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Magic Brewing: Coffee and Visual Literacy in the Darkroom

Marita Ibañez Sandoval
University of Tsukuba, Japan
Gary McLeod
University of Tsukuba, Japan
Amber Ma
University of Tsukuba, Japan

Abstract

If sole use of digital cameras leads to impoverished means for visually recording and expressing experiences, ways are needed to introduce everyday camera users to affordances of other photomedia. As a typical first move, camera film enjoys consumer attention as an analog alternative to digital photomedia. However, developing the film at photo labs also distances users from conversations about environmental impact. Caffenol is often proposed as one sustainable alternative to traditional film development. Comprising coffee, washing soda, and vitamin C, it is receiving more attention in educational environments and enjoying discussion about its techniques and recipes. Though much emphasis has been on technical and environmental merits, less is said about the experiential dimension of using caffenol, including how to perceive and engage with the creative and sensory aspects of the development process in educational settings. This chapter adopts an anecdotal yet visual approach to explore caffenol through practical activities with varied student groups. Promoting informal repetition, analysis, and conversation, we posit that the caffenol process is not only environmentally friendlier and accessible—not to mention aromatic––but it can also support visual literacy and cultural understanding.

Keywords: Caffenol, Sustainable Photography, Darkrooms, Photomedia Literacy, Visual Literacy

Introduction

As a concoction of coffee, washing soda, and vitamin C, caffenol has been brewing as an alternative photographic process since the last decades of the 20th century. Although specific examples of early experiments with similar alternative film developers are not extensively documented, anecdotal evidence has suggested photographers experimented with various household items in times of resource scarcity (Reinhold, 2012). Caffenol was formally introduced in 1995 by Dr. Scott A. Williams from the Rochester Institute of Technology. Its potential as an environmentally friendly developer emerged as a response to environmental concerns associated with conventional darkroom chemicals. It also raised the profile of all caffeine-based drinks as viable photographic developers because they were rich in phenolic acids (Williams, 1995). When learning that Vitamin C and Sodium Carbonate (substitutes for potassium hydroxide and baking soda) improved image clarity, caffenol became an effective yet less environmentally damaging alternative (Alves, 2021)[1]. Its popularity was helped further by a revival in analog photographic techniques at the end of the 20th century and a more recent rekindled interest in the search for home development methods (Antonini et al., 2015). Studies have since considered caffenol's chemical properties and darkroom applications (Cepillo et al., 2018; Leglise, 2019; Wilson, 2012; Witten, 2016), as well as its environmental sustainability (Alves, 2021; Martorell, 2018; Silva, 2022), but there is less discussion about creating access to and interest in the process. With the development of caffenol formulas and variations emerging from places as far apart as Japan, Brazil, and Germany, it is also worth noting how it relates to global visual literacy. Despite symbolizing innovation and environmental consciousness among photography practitioners and gaining a following among artists and photographers are drawn to its unique qualities and the "eco-aesthetic" it represents (Catanese & Jussi, 2018; Suing Ruiz et al., 2019). Unfortunately, industrial chemicals remain the (aging) standard for "retro" driven consumers.

If caffenol development remains niche and training specialized, we ask what it can teach us about visual documentation and expression. Our investigation aims to expand an understanding of caffenol's applications, highlighting its effectiveness as a tool for photomedia literacy (McLeod, 2023) and an eco-

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friendly alternative in darkroom practices. As such, this paper explores the experiential nuances of caffenol's chemistry, environmental impact, and image-making potential with undergraduate and graduate students from varying majors in Japan. It describes three instances of using caffenol in teaching contexts. The first was instruction in developing black and white 35mm film with caffenol, a procedure generally done with industrially manufactured chemicals. The second was an individual activity involving creating and developing photograms (i.e., photographs made without a camera). The third activity immersed students in coffee culture and involved them in making caffenol and its application. It should be mentioned that within the text, we have also chosen to incorporate illustrations from a participant from the third activity. Images (whether created by researchers, participants, or through collaboration) are at the core of analyzing the social-cultural visions and perceptions of students, educators, or community members in visual ethnography (Barrantes-Elizondo, 2019). Thus, the images included here serve a purpose: to complement and enrich the narrative by offering observations and interpretations of the contexts and concepts discussed in the activities. In doing so, this paper contributes to broader discourse on sustainable practices in analog photography and its potential for developing what McLeod (2023) calls "photomedia literacy."

