A Proposal on a method for enhancing creative expression in craft design through reflecting on the creative process

by

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Abstract

Craft design plays a crucial role with a historical background in design research. However, inquiring about craft design in contemporary society still left space for enriching the understanding of craft creativity in the design community. This study aims to propose a method to enhance creative expression by reflecting on the creative process of craft design. The passion of this research is rooted in the question, “how do craft designers reflect on their creations?” Is the reflection impact the creative expression? Therefore, exploring designers' reflective practice as a subjective experience from an internal perspective could be an effective way to provide a new understanding within design research and is expected to benefit novice designers. This research focuses on ceramic design as the craft area to explore. On the one hand, ceramic design has a long tradition of interacting with humans and the material world. On the other hand, due to the researcher's background, that experience as a ceramic designer to access the data source. This research seeks to answer the following three questions: what kind of reflection do craft designers engage in the creative process? How can diverse reflection facilitate creative expression? How do we promote novice designers' creative expression through reflective practice?

We primarily served the literature across the design and creativity domain to clarify the existing research concerning reflection, creativity, and craft research. In this standing, we adopted multiple qualitative research incorporating diverse data embedded in three phases to fulfill the research. **Study I** explored the forms of reflection by interviewing experienced ceramic designers with a design education background. Seven forms of reflection in the creative process have been identified through qualitative content analysis and primarily mapped in a framework with two dimensions according to the data analysis. Appling Material Engagement Theory (MET) to indicate the next research phase. **Study II** examines the designer's reflection during the execution stage that affects the creative expression by adopting observation and visual data analysis. The findings have characterized the framework generated in **Study I** and further discussed the implications of experienced designers' reflection associated with Material Engagement Theory (MET) while developing a method to guide novice designers' reflective practice. **Study III** instructed student designers to conduct reflective practice in a multi-cultural environment in fieldwork and collect photo diaries and self-reports as the data source. Three themes were highlighted in the thematic analysis and referenced Three-Dimensional reflective frameworks from literature to reveal the findings. Finally, we discussed the main results from three studies in this research and suggested an RLCD framework to contribute to craft and design education. The implications and the recommendations for future work also can be found in the discussion and conclusion section.

Keywords： craft design, creative process, reflective practice, design education, creative expression

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MET: Material Engagement Theory

KM: Knowledge Management

Glossary of common terms

Term	Definition
Content Analysis	an analysis method used to determine the presence of certain words, themes, or concepts within descriptive data
Thematic Analysis	a method for analyzing qualitative data that entails searching across the data to explore the patterns in data source
Observation	an act of seeing or taking notice of something
Video Recording	recording the actions or environment by camera settings
Photo Diary	create the photo to record the diary feelings or thinking
Self-Report	any test, measure, or survey that relies on an individual's report of their symptoms, behaviors, beliefs, or attitudes
Meaning Unites	reduced in volume, area, length, in a condensed version of text data
Visual Data	a form of content in images , pictures and films as the data source to support the exploration

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Chapter 1. Introduction

1.1Research context

Craftworks have evoked interest from several psychologists and philosophers to observe and comment on it as a reflective theme in the last century. For instance, John Dewey (1933) constructed the philosophy of experience on a discussion of aesthetics. He considered it an *"esthetic quality that rounds out an experience into completeness and unity as emotional" (p. 43).* The practical and experienced works usually evolve rich expressions that nourish rich meanings, and these meanings are deeply rooted in previous individual experiences. Therefore, art or craft art could be seen as a phenomenon related to the practitioner interacting with the external environment by individual behavior that reflects one's profound levels yet is directed to the groups. Over the five decades, the craft practice turned into a unique area that combined art and design. Even within the design domain, step back to a practical project since it has shed a productive role in industrial society.

