

***Empowering Indonesian Ceramicists Through Participatory Design:  
Co-designing a Mobile App***

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**Abstract**

Ceramics is a form of culture that carries traditional values that have existed for a long time in Indonesian society. More than 100 Indonesian ceramicists gathered in ID Ceramics community, an Indonesian ceramicist community initiated by ceramic enthusiasts in Jakarta. Every ceramicist has many ways of explorations and practices in making ceramic glazes. The iterative process of making ceramic glazes is crucial as it contains valuable information that must be properly documented. Several Indonesian ceramicists log the process of making ceramic glaze by using handwritten notes which were prone to damage. Mostly glaze exploration is a spontaneous process that occurs in the studio and is missed to be logged. This paper presents the participatory design process for developing a glaze production log mobile application for Indonesian ceramicists. The participatory design approach involved 8 Indonesian ceramicists in the Ideation phase as end users. Co-design and observation are used as the main methods. Each participant with their expertise to provide insight into the design process of the mobile app, ensuring that future mobile app features align with the specific characteristics of the practical needs of the ceramic maker's workflow. This paper discusses the participatory design process involving Indonesian ceramicists, the challenges, and the overall impact on the design and features of future mobile applications. The results highlight the importance of end-user involvement in the development and design process to gain valuable insights for future mobile applications that integrate technology with traditional practices, especially ceramics in Indonesia.

Keywords: Participatory Design, Indonesia Ceramicists, Co-design, Mobile Application

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## Introduction

Pottery, grab an important role in Indonesian society since long time ago, it represent an intangible manifestation of long-lived traditions. Archaeological evidence from the Sriwijayan era, Southeast Asia's most well-known maritime empire, witness to the widespread use of ceramics in the archipelago (Taim, 2020). This historical significance highlights ceramics' enduring role in Indonesian society. While pottery is consistently associated with rural handi-craft centers, the past few years independent ceramic studios in Indonesia's urban areas has expand rapidly. Ceramicists in Indonesia possess unique techniques and traditions that represent an intangible cultural heritage (Yasmine et. al., 2021). A preliminary survey, combining self-reported data and social media analysis, identified over 100 independent ceramic studios, primarily in Java and Bali. These situations suggest a significant potential for further exploration and documentation of Indonesia's ceramic heritage. Every ceramicist has many ways of explorations and practices in making ceramic glazes. The complex process of making glaze formulation involves numerous iterations and represents a valuable repository of knowledge. The iterative process of glaze formulation involves a wealth of knowledge that is often undocumented. To address this gap, a participatory design approach was adopted to co-create a mobile application tailored to the specific needs of Indonesian ceramicists. In the process of making ceramic glazes requires well documentation, so the processes can be evaluated later on (Widjono & Oktanuryansyah, 2023). Through collaborative workshops with eight ceramicists of varying experience levels, the project aims to develop a user-friendly tool for documenting glaze recipes and experimental processes. Participatory design (PD) is a user-centered approach that empowers end-users to collectively create solutions that align with their needs, preferences and technology capabilities (Simonsen & Robertson, 2013). The primary objective of this study is to reveal the process of participatory design workshop that involves Indonesian ceramicists, by discussing the benefits, challenges, and impact on the design process for future development. By highlighting these valuable insights, this study will contribute to the preservation of Indonesia's intangible tradition and empower ceramicists to share their knowledge with future generations.

## Material and Methods

This participatory design workshop aimed to mapping content priorities and visualize the ideal mobile application features as perceived by each participant.

### *Creating Participant Criterias*

To select participants for the participatory design workshop, criteria were established based on studio profile data collected by the ID Ceramics community since 2018 to 2024 more than 100 studios was recorded.

1. Demographic:
  - Age: 27-50 year old
  - Sex: Male & Female
  - Occupation: Full-timer Ceramicist
  - Level: Ceramicist in last 2 years
  - Tech skill: Any
2. Geographic: Indonesia
3. Other Criteria: Actively making ceramics, using glaze on their ceramics

Based on the data, eight ceramicists from the Jakarta, Tangerang, and Bogor areas were selected. These participants were chosen based on criteria that would make them representative of ceramicists across Indonesia. All participants volunteered their time for this research.