Our work on caffenol in educational spaces is inspired by the cultural practices related to coffee consumption in Latin America. One of the researchers in this work is a Latina living in Japan, which offers a different vantage point for exploring social interactions and traditions facilitated by coffee in Latin American communities. Moreover, this paper is enriched by studies on how coffee acts as a social glue, bringing people together in diverse settings. For instance, we developed a workshop inspired by the *sobremesa*, the Latin American and Spanish tradition of sitting at the table after a meal, usually over coffee. Such a cross-cultural perspective informs understanding of the role of coffee in social interactions and carries ideas of team building into the darkroom and learning processes.

Figure 1
Caffenol Ingredients.

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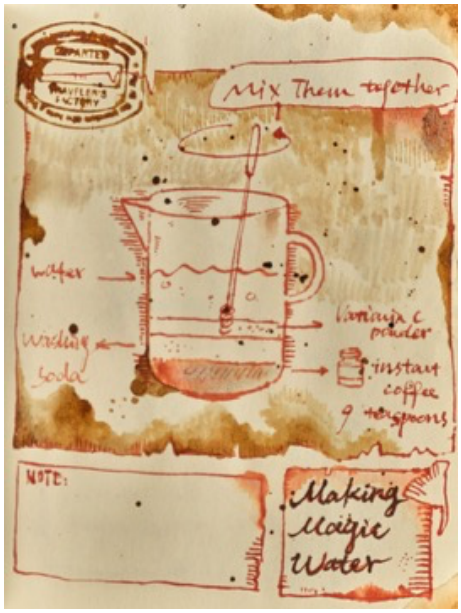
Figure 2
Instructions on how to prepare caffenol.



Hand-drawn illustration in notebook. ©Amber Ma (2023). Used with permission.

A Break from Digital

Originating from Ethiopia, coffee's rich history extends beyond its traditional role as a beverage, forming a crucial social and cultural fabric. According to legend, coffee was discovered by a goat herder named Kaldi in Abyssinia, present-day Ethiopia, who noticed that his goats were energetic after eating some red berries and decided to try them, sharing the same effects (Muñoz-Pajares et al., 2023). This discovery was shared with Sufis monks, who created a drink that helped keep the monks awake; thus, coffee became a religious enhancer among them (Topik, 2009).

Yemen has the oldest recordings of coffee consumption, dating back to the 15th century (Muñoz-Pajares et al., 2023). From Turkey to Syria, coffeehouses appeared throughout the Middle East as fundamental spaces for socialization, storytelling, and political discourse during the 15th century (Pendergrast, 2010). In Turkey, coffeehouses became known as social centers of intellectual exchange and entertainment (Hattox, 1985), setting a precedent for the European coffeehouses of the Enlightenment, noted for their role in cultivating the public sphere and democratizing discourses (Habermas, 1989). Coffee culture spread from Africa and the Middle East to Europe and Latin America, fostering community and dialogue.

In Latin America, during the 20th century, coffee was a pivotal element in social rituals, illustrating its profound impact on various aspects of society (Topik, 2009). The emerging middle class used these shops to socialize and establish norms and codes of conduct to bridge the gap between social classes, thus fostering sociability among social classes (González Parra, 2012). *Cafés* became centers for sharing stories and experiences, reinforcing social ties. Thus, more than its physical utility, it has become an essential economic good; its prominence is mainly attributed to community building (e.g., coffee shops), and its popularity is linked to modern social life, connections to global markets, groups, and national identities, as well as to economic and political dimensions (Tucker, 2011).

The global expansion of coffee culture, including its importance as an economic product, is marked by its ability to adapt and find relevance in diverse cultural contexts that extend to Japan. The adaptation of coffee rituals in Japan, a country with rich and distinct beverage traditions, underscores the role of coffee as a cultural conduit. For international students and emigrant communities in Japan, the experience of Latin American coffee rituals can provide insight into the diversity of global coffee cultures, fostering spaces for

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dialogue and cultural exchange. Moreover, academic settings such as workshops or classes can be conducive to horizontal and peer learning, openness, and intellectual exploration. Given these social potentials, it is helpful to unravel the significance of coffee in caffenol development and related darkroom practices, particularly for acknowledging diverse backgrounds and perspectives.

