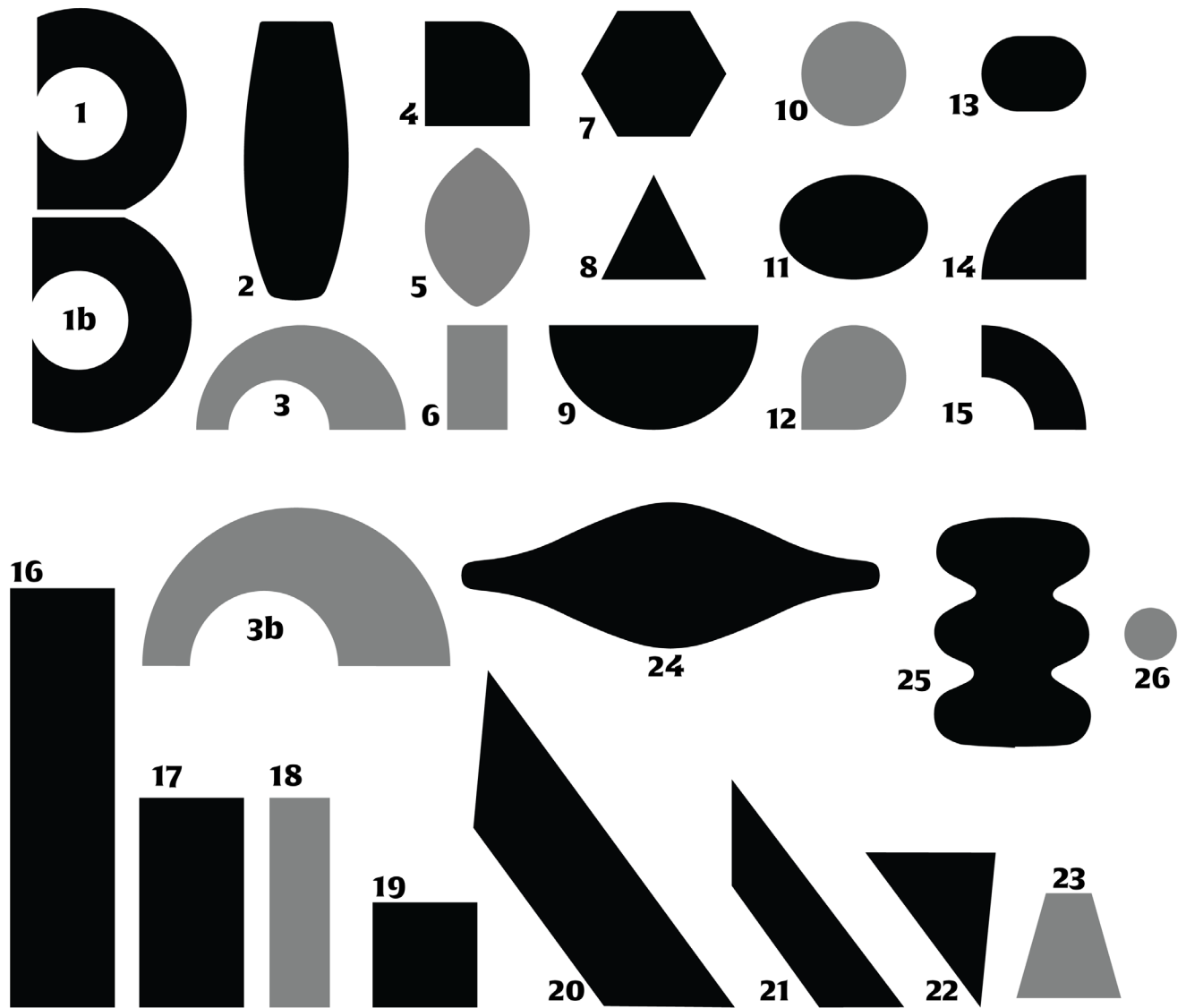


Figure 74. First set of shapes established for carving. Numbered shapes for reference and organization during prototype test with participants and semi-structured interviews. ESAD.cr, Caldas da Rainha. Photo from the author (2024).



Figure 75. First 3D printed plastic terra cotta-colored cutouts printed by João Mateus. ESAD.cr, Caldas da Rainha. Photo from the author (2024).

4. Project: Stage Two - Implementation for Final

The final project seeks to implement and display the convergence of ancient artistic practices such as tilework, mosaics, with contemporary bitmap technology, thereby creating a synthesis of tradition and innovation. Thus, making ceramics a useful tool as an analog approach to graphic design and type design practices. Additionally, the project presents how ceramics can be used as a tool for exploring the systems for creating a modular type design. Specifically, it introduces an *avant-garde*-inspired system of elements designed for letterform creation. The system incorporates a range of geometric shapes, including rectangles, squares, circles, ovals, half-circles, triangles, hexagons, and trapezoids, alongside additional forms that evoke organic shapes and traditional ceramic tile patterns. The system allows for up to 729 combinations of two shapes and 19,683 combinations of three shapes, offering extensive possibilities for letterform design and a rich array of creative options. This is to say that with twenty-six shapes, the combinations available are immense.

The significance of geometric shapes in type design lies in their ability to expand the possibilities for creating multiple alphabets, thereby enhancing the accessibility and versatility of typographic systems across different languages. Geometric shapes serve as fundamental building blocks that can be systematically manipulated to form diverse letterforms, allowing for the adaptation of typefaces to various linguistic scripts. As Josef Albers once said about graphic-tectonic' lithographs are "stable yet dynamic, flat yet deep, uncolored yet colorful, simple yet complex" (Bucher, 1961). By deconstructing letterforms into smaller, modular components, designers can construct a broad array of characters that cater to the specific needs of diverse alphabets, including those with more complex structures.

In theory, this approach applies the principles of modularity and simplicity to enhance the accessibility and adaptability of type design across diverse linguistic contexts. Because geometric shapes are inherently recognizable and easily reproducible, they serve as effective components for constructing a typographic system that can be efficiently scaled and modified. By deconstructing letterforms into fundamental geometric units, designers can reassemble them in various configurations to reflect the distinct phonetic and visual characteristics of different languages. This method not only supports the development of alphabets for underrepresented languages in existing typefaces but also promotes the exploration of innovative typographic forms that challenge conventional design paradigms.

The mosaic and bitmap approaches to type design exemplify this potential. In both approaches, letterforms are simplified into a grid-based structure, where each segment or pixel can be considered a geometric unit. This simplification process is particularly powerful for designing alphabets that require a high degree of precision or that must operate within constrained environments, such as low-resolution screens or architectural signage. By abstracting letter shapes into a series of geometric elements, designers can create versatile, modular systems that can be applied to a wide range of scripts, from the Latin alphabet to more complex systems like Arabic, Cyrillic, or Japanese characters.

The application of geometric shapes in type design represents a significant theoretical and practical advancement in the field. By



Figure 76. Mosaic welcome sign using a sans-serif modular approach to letterforms. Designed by Jan's Glass by the Sea studio (2024).

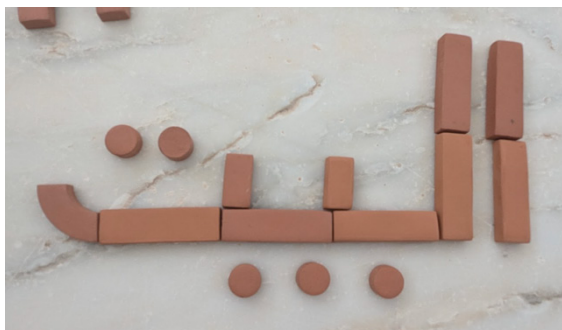


Figure 77. Arabic (Egyptian) example using long and short rectangles with small circles. Photo from the author (2024).



Figure 78. Sans-serif type design using only one shape for modular design. Photo from the author (2024).

breaking down letterforms into modular, geometric components, designers can create flexible and scalable typographic systems that enhance the accessibility of type design for a wide range of languages.



Figure 79. Process of organizing shapes with earthenware, stoneware, and porcelain tiles. Photo from the author (2024).

5. Qualitative Interviews and Product Test

The prototype test took place in July 2024 and involved a small but diverse group of participants, including Master of Fine Arts students, graphic designers, Master and Bachelor of Graphic Design students, ceramic artists, educators, type designers, professors from relevant fields in graphic design and ceramics, as well as bilingual designers who engaged with the project. Participants will be referred to in sequential order of conducting the experiment. Participants involved are referred to as follows:

Name	Profession	Native Language	Second Language	Third Language
Participant 1	Bachelors' student of Graphic Design taking an elective in ceramics	Portuguese	English	NA
Participant 2	Ceramic and Glass Technology Teacher	Turkish	English	NA
Participant 3	Professor of Graphic Design	Portuguese	English	NA
Participant 4	Masters' student of Graphic Design 2nd Year	Arabic (Egyptian)	English	NA
Participant 5	Professor of Graphic Design and Typography	Portuguese	English	NA
Participant 6	PhD student of ceramics and ceramic studio technician	Portuguese	English	NA
Participant 7	Masters' student of Graphic Design 2nd Year	Bulgarian	English	Japanese
Participant 8	Masters' student of Graphic Design 2nd Year	Portuguese	English	NA
Participant 9	Masters' student of Graphic Design 2nd Year	Portuguese	English	NA
Participant 10	Masters' student of Graphic Design 1st Year	Portuguese	English	NA

Participants were seated at a large table with 15 replicas of 28 shapes organized into groups. Starting from the left of the participant, the angular shapes with pointed edges are stacked and moving across the table, shapes become more rounded and organic. Some of the groups of shapes are arranged to be less imaginative without displaying any pattern. While other piles of shapes are placed alluding to possible patterns constructed with the same shape. This approach was intentional to anticipate the overwhelming effect many shapes can present. The theory was by showing just a few pattern possibilities, it can be helpful as an ice breaker to piece selection.

Another ice breaker presented was to allow the participant to prompt free play and make designs or patterns that came naturally to them. This technique presented the opportunity to become familiar with the pieces, determine which shapes they were drawn to and to develop a relationship with the product. From this experience, they can develop a preference for texture, color, size, and shape availability. Once the participant has shared their design, they are prompted to spell the word “home”. Letter case is not specified to encourage possibilities of letter form creativity. The word home connects with the significance of terra cotta and natural clay from the earth and ancient traditional ceramics. From a typographic point of view, home in the uppercase and lowercase presents an option letters with curves and vertical stems. For the participants who speak other languages, they were prompted to spell home in their first, second, and/or third language. The prompt was to determine if the modular type can be applied to a variety of alphabets.

The exercise was conducted individually to allow participants to explore the shapes freely without being influenced by the combinations created by others. The first prompt instructed participants to engage in unstructured play with the pieces, encouraging them to generate designs or patterns organically. This unstructured exploration allowed participants to become familiar with the pieces, their interactions, and potential combinations. This process also served as an icebreaker, facilitating conversation and increasing participants’ comfort with both the discussion and the overall process.

Questions were structured according to the timing and progress of the exercise. The sequence of questions corresponded to the participant’s increasing familiarity with the pieces, ensuring that they could respond more effectively as they gained experience. As participants became more accustomed to the shapes, they were better equipped to answer specific questions regarding

their preferences for shapes, colors, and textures, as well as their potential applications in graphic design and typography.



Figure 80. Red clay tiles unglazed and arranged strategically for the prototype experiment. Photo from the author (2024).

Once participants designed a composition they were satisfied with and no longer felt the need to adjust or modify, they proceeded to the next prompt. They were instructed to spell the word “home”. This word was introduced by the second participant, who associated the terra cotta pieces with family and home. The selection of this word was relevant to the research because it included diverse shapes and posed challenges in achieving visual harmony, such as balancing the proportions of the letter (o) with (m) and analyzing the interaction between vertical stems, apertures, and curves. Uppercase and lowercase letters were not specified, allowing participants some degree of decision-making within the constraints established by the researcher.

The primary objective of the workshop was to develop a deeper understanding of how individuals interact with shapes to communicate. Additionally, the workshop aimed to observe the extent to which participants engaged playfully with the provided shapes. Through this interaction, participants demonstrated an understanding of the fundamental components of letterforms. Lastly, the research sought to determine whether engaging with these shapes fostered a stronger connection to letterforms and improved comprehension of basic typographic principles.

1. When was the last time you made time for play?
Doing an exercise with creative freedom?
2. Do you get to play in your work?
3. Are you feeling about the number of pieces?
4. Do you incorporate play into your graphic design practice?
5. Could you see this used for graphic design?
6. Have you designed a typeface before? Are you familiar with typographic systems?
7. Why do you like working with the pieces?
8. Do you like the texture of the clay pieces?
9. How do you feel about graphic design as an art?
10. How do you feel about the shapes?
11. Do you have a favorite shape or color?
Do you like the terra cotta? Why?
12. Have you taken a course in pattern design?
13. Have you seen something like this?
14. Is there something you think could improve?
15. Could you see yourself using this set
for your design practice?
16. Do you find this as a useful tool for type design? Or learning about letterforms?
17. Overall feelings about the experience?
18. Overall observations/conclusions field notes:

Participant (1) played the role in determining which word to use for the prompt as well as the structure in the interview. The participant's primary language is Portuguese with English being their second language. At first the participant was reserved and quite but as they worked with the pieces with a prompt, they became more relaxed and talked more freely. The questions helped inspire conversation

and the semi-structured interview allowed interviewer and interviewee dive deeper into responses and core thoughts about the project and practice. The first word prompted was the word “hey” a casual word and short enough not to overwhelm the participant. Below are the results of the first prompt of creating a design of any kind for fun. The second was to spell out “hey” however they saw fit.



Figure 81. Participant (1): Kristóf Martins designs and typography with terra cotta tiles. Photo from the author (2024).



The outcome of the study represented an innovative approach to type design, expanding the boundaries of legibility and unconventional letterforms. Participant (1), despite having a strong understanding of typographic principles, chose to disregard these conventions, producing chaotic letterforms that deliberately deviated from established typographic norms. In contrast, participant (2), who had no formal training in graphic or type design, successfully developed a coherent typographic system. Initially using shapes (3), (6), (15), (18), and (26), participant (2) later removed shape (26) and redesigned the letter (e) to align with the structural approach established for (H). They demonstrated proficiency in generating patterns and explored multiple strategies for constructing typographic systems. Additionally, participant (2) integrated Turkish diacritics into their designs, ensuring that the Turkish characters were fully compatible with the provided set of shapes.



Figure 82. Participant (2): Canan Salman designs and typography and Turkish diacritics with terra cotta tiles. Photo from the author (2024).

Like participant (1), participant (3) has a background in graphic design and typography, which informed their approach to the project. Like participant (1), they sought to challenge the conventional boundaries of legibility and typographic norms. However, Participant (3)'s approach was notably personal, as they chose to design letterforms connected to a business, they had previously operated. Without external suggestion, they selected the word "Rigor" as the basis for their design. This choice reflects both a creative engagement with the task and a unique, self-directed exploration of letterform design. Their approach demonstrated a distortion of typography, integrating personal meaning while pushing the limits of conventional legibility and design aesthetics.



Figure 83. Participant (3): Luísa Barreto designs and typography with terra cotta tiles. Photo from the author (2024).



Participant (4), who also possessed a background in graphic design, began the process by spelling out words during an initial ice-breaker exercise. This spontaneous activity led to the unprompted creation of the phrase “tax the rich,” incorporating a dollar symbol in a striking and unconventional manner. Their approach to the Latin alphabet was marked by a deliberate disregard for traditional typographic rules, reflecting a more *avant-garde* style. In contrast, their treatment of Arabic (Egyptian) adhered more closely to established typographic conventions, suggesting a nuanced understanding of cultural and linguistic distinctions in design.