Figure 1: 8 Indonesian Ceramicists as Participants in Participatory Design Workshop

### ***Techniques***

Another important aspect was the physical space that was convenient for the participant. To gain a comprehensive understanding of the participants' daily work environment and practices, on-site visits were conducted at their ceramic studios between the 8th and 13th of September 2024. Given time and geographical constraints, data collection was limited to the Jakarta, Tangerang, and Bogor regions, covering approximately 100 kilometers in total. Visits were limited to one or two studios per day to optimize time spent on travel between studios.

The participatory design workshop utilized the following methods:

1. Studio observations were conducted to understand the participants' work environment and routines.
2. Interview: Semi-structured interviews were conducted with open-ended questions to gather the ceramicists' perspectives.
3. Card Sort: Participants were asked to categorize information cards based on their preferences and priorities.
4. Co-Design: Participants were tasked with designing their ideal mobile application for daily studio use. To provide a clear context, participants were given a simple scenario to guide their visualization process.

### **Findings**

The table below provides a summary of the progress and time taken by each participant during the workshop. Each participant required a different amount of time to complete all workshop sessions. As Table 1 illustrates, some participants were unable to fully complete all sessions.

Table 1: Session Completion of the Participatory Design Workshop

Participant	Est. Studio	Studio Loc.	Observation	Interview	Card Sort	Co-design	Duration
Participant A	1995	Jakarta	✓	✓	✓	-	2h 47m 27s
Participant B	2023	Tangerang	✓	✓	✓	✓	2h 57m 25s
Participant C	2018	Tangerang	✓	✓	✓	✓	2h 55m 09s
Participant D	2015	Tangerang	✓	✓	✓	✓	1h 17m 32s
Participant E	2015	Jakarta	✓	✓	✓	✓	1h 28m 30s
Participant F	2023	Bogor	✓	✓	✓	✓	2h 54m 30s
Participant G	2010	Jakarta	✓	✓	✓	✓	
Participant H	2023	Bogor	✓	✓	✓	✓	1h 7m 09s

### ***Observation***

In many cases, Indonesian ceramicists fail to document their studio explorations adequately. Handwritten methods are commonly used to record glaze recipes, with labels attached to glaze samples. While this approach is widely adopted, it is susceptible to damage, loss, and incomplete records, which can hinder the reproducibility and preservation of traditional glaze-making knowledge. Each ceramicist possesses unique approaches to glaze formulation and application. The lack of comprehensive documentation among Indonesian ceramicists poses a significant threat to the preservation of their intangible cultural heritage. The challenges associated with documenting diverse glaze-making practices, including the complexities of recipe sourcing, customization, and evaluation, often discourage ceramicists from developing systematic documentation practices.