Looking closely at preparing a cup of coffee can highlight the communal and relational dimension of the experience while understanding the steps of making, while always resulting in an at least slightly different outcome. This is a notable contrast to the use of digital photographic media. Most digital cameras are one-dimensional because they produce similar results, and in-built image processing lessens the need for learning skills. As Johannessen and Boeriis (2019) have noted, with camera-enabled smartphones, users need to learn only how to operate an interface rather than how a camera creates an image. Digital cameras are thus compellingly convenient and render a feedback loop that enables camera users to remember quickly through doing, which should not be discouraged. However, a standard draw for enrolling in photography classes at our university is that we list analog photomedia as part of the syllabi. Enrolled students think of it as providing something different from what they already know with digital cameras, likely presenting a challenge that digital may not. Although some digital cameras (if understood fully) can simulate the same affordances that make analog cameras appealing (e.g., the delay inherent in reviewing a film-developed image can be simulated by turning off the camera monitor review function), such affordances are rarely seen as immediately apparent (McLeod, 2023). By all appearances, digital looks fast and can be assumed to be precisely that. Caffenol challenges that.

To be fair, any so-called “alternative” analog development technique could present a comparatively slower experience than digital. Preparing and developing mixtures can take valuable time (often by the darkroom technician, not a student), and the consistency problem in the results (e.g., clear images) becomes more significant with less stable solutions, thereby requiring more experiments and even more time. Traditional darkroom photography is revitalized with natural and sustainable methods, keeping it relevant to contemporary photographic practice (The Sustainable Darkroom, 2022). However, as caffenol also carries a culture, could it manifest engagement by exploring how to pass the time? The following instances contribute to a picture of such time passing. It should be noted, however, that our description of these instances is deliberately anecdotal, a high-resolution strategy that Cubitt (2013) noted provided “depth” and “color” to any general findings of methods that deal with multiple instances and large-scale tendencies. We share his understanding that anecdotes test “hypotheses against the unique qualities of artworks and experiences” (Cubitt, 2013, p.6), thereby grounding them.

Changing Taste

Our first example comes from classes taught at our university with graduate students from the School of Comprehensive Human Sciences. Two classes, Photomedia Exercises A and Photomedia Exercises B, serve as an introduction to photography. Photomedia Exercises A (discussed further in the third example) is an intensive class carried out over two or three days during a summer period, which aims to teach students about photographic apparatuses before the 20th century. Students learn about making photograms, a camera-less approach that involves exposing a light-sensitive surface directly to light. In such techniques, light rays obstructed by an object create a shadowed form from which a subject can be understood. Photomedia Exercises B, on the other hand, prioritized instruction in camera-based photography of the 20th century.

In contrast with Photomedia A, this class was technically more challenging because students borrowed cameras of different types and formats. Despite student interest in the classes, the expected use of industrial-strength (not to mention harmful) chemicals as a developer was a pre-existing concern. Not only are such chemicals expensive to purchase, but an educational environment in Japan also requires protective gear (e.g., gloves, aprons, goggles) and managed disposal, which adds further cost and which are problematic for managing groups of students larger than six people due to spatial limitations. To counter these challenges, the decision was made to replace industrial chemicals with caffenol. Students were each given one 35mm black and white film to make photographs, and after a week, students returned to develop their films. A demonstration was then given of how to make the caffenol developer. This demonstration gave the process transparency, and students could experience (see and smell) the different components