Despite these connections, craft art still maintains rich knowledge of experience regarding material creation that continues to nourish design as a comprehensive practice that needs diverse knowledge to support new ideas. However, at least in the academic area, there has less concern about the craft as a domain that recognizes craft making as a creative practice worth more exploration rather than a skillful work to heritage in modern society. Sennet clarified that the core of the traditional craft is a desire to complete quality work(Sennett, 2008). Nevertheless, the situation of craft is changing since the creative workshop became popular initially in the UK in recent decades. More and more craft practitioners who are well educated in design and art have established individual studios to produce and present their works in several ways. This evolution impacted and saved the craft from traditional

production to art-making. Moving eyes to the craft design would be a chance to know the craft creativity contributes to the design research and pregnant a new tradition in the future.
Finally, another benefit of studying craft is the existence and use of ornaments or patterns and their unique symbolic value. As Valsiner (2007) argues, our lives are decorated lives, and the patterns and textures of materials are not simply aesthetic accessories. They become cultural instruments that guide our behavior. Craft products, in general, are slowly developing in contemporary society's relationship to established art forms (Becker, 2009) and are increasingly appreciated as examples of deep and meaningful creativity. Furthermore, this view echos to agree with the Japanese folk theorist Yanagi Munoyue who advocated that the process of making crafts for daily life is a way to gain creativity.
Contemporary craft design has moved away from the role of production in the changing times, and the widespread conceptions of modern design and art concepts are cultivating a new generation of craft practitioners with a professional design education background vastly different from traditional craftsmanship. The current research on craft has focused on the process of making and the analysis of the practitioner's embodied cognition (Groth, 2017) aimed at explicit, tacit knowledge. In this sense, craft design is an active process that involves cognition, creation, and meaning construction (Botella et al., 2013; V. P. Glaveanu, Tanggaard, & Wegener, 2016). Moreover, from the social-cultural perspective, that has brought craft work as an object of attention in design and culture. However, the practitioner's view continues to remain silent in many studies. This research is interested in the internal perspectives of craft design, primarily focusing on the creative process that involves rich psychological activities and creative expression.
In this context, this study defines craft as a practice-led design field that attempts to explore subjective experience and creative expressions through a reflective lens to provide new insights for design and art research.

1.2 Problem Statement

1.2.1 Researcher Background

As a designer who has studied and worked in a capital city of ceramic, Jingdezhen, CHINA, and engaged in ceramic design for seven years. The practical experiences provide a foundation for the researcher to access, communicate and collect rich data from the craft design field. Communicating with ceramic designers through different practice projects helps

interpret the data from an internal perspective within this study, thus promising depth analysis. Based on the long-term field observations, reflective practice is a unique lens to inquiry how to promote the creativity of craft design by continuously negotiating the intersection of a creative and traditional way of making. In addition, the reflective practice provides a chance to access a co-inquiry relationship between researcher and practitioner to understand the creative process and generate new insights into craft practice. Last but not least, the researcher's background has been clarified here to enhance the reliability of the data analysis and explanation.

1.2.2 Research purpose

The purpose of this study is to propose a method to enhance craft students' creative expression by reflecting on the creative process. Therefore, the two sub-goals have been highlighted to fulfill the purpose.

a) To identify the forms of reflection in the creative process of experienced craft designers.
b) To propose a framework for characterizing craft designers' reflective practices in the creative process
c) To propose a method to enhance craft students' creative expression by reflecting on the creative process

1.2.3 Research Questions

This study focused on the reflective practice of craft design by applying the multi-stage qualitative study to inquiry how to enhance craft students ' creative expression through reflecting on the creative process.
Based on this primary question, the main research question and three sub-questions have been developed as below:

Main Question:

How do craft designers enhance creative expression by reflecting on the creative process?

Sub-questions:

a) What forms of reflections do experience craft designers consist of in the creative process?
b) How do we frame the designers' reflections in the creative process?
c) What method can promote craft students' reflection to enhance creative expression in the creative process?

These questions were inquired by adopting a multi-stage qualitative study that is briefly shown in **Table 1**. Reflection as an experience in the creative process, an action to explore experiential knowledge, and a pathway to self-learning for novices were examined from different perspectives through a multi-step qualitative study. According to Pink (2001), it is interesting to analyze and delineate experiences into categories of each meaning to give meaning to the cultural constructs of the activity under study (p. 267). To get close to reflective practice, it was necessary to use various methods, including long-term field observations, interviews, self-reflection, participant observation, collecting many types of data, and writing analytical memos.