Despite the unconventional nature of their Latin-based work, participant (4)’s use of the provided shapes allowed Arabic-speaking designers to explore typographic expression within the design system’s constraints. This facilitated creative exploration while maintaining legibility and respecting typographic norms specific to Arabic (Egyptian). Their dual approach highlights the participant’s versatility in navigating both rigid or flexible design frameworks, depending on linguistic and cultural context.

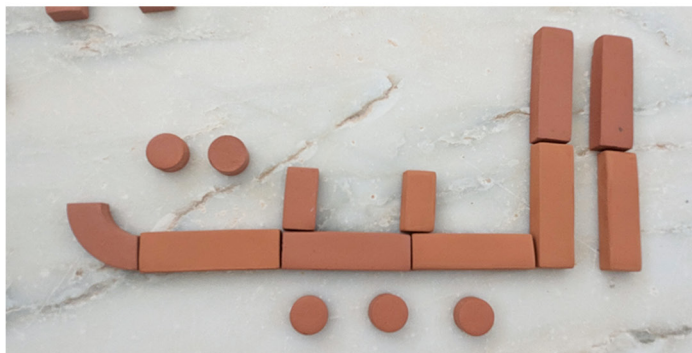


Figure 84. Participant (4): Sohaila Elmoatzebella Ahmed Hamed Mansour designs and typography with Arabic (Egyptian) with terra cotta tiles. Photo from the author (2024).

Participant (5), who possessed the most extensive experience in typography and lettering design among the group, demonstrated a high level of proficiency in developing a functional and aesthetically compelling typographic system. Despite their expertise, they initially encountered challenges in creating a complete set of both uppercase and lowercase letters using only shape (24). The limitation of relying solely on a single shape presented issues with maintaining correct proportions across the letterforms, underscoring the complexity of the design task.



However, by strategically incorporating additional shapes to address proportional challenges, participant (5) was able to refine their typographic system. This adaptation not only resolved the technical difficulties but also resulted in a design that was both functional, meeting practical legibility requirements, and visually compelling. Their process reflects a strong understanding of typographic principles and an ability to apply creative problem-solving strategies. This outcome illustrates how design constraints can foster innovative solutions when approached with skill and adaptability.

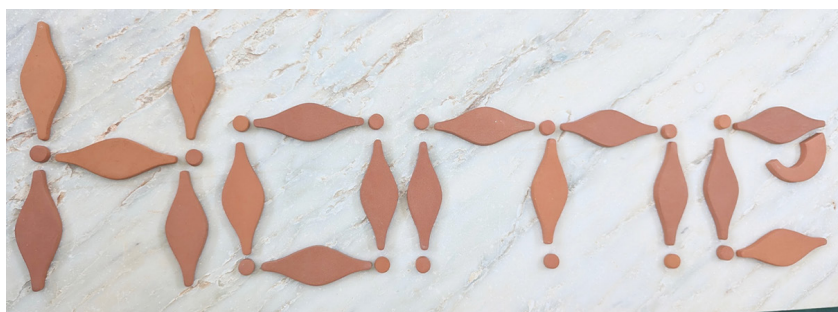


Figure 85. Participant (5): Ricardo Santos typography with terra cotta tiles. Photo from the author (2024).



Participant (6), a ceramic artist with no formal background in graphic design or typography, approached the task with a novel and unconventional perspective. Drawing on their artistic experience, they created intricate and symmetrical patterns that were visually compelling. Despite the absence of formal training in typographic design, their letterforms demonstrated a deliberate and creative integration of design elements, resulting in compositions that were both legible and distinctive.

Their approach was characterized by a balance between complexity and clarity, producing letterforms that, while unique to their personal style, maintained sufficient legibility. This demonstrates the participant's ability to translate their skills from ceramic artistry into the realm of typography, highlighting an intuitive understanding of pattern, form, and composition that transcended disciplinary boundaries. The intricate nature of their designs reflected their artistic background and introduced a novel aesthetic to the typographic system.

Figure 86. Participant (6): Rita Frutuoso designs and typography with terra cotta tiles. Photo from the author (2024).



Participant (7), an illustrator with a background in graphic design and proficiency in three languages, including Bulgarian as their native language, English, and Japanese, demonstrated a strong ability to compose letterforms across multiple writing systems. They successfully designed Cyrillic letterforms by drawing on their proficiency in Bulgarian and developed Katakana characters in Japanese. However, they encountered greater difficulty in replicating Hiragana characters due to the script's more organic and curvilinear nature.

Through their exploration, participant (7) observed that accurately representing Hiragana would require a modular or mosaic approach, breaking down curves into simpler geometric forms. They further noted that this limitation of the shape-based system would likely extend to other scripts with complex structures, such as Devanāgarī (India), which would also present challenges unless similarly deconstructed into smaller, modular components. This insight reflects the participant's deep understanding of the structural differences across writing systems and their ability to adapt design techniques accordingly.

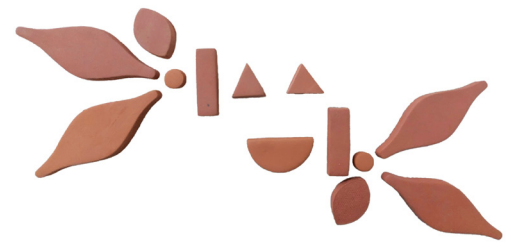


Figure 87. Participant (7): Dimana Tomova designs and typography with Cyrillic and Japanese characters made with terra cotta tiles. Photo from the author (2024).



Participant (8) was the first to experiment with stacking shapes and exploring their dimensionality, bringing an innovative approach to the design process. During the initial ice-breaker exercise, they created a creature design inspired by a fusion of a cow and a tiger, showcasing their creativity and willingness to push the boundaries of the provided shapes.

As a native speaker of Portuguese, participant (8) successfully incorporated Portuguese diacritics into their letterform designs, ensuring linguistic accuracy and functionality within their typographic system. Additionally, they demonstrated an aptitude for developing letterforms that could be effectively applied to logo design, highlighting their versatility in adapting typographic elements to both expressive and commercial contexts. Their exploration of shape stacking and dimensionality not only enriched the visual complexity of their work but also introduced new possibilities for the application of letterforms in branding and identity design.



Figure 88. Participant (8): Pedro Cardoso designs and typography with terra cotta tiles. Photo from the author (2024).

Participant (9) explored the potential of stacking the provided shapes to construct designs, demonstrating an alternative method of using the shapes as modular building blocks. Their creation of a small structure was both impressive and highly creative, showcasing their ability to think beyond conventional approaches. Following this initial ice-breaker exercise, participant (9) applied a similarly innovative approach to the design of letterforms. Instead of constructing the letters directly, they opted to use the shapes to outline the letterforms by utilizing negative space, allowing the letters to emerge through the absence of form.

This unexpected technique, which the researcher had not anticipated or considered feasible, introduced a novel perspective on the potential of the provided shapes in typographic design. By leveraging negative space, participant (9) expanded the possibilities of the design system, offering a unique and creative method of letterform construction that challenged traditional approaches to modular typography. This contribution highlights the participant's ingenuity and ability to rethink the structural possibilities of the shapes.





Figure 89. Participant (9): Francisco Seco designs and typography with Portuguese diacritics made with terra cotta tiles. Photo from the author (2024).

Participant (10), a first-year master's student in graphic design, demonstrated considerable skill in developing intricate and original letterforms. Initially expressing dissatisfaction with the unglazed shapes provided, they were given the opportunity to incorporate glazed shapes into their design process. This adjustment enabled them to explore a broader range of aesthetic possibilities.

Their approach to letterform creation challenges conventional notions of legibility, focusing instead on the potential for creating decorative and display typefaces. This innovative methodology highlights their capacity to push the boundaries of traditional typographic design and suggests significant potential for developing visually striking typefaces intended for specific, non-standard applications.

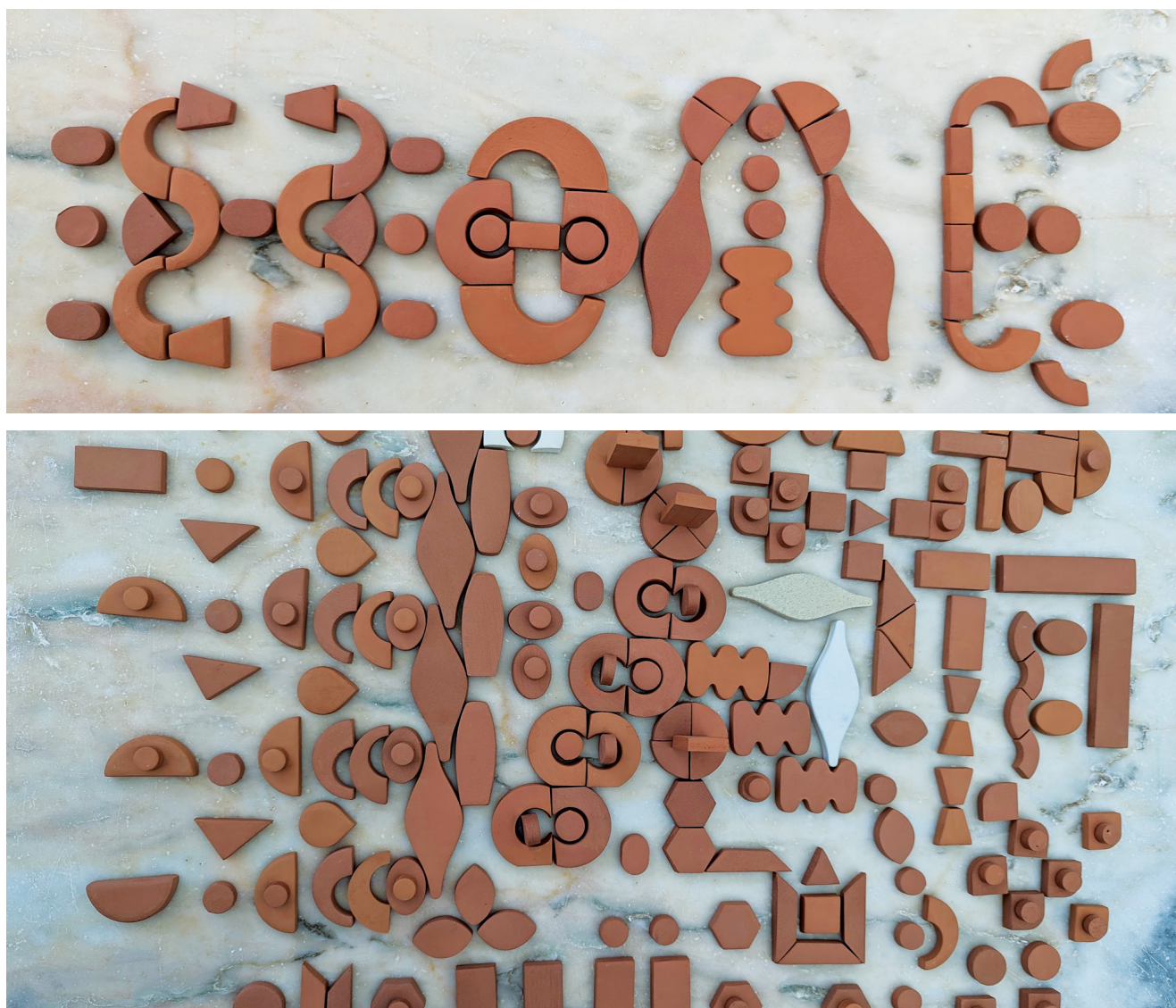


Figure 90. Participant (10): Joana Correia designs and typography with terra cotta tiles. Photo from the author (2024).

The final results for the word home are as follows:



Figure 91. Home. Compilation of participants type design outcomes. Photo from the author (2024).

6. Data Analysis

The prototype experiment involving modular clay geometric tiles proved highly successful in fostering creativity within the fields of graphic and type design. Participants who engaged in the testing of the prototype consistently expressed their enjoyment in working with the product, highlighting its value as a tool for design exploration. The hands-on, tactile nature of the exercise provided an opportunity for participants to step away from the computer screen, enabling them to approach the design process from a more playful and productive perspective. This break from digital design not only sparked creativity but also offered a refreshing shift in their workflow.

Participants also noted the potential applicability of the modular clay tiles within a professional design studio setting. They envisioned spending considerable time experimenting with various combinations, emphasizing the tool's ability to facilitate creative exploration. While the initial number of tile options seemed overwhelming, participants found that once they began combining the shapes, the abundance of options became an asset, encouraging them to push the boundaries of their designs further. This iterative process allowed for the generation of increasingly complex and refined compositions, fostering innovation and deeper engagement with the design possibilities.

Observing the interactions and outcomes participants had with the designs, some shapes were deemed problematic and disruptive. Specifically, shapes (2) and (25) were omitted from the final set due to their disproportionate size and form in relation to the other shapes. These organic shapes presented challenges, as their contrast and height did not align harmoniously with the more geometric elements of the set. To successfully integrate organic forms into the system, it is essential that they adhere to standardized proportions, such as widths of 1.5 cm or 2.5 cm, and lengths of 2.5 cm or 1.25 cm. This ensures a cohesive visual balance among all the shapes in the set, enabling designers to seamlessly combine different elements while maintaining consistency in form and scale.

Furthermore, shapes (3, 3b, 20, 21), and (23) require revisions due to their unequal proportions, which disrupt the overall unity of the set. In particular, the narrow tail of shape (3) should be adjusted to align with the width of shape 6, which measures approximately 1.5 cm, as well as with the width of shape (19), which has a width of 2.5 cm. This refinement is critical to ensuring that the shapes can be used interchangeably within the system without causing visual imbalance or design complications.

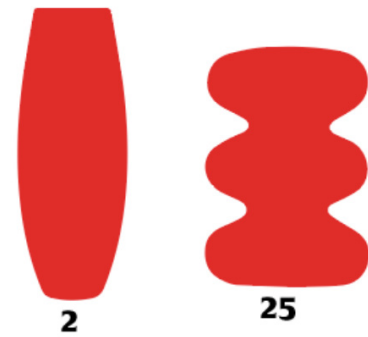


Figure 92. Organic shapes to be omitted from final set of pieces. Photo from the author (2024).

By refining these shapes and ensuring proportional consistency, the tool will allow for greater flexibility and creative exploration while maintaining structural coherence. The research underscores

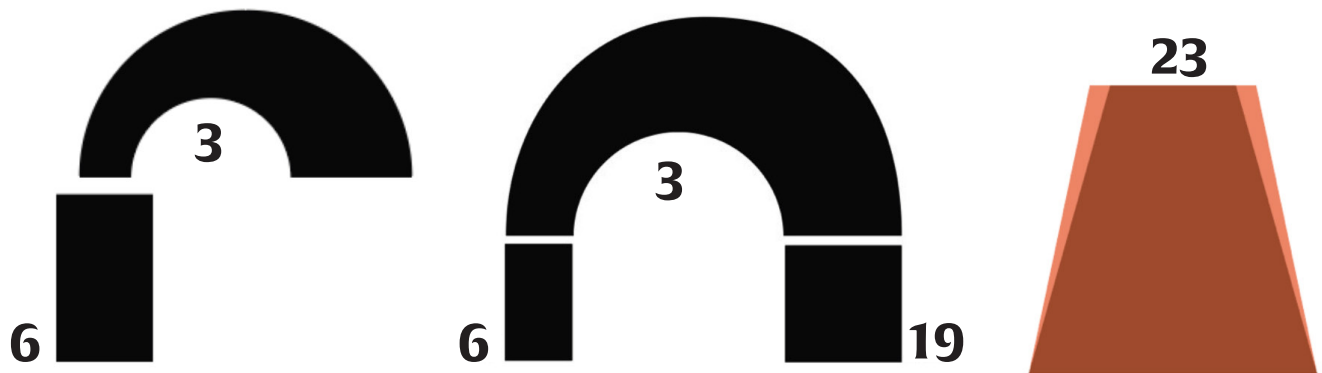


Figure 93. Suggested alterations to shapes for a more cohesive and harmonious combination. Photo from the author (2024).

the importance of balancing creativity with functional design constraints and highlights how analog tools can reinvigorate traditional design practices, providing a fresh perspective in a field increasingly dominated by digital technologies. Ultimately, this tool serves as both a practical and conceptual contribution, encouraging designers to revisit analog methodologies and explore new possibilities for typographic form-making.