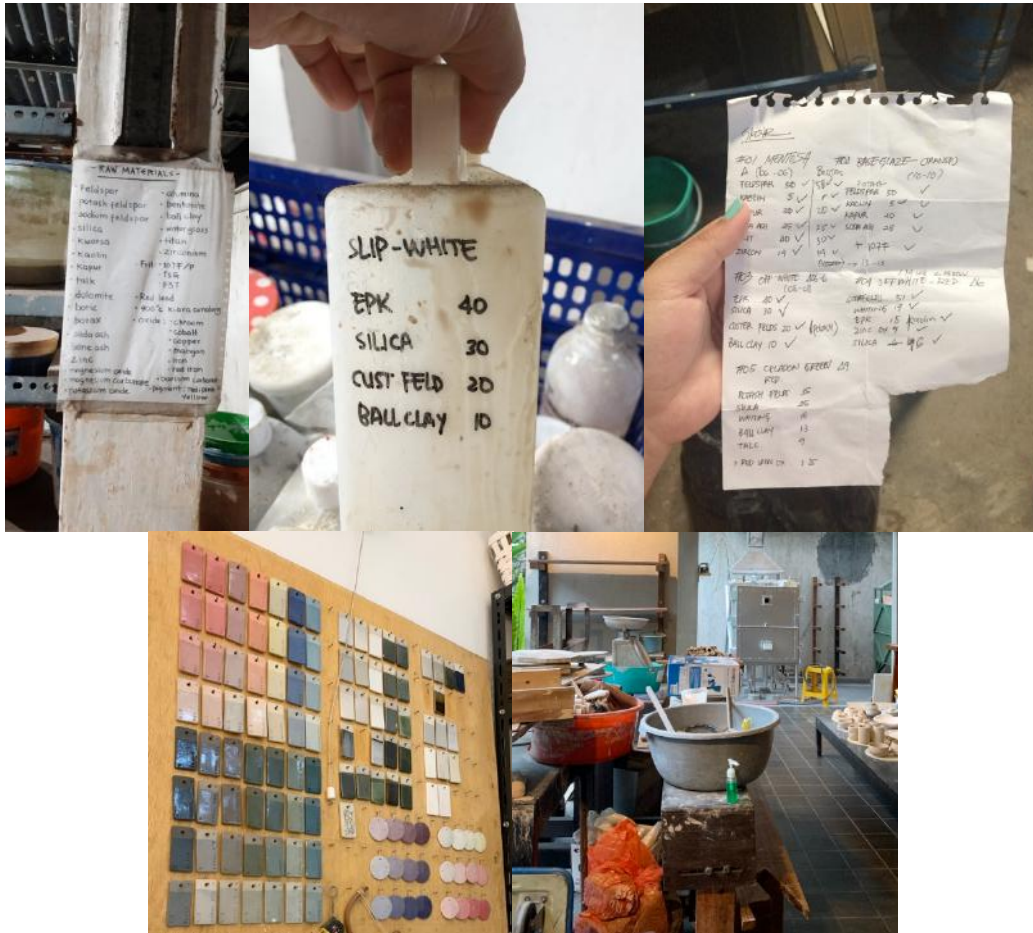


Figure 2: Ceramics Studio Environment and Glaze Documentation

### *Interview*

The interview session consisted of 15 open-ended questions. Given the diverse experience levels of the eight participating ceramicists, the interviews provided valuable insights into their thoughts and feelings. While the research aimed to co-design a digital tool to enhance ceramicists' documentation practices, some participants expressed enthusiasm, while others, particularly one with extensive experience, voiced concerns about the potential negative impact on their creative process. This participant shared numerous personal anecdotes and expressed fears that such a tool might hinder their creativity and diminish the enjoyment of their craft.