	Objectives	Methods	Analysis
Pilot Study	To identify the forms of reflection in the creative process of experienced craft designers.	• Desk research with the publications of craft research • In-depth Interviews with 12 designers	Content analysis
Main Study 1	To propose a framework for characterizing craft designers' reflective practices in the creative process.	• Observation • Video record • Post-Interview	Content analysis Visual research
Main Study 2	To propose a method to enhance craft students' creative expression by reflecting on the creative process.	• Creative course • Self-reports • Photo dairy	Content analysis Thematic analysis

Table 1 The methods adopted in the research.

1.2.4 Origins and Novelty of this research

Generally, this research is expected to contribute to the craft and design domain from a reflective perspective. The origins and novelty of the study come from three primary sources.

First, we focus on the practitioners' perception of contemporary craft design as a creative domain. Exploring the practitioner's perspective allowed us to explore the reflection as an internal experience of how experiential knowledge is learned, applied, questioned, and evolved into new ventures to support creative design.

Secondly, this study incorporates the researcher into the method and tools: observation and video record of the execution process and corporate with participants post-interviewing while generating insight through co-reflection. Moreover, inviting the participants to review the video and conduct post-interviews contribute to studying the reflective practice from different perspectives.

Finally, using visual data combined with reflective writing maximizes students' thinking capacity and provides a new reference in design education for promoting student creativity.

1.3 The outline of the dissertation

The rest of this paper is organized as follows.

Chapter 2 begins with a review of the nature of creativity, focusing on the characteristics of the creative process and process design, and approaching reflective practice in process design with the MET theory. This part summarizes the influence of reflective practice on the creative process in literature and lists relevant research and exploration perspectives. To understand how reflective practice, as an experience in the creative design process, stimulates and promotes designers' cognitive ability and creative expression. It is necessary to consider that craft designers have more diverse forms of reflective practice than they can clearly define. They must be aware of the potential impact of reflection on creative design.

Chapter 3 discusses the research design of this study. It then investigates a strategy inspired by phenomenological research to approach, process, analyze and explain how reflective practice may enhance the craft designer's experience of the design process. Specifically, two main research methods used to generate themes in exploratory research are compared and discussed: content analysis and thematic analysis. This approach was used to evaluate all three studies discussed in this work, including the rationale for their objectives and questions, practical choices of methods and participants, the coding methods, and researcher memos. Although both reflective practice and creative process are personal, the description of subjective experience can lead to a shared experience that can be understood. This study

employs a series of qualitative generalizations and interpretations (interviews, observations, graphic data) to focus on the designers' reflections on the creative process and encourage researchers to understand and interpret the tested reflective experiences.

Chapter 4 examines the various ways craft designers reflect on the design process, defining reflection as a dynamic and unified experience within the design process and clarifying seven forms of reflection within this research. The different forms of reflection are conceptualized as experiences from the designer's internal perspective, and the modes of interaction of reflective practice with a matter in craft design are clarified. It is explained that the experience of reflective practice in craft design as an individual's internal perspective begins with a keen perception of linking the external environment with internal conceptions and generates content that makes the designer think deeply. Furthermore, two patterns of reflection, in-action and out of action, have been framed that essentially influence the creative expression of craft, mainly focusing on four forms of reflection: Validation, Association, Integration, and Appropriation. The designer can develop fresh ideas through contemplation and sharpen perceptions to confirm or adjust work in progress, particularly in the interim after a phase of operation. Active reflection can reveal more concealed understandings of the production. Reflective practices link the designer's past learning and creative experiences with personal perceptions to advance the next stage of creative expression. Furthermore, these results have been explained by Material Engagement Theory which demonstrates the value of designers' deliberate use of reflective thought to improve creative expression.