Beyond its practical application in graphic and type design, the experiment revealed unexpected benefits related to communication and interaction. Participants reported that the tactile and non-verbal nature of the exercise allowed them to communicate more freely without the need for eye contact. This unexpected outcome suggests that the prototype may have potential therapeutic applications, enabling participants to express themselves in new ways. The exercise's capacity to facilitate non-verbal communication opens possibilities for its use not only as a design tool but also as a therapeutic resource for psychologists and educators, particularly in settings where traditional verbal communication may be challenging.

The modular clay tile prototype has demonstrated its effectiveness as a tool for enhancing the creative process in both graphic design and type design. It promotes a hands-on, exploratory approach that encourages playfulness, innovation, while offering additional potential as a therapeutic and educational tool. The positive response from participants underscores its value as a multi-faceted resource that bridges the gap between digital and physical design practices.

7. Project Results

In the future, the proposed tool named *terra type* could be marketed through an e-commerce platform, offering designers the option to purchase a full set of prefabricated shapes, with customization options for glazes, clay types, or unglazed alternatives. Alternatively, designers could select shapes individually “à la carte,” providing flexibility in quantity and customization while minimizing shipping weight. This modular approach would appeal to designers and studios seeking creative flexibility, while also serving as a resource for educational institutions such as universities, where it could be utilized in design programs to expand students’ creative processes. For mock-up purposes, the project has been named “terra type” as a play-on-words for terra cotta, modular type, and its similarity to the game *Tetris*. The mock-up logo consists of three shapes evoking the letter (T) but also represent building blocks. In the mock-up photo of boxes presented, a mixture of earthen colors such as terra cotta and porcelain are included in the brand’s color palette. An option for a random set of shapes and colors for a creative challenge could also be available.

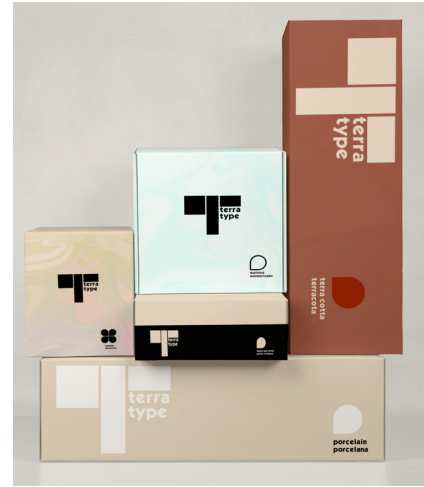


Figure 94. Mock-up of boxes containing project with branding of project terra type. Boxes contain information like clay and glazes. Photo from the author (2024).

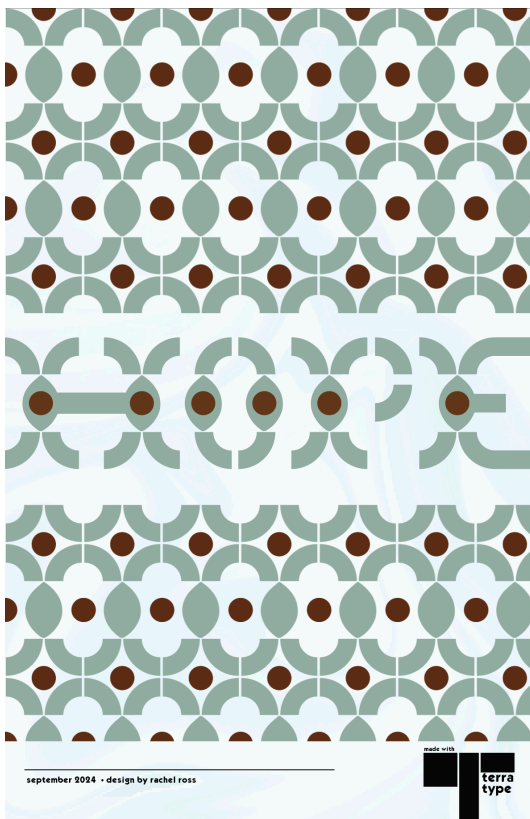


Figure 95. “HOPE” poster displaying a digitized version of tile composition. Photo from the author (2024).



Figure 96. Developing typographic systems poster. Photo from the author (2024).

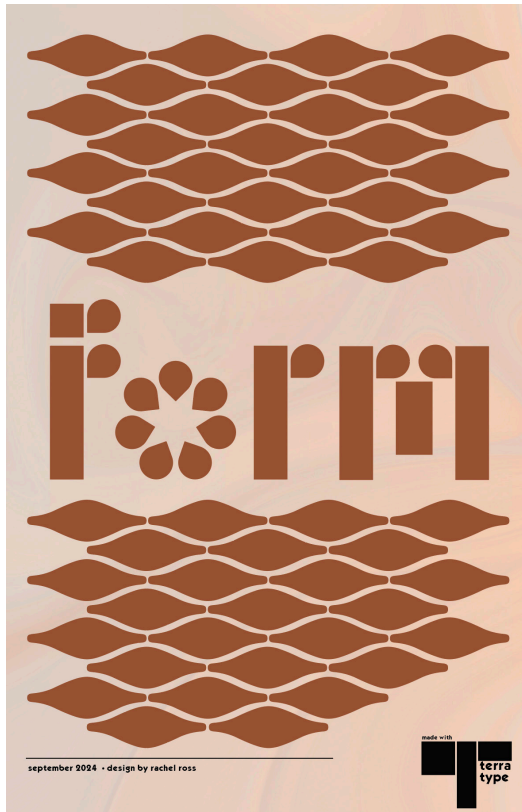


Figure 97. "Form" poster displaying a digitized version of tile composition. Photo from the author (2024).

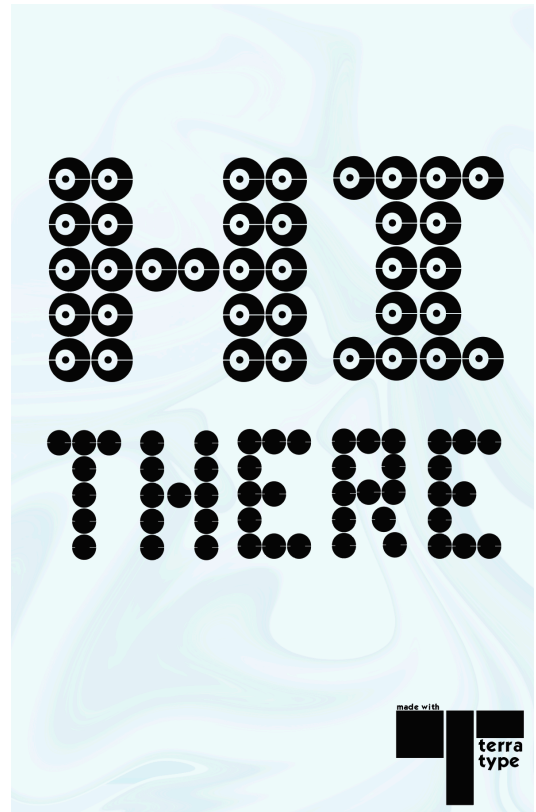


Figure 98. "Hi there" modular typography designed and inspired by tile shapes. Photo from the author (2024).

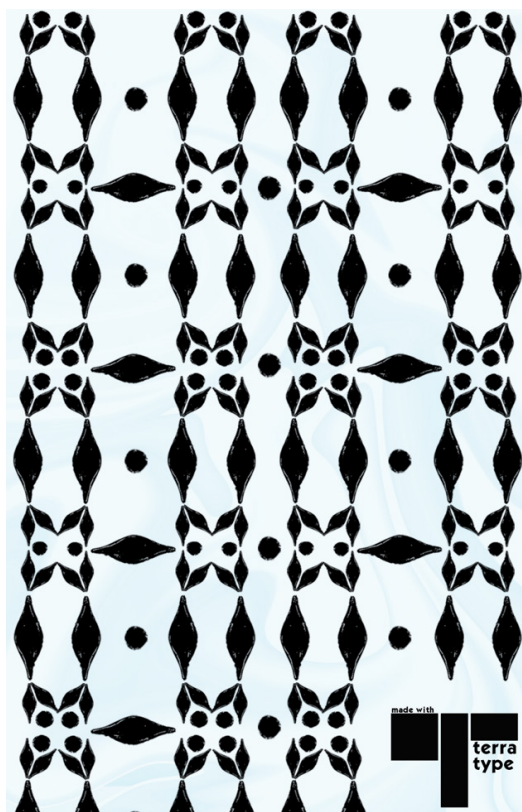


Figure 99. Relief pattern made from applying ink to glazed shapes and printing them on paper. Prints have been digitized and shapes isolated to create a pattern with inky texture. Photo from the author (2024).



Figure 100. Relief pattern made from applying ink to glazed shapes and printing them on paper. Prints have been digitized and shapes isolated to create a pattern with inky texture. Photo from the author (2024).



Figure 101. Photograph of tiles used as a background showing black shapes as the final and old shapes in the background. Composition photographed then digitized preserving natural textures and pencil lines to show process. Photo from the author (2024).



Figure 102. "K" Relief print technique using glazed tiles with ink pressed on paper. Digitized and edited in photoshop. Photo from the author (2024).

8. Conclusions

This research set out to explore the intersection of typography and ceramics, prompted by the innovative work of Laura Hilbert and Sarah Stendel. Their method of screen-printing on clay—where the wet slab’s plasticity allowed the printed design to indent the surface and create depth and texture—raised the intriguing main question: Can ceramics be a useful analog approach to graphic design and type design practices?

The initial phase of the study involved an extensive review of existing literature and case studies, revealing that while substantial resources exist for both ceramics and typography independently, few works have bridged the gap between these disciplines. This gap motivated a comprehensive investigation into ceramic techniques that could potentially enrich typographic design. Under the guidance of ceramic professionals and through hands-on experimentation, various methods were evaluated. The research demonstrated that digital tools and traditional ceramic practices could operate in tandem, with the interplay between both approaches significantly influencing the final project outcomes. After exploring the various ceramic practice methods, one stood out more than the rest. The creation of tiles presented many possibilities including combining the concepts of zellige tiles and mosaics to construct letterforms. Tiles presented the opportunity to break down letterforms into small shapes. When combined, the small shapes can construct more complex letterforms. An additional useful aspect of tiles is the tactile and playful qualities provided to users. The end result of tiles can be used by those without ceramic experience as well as a reusable tool. This led to the second research question: how can ceramics be used as tools for modular typeface designs?

A focal point of the study transitioned to the exploration of tile-based techniques. Organic, hand-sculpted forms initially provided an avenue for experimentation; however, the transition to a modular typeface system necessitated a more systematic approach. By deconstructing the anatomy of Latin letters into basic shapes using Adobe Illustrator, the study identified a method to combine digital design with ceramic expression. The use of paper prototypes emerged as a critical step, allowing for rapid testing of size, proportion, and form, thus mitigating the time constraints imposed by working directly with clay.

Constraints such as limited ceramic proficiency and the time-intensive nature of traditional sculpting led to the integration of 3D printing. The use of plastic cutouts to perforate clay slabs resulted in more precise and consistent shapes, despite challenges related to printing duration and the clay’s adherence to the printed forms. Iterative refinements, including the design of additional 3D printed tools to facilitate

clay release, underscored the potential for future enhancements, such as optimizing rounded versus angular shapes to ease material handling.

Material selection further aligned with the study's objectives. Terra cotta was chosen to evoke the ancient traditions of ceramics and a connection with the earth, while the warm color and unglazed textures were selected to foster approachability and durability. These aesthetic decisions were subsequently evaluated through semi-structured interviews with professionals and students. The participant's responses, ranging from excitement to initial overwhelm, suggested that the tactile and interactive nature of the ceramic pieces encouraged creative expression and dialogue. Notably, the product also hinted at interdisciplinary applications, with potential benefits in therapeutic contexts by providing a non-invasive means of communication.

The findings indicate that while the integration of ceramics into typography holds considerable promise, especially as a tool for graphic design, further exploration is required to fully realize its potential in type design. Future research should address the tactile sensitivities of diverse user groups, explore a broader range of glaze textures and color pairings, and continue refining the digital-analog hybrid approach. Additionally, collaborative efforts among graphic designers, type designers, and ceramic artists are essential to overcome technical challenges and harness the full spectrum of creative possibilities inherent in this interdisciplinary approach.

Although the physical prototype is not yet fully refined, it demonstrates potential as a practical and inspiring tool for digital designers seeking a break from the screen to explore more hands-on methods of creation. Future developments for this product could include the creation of instructional materials, such as books containing exercises and design challenges, along with accompanying tabletop mats for enhanced color contrast. The tool could also be expanded to include relief tiles that can be glazed and used as stamps or for creating prints, further enriching the analog design process. Another option would be allowing ceramic studios and individuals to purchase the 3D printed cutouts and use them for typographic solutions for mosaics, signage, vessels, and more.

Moreover, the tool proves effective in creating physical mock-ups of typographic designs, which can be refined in a digital environment. The project illustrates how physical prototypes not only serve as a foundation for exploring form and composition in a tangible medium but also act as a bridge to digital platforms, expanding the possibilities for typographic design. By

leveraging both physical and digital methodologies, designers can experiment with a broader range of creative outcomes, enhancing the flexibility and versatility of the design process.

Overall, the investigation has expanded the dialogue between two traditionally separate disciplines and has also provided a practical framework for incorporating ceramics into contemporary design practices. By demonstrating that ceramics can contribute meaningfully to graphic and typographic design, this research lays the groundwork for future innovations that embrace both the material and digital realms.