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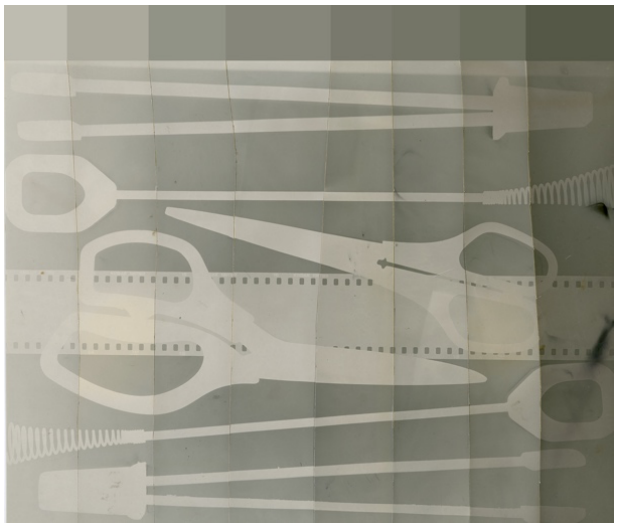
of the caffenol solution. This contrasted strongly with colorless industrial chemical compounds poured from opaque plastic bottles. Moreover, it modeled the process as accessible because students could recognize everyday products from supermarkets and relate to them.

The nature of the Photomedia B course (as taught in fall 2022) meant students could pick specific photomedia to use for their class project, and it was telling that most chose to work with digital cameras instead of analog processes. If assignments are not didactic, students again exemplify the power of convenience embodied by digital cameras. One student, however, saw value in pursuing the caffenol approach for her class project. As an international student from Latin America, she found an appropriate application for expired Costa Rican coffee. Her work consisted of making photograms with the screen of her laptop as a light source. Using photographs previously taken with a digital camera during travels in Japan, the student decided to invert them digitally, generating digital negatives that could then be used to generate positive images on the photo paper when developed. The resulting images were then cropped and reassembled as a diorama.

Knowing that caffenol has a shorter lifespan than industrial developers means that caffenol gets exhausted faster. The student's work prompted us to consider the tonal possibilities of caffenol, measuring tonal times and consistencies from the concoction's preparation and the differences in coffee, origins, and bean type (see Figure 3). Thus, the influence of coffee in the darkroom can also be observed as something that intensifies learning and generates new questions. As our classes tend to have students from different academic backgrounds and from connecting through coffee (or not), it originates a sort of cultural exchange in the academic environment. As Figure 4 suggests, sometimes students feel intimidated when asked to work in groups with people they have just met, so it is thought that caffenol could increase participation and engagement within student groups.

Figure 3. *Robusta tonal gradient.*



Photograms made with a darkroom enlarger, exposed for 20 seconds. Developed at 10-minute intervals. ©Marita Ibañez Sandoval (2023). Used with permission.

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Figure 4. *Entering the Darkroom.*

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Quick Cup of Joe

Our second example was a two-hour workshop for a high school group visiting the university in June 2023. The aim was a simple introduction to photomedia and an encouragement to explore alternatives to digital cameras. Emphasis was placed on camera-less photomedia; mainly photograms made using things to hand. All professional lights in the photo studio were turned off, and safe lights (typically red lights found in a darkroom) were placed around the room. This setup allowed for darkroom photo paper (which is not sensible to red light) without accidentally exposing the paper. As a group, students were given a piece of photo paper and asked to place their objects in an arrangement that mattered to them. When ready, a single strobe light (typically used for flash photography) created a short, intense light toward their arranged papers. We then proceeded to an adjacent darkroom to develop the results (Figure 5).

Although none of the students had experience with analog film photography, they were aware of darkrooms being portrayed in horror movies (a popular association). Darkrooms can be intimidating places to work because students are not used to low levels of light or color (the paper itself is not sensitive to red light). However, the intimidatory nature of the dark room did not appear to matter as the results of their photograms emerged. Despite the caffenol not being mixed in front of them, the students could all quickly grasp the possibility of using coffee to make a developer (notably the strong smell). Conversation with them also revealed a particular enthusiasm for the process. Aside from the lighting requirements, the simplicity of the exercise suggested that this process was achievable and portable. Moreover, making images without a camera excited them, prompting them to remember how they had previously made cyanotypes in a school class (an iron-potassium solution that results in Prussian blue-colored images).