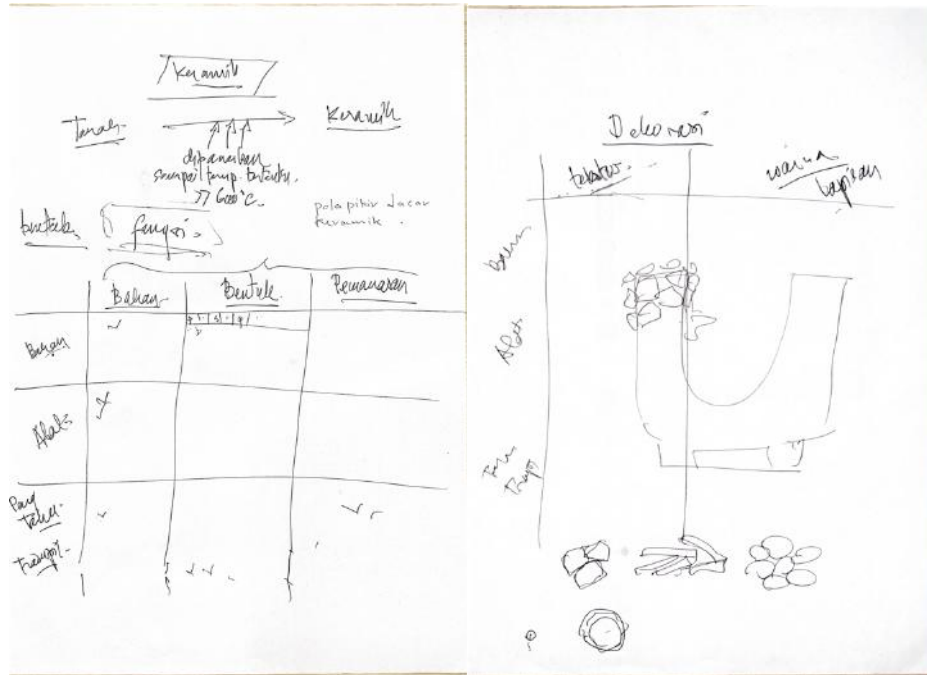


Figure 3: Participant's Sketches of His Long-Held Beliefs About Pottery on Interview Session

### Card Sort

Card sorting was employed to classify and organize data based on individual interests (Lobringer & Brantner, 2020). The card sorting session aimed to identify participants' priority information. With 8 main topics and 46 subtopics, the task involved sorting 54 cards. Some cards contained similar terms across different main topics, leading to potential confusion. Due to the small size of the cards and the redundancy in terminology, participants often found the task overwhelming and required repeated clarification to ensure accurate understanding. During the card sort session, Participant A expressed discomfort with the structured research approach, stating that it forced him to question his long-held beliefs about pottery. Since the participant voiced discomfort with the research's imposition of a structured approach, asserting that it conflicted with his deeply held beliefs, I decided to discontinue the next session, Co-Design.



Figure 4: Card Sort Session

### ***Co-design***

Co-design refer to creative cooperation during creative process (Steen, Manschot, & Koning, 2011). During the co-design session, participants were tasked with envisioning their ideal mobile application for studio use. While some participants expressed confidence in their ability to visualize their concepts, others struggled to differentiate between application and website formats. To facilitate clarity, participants were given the option to verbally describe their ideas, rather than relying solely on visual representations.

Sometimes the participants have no confidence to expressing their idea through pen and paper. As seen in figure 4, one of participants successfully visualize her mobile app concept into simple wireframe. Some of participant likely to making a list of main menu & sub menu. And draw a layout of mobile app page at the beginning, and end up with Information Architecture. One of participant more comfortable to describing the concept with words since text is more like understandable. And last participant trying to visualize the concepts but mixed up between mobile app and websites.