9. References

- Merriam-Webster. (n.d.). (2024, September 7). *Ball clay*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/ball%20clay>
- American Psychological Association. (2018, April 19). *cross-modal association*. Retrieved from American Psychological Association: <https://dictionary.apa.org/cross-modal-association>
- Merriam-Webster. (n.d.). (2024, September 7). *Cuneiform*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/cuneiform>
- Merriam-Webster. (n.d.). (2024, September 7). *Cylinder seal*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/cylinder%20seal>
- Merriam-Webster. (n.d.). (2024, September 7). *Earthenware*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/earthenware>
- Merriam-Webster. (2024, September 7). *Frit*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/frit>
- Merriam-Webster. (2024, September 7). *Geometric*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/geometric>
- Glendale Community College. (2024, September 7). *Glaze Composition*. Retrieved from Glendale Community College: <https://www.glendale.edu/academics/academic-divisions/visual-performing-arts-division/ceramics/study-guides/glaze-composition>
- Merriam-Webster. (n.d.). (2024, September 7). *Monogram*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/monogram>
- Elnaz Sadat Mirdamadi, M. H.-H. (2021). 10 - Metal oxide-based ceramics. In M. H.-H. Elnaz Sadat Mirdamadi, *Structural Biomaterials* (pp. 301-331). Woodhead Publishing.
- (n.d.), Merriam-Webster. (2024, September 7). *Porcelain*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/porcelain>
- Merriam-Webster. (n.d.). (2024, September 7). *Silk screen*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/silk-screening>
- Merriam-Webster. (2024, June 16). *stencil*. Retrieved from Merriam Webster Dictionary: <https://www.merriam-webster.com/dictionary/stencil>
- Merriam-Webster. (n.d.). (2024, September 7). *Stoneware*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/stoneware>
- Merriam-Webster. (n.d.). (2024, September 2024). *Sgraffito*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/sgraffito>
- Aicher, O. (1991). *Die Welt Als Entwurf*. Berlin: ernst & sohn.
- Schofield, J. (2011, October 5). *Steve Jobs obituary*. Retrieved from The Guardian: <https://www.theguardian.com/technology/2011/oct/06/steve-jobs-obituary>
- Clayton, E. (2013). *The Golden Thread: The Story of Writing*. Berkeley: Counterpoint Press.
- Tomas, H. (2013). Saving on Clay: The Linear B practice of cutting tablets. In K. E. Piquette, *Writing as Material Practice: Substance, surface and medium*. (pp.

- 175-191). London: Ubiquity Press.
- Bagnall, R. S. (2020). *Reading Papyri, Writing Ancient History: Second Edition*. New York: Routledge.
- Mieroop, M. V. (1999). *Cuneiform Texts and the Writing of History*. London: Routledge.
- Brian A. Brown, M. H. (2014). *Critical Approaches to Ancient Near Eastern Art*. Boston/Berlin: Walter de Gruyter Inc.
- Sebesanu, K. C. (2017, August 7). *Storytelling and Ceramics: Greeks vs. Amazons*. Retrieved from The MET: <https://www.metmuseum.org/articles/greeks-vs-amazons>
- University of Oxford. (2024, August 7). *Inscriptions*. Retrieved from Classical Art Research Centre: <https://www.carc.ox.ac.uk/carc/resources/Introduction-to-Greek-Pottery/Inscriptions/Introduction>
- Al-Hissan, S. A.-G.-k. (2022). Discovery of the Oldest Church of the World. *Architectural Science Review*, 45(4), 295–297.
- Hochschule für Gestaltung Karlsruhe. (n.d.). *History of HfG Karlsruhe: A short history of Karlsruhe University of Arts and Design*. Retrieved 2025, from <https://hfg-karlsruhe.de/en/hochschule/geschichte/>
- House Industries. (n.d.). *About*. Retrieved from House Industries: <https://hello.houseind.com/about/>
- WIM CROUWEL (1928-2019). (2019, September 20). Retrieved from Stedelijk: <https://www.stedelijk.nl/en/news/wim-crouwel-1928-2019-2#:~:text=Following%20the%20example%20of%20Swiss,an%20attitude%20he%20robustly%20upholds.>
- Bringhurst, R. (2016). *The Elements of Typographic Style*. Seattle and Vancouver: Hartley & Marks Publishers.
- Dawson, P. (2014). *The Field Guide to Typography: Typefaces in the Urban Landscape*. London: Thames & Hudson Ltd.
- Lupton, E. (2014). *Thinking with Type*. New York: Princeton Architectural Press.
- Strals, B. W. (2009). *Lettering & Type*. New York: Princeton Architectural Press.
- Luc Devroye. (2024, August 15). *Josef Albers*. Retrieved from Luc Devroye: <https://luc.devroye.org/fonts-32493.html>
- Ward, C. and Petridou, C. (2021, November 2). *'brik font' by craig ward is an intricate typography series made of LEGO bricks*. Retrieved from designboom: <https://www.designboom.com/art/brik-font-craig-ward-typography-series-lego-bricks-11-02-2021/>
- Hoadley, T. (2024). *NERIKOMI: The Art of Colored Clay*. London: Herbert Press.
- Rahill, F. (2024, April 12). *Creating Nerikomi Blocks: Decorating with Colored Clay Patterns*. Retrieved from Ceramic Arts Network Daily: [https://ceramicarts-network.org/daily/article/Creating-Nerikomi-Blocks-Decorating-with-Colored-Clay-Patterns#:~:text=Nerikomi%20\(often%20referred%20to%20as,used%20as%20an%20applied%20decoration.](https://ceramicarts-network.org/daily/article/Creating-Nerikomi-Blocks-Decorating-with-Colored-Clay-Patterns#:~:text=Nerikomi%20(often%20referred%20to%20as,used%20as%20an%20applied%20decoration.)
- Marcelo Dal Bó, A. M. (2014). Formulation of ceramic engobes with recycled glass using mixture design. *Journal of Cleaner Production*, 243-249.
- Merriam-Webster. (n.d.). (2024, September 7). *Stencil*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/stencil>
- Highsmith, C. (2024, June 8). Thinking with Your Hands Workshop. *Thinking with Your Hands*.
- Bucher, F. (1961). *Josef Albers: despite straight lines : an analysis of his graphic constructions*. New Haven: Yale University Press.

10. Bibliography

- (n.d.), Merriam-Webster. (2024, September 7). *Porcelain*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/porcelain>
- Aicher, O. (1991). *Die Welt Als Entwurf*. Berlin: ernst & sohn.
- Aicher, O. (2015). *The World as Design*. Berlin: Ernst & Sohn.
- Al-Hissan, S. A.-G.-k. (2022). Discovery of the Oldest Church of the World. *Architectural Science Review*, 45(4), 295–297.
- American Psychological Association. (2018, April 19). *cross-modal association*. Retrieved from American Psychological Association: <https://dictionary.apa.org/cross-modal-association>
- Anderson, S. H. (2021). *Type Speaks*. New York: ABRAMS.
- Art Institute of Chicago. (2022, May 24). *Clay, color, and fire: The art of maiolica*. <https://www.artic.edu/articles/983/clay-color-and-fire-the-art-of-maiolica>
- Bagnall, R. S. (2020). *Reading Papyri, Writing Ancient History: Second Edition*. Abingdon, Oxon: Routledge.
- Bagnall, R. S. (2020). *Reading Papyri, Writing Ancient History: Second Edition*. New York: Routledge.
- Brian A. Brown, M. H. (2014). *Critical Approaches to Ancient Near Eastern Art*. Boston/Berlin: Walter de Gruyter Inc.
- Bringhurst, R. (2016). *The Elements of Typographic Style*. Seattle and Vancouver: Hartley & Marks Publishers.
- Bucher, F. (1961). *Josef Albers: despite straight lines : an analysis of his graphic constructions*. New Haven: Yale University Press.
- Cambridge University Press. (2024, August 6). *ceramics*. Retrieved from Cambridge Dictionary: <https://dictionary.cambridge.org/us/dictionary/english/ceramics>
- Carter, R., Day, B., & Meggs, P. B. (2015). *Typographic design: Form and communication*. Wiley.
- Castanheira, I. (2014). *As Caldas de Bordalo*. Lisbon: Arranha Céus.
- Cemento. (2024). *Moroccan Zellige Porto Mosaic Tile*. Retrieved from Cemento: https://www.cementocollection.com/products/moroccan-zellige-porto-mosaic-tile?variant=45734654738667¤cy=USD&utm_medium=product_sync&utm_source=google&utm_content=sag_organic&utm_campaign=sag_organic&gad_source=1&gclid=Cj0KCQjwjNS3BhCHARIsAOxBM6rYXhj
- Charles Spence, D. S. (2009). *Crossmodal processing*. Springer.
- Clayton, E. (2013). *The Golden Thread: The Story of Writing*. Berkeley: Counterpoint Press.
- Coles, S. (2012). *The Anatomy of Type*. New York: Harper Design.
- Collection, K. M. (n.d.). *Library of Congress*. Retrieved from Image 1 of Cuneiform tablet no. 27 Cuneiform tablet no. 27: https://www.loc.gov/resource/amed-scd.2020741396_cf0027/?sp=1&r=-0.679,-0.027,2.357,1.422,0
- Craig Ward and Christina Petridou. (2021, November 2). *'brik font' by craig ward is an intricate typography series made of LEGO bricks*. Retrieved from designboom: <https://www.designboom.com/art/brik-font-craig-ward-typography-series-lego-bricks-11-02-2021/>
- Dawson, A. (2014). *Wim Crouwel: Modernist master*. Unit Editions.
- Dawson, P. (2014). *The Field Guide to Typography: Typefaces in the Urban Landscape*. London: Thames & Hudson Ltd.
- Ebert, G. (2022, January 7). *Typeface Studies by Designer Craig Ward Recreate Fonts and Iconic Logos in LEGO*. Retrieved from Colossal: <https://www.thisiscolossal.com/2022/01/craig-ward-lego-typeface/>

- Egypt Museum. (2024). *Learn Egyptian Hieroglyphs*. Retrieved from Egypt Museum: <https://egypt-museum.com/learn-egyptian-hieroglyphs/>
- Elnaz Sadat Mirdamadi, M. H.-H. (2021). 10 - Metal oxide-based ceramics. In M. H.-H. Elnaz Sadat Mirdamadi, *Structural Biomaterials* (pp. 301-331). Woodhead Publishing.
- Farmer, R. G. (2017). *Mid-Century Modern Tiles*. Gloucestershire: Amberley Publishing.
- Friedl, F., Ott, N., & Stein, B. (2013). *Typography: When, who, how*. Könemann.
- Fuel, A. (2024). *About*. Retrieved from A/F: <https://www.addfuel.com/about/>
- Glendale Community College. (2024, September 7). *Glaze Composition*. Retrieved from Glendale Community College: <https://www.glendale.edu/academics/academic-divisions/visual-performing-arts-division/ceramics/study-guides/glaze-composition>
- Haslam, A. (2011). *Lettering: A Reference Manual of Techniques*. London: Laurence King Publishing Ltd.
- Hayes, L. (2018, May). *The Three P's: Papyrus, Parchment and Paper*. Retrieved from The University of Adelaide: <https://www.adelaide.edu.au/library/special/exhibitions/cover-to-cover/papyrus/#:~:text=Invented%20by%20the%20Egyptians%20in,delta%20of%20the%20River%20Nile>.
- Henriques, P. (n.d.). *A National Ceramics Factory*. Museu Bordalo Pinheiro. Retrieved June 14, 2025, from <https://museubordalopinheiro.pt/en/a-national-ceramics-factory/>
- Hoadley, T. (2024). *NERIKOMI: The Art of Colored Clay*. London: Herbert Press.
- Hochschule für Gestaltung Karlsruhe. (n.d.). *History of HfG Karlsruhe: A short history of Karlsruhe University of Arts and Design*. Retrieved 2025, from <https://hfg-karlsruhe.de/en/hochschule/geschichte/>
- House Industries. (n.d.). *About*. Retrieved from House Industries: <https://hello.houseind.com/about/>
- Hyndman, S. (2016). *Why Fonts Matter*. London: Penguin Random House UK.
- Jan's Glass by the Sea. (2024). *Mosaic Workshops*. Retrieved from Jan's Glass by the Sea: <https://www.jansglass.ca/jans-glass-academy/mosaic-workshops/>
- Jones, R. (2022, December 6). *Rémi Volclair's type designs are charged with an irresistible playfulness*. Retrieved from It's Nice That: <https://www.itsnicethat.com/articles/remi-volclair-discover-graphic-design-061222>
- Kinross, R. (2002). *Unjustified texts*. London: Hyphen Press.
- Kosloff, A. (1962). *Ceramic Screen Printing*. Cincinnati: The Signs of the Times Publishing Company.
- Lamb, B. N. (2022). *Cups as a Record of Humans: Material Culture Effects on Social Communication*. Dayton: Wright State University. <https://corescholar.libraries.wright.edu/humanities/21>
- Lee, T. (2014). *Re-materialization of Type*. Champaign: University of Illinois.
- Lemmen, H. v. (2013). *5000 Years of Tiles*. London: The British Museum Press.
- Livingston, A. L. (1998). *Dictionary of Graphic Design and Designers*. London: Thames and Hudson Ltd.
- Lobo, C., & Barreto, L. (2013, July 25). *Rewriting on the wall* [Conference presentation]. Well-being 2013 Conference: Second International Conference Exploring the Multi-dimensions of Well-being, Session "Sensory Engagement", Birmingham City University, Birmingham, UK.
- Luc Devroye. (2024, August 15). *Josef Albers*. Retrieved from Luc Devroye: <https://luc.devroye.org/fonts-32493.html>
- Lupton, E. (2014). *Thinking with type: A critical guide for designers, writers, editors, & students*. Princeton Architectural Press.
- Marcelo Dal Bó, A. M. (2014). Formulation of ceramic engobes with recycled glass

- using mixture design. *Journal of Cleaner Production*, 243-249.
- Marsh, L. (2022, December 19). *5:02 / 7:36 The History of Graphic Design Styles - Part 1 - Bauhaus and Art Nouveau*. Retrieved from YouTube: https://www.youtube.com/watch?v=BiKebTS_dy0
- McLauhan, M. (1962). *The Gutenberg Galaxy*. Toronto: University of Toronto Press.
- Merriam-Webster. (2024, September 7). *Frit*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/frit>
- Merriam-Webster. (2024, September 7). *Geometric*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/geometric>
- Merriam-Webster. (2024, June 16). *stencil*. Retrieved from Merriam Webster Dictionary: <https://www.merriam-webster.com/dictionary/stencil>
- Merriam-Webster. (n.d.). (2024, September 7). *Ball clay*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/ball%20clay>
- Merriam-Webster. (n.d.). (2024, September 7). *Cuneiform*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/cuneiform>
- Merriam-Webster. (n.d.). (2024, September 7). *Earthenware*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/earthenware>
- Merriam-Webster. (n.d.). (2024, September 7). *Monogram*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/monogram>
- Merriam-Webster. (n.d.). (2024, September 2024). *Sgraffito*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/sgraffito>
- Merriam-Webster. (n.d.). (2024, September 7). *Silk screen*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/silk-screening>
- Merriam-Webster. (n.d.). (2024, September 7). *Stencil*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/stencil>
- Merriam-Webster. (n.d.). (2024, September 7). *Stoneware*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/stoneware>
- Merriam-Webster. (n.d.). (2024, September 7). *Cylinder seal*. Retrieved from In Merriam-Webster.com dictionary: <https://www.merriam-webster.com/dictionary/cylinder%20seal>
- Mieroop, M. V. (1999). *Cuneiform Texts and the Writing of History*. London: Routledge.
- Miller, C. A. (1916). *How to Make Show Cards*. Boston: The Spatula Publishing Co.
- neurons and Monotype. (2024). *Typography Matters: How science can help you master the art of typeface selection*. neurons and Monotype.
- Oxford English Dictionary. (2023, July). *avant-garde (n.)*. Retrieved from Oxford English Dictionary: <https://doi.org/10.1093/OED/5795405960>.
- Oxford English Dictionary. (2023, July). *calligraphy (n.)*. Retrieved from Oxford English Dictionary: <https://doi.org/10.1093/OED/6091147057>.
- Oxford English Dictionary. (2023, July). *Ceramic*. Retrieved from Oxford English Dictionary: https://www.oed.com/dictionary/ceramic_adj?tab=fact-sheet#9720849