From a single attempt with photo paper, students could observe (and marvel at) the relationship between the paper and the light and quickly get a sense of achievement. While their images may have just been that of a bottle or a keychain, such everyday items were personal for whatever reason and, therefore, underwent a stage of defamiliarization, leading to questions about what else was possible and whether it could be done at home. The images made during that activity were fixed using a traditional “hypo” (sodium thiosulfate) solution. However, using this industrial chemical (necessary for halting the development process) undoes the sustainable impression that caffenol creates. As the hypo clears away the remaining silver particles from the exposed paper, used fluid — though diluted — cannot be drained into the water table, requiring separation or destruction. Organic fixers have been recently touted as a possibility, but the required fixing times (over an hour) were not practical in this workshop. It can even be argued that fixing a developed photograph (such as those discussed) ought not to be necessary, as implied by Kaja Silverman

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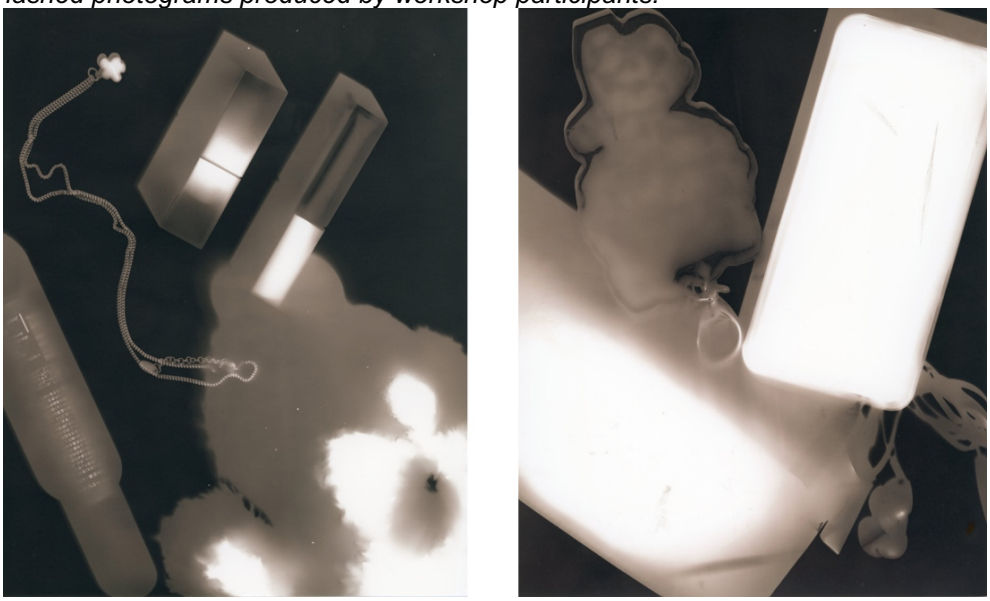
in her discussion of photography as analogous to being (i.e., existing) and, therefore, in constant flux (2015). Thus, we recognize that "Photography develops […] with us, and in response to us" (Silverman, 2015, pp. 11–12). Fixing an image is perhaps merely an accepted norm within photographic history and culture that using caffenol could contest.

Figure 5. *Flashed photograms produced by workshop participants.*



Featuring everyday items such as bottles and keychains. Fixed photo paper. © Gary McLeod & Others (2023) used with permission.

Magical Café

Our third example occurred in a Photomedia A class with graduate students in the summer of 2023. As an intensive class, the aim was to immerse students in making photographs without cameras. For two years, the emphasis of the class has been associations between photography and magic. While magic has always been a touchpoint for artists using photography (e.g., Cotton, 2015), the goal was to demystify the magic of photographic development. Building on previous experiences, the class decided to create a large photogram together using a piece of light-sensitive black and white photo paper (150cm×60cm) left over from another project. As the photo paper was appropriate for a bar-height table in the darkroom, we created an experience that alluded to the *sobremesa* as a social space charged with coffee. In Latin America, the word *sobremesa* is understood not only as that time together for socializing but also as that drink or dessert accompanying it. In our case, that is caffenol (although not for drinking).