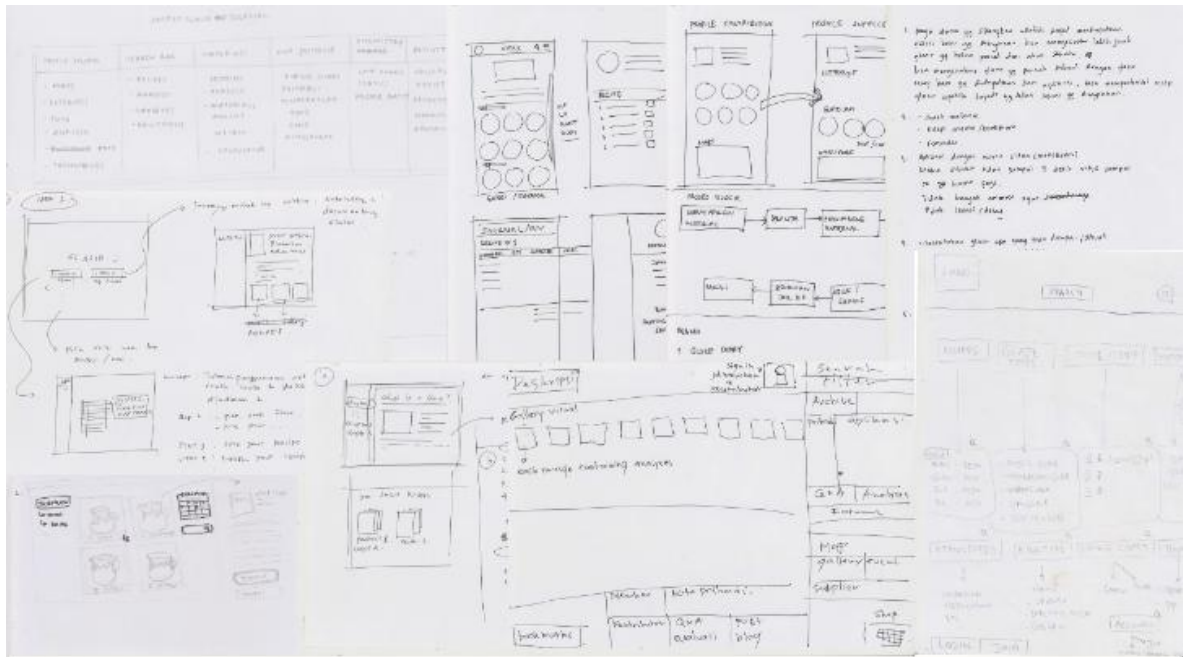


Figure 4: 7 Participants' Sketches on Co-design Session

## Discussion

The following examples demonstrate the potential of participatory design to yield more inclusive, effective, and sustainable design outcomes:

1. **Enhanced User Experience and Usability:** By actively involving ceramicists in the design process, participatory design ensures that the final product aligns closely with their specific needs and expectations. Understanding their studio practices provides valuable insights for future design iterations. When ceramicists are actively involved, they contribute to the design process, leading to increased usability and satisfaction.
2. **Increased Adoption and Ownership:** When ceramicists are directly involved in the design process, they often experience a greater sense of ownership and connection to the final product. This increased sense of ownership can lead to higher adoption rates, especially in community-oriented projects where user buy-in is crucial.
3. **Locally Relevant Designs:** A wider target audience can foster the development of habits and locally relevant designs, particularly among participants from diverse backgrounds and with varying levels of digital literacy. By incorporating users' cultural contexts into the design, the product can be more appropriate and effective in its specific setting.
4. **Amplifying Diverse Voices:** Indonesian ceramicists, especially those with limited formal training or experience, can benefit significantly from participating in the design process. This can lead to more equitable and inclusive outcomes. By giving them a voice in the design process, we can ensure that the final product meets the needs of a diverse range of users.
5. **Sustainable Development:** The involvement of Indonesian ceramicists in the design process can contribute to the development of more sustainable and long-term solutions that genuinely reflect the needs and capabilities of the community. Participatory design is often employed in sustainability initiatives. By involving local stakeholders in the design process, projects are more likely to result in sustainable, long-term solutions that reflect the needs and capabilities of the community.



Despite the potential benefits, several limitations were encountered during this study:

1. Time and logistical constraints: Co-design sessions were conducted individually at each ceramicist's studio, which was a time-consuming process. While the literature does not explicitly state that participatory design (PD) must be conducted on-site, the data collection in this study required participants to be observed in their familiar work environments (ceramic studios) to facilitate their ability to envision potential applications. Applying distributed participatory design (DPD) in future research could help to overcome these geographical challenges.
2. Participant recruitment: Recruiting suitable participants for co-design was challenging. In addition to meeting the criteria for end-users, potential participants needed to be able to articulate their needs. This was because they might not have been aware of existing problems that could be addressed. The ability to engage in creative and critical thinking was a necessary soft skill for participating in the co-design process.
3. Tool and instruction design: Appropriate tools and clear instructions were necessary. The brief needed to be easily understandable, especially considering the varying levels of creative and critical thinking abilities among participants.

## **Conclusion**

This participatory design process revealed both the potential and challenges of developing a mobile app for ceramicists. While some participants felt the app might restrict their creativity, others offered valuable insights into how it could support their studio work. The card sorting and co-design sessions helped clarify user priorities, though participants sometimes struggled to understand terms and differentiate between digital formats.

The process showed that involving ceramicists directly in the design leads to more tailored solutions and a stronger sense of ownership. However, challenges included the time-consuming nature of onsite co-design sessions, finding suitable participants who could clearly express their needs, and ensuring the tools and instructions were easy to understand. Despite these difficulties, this approach offers a promising way to create long-term, sustainable solutions that meet the needs of diverse ceramicists, particularly in Indonesia.

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