- Oxford English Dictionary. (2023, July). *ceramic (adj.)*. Retrieved from Oxford English Dictionary: <https://doi.org/10.1093/OED/3435550331>.
- Oxford English Dictionary. (2024, June). *3D printer (n.)*. Retrieved from Oxford English Dictionary: <https://doi.org/10.1093/OED/5369009110>.
- Palla, V. (2011). *Victor Palla: Dommunication Design*. Lisbon: Imprensa Nacional.
- Rahill, F. (2024, April 12). *Creating Nerikomi Blocks: Decorating with Colored Clay Patterns*. Retrieved from Ceramic Arts Network Daily: [https://ceramicartsnetwork.org/daily/article/Creating-Nerikomi-Blocks-Decorating-with-Colored-Clay-Patterns#:~:text=Nerikomi%20\(often%20referred%20to%20as,used%20as%20an%20applied%20decoration.](https://ceramicartsnetwork.org/daily/article/Creating-Nerikomi-Blocks-Decorating-with-Colored-Clay-Patterns#:~:text=Nerikomi%20(often%20referred%20to%20as,used%20as%20an%20applied%20decoration.)
- Schmandt-Besserat, D. (1981). Decipherment of the Earliest Tablets. *Science*, vol. 211, no. 4479, 283–285.
- Schofield, J. (2011, October 5). *Steve Jobs obituary*. Retrieved from The Guardian: <https://www.theguardian.com/technology/2011/oct/06/steve-jobs-obituary>
- Science Learning Hub – Pokapū Akoranga Pūtaiao. (2010, April 27). *What is Clay?* Retrieved from Science Learning Hub: <https://www.sciencelearn.org.nz/resources/1771-what-is-clay#:~:text=Clay%20is%20a%20soft%2C%20loose,over%20vast%20spans%20of%20time.>
- Scott, P. (2002). *Ceramics and Print Second Edition*. Philadelphia: University of Pennsylvania Press.
- Sebesanu, K. C. (2017, August 7). *Storytelling and Ceramics: Greeks vs. Amazons*. Retrieved from The MET: <https://www.metmuseum.org/articles/greeks-vs-amazons>
- Strals, B. W. (2009). *Lettering & Type*. New York: Princeton Architectural Press.
- TATE. (2024, August 27). *El Lissitzky*. Retrieved from TATE: <https://www.tate.org.uk/art/artists/el-lissitzky-1519>
- The Anatomy of Type*. (2021, January 18). Retrieved from Type Anatomy: <https://typeanatomy.com/>
- The British Museum. (n.d.). *The British Museum*. Retrieved from cylinder seal: https://www.britishmuseum.org/collection/object/W_1835-0510-2
- Tomas, H. (2013). Saving on Clay: The Linear B practice of cutting tablets. In K. E. Piquette, *Writing as Material Practice: Substance, surface and medium*. (pp. 175-191). London: Ubiquity Press.
- Understanding typography*. (2024). Retrieved from Material Design: <https://m2.material.io/design/typography/understanding-typography.html#type-properties>
- University of Oxford. (2024, August 7). *Inscriptions*. Retrieved from Classical Art Research Centre: <https://www.carc.ox.ac.uk/carc/resources/Introduction-to-Greek-Pottery/Inscriptions/Introduction>
- Willen, B., & Strals, N. (2009). *Lettering & type: Creating letters and designing typefaces*. Princeton Architectural Press.
- Wim Crouwel (1928-2019). (2019). Museum of Modern Art (MoMA). <https://www.moma.org>
- WIM CROUWEL (1928-2019)*. (2019, September 20). Retrieved from Stedelijk: <https://www.stedelijk.nl/en/news/wim-crouwel-1928-2019-2#:~:text=Following%20the%20example%20of%20Swiss,an%20attitude%20he%20robustly%20upholds.>

YouTube. (1997). *Apple's World Wide Developers Conference 1997 with Steve Jobs*. Retrieved from YouTube: <https://www.youtube.com/watch?v=GnO7D5UaDig>

11. Glossary

3D Printer: A machine with the ability to create a physical object from a three-dimensional digital model by laying down multiple thin layers of a material in succession.

Aperture: The size and shape of the opening of a counter of rounded letters.

Apex: The pointed tip of a character extending beyond the x-height.

Arm: A stroke that doesn't connect to another stroke or stem on one or both ends.

Ascender: A part of a letter that extends beyond the (x) axis.

Avant-Garde: New and experimental ideas and methods in art, music, or literature.

Axis/stress: An invisible line running through a letter to reveal the angle of the contrast in letterforms.

Ball Clay: A plastic high-firing clay that fires white and is used especially to give plasticity to clayware bodies containing short clays.

Ball Stylus: A ceramic tool made for creating and measuring holes in clay. It is also a tool for indenting the surface of clay.

Baseline: Invisible line used for bottom alignment and spacing letters on a line of text.

Bisque Fire: The first firing of a ceramic ware.

Bowl: An enclosed round part of letters such as (a), (b), (d), (o), (p), and (q).

Bracket: Portion of the connection point between the serif to an angled stroke or vertical stem.

Calligraphy: The art of decorative handwriting or lettering with a pen or brush.

Cap-height: The height of capital letters above the baseline.

Carving: The process of cutting or scraping a surface.

Ceramics: The art of making objects from clay, then firing them until hardened.

Clay: Material from earth consisting of grain-sized particles formed from specific rock erosions containing feldspar.

Contrast: When strokes of different thicknesses are connected. Typically refers to the degree of contrast between the thin and thick strokes of a letter.

Counter: The negative space of an area of a letter enclosed by a letter or symbol.

Cross-Modal: The coordination of sensory inputs involving different brain regions. It is usually required in tasks that involve matching auditory and visual inputs, tactile and visual inputs, or a similar combination of cognitive functions.

Cuneiform: Composed of or written in wedge-shaped characters.

Cylinder seal: A cylinder (as of stone) engraved in intaglio and used especially in ancient Mesopotamia to roll an impression on wet clay.

Descender/Extender: A portion of a letter that extends beyond the baseline.

Diagonal stroke: Any angled line within a letterform. A stroke that is not vertical or horizontal.

Ear: Small stroke or serif extending from the top right corner of a lowercase (g).

Earthenware: Ceramic ware made of slightly porous opaque clay fired at low heat.

Engobe: Clay slips often colored with pigments applied to clay at wet or leather-hard stage. Used for adding texture and color variation.

Eye: The closed counter of a lowercase (e).

Font: A set of letters, numbers, and symbols designed in a specific style and size.

Frit: Any of various chemically complex glasses used, especially to introduce soluble or unstable ingredients into glazes or enamels.

Geometric: Of or relating to art based on simple geometric shapes (such as straight lines, circles, or squares).

Glaze: A liquid substance consisting of silica, alumina/frit, and flux. Used to coat bisque fired ceramic pieces to decorate and seal a piece. Glaze hardens to create a glassy surface of a piece.

Horizontal stroke/crossbar: The horizontal stroke connecting two separate strokes.

Kiln: An oven used to fire ceramic pieces.

Leather-hard: A stage of the clay reaching firm and slightly dry consistency ideal for constructing or tooling.

Leg: An extended stroke stemming from another stroke.

Metal Rib: A metal ceramic tool used for hand building and throwing. Used to smooth the surface of wet and leather-hard clay.

Nerikomi: A method of coiling and/or layering and combining colored clay to create designs and patterns during the wet clay stage.

Modeling tools: Various set of tools made by wood, plastic, rubber, or stainless steel used to control and manipulate the surface of clay.

Modular Letters: Letters assembled from a limited palette of distinct elements.

Monograms: A sign of identity usually formed of the combined initials of a name.

Mosaic: Composing small ceramic shapes to design a surface with patterns, images, and/or words.

Oxides: Powdered inorganic compounds of metallic or metalloid elements combined with oxygen. Often mixed with water to apply over or under glaze after the bisque firing stage. Oxides are used for adding texture and display chemical reactions to various kiln temperatures.

Plastic Wrap: A thin plastic film used to wrap around clay to prevent rapid drying and lock in moisture.

Plasticity: A form easily shaped or molded.

Porcelain: A hard, fine-grained, sonorous, nonporous, and usually translucent and white ceramic ware that consists essentially of kaolin, quartz, and a feldspathic rock and is fired at a high temperature.

Screen printing: A stencil process in which coloring matter is forced onto the material to be printed through the meshes of a silk or organdy screen so prepared as to have pervious printing areas and impervious nonprinting areas.

Sculpting: The process of carving and shaping wet to leather-hard clay.

Serif: A line or stroke that appears at the end of a letter or symbol of a serif typeface.

Slab: A flattened sheet of clay by using a rolling pin or a slab roller machine.

Slip: Created by adding water, sometimes small amounts of vinegar, to clay to form a creamy paste. Can be used as a glue to connect clay parts or as the base for engobes.

Spine: The center curved stroke of a lowercase or uppercase letter (S).

Stem/vertical stroke: The main vertical line of a letter.

Stencil: An impervious material (such as a sheet of paper, thin wax, or woven fabric) perforated with lettering or a design through which a substance (such as ink, paint, or metallic powder) is forced onto a surface to be printed.

Stoneware: A strong opaque ceramic ware that is high fired, well vitrified, and nonporous.

Sgraffito: Decoration by cutting away parts of a surface layer (as of plaster or clay) to expose a different colored ground.

Relief: A method involving wet, or leather hard clay being bonded to another clay background. Creating dimension and an elevated surface design.

Tail: The descender of a (Q) or short diagonal stroke of an (R).

Terminal: The end of any stroke that doesn't include a serif.

Type Design: The process of designing letterforms.

Typography: The arrangement of letters and words for designs.

Width: The space occupied from the left to right edges of a character.

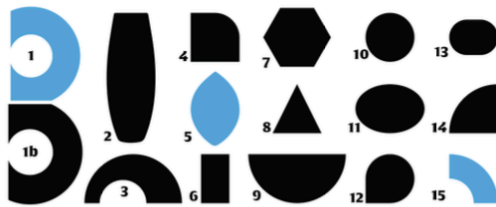
X-Acto knife: Sharp and thin metal razor used like a pen to make incisions.

x-height: The height of lowercase letters not including the ascenders or descenders.

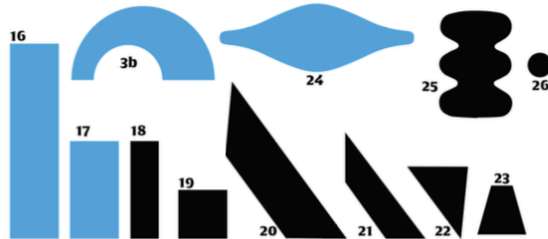
Zellige: Hand-cut tiles used to create mosaic designs involving complex geometry.

Annex 1 – Prototype Data Sheets

Name	Profession	First Language	Second Language	Third Language	First piece chosen
Participant 1	Bachelors' student of Graphic Design taking an elective in ceramics	Portuguese	English	NA	15
Participant 2	Ceramic and Glass Technology Teacher	Turkish	English	NA	15
Participant 3	Professor of Graphic Design	Portuguese	English	NA	3B
Participant 4	Masters' student of Graphic Design 2nd Year	Egyptian Arabic	English	NA	17
Participant 5	Professor of Graphic Design and Typography	Portuguese	English	NA	24
Participant 6	PhD student of ceramics and ceramic studio technician	Portuguese	English	NA	24
Participant 7	Masters' student of Graphic Design 2nd Year	Bulgarian	English	Japanese	1
Participant 8	Masters' student of Graphic Design 2nd Year	Portuguese	English	NA	5
Participant 9	Masters' student of Graphic Design 2nd Year	Portuguese	English	NA	16
Participant 10	Masters' student of Graphic Design 1st Year	Portuguese	English	NA	24



CONCLUSION:



Question 1: When was the last time you made time for play? Doing an exercise with creative freedom?

Name	
Participant 1	This is the first time to play since school has finished.
Participant 2	This week. I think working with your hands is a form of play.
Participant 3	Often with illustration and working with my students.
Participant 4	I don't remember. N/A
Participant 5	I have many crazy things in my notebooks but the process is different. I'm systematic. "Yes. Sometimes I feel necessity to play because it's the way to make me happier. I think when you try to find fun in your work, you are happier and are more connected with the original personality.
Participant 6	When you get older you have a harder time playing." "I don't know. Its probably been a while. I would say its been a year since I've done that. Depends on my sketchbooks. Im trying to be more creative free and accepting but its tough. But that's why I like abstract art. The more simple the less detailed the more expressive and calm me down."
Participant 7	I think I try to do that as much as possible. I think there are real limits and circumstances that change the way you behave. You should live a life that is like a playground. So yesterday.
Participant 8	"Last year when we did that poster in class with erasers."
Participant 9	"I try to play with whatever I have currently. I tend to make a small picture in my mind and then try to play with the outcome. I try to not work towards perfection. I try to not be so harsh on yourself.
Participant 10	Playing is fun but didn't get to that much in my bachelors. "

Question 3: Are you feeling about the number of pieces?

	Feeling a little overwhelmed, but there are too many varieties in shapes to choose from.
Participant 1	There are so many pieces. It's good! There are many but they are organized, and I know there are many
Participant 2	combinations to play with. Its a lot but it's a good a lot. Good enough to have different shapes so you can design
Participant 3	without doubts. I feel like I can write whatever. I am a little overwhelmed with which ones I want to go
Participant 4	with. But not really overwhelmed.
Participant 5	There are many but that's okay. It's so much information. It's difficult to decide and focus on specific forms. The pieces
Participant 6	I will choose first are the ones I have more empathy towards. It gives you a lot of options and a bit overwhelming at first but its simplistic.
Participant 7	Overwhelming in an exciting way.
Participant 8	Amazing. There a lot but a good number of pieces. There is a lot! My vision is tainted by knowing how they are made and how long it took so
Participant 9	take this with a grain of salt. It's overwhelming in a positive way. If you were to give me a task right now, I would be happy with the number of options I have. The pieces are already a restriction. The variety than quantity is more overwhelming but appreciated because I know I can make many things with them.
Participant 10	I think there are enough. I don't like when I have too many choices. I do feel that with these and feel like there are too many options.

CONCLUSIONS: All participants expressed how impressed they were with the number of pieces. First impressions they can be perceived as overwhelming but some are excited by the challenge and others find it useful to have the number of options once they start exploring the combinations. It won't be useful to add more shapes but possible to replace shapes with others that may be more useful.

Name	Question 4: Do you incorporate play into your graphic design practice?
Participant 1	Graphic doesn't seem like a thing on its own. It's inspired by other disciplines.
Participant 2	No, I am not a graphic designer but I play in my work. Yes of course. I can see it being used for printing. The imperfections of the material are the best part.
Participant 3	Nothing is equal. Yes, I like to include analog play if the project allows me to. Paper, scanning, magazines, spray paint.
Participant 4	But mostly paper.
Participant 5	Yes with my sketches.
Participant 6	NA. Participant is not a graphic designer. Only once for a poster but I feel like I'm behind in my skills. You must learn the system before you can break it.
Participant 7	break it.
Participant 8	Yes, I try to create material with random processes. Try to introduce randomness into your work.
Participant 9	Yes. As mentioned above.
Participant 10	Yes, I am. For a while I've been trying to play with the computer. Using photography and trace in illustrator and experiment with the tools in illustrator. It's fun because it's my work but some steps aren't mine but love the outcome.

CONCLUSIONS: Both ceramic professionals consider their work to incorporate play. The graphic designers in this case share how they understand the importance of play but don't often get to.

Name	Question 5: Could you see this used for graphic design?
Participant 1	Yes, because graphic design is about the shapes and we are not very good at creating organic shapes. It can be used as a tool and to understand geometric shapes.
Participant 2	Yes! I can imagine these can help with composition and design.
Participant 3	Yes I can see this working for graphic design.
Participant 4	Yes. At the studio.
Participant 5	Yes. Yes totally. I have seen a graphic toy with a kid and more interactive. I could see it being used to make patterns and then digitized. Great to see different perspectives and add dimension to the design and point of view. It's nice to see the letter at different perspectives.
Participant 6	Yes. These could work well for graphic design. Because when you are trying to make graphics, artists want to use anatomy. Simple shapes create complicated shapes. these shapes create balance.
Participant 7	Yes very easy. It has to do with a modular design. To break pieces down and how to make them work.
Participant 8	I mean totally. I would totally photograph parts of my creation. You can spend hours trying to make a realistic model of this or you can do it with your hands quickly. And its real. I want to make real things with your hands and don't spend so much time on your computer. And we know, that's bad for you.
Participant 9	Yes, I could. I think this would be great if you made something and then paint it and make prints it. It would be easier to change the design with moving the pieces. It's fun because at the same time you are making shapes with shapes and training your brain to make new things on the spot. Its more immediate.
Participant 10	

CONCLUSIONS: 100% of participants agree that this is a useful tool for the graphic design process. Not one hesitation or constructive criticism from participants.

Name	Question 6: Have you designed a typeface before? Are you familiar with typographic systems?	
Participant 1	Yes and yes.	yes
Participant 2	No and no.	no
Participant 3	Not really. I designed letter forms on tiles. I just made the digital design for the tiles.	no
Participant 4	Yes, for academic purposes but not on my own. Yes, I would think so.	yes
Participant 5	Definetely.	yes
Participant 6	No and no.	no
Participant 7	Yes. I'm kind of familiar and have touched on the subject.	yes
Participant 8	Yes I am familiar with the systems. And I have already done a font. I prefer experimental type design. Display typefaces are my favorite.	yes
Participant 9	Not a successful one but yes. Yes, I am familiar with typographic systems.	yes
Participant 10	Yes for my professors course. IT was really fun like making a puzzle. After learning rules and problems and it was tough but fun. If you know the rules it comes out right. I was taught the typographic systems. It takes time but its not that time consuming for each letter. Kind of like the pieces in front of me, I'm making my own rules and the pieces are consistent.	yes

CONCLUSIONS: 3 out of 10 were not familiar with typographic systems and have not attempted to design a typeface before.

Name	Question 7: Why do you like working with the pieces?
Participant 1	I like when you have a lot of variables because whatever you are doing can be used by a lot of people and it becomes more organic and spontaneous.
Participant 2	It's familiar and comfortable.
Participant 3	I do. I'm having fun. Because none of the shapes are directly remind me of a typeface. I can make p's and r's easily but with a more complex letter, you have to get creative and use unusual shapes.
Participant 4	I like the sound they make, and they feel strong. It's fun to work with tiles.
Participant 5	Yes, definetely.
Participant 6	I like them. I've seen many tiles! I think it's really nice to play with mosaic. You can buy these pieces to make a mosaic table. It's a bespoke piece.
Participant 7	Yeah! Its fun. I really like working with limited supplies. It makes you more creative. In photoshop you have so many options that it is even more overwhelming. The constraints are nice.
Participant 8	I love. Like when we are designing we are trying to creat visual identities and these pieces could make great designs and images. You could create a studio with all the pieces.
Participant 9	I like it. Reminds me of checkers. The sound is nice and satisfying.
Participant 10	Its fun to work with the pieces though.

CONCLUSIONS: All participants shared that working with the pieces was fun. The shapes are inspiring and participant still enjoyed the experience even with the dislike of the texture of the unglazed tile.

Name	Question 8: Do you like the texture of the clay pieces?	
Participant 1	Yes. I really like working with clay and with my hands.	yes
Participant 2	Yes, of course!	yes
Participant 3	A lot. The porous is really nice to the touch. You can grip it.	yes
Participant 4	I like the texture but I liked the glazed texture more.	yes
Participant 5	Not really. I prefer the glazed shapes because they feel less gritty.	no
Participant 6	Yes, I like the texture. Its comfortable, the temperature is nice and it's a sensorial feeling because one side is smooth, and the other is rough. The ceramic process is presented here and gives me information.	yes
Participant 7	Yes its like playing with something you've never played with before. Its interesting because its very abstract.	yes
Participant 8	Yes, it's like sand. Its cool. It reminds me of opening a coffee machine / mocha pot/ gritty. A good sensation. Like an exfoliation.	yes
Participant 9	They feel like fossils. When you go into the field you identify fossils be feel and byyour tongue. There's a resistance when you lick it.	yes
Participant 10	No. The texture is dusty and feels dirty. I want to wash my hands after this. The texture tickles my brain. Its sandy and could never be a ceramic person. The glazed pieces are softer and better for my hands.	no



CONCLUSIONS: Two out of ten people didn't like the texture of the terra cotta unglazed tiles. They did express preference for the glazed tiles off to the side. Both participants are graphic designers and do most of their work on the computer. A glazed option should be available for participants who are sensitive to textures.

Name	Question 9: How do you feel about graphic design as an art?	
Participant 1	I think it can be both. We are trying to represent what we see in a medium.	Yes
Participant 2	I think so.	Yes
Participant 3	Graphic design can be art.	Yes
Participant 4	I think graphic design can be an art but it can and should be functional as well.	Yes
Participant 5	Yes of course it is an art.	Yes
Participant 6	Yes completely.	Yes
Participant 7	It could be but it's an artform that has other opinions on it. Functionality is crucial and not as free as art. Graphic design is an artform of communication. But maybe not freedom of expression.	Kind of
Participant 8	That's a difficult question. I see design as a tool to be more strong in the art world. Its about communication but art is what do you want to communicate. I feel like design is more about a specific communication. Design should be practiced more like art rather than rigid science.	Kind of
Participant 9	I don't think it's an art. I think that question stems from the people thinking both can be done at once. The questions you are making are not art. They are problem-solving, engineering. I compare it with engineering and physics. They are not the same. You can't have one without the other, but they are clearly different, and you need to learn about both.	No
Participant 10	I think graphic design and art touch each other. I think it depends on the designer you are talking to. I am more interested in doing work that I like what I'm doing. It's not for profit or publicity. For me graphic design is for communicating what you want. It's an opportunity to voice something and communicate. It depends on who you are talking to. Some see it as capitalism or culture. It can be.	Kind of

CONCLUSIONS: Ceramic artists and Type designers view graphic design as an art. Three graphic designers are on the fence on how much creative freedom graphic designers have and one graphic designer doesn't think it's art.

Name	Question 10: How do you feel about the shapes?
Participant 1	It's not usual and I feel like I could spend a few days just making things. They could also be used like Tangrams.
Participant 2	Fruitful to make new arrangements. I don't feel overwhelmed by the options. The fact that there are so many options is exciting because of all the possibilities.
Participant 3	There are a lot! But makes many possibilities.
Participant 4	They seem like they are limiting however they are not. Some letters are really hard to produce and maybe its because I'm not used to it.
Participant 5	A bit skeptical about if the hard letters work with these shapes.
Participant 6	I like them. I've seen many tiles! I think it's really nice to play with mosaic. You can buy these pieces to make a mosaic table. It's a bespoke piece.
Participant 7	I thought they were going to limit me at first but they are actually enough. There are a lot of sizes I can work with. I can see the basic shapes have size variations but the stranger shapes are restricted to a limited size.
Participant 8	I like it. All the compositions have symmetry but then you have to break it. They are very simple, but you make symmetric. You can make strange combinations as well. I like how you start with the obvious but can test it and push it to something less obvious. Simple but complete.
Participant 9	They look edible. They looked baked but some shapes remind me of dishwasher tablets. The wavy shape reminds me of the yellow Portuguese cookies.
Participant 10	I really like the small shapes and the more organic shapes. They seem easier than the squares. They work well combined with other pieces. Triangles are challenging. You really have to think were to put them. The organic shapes can be put anywhere, and they look nice. Organic shapes also feel soft. Its more forgiving and it doesn't matter if there is a mistake because its organic.

CONCLUSIONS: At first there was apprehension about using the tiles to construct letterforms when considering traditional rules of typography. But once they start getting familiar with the shapes and combinations, it became easier to get creative with construction. It is interesting to see the approaches to type design for some who are not familiar with modular typefaces.

Name	Question 11: Do you have a favorite shape or color? Do you like the
Participant 1	I like the smaller shapes because you can combine them to have more control of the designs.
Participant 2	Yes, the half circle (3B). Yes, and I also like the glazed pieces because they are smooth. I like combining the different colors. Because it makes a nice contrast.
Participant 3	I like the terra cotta.
Participant 4	Yes I like the terra cotta.
Participant 5	I prefer the glazed texture.
Participant 6	I like the terra cotta. I also am drawn towards the organic shapes.
Participant 7	Yes, I love the wiggly shape because its more interesting to look at. I like the terra cotta.
Participant 8	The eye shape.
Participant 9	I think I like the terra cotta.
Participant 10	Don't like the terra cotta. The little circles/ does are my favorite. I love small elements and it connects things and how you can make a whole figure with one small piece. Its small but mighty. Even the smallest things have power.

CONCLUSIONS:

The set would benefit from glazed and unglazed pieces. If tiles v designers have the option to chose shapes and glazes as pleas participant felt the pieces would get chipped over time on speci Rounded corners may be an alternative for sharp edges. Round from the 3D cutouts.

ie terra cotta?

Why? It's not usual and I feel like I could spend a few days just making things. They could also be used like Tangrams.



Why? I can change the rotation of composition with the curves. It provides sustainability of surface. This shape has more possibilities for directions and compositions



Why? It reminds me of clay. I prefer the white ones because the forms are strong and if you have a white background with the shadows. The white ones are more sexy for photography.



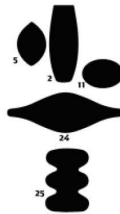
Why? Its raw and limitless. The red is like a raw document. The red is clay 101.



Why? My hands feel like they could be dirty.



Why? The terra cotta is familiar.



Why? It makes me feel of natural things closer to earth. Its raw and if there were more colors were involved, I would be overwhelmed.



Why? (answered why they liked the terra cotta) It's a very good color. I wouldn't choose this color for computer images. It's a nature color not a computer color.



Why? I associate them with bricks or clay, I think of them as construction pieces. They are not like a product. It's good for playing but I don't feel like they will break. Imagine a child finds a lot of bricks and a lot of bathroom tiles, I think they will associate the brick with building a house. The bathroom tiles are too breakable and not allowed to be played with. They remind me of my childhood because our primary school was still under construction. We were in a small town named barro/ clay and in the middle of vineyards and fields. We just played there and found bricks. The terra cotta reminds me of childhood. It prompts play.



Why? The color doesn't do anything for me. I've never had the tendency and it's not a beautiful color to me. I want to see ink and how colors interact with paper. I prefer paper and ink reactions.



ere to be sold as a product, an à la carte option so that d. More like purchasing tiles than a boxed set. One ic shapes that have sharper edges or higher contrast. id corners also proved more successful for an easier release

Name	Question 12: Have you taken a course in pattern design?	
Participant 1	No.	No
Participant 2	Yes, I have an education in fine arts compositions, mixed surfaces, textures.	Yes
Participant 3	No, not really.	No
Participant 4	No. I have made digital patterns before though.	No
Participant 5	No but I have done work with patterns.	No
Participant 6	Yes, in the first year of my ceramic course. We had to make tiles and a model for reproduction. To develop an infinite pattern design.	Yes
Participant 7	No. Im actually really bad at patterns.	No
Participant 8	No. When I was a kid, we did things with patterns but not as an adult. I just like to draw creatures. I like geometry but not that much. I like organic patterns.	No
Participant 9	No no.	No
Participant 10	No never but I would like to. I feel like my brain works in patterns. My first drawings were inside the grid paper. I would follow the grid. You can do whatever you want with a pattern and design, but the grid stays the same.	No



CONCLUSIONS:

Only two of the ten participants were educated on pattern designs. This question was relevant in understanding participants knowledge of patterns. This experience can influence how they approach geometric shapes to create designs. Although a majority of participants were not taught to design patterns, they had no problem developing them with these shapes.

Name	Question 13: Have you seen something like this?
Participant 1	Tangrams.
Participant 2	I've seen similar technique in mosaic lamination. Like Alhambra with Islamic patterns and my grandmother's house has these tiles. Black, white and gray tones and optical 3D designs in the kitchen floor. But the living room had a different pattern. As a child, I loved her house because of the tile floor. I felt like I was in another place with these shapes. They demolished this house, and I couldn't go and save the tiles and it's so sad. I am angry. But, these shapes make me feel happy. The house had a backyard with a little bit of nature in the middle of the city. They took away our family history. Located in Izmir, Turkey.
Participant 3	Yes it reminds me of my tile project. Phil Bains also does something similar. And Aprigio and Rubins type.
Participant 4	No. It reminds me of something for kids because it has a toy like feeling but the material makes it appear more for adults. Ghada Wali : How I am using logo to teach Arabic
Participant 5	Not really. It reminds me a little of Legos. Also reminds me of master chef with using my tools to create designs.
Participant 6	It reminds me of tangrams/ dominos/ Lego. Checkers.
Participant 7	Not really. Maybe when I was younger, but I don't remember.
Participant 8	I feel like yes. It reminds me of old typography. When designers had to construct type to make posters. The process is more ancient. Its familiar because it makes me remember Legos. I haven't seen it a lot. A family of shapes.
Participant 9	They remind me of Legos and bricks. But not a set made of clay.
Participant 10	Only similar to Freida da silva but it's not really like this. His shapes are different and colors are different. Here it's a combination of your work and the person who designs it. -- Reminds me of a city and making a whole city plan with the pieces.

CONCLUSIONS: Tangrams and LEGOS were brought up with two participants. The process and shapes felt familiar but have never experienced it with ceramics. The material made one participant feel like this was designed for adults.

Name	Question 14: there something you think could improve?
Participant 1	I need a mission. I am more accustomed to finding a mission for graphic design.
Participant 2	I would like a larger half circle to complete my pattern. But no, the quantity is enough, and the quality is enough. The shapes are smooth and feels good. I really like to play with the pieces.
Participant 3	I just miss the background. A dark background for contrast.
Participant 4	I wish there was a thinner longer rectangle.
Participant 5	Maybe explore different shapes that replicate portions of letterforms. And develop a full set of glazed tiles as an option with maybe more color options.
Participant 6	I wish the pieces fit better together. The details between the forms could fit better. The sizing could be more consistencies.
Participant 7	I wish the stranger shapes had other sizes. And a bigger circle.
Participant 8	I would love thin pieces.
Participant 9	The way the shapes are presented with the half circles is difficult to disconnect from a circle. Seeing the combinations is distracting and I want to use the pieces for what they are. If I don't want to work with a circle, I discard them already.
Participant 10	A set of glazed pieces with color. Another dimension.

CONCLUSIONS: Four participants requested specific shapes missing such as a thinner, longer rectangle. Along with larger options of the organic shapes, and a larger whole circle. One suggestion to implement is the option for different backgrounds for the tiles. So that one can play with black tiles on a white table or terra cotta shapes on a blue table. This would work with photography better rather than focusing only on compositions.

Name	Question 15: Could you see yourself using this set for your design practice?	
Participant 1	Yes. It's a nice exercise to break away from the computer and help with "designers block".	Yes
Participant 2	Yes, I can make a connection with the ceramic pieces I make, not only in terms of the sustainability of life, but also in terms of the composition of shapes when they come together.	Yes
Participant 3	Yes.	Yes
Participant 4	Definitely.	Yes
Participant 5	Yes. Because It allows me to process. For me, its good to break conventions. If I have all rules, Ill be stuck and let allows you to be free and embrace the unexpected.	Yes
Participant 6	Yes, I could see myself using these in my work. I could see myself making workshops with the forms. I could teach play and combinations. But if I want to go more deep, I can suggest the participants to construct words and practice composition.	Yes
Participant 7	Yes. I think I would. Especially if I'm having a conundrum. It would have fun to have something to try things on.	Yes
Participant 8	Yes completely. I would definitely use this.	Yes
Participant 9	Yes. I like material use in graphic design. It's a little like cinema. I love the technical side of film. Even if its super dated, you can see the creativity and resourcefulness. I want to see stuff like these pieces in design. The texture is very important	Yes
Participant 10	Yes! Not only for taking a break from the computer but this process is relaxing. Only me with the pieces and there's nothing wrong with it. I'm not making mistakes. It's a fun thing to have in a studio and if they are super stressed, they can come to these pieces to calm down and escape from the real-world pressures. It can also be used to make different designs and shapes then photoshop them or print on them and be functional. It's an escape for designers but also a tool for graphic design.	Yes

CONCLUSIONS: 100% of all participants answered yes to using this as a tool for their design practice. This is interesting because not only does it work for ceramic artists, it also works for graphic designers. Connecting two different disciplines and their processes.

Name	Question 16: Do you find this as a useful tool for type design? Or learning about letterf	
Participant 1	I think this approach to letterforms evokes the works of Jose Mendes and Diogo Potes with their unconventional letterforms.	Yes
Participant 2	Yes.	Yes
Participant 3	It doesn't have to be just digital. This is a very appealing project to make something different. You can make something and digitize it and make your own alphabet.	Yes
Participant 4	Yes and logo design.	Yes
Participant 5	Not really a useful tool for learning typography. But, It breaks the fear and not a learning tool but an exercise.	No
Participant 6	Yes.	Yes
Participant 7	Yes, it helps to feel the shapes in your hands. It orients you in some kind of way. Its good to see type in true scale. It's helpful for orientation and proportions. Here you have an idea of the scale and feeling of shapes. I think it's great if you're stuck and a great exercise before designing. I see it working better for patterns or if you feel lonely.	Yes
Participant 8	Yes completely. This could be a good way to make typefaces in digital software. This is a good exercise to understand how shapes interact with each other. I see these as an opportunity to do this more intuitively. It is useful to see how it could work with specific shapes.	Yes
Participant 9	This would be great for teaching. (I didn't even have to ask) specifically for classes. It needs a teacher to use this but you can try and experiment, its fun, you have friends here. You see what others are doing. We need crafts and exercises like this in our classroom.	Yes
Participant 10	Yes, in the beginning to get inspired. If you have these shapes, you can figure out which pieces you want to use. I think it could help with learning. It pushes the boundaries of legibility. In graphic design it so fast but our brains are so rotten because everything has to be so easy to read. I want someone to lose their 10-15 seconds to look at my work. With this you have to take tome and do something with it. Loose time with the pieces and shapes. Yes, you are working with the idea of time and that's really cool.	Yes

CONCLUSIONS:

Only one out of ten participants didn't see this as a useful tool for learning about letterforms. This participant has the most experience when it comes to type design so to be sure, more type designers should experiment in order to better understand its teaching potential. For the purposes of this research, it has proven a useful tool for designing bespoke letterforms with a modular and experimental approach. Research has reveealed it doesn't meet certain standards for designing legible text for large bodies of text. But could inspire letterform construction when designing legible typefaces.

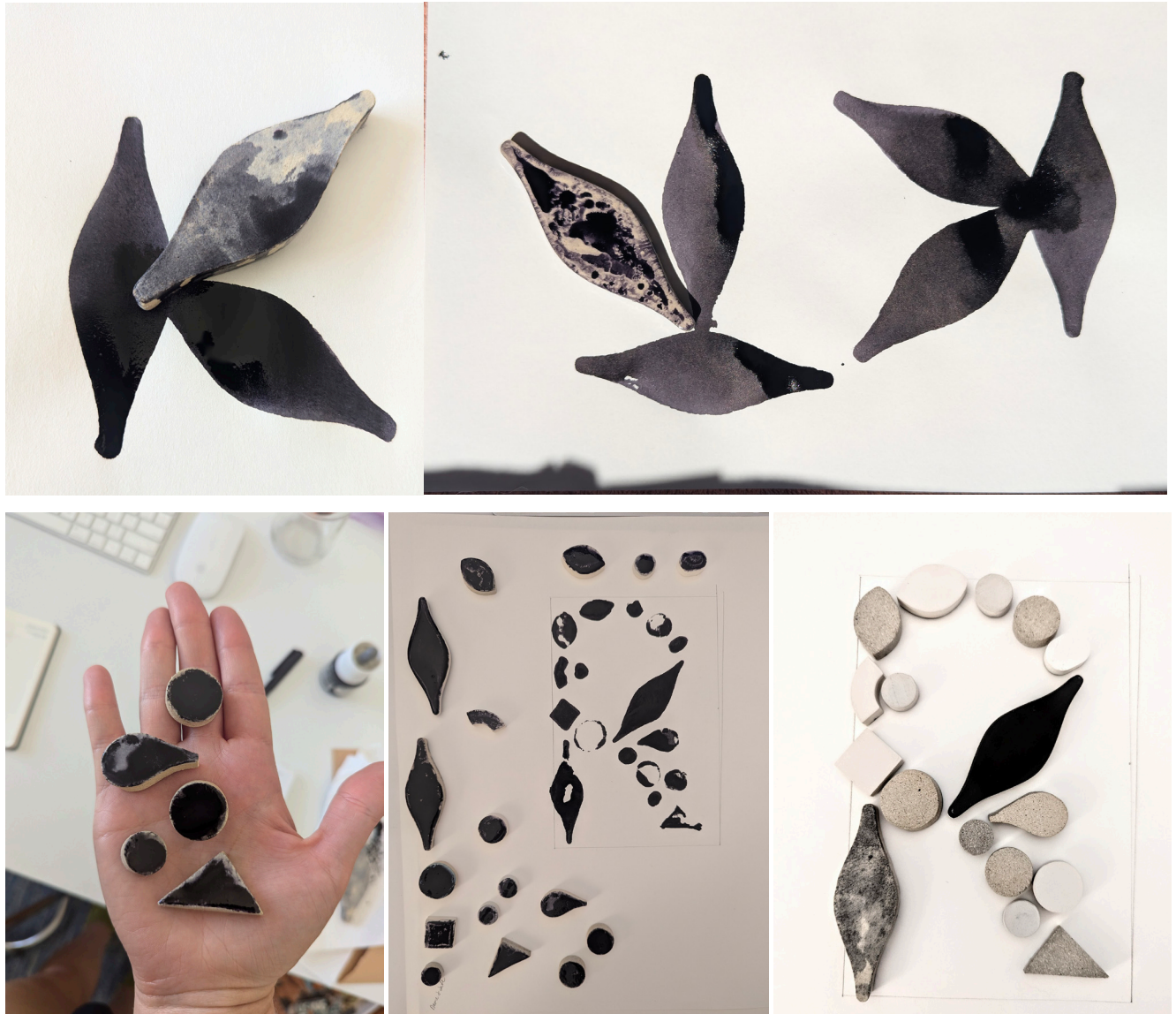
Name	Question 17: Overall feelings about the experience?
Participant 1	I really liked it. I could see myself playing with the shapes for hours.
Participant 2	The touch of the clay feels like home. I know this materials language and I know this material. Its familiar and its traditional and has new opportunities to use in different areas. Used in the field of art and architecture and daily life in every filed of the materials we use in the kitchen. In terms of my profession, I know this material well, the opportunities it provides me in terms of its shaping and use. But while I shaped it, it also shaped me. Because while you think you have shaped it, it teaches patience, makes you feel your own limits, helps you know your own limits. You have tried many methods while shaping these parts. You have tried many drying methods and thought of many glazing methods and finally you have always tried to develop the shaping method that suits your project within the limitations of the material.
Participant 3	It's a discovery experience. you don't know when to stop because there are so many options, shapes, colors, textures. Like a kid playing with Legos.
Participant 4	It was really fun and a challenge.
Participant 5	It's a fun exercise to help with creativity.
Participant 6	It's fun and helps me to play and be present. The infinite possibilities is amazing and made me feel more calm. I would like to play again.
Participant 7	It's really fun. It would work great for logos and an element of surprise. I played around we talked about it we laughed it was an experience. I got to create something I wouldn't usually do. It's a free process, no expectations. I found it therapeutic.
Participant 8	It is a very fun experience. If I could spend more time here, there is so much you can do. I would love to write it in 50 ways. Its infinite. I think this is a game as well and introduces play into our work. I love it. And would love to spend more time with it. Its really fun to deal with.
Participant 9	It was very fun and playful and I mean this in the best way possible: you can play with anything but sneaky play. This doesn't feel sneaky. At one point I forgot I was playing with clay. It's the best way possible and how I didn't think you could play with ceramics. Making the letters, it's a good training and great for logos. Not sure about typefaces because of the lack of regularity. But its great for lettering, posters, and decorative type. Lettering workshop or typography to develop inspiration. We did something similar for Ricardo, we had a class with an alphabet with pieces of magazine. I felt very constricted during it on a screen. It's a great way to escape screens. I think people will go back to an analog approach to design.
Participant 10	I really really like it. I was having a terrible day and it made me come back to a peaceful place and something soft and careful and thinking about what I'm doing. Its very calming way of working and playing. Sometimes you really need to take time to play with your hands. I don't really draw but I really like this because its easy and there are no mistakes and its forgiving and freedom. So much work and then it disappears.

CONCLUSIONS: 100% of participants shared the overall experience was "fun" and gave them a chance to play. The responses were overwhelmingly positive and not only helped designers with getting creative but it also felt like a theraputic exercise. A good tool to eliminate fear and improve mental heath.

Name	Question 18: Overall observations/conclusions field notes:
Participant 1	At first, participant was shy and not making eye contact. As they played with the pieces, they became more relaxed with body language and increased eye contact at the end. Went for the 3B shape first. Doesn't like the idea of the grid. "I don't understand the grid just yet and it feels constraining."
Participant 2	Humming while playing with the pieces. Seems to be very content with exploring the possibilities and combinations. Used piece 1 for m but then changed her mind because the proportions didn't work. Like participant 1, as they played with the pieces, they became more open to talking and relaxed. Both participants so far have expressed sadness with stopping the exercise. It's been an effort to end the exercise because participants don't want to stop.
Participant 3	Those who interact with the pieces become more open and talkative as they play with the pieces. They speak freely while keeping their eyes on the pieces. They also become very engaged with the pieces and focused. Everyone has said it's so fun and that they could do it for hours. Interviews tend to take longer than expected because I don't want to disrupt their play and allow them to make something they are satisfied with. At first, allowing the participant to make whatever they want first is valuable. This process allows them to become familiar with the shapes that then will help inform them what is possible with letterforms. So far, English, Turkish, and Portuguese works with these shapes. Started talking about a bar she used to run. The grid is not necessary because the shapes themselves are the grid. Word spelled Rigor as well.
Participant 4	I can image this at the workspace at a studio, at a place school. Also spelled out "TAX THE RICH" The white/blue feels more polished and something I would purchase. The wavy shape (shape 25) should be cut in half to make Arabic characters.
Participant 5	I think I could work faster on the computer. It's like drawing with objects. Humming while doing it. My design reminds me of a puppet that could be digitized and animated. Harmony leads to legibility. Participant is animated and worked while standing up. Gave short answers because they were so focused on analyzing the shapes and determining combinations. Their typographic expertise is almost a disadvantage to exploring experimental type design. They shared that they follow the rules they learned so it is difficult to develop an avant-garde design.
Participant 6	"The way the pieces are combined and stacked it influences me. It's helpful to see the options and becomes less daunting." "I read a book last night about craft and the materials say something." "The pieces are saying to me like a person, it's saying I can be soft nice, and kind and I can also be rough. Depends on how you treat me." "A ceramic comes in and interrupts to see if he could use the rectangles for his work. But needs a larger size." "I'm drawn to the curves, but I want to force myself to use the sharper and shapes with edges. Not interested in the glazed pieces." "The color of the clay influences your decision. The color influences your designs, and the materials talk to you." "I like that they are imperfect and the spacing isn't the same, but I like that because it's made my hands and human touch and we need that because the society is so technologically dependent." "Graphic design could use more imperfection and human touch. The environment in graphic design appears to only be on the computer. It feels obsessed with perfection. We want perfection in all aspects of our life."
Participant 7	The last time I played with clay, I was a kid. I want to play with all of them, but I don't know what to do. Asked for a bigger circle. I miss being a kid. Made Cyrillic characters and Japanese Kanji. Katakana is more angular. Hiragana may not be possible with the curves. Playing with pieces help me talk and it's nice to talk with someone while doing it. I'm really opening up and oversharing right now. I think it would be really good for therapy. I really like seeing the Cyrillic and playing. The different textures give you different ideas. The material influences the design. The white reminds me of beach, Gres/earthenware reminds me of sand. Emotionally I would choose different colors. It has an emotional edge.
Participant 8	I feel like I'm playing with a type. I'm doing a work about a visual artist who works with modular ceramics and feel this connecting with Frieda da Silva.
Participant 9	These look edible. Gathered shapes that felt edible. Like a chocolate bar. Imagine these shapes in chocolate. The shapes remind me of chocolate edible and soft. They look baked. I think analog helps getting ideas out of my head on paper. It visually organizes information. I try to solve problems with my hands with doodling. To organize ideas. I do use the computer too. But on the screen, we don't see the reality of it. You need to go to a candy store where they have gummies and you. The shapes are reminding me of candies. I'm vexed by the 24-tile shape. It's not like the others. Its good you don't have letters here because it would create a bottleneck. Suddenly everything would have to be according to that "s". Nothing reminds me of letters. They are completely abstract. I think they should both be flat on both sides because the roundness of one side influences my decision. I think it helps that they are not perfect. You feel free to play with them. I'm learning about myself during this process. We came up with the name Brickinhos for the project. I wish I could have these in my studio. But I worry they would break like chip over time. I'm clumsy by nature. I could drop them constantly. Designing something that he said looks like a logo. This process is making me think how I have forgotten how some letters are constructed. I'm missing a slanted rectangle. Made home with the concept bricks and spelling it out in the negative space. Its super useful for logo design. I try to identify what's obvious and avoid that. Shared that he had a stress dream about doing this exercise. I want a large curve. I still have to problem solve the pieces I don't have but want. The shape of the letters is all curved, so it feels curvy instead of the bricks. Home in Portuguese is curved and in English its brick like. I want a shape like a rectangle with a curve cut out from the middle. Even in general because there are a lot of flat and round shapes that aren't equal proportions. To help with negative space. Curved letterforms could be helpful to see the negative space. There's no right or wrong way to use these pieces and I like that.
Participant 10	The computer will crash and its scary! She prefers multiple colors and glazes. I think it would be helpful to have color coded shapes. I really like black and white and maybe lilac purple/ soft red, green, blue (not yellow) orange and that's it. Its more interesting to see someone work with your work. Even if they hate it it's fun. It's like a psychology class. It feels like a never-ending process. "They don't feel fragile, and I'm not concerned about breaking them." "You should really make a patent".

CONCLUSIONS: This project is accessible to Latin, Arabic and Cyrillic alphabets. Hirigana characters are more restricting and can only work with the smaller shapes but not all shapes provided.

Annex 2 – Additional Experiments with Final Project



The ceramic tiles were considered as a tool for creating relief designs. The glazed tiles were better at transferring the ink than the unglazed tiles. Fired bisque tiles absorbed the ink before it could be transferred to the paper. Some tiles also had an uneven surface which led to an uneven coating of transferred ink. Designers looking to incorporate texture and imperfection could use this method in their designs.

Annex 3 – Interview with Taekyeom Lee

February 20, 2024

Interview via Zoom

What was your inspiration for using clay with letterforms?

Why clay and what techniques did you try? *Inspiration came from taking a ceramics class once, experiencing a vision issue.*

Do you think clay has a place in graphic design and typography? *Yes, it's in human history and an extension of our hands. Its tangible typography.*

Do you think clay can make design more accessible? *Yes, and they take more time with clay and the tangibility of type is valuable.*

In your experience, can clay limit or expand the possibilities of letter forms? *3d printing creates soft curves. Not meant to be invisible.*

In your opinion, do you think graphic designers could improve their design process by working with physical materials/analogue? *I agree with that. Computers are production tool. Design happens in the mind. You should be able to simulate designs (pasta)*

What were the limitations of 3D printing letter forms with clay? Do you think this process could prompt new designs for letter forms? *Yes, many people are doing it and loves clay and printing it. Maybe start with the clay and using another material to mark on clay. Vinyl cutters are useful for stencils.*

Lastly, do you have any advice for approaching letter forms with clay? And what was one of the most valuable lessons you learned from your master's project? *Don't be a perfectionist. You need a community. Break the boundary and bubble, you need to surrender.*

Annex 4 - Digitized Participant Works



Figure 103. Participant 1: Kristóf Martins design digitized with branding of terra type. Photo from the author (2024).



Figure 104. Home. Participant 2: Canan Salman design digitized with branding of terra type. Photo from the author (2024).



Figure 105. Home. Participant 3: Rita Frutuoso design digitized with branding of terra type. Photo from the author (2024).

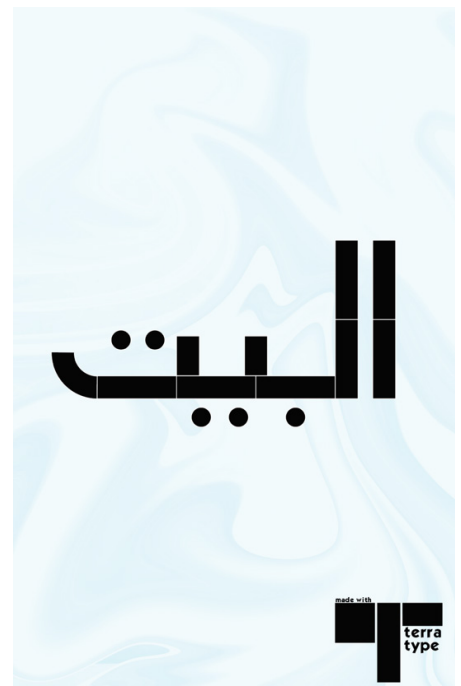


Figure 106. Home. Participant 4: Sohaila Elmoatzebullah Ahmed Hamed Mansour design in Arabic digitized with branding of terra type. Photo from the author (2024).

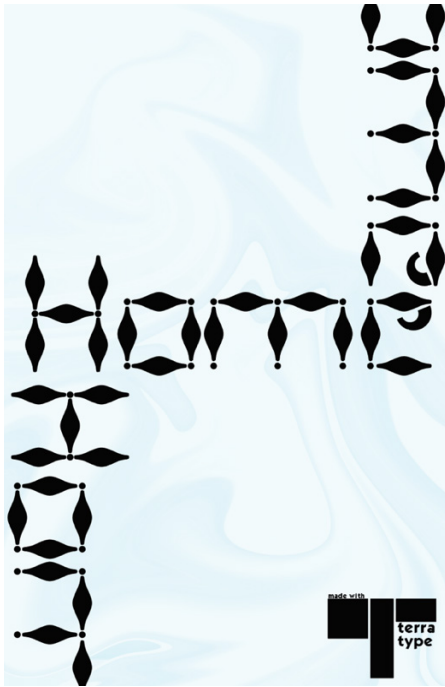


Figure 107. Home. Participant 5: Ricardo Santos design digitized with branding of terra type. Photo from the author (2024).

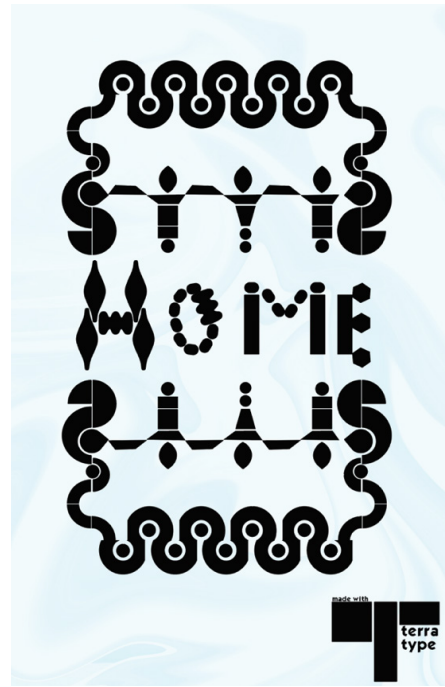


Figure 108. Home. Participant 6: Rita Frutuoso design digitized with branding of terra type. Photo from the author (2024).



Figure 109. Participant 7: Dimana Tomova design digitized with branding of terra type. Photo from the author (2024).



Figure 110. Home. Participant 7: Dimana Tomova design digitized with branding of terra type. Photo from the author (2024).



Figure 111. Home. Participant 8: Pedro Cardoso design digitized with branding of terra type. Photo from the author (2024).



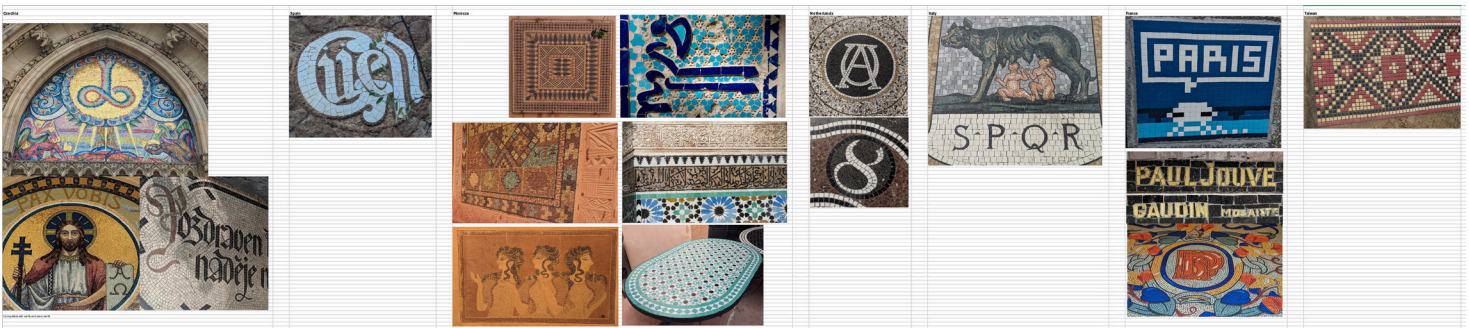
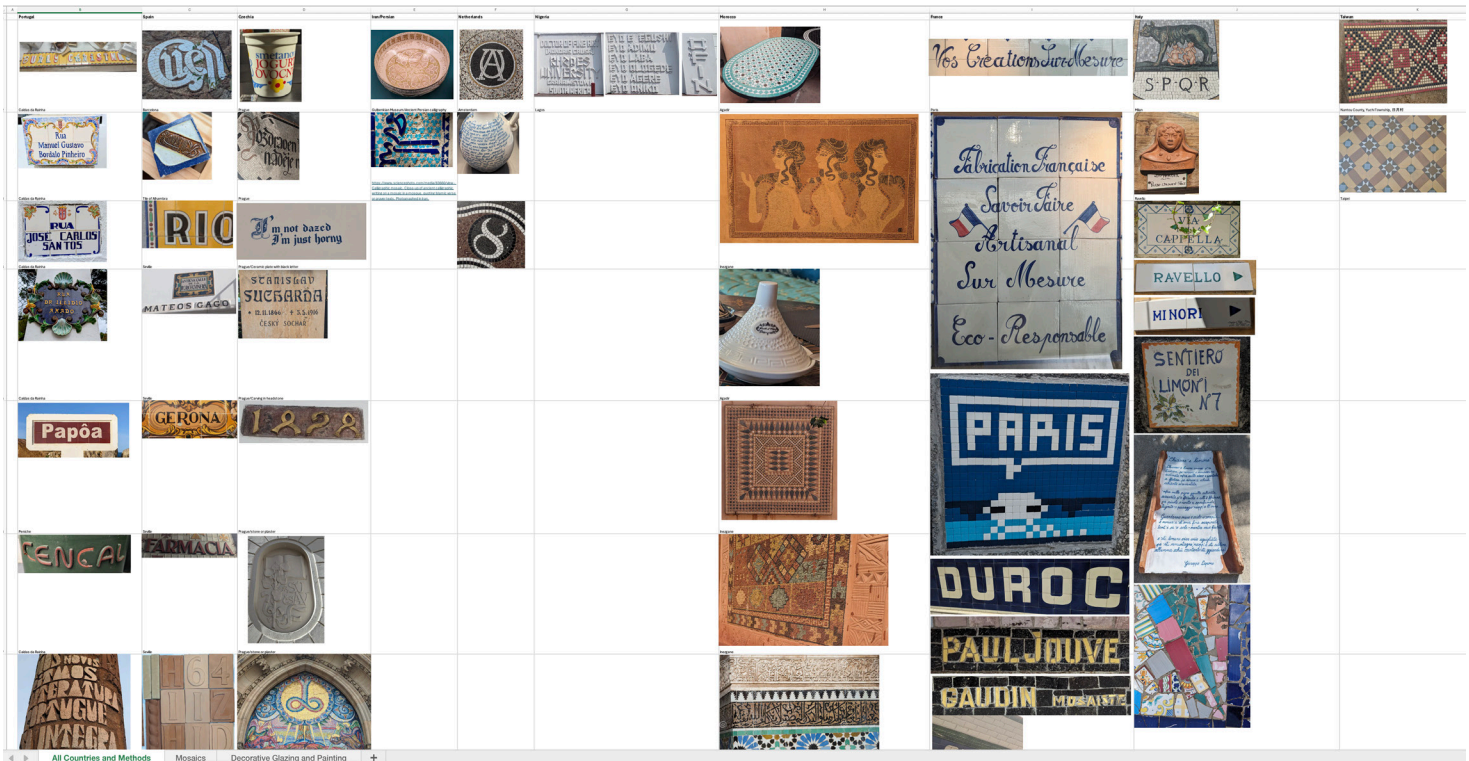
Figure 112. Home. Participant 9: Francisco Seco design digitized with branding of terra type. Photo from the author (2024).



Figure 113. Home. Participant 10: Joana Correia design digitized with branding of terra type. Photo from the author (2024).

Annex 5 – Catalog of Methods

In the initial stages of the research, the author conducted a photographic survey to document examples of ceramics incorporating typography. This collection was assembled during fieldwork in Spain, France, Italy, Portugal, Czechia, Nigeria, the Netherlands, and Morocco. Additionally, ceramics from Iran were photographed in Lisbon. The purpose of this collection was to identify existing instances of the intersection between type and ceramics, as well as to explore potential patterns and design approaches across different cultural contexts. This visual catalog provided a foundational reference for the study, informing the analysis of typographic integration within ceramic traditions.



Annex 6 – Participant Consent Forms

Signatures were obtained in writing or electronically signed.

Participant Consent Form

This template is designed primarily for those doing qualitative interviews with adults from non-vulnerable populations and dealing with non-sensitive topics.

The form would be different in the case of focus groups or quantitative research. If conducting research with vulnerable populations and / or sensitive topics please see Research Ethics Committee website for further details.

The points listed on the template below are for illustration only. You may alter the wording to suit your project as you see fit.

A consent form is not simply about a person giving you permission to involve them in research, it is an agreement between the researcher and the research participant outlining the roles and responsibilities they are taking towards one another throughout the whole of the research process.

The researcher should retain one copy of the consent form signed by both themselves and the participant. The participant should also be given a copy of the consent form as a record of what they have signed up to.

Even if a person has signed a consent form consent should still be re-established at the point of doing the interview.

Template

[*Title of project*]

Consent to take part in research

- I Sohaila Elmoataz voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.
- I understand that participation involves...*[outline briefly in simple terms what participation in your research will involve]*.
- I understand that I will not benefit directly from participating in this research.
- I agree to my interview being audio-recorded.
- I understand that all information I provide for this study will be treated confidentially.
- I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.
- I understand that disguised extracts from my interview may be quoted in...*[list all forum in which you plan to use the data from the interview: dissertation, conference presentation, published papers etc.]*.

- I understand that if I inform the researcher that myself or someone else is at risk of harm they may have to report this to the relevant authorities - they will discuss this with me first but may be required to report with or without my permission.
- I understand that signed consent forms and original audio recordings will be retained in [*specify location, security arrangements and who has access to data*] until [*specific relevant period – for students this will be until the exam board confirms the results of their dissertation*].
- I understand that a transcript of my interview in which all identifying information has been removed will be retained for [*specific relevant period – for students this will be two years from the date of the exam board*].
- I understand that under freedom of information legalisation I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Names, degrees, affiliations and contact details of researchers (and academic supervisors when relevant).

Signature of research participant

Signature of participant

15/08/2024

Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study

Signature of researcher

Date

Signature of research participant

Kristóf Reis Martins
Kristóf Reis Martins (Jul 20, 2024 18:54 GMT+1)

Signature of participant Date

11/07/2024

Signature of researcher

Rachel Ross

I believe the participant is giving informed consent to participate in this study

Signature of research participant

Signature of participant Date

12.07.2024

Signature of researcher

Rachel Ross

I believe the participant is giving informed consent to participate in this study

Signature of research participant

Sofia

15/08/2024

Signature of participant

Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study

Rachel Ross

15/08/2024

Signature of researcher

Date

Signature of research participant

Pirola Santos

17/07/2024

Signature of participant

Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study

Rachel Ross

17/07/2024

Signature of researcher

Date

Signature of research participant

Assinado por: **LUÍSA MARIA PIRES BARRETO**
Num. de Identificação: 05672131
Data: 2024.07.16 19:04:30 +0100

Signature of participant Date

Signature of researcher

Rachel Ross

I believe the participant is giving informed consent to participate in this study

Signature of research participant

Pedro Rodrigues Cardoso

Signature of participant Date

17.07.2024

Signature of researcher

Rachel Ross

I believe the participant is giving informed consent to participate in this study

Signature of research participant

Aut

Signature of participant Date

17.07.2024

Signature of researcher

Rachel Ross

I believe the participant is giving informed consent to participate in this study

Signature of research participant

Joana Beatriz Carneiro Correia

Signature of participant Date

17.07.2024

Signature of researcher

Rachel Ross

I believe the participant is giving informed consent to participate in this study

Molding Typography

The Exploration of Clay as a Typographic Tool
by Rachel Ross

Advisors: Ricardo Rodrigues dos Santos and Carla Maria d'Abreu Lobo Ferreira

Master's Thesis 2025

Graphic Design

IPL/School of Arts and Design Caldas da Rainha



**POLITÉCNICO
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