Before the class, students were asked to each bring a jar of instant coffee to the darkroom. Like a barista, the darkroom technician demonstrated how to prepare the caffenol solution using instant coffee. In red safelight conditions, the sheet of photo paper was laid flat on the table, and students were asked to arrange various cups, glasses, and cutlery. Similar to the exposure technique used in the previous example, a strobe light was brought into the darkroom and flashed once on the paper. As with other photograms, the image was apparent when the caffenol solution was applied this time through trigger sprays and wiping. Collectively, students gathered around the paper to apply the caffenol and develop the image. After a shared gasp of wonder at the image's appearance, water was similarly applied, and the paper was then moved to a nearby sink to rinse (Figure 6). With the room lights on and the paper washing, students could see unexposed areas change from white (the paper color) to yellow, pink, and then purple as the paper was, on this occasion, not fixed (Figure 7). Witnessing this change presented a feeling of privilege in seeing a change that could only occur once because it cannot be undone. At the very least, it generated questions about why that change was visibly taking place—itself a memory created. Thus, demystifying the magic of development became a learning point and a subject of illustration (Figure 8).

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Figure 6. *Illustration of Photomedia A students washing the large photogram.*

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Figure 7. *The surface of the photogram after development and exposure to regular lighting.*

As it was not fixed, the unexposed areas turned purple. Photo © Gary McLeod & Others (2023). Used with permission.

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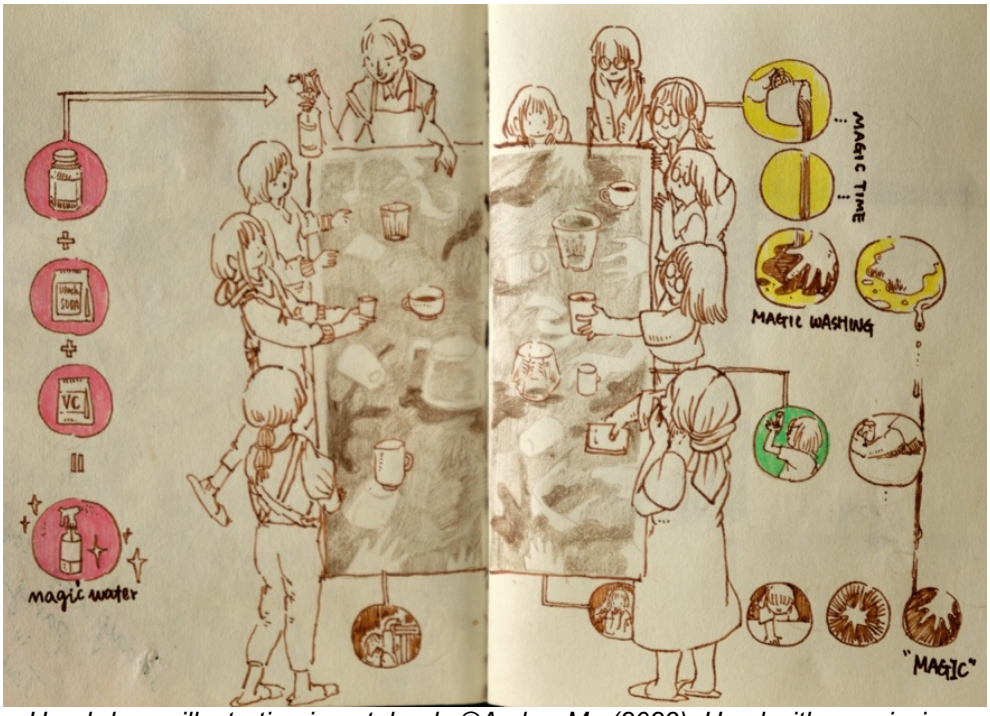
Figure 8. *Illustration of Photomedia: A students and Darkroom Technician conveying how the photogram was made*



Hand-drawn illustration in notebook. ©Amber Ma (2023). Used with permission.