Chapter 5 presents research that adopted the designer's autoethnography by recording the execution process in the studio setting and post-interview to reveal the reflection In-action mainly focuses on the execution process. It is primarily based on Chapter 4, which clarifies the reflection forms and needs to explore further the execute stage in the specific process. Pre-interviewing and observing the designer, recording video data, and inviting designers to self-observe to capture reflections and subtle perceptions in the execution. The findings investigate the specific forms of reflection in the execution stage that include Appropriation, Validation, Habituation, Association, Introspection, and Integration, as well as contribute to mapping the framework combined results of the pilot study in Chapter 4. Specifically, it also investigates the subtle aspects of reflection in the execution stage that further provide space to explore the patterns of reflection in the craft design process from the designers' perspective, indicating that the reflections in execution addressed short-term goals and problems at completion. At the same time, the progress is material-led, re-called the experience in

constant adjustment. It finally provides insights associated with Material Engagement Theory for design practice.

Chapter 6 investigates and analyzes the students' reflective practices. Based on the research in Chapter 4 and Chapter 5, which identified the primary types of reflective practice in the craft design process and the different forms o reflection within the creative process that affect the creative expression, a reflective framework is proposed to guide and support craft design and education. According to previous research's definition and findings, the student's reflection in fieldwork is to test the reflection out of -action to strengthen the connection with a broader environment to enhance creative expression. The photo diaries and self-reports have been analyzed in 3 themes that referenced the Three-Dimensional Reflection framework to explain the findings to generate a method for facilitating creative expression by reflection.

Chapter 7 highlights the conclusions of this paper and identifies key issues and findings to summarize the whole study. It suggests reflection on craft and design practice and the benefits of design education. Moreover, the critical issues beyond the present study have been extended and discussed in this section to direct future work. Finally, it claimed the implications and limitations of this research.

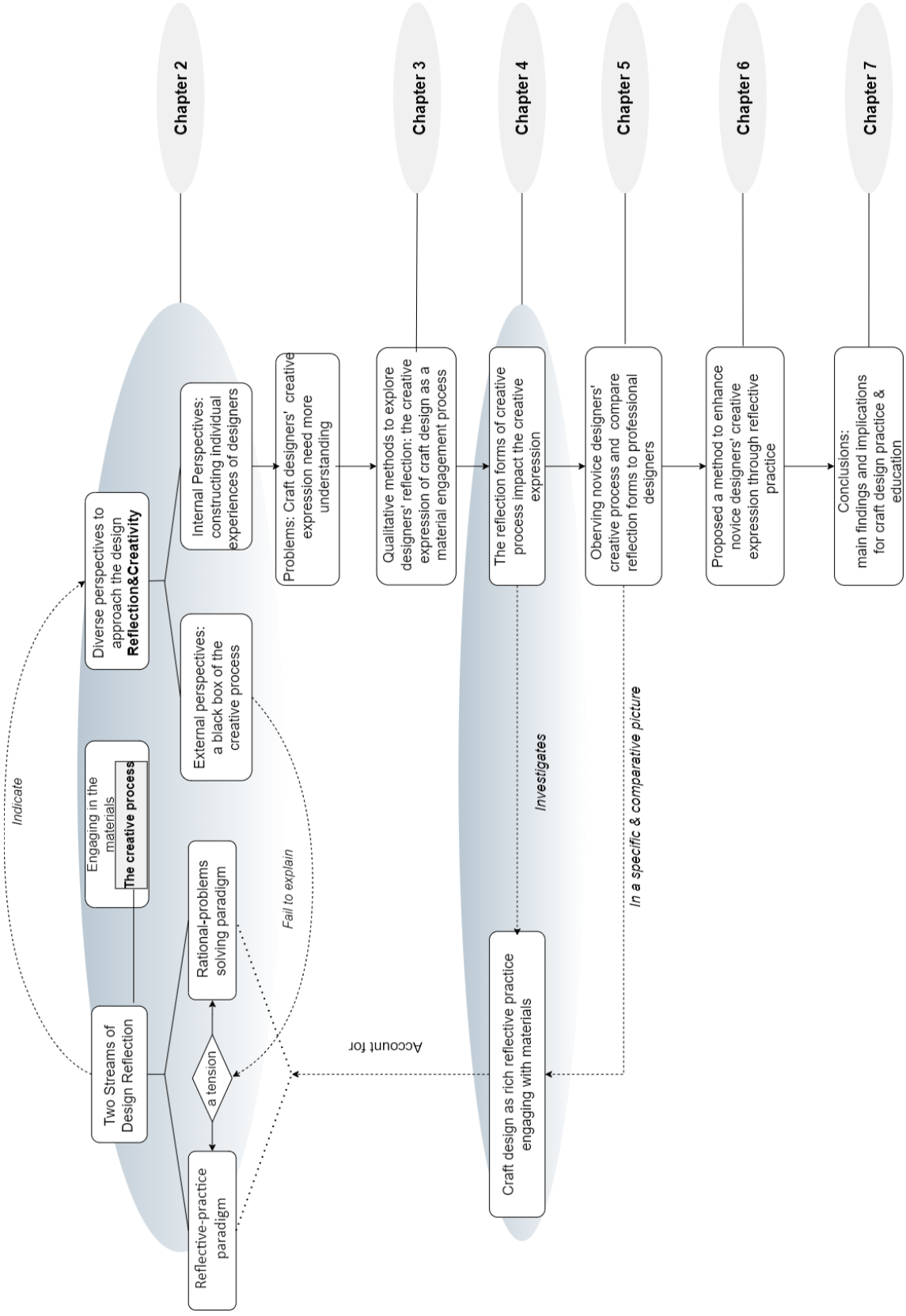


Figure 1 The outline of the dissertation

Chapter 2 Literature review

2.1 Inquiring about creative expression and creative process

2.1.1 What can we learn about creativity?

Currently, creativity and creative expression attract much attention to improve the quality of practice in the whole field. While almost everyone agrees that creativity is beneficial and that we should have more of it, there is surprisingly little discussion about what creativity is and how it is perceived in this context. In other words, what do we mean when we apply the term to a person, thing, institution, or situation? Consider this deceptively simple question: "Are you creative?" On the face of it, the question seems obvious, and based on what we say or hear about creativity, it should not be hard to determine whether we are creative or not. However, many people find it difficult to answer this question concisely.

Csikszentmihalyi(2006)defined creativity as only observed in the interrelationship between systems consisting of three main components. The first is the domain, which contains a set of symbolic rules and processes nested within what we usually call culture or comprehensive knowledge shared by a particular society. The second component is the field, which includes all individuals who act as gatekeepers for the area. Their job is to decide whether a new idea or product should be included in a domain name. Finally, the third component is the individual. Creativity occurs when one uses symbols in a particular field (such as music, engineering, business, or mathematics) to come up with a new idea or sees a new pattern, puts this novelty into the appropriate field, and incorporates it into the relevant area. Therefore, with this standing, we can conclude that creativity is any behavior, idea, or product that changes an existing field or transforms something old into a new one. A creative person is defined as one whose thoughts or behavior changes or establishes a new area. However,

no matter which definition of creativity we accept, we face challenges that inspire us to find solutions through the process of invention or to respond to them through creative expressions. When faced with such challenges, it helps us to think that what we are doing is a response, not an answer or a solution. This approach allows studies of creativity to produce a broader range of responses than the results themselves. Some reactions do not involve physical objects and can be an actual process. Thus, from a pragmatic point of view, all human experience is potentially creative because it comes from dealing with disorders or breakdowns in a flexible, meaningful, improvisational way (Beghetto, 2016). However, creative qualities are more appropriate for specific experiences. In other words, innovative experiences can be defined as novel human world encounters based on meaningful actions and interactions, characterized by open, nonlinear, pluralistic perspectives and future-oriented principles (Glăveanu & Beghetto, 2021). This definition resembles the standard by Runco and Jaeger in that it still recognizes the importance of freshness and meaning but goes beyond it by asserting that freshness and meaning are insufficient to describe creative experiences.

Since the 1950s, creativity has been defined and studied in clusters of two main attributes: on the one hand, novelty, originality, and surprise, and on the other hand, value, usefulness, effectiveness, or task suitability. Among these attributes, novelty often outweighs the benefit in two basic understandings (Diedrich, Benedek, Jauk, & Neubauer, 2015) and scientific research. Regarding novelty as the central emphasis, most definitions focus on the **results** (i.e., ideas and products) and rarely consider other creativity factors. The result-led purpose of the invention is attractive for