Caffeinated Darkrooms

Coffee and caffeine boost energy and alertness (Harpaz et al., 2017) and increase happiness and well-being (Mai, 2016). Bringing coffee into the darkroom, as in a "Caffeinated Darkroom," brought new experiences and lessons learned. Throughout the three activities, the experience increasingly embraced the essence of *sobremesa* (central to Latin American culture), eventually integrating it into our workshop to explore possibilities beyond mere film development. The third activity made the ritual of *sobremesas* explicit, a time cherished for relaxation, coffee, and deep post-meal conversations, symbolizing food's cultural and social essence in Hispanic and Latin American communities (Perez, 2010). Students were temporarily immersed in this tradition by bringing their coffee and typical café items and blending the communal aspects of *sobremesa* with the creative process of making photograms, producing photographic images, and embracing Latin American coffee culture's warmth and communal spirit, pointed to *sobremesa* as a more complex and significant experience than a mealtime tradition: a period of meaningful connection and sharing, reinforcing social ties and community bonds (Perez, 2010; Salas Gonzalez, 2020).

From the perspective of photomedia literacy, the activities also revealed the following. In choosing to make and develop photograms rather than process black and white film, the second and third activities were particularly instrumental in presenting camera-less photography as more accessible than camera media (e.g., roll film). Making photograms (by way of "magic") was also more transparent for learners. This point seemed conversant with caffenol and ironic references to "magic materials" and "magic water." Thus, when learners used their smartphone cameras to record experiences (Figure 9), a latent comparison may have been established between different types of photomedia (not just digital vs. analog, but also camera vs. camera-less) that might be enough to retain understanding and repeat.

What was evident through the above activities was that caffenol not only reiterated the darkroom as a social space of visual play but also offered a rich medium for learning. Experiencing photography in this way can

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directly improve photomedia literacy by familiarizing students with other non-digital photomedia and welcoming comparisons between them. According to McLeod (2023), photomedia can have a meaningful effect on a student's visual literacy in that they can critically recognize how a photograph is made with a particular apparatus. In this case, the hands-on learning experience with so-called "magic" materials to demystified the darkroom while attesting to its versatility (Margadona & Pereira de Andrade, 2019; Morelock, 2022). In terms of darkroom sustainability, caffenol emerges as an alternative means of photographic development, particularly when considering larger scales of production (like those encountered in art departments) and when considering the varied tonal effect afforded by coffee bean varieties (e.g., sometimes close to sepia, others maintaining the black and white coloring). Our explorations have found that while Caffenol addresses the growing demand for eco-friendly practices in photomedia expression, it can also do so in a way that draws attention to cultural connections and possible diversity among student groups. Experiential aspects of caffenol can, therefore, contribute to a relaxed atmosphere in the darkroom and potentially open new avenues for teaching and learning, encouraging creativity, cultural exploration, and environmental awareness.

Figure 9. *Photomedia A students making a collective photogram for Cafe Magic and taking digital snapshots of their experience with their smartphones (2023)*

Photo © *Gary McLeod 2023. Used with permission.*

More Grinding

Considering the educational effects of caffenol, our exploration was important for students to develop greater photomedia literacy; that is, an ability to "read" and "write" images with a variety of photomedia — as opposed to just digital photomedia, which, despite being convenient and capable of accelerating learning, risks sidelining notable affordances of alternative photomedia, thus narrowing the experiential spectrum available to students (McLeod, 2023). Incorporating a diverse array of photomedia, such as the hands-on experience with caffenol, teaches darkroom processes and potentially broadens students' visual vocabulary.

Future research could delve deeper into the nuanced cultural connections fostered by caffenol, examining its role in promoting cross-cultural understanding within diverse educational settings and regions. For

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instance, what would a similar caffenol activity feel like in Italy or Brazil? Additionally, exploring the long-term effects of caffenol integration on students' continued engagement with photography and ecological practices could provide valuable insights into its impact on educational environments. Tangentially, there is space for further studies on the importance or necessity of fixing images in the darkroom while also acknowledging the possibility of "fixing" them digitally. Further investigations might also address the potential adaptation of caffenol in different educational contexts, considering its applicability across various disciplines and institutions (e.g., visual sociology). Similar explorations of the cultural significance and experience of using other alternative developers (plant-based developers, "wineol," or "teanol," among others) could also be made. As with caffenol, they can be an aromatic catalyst for hands-on learning, cultural appreciation, and student involvement, invoking curiosity and active engagement within darkroom practices and photomedia literacy. Now, where is the coffee?

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Footnotes

1. Notably, the presence of phenols in coffee is the basis for using caffenol as a developer (Anderson, 2022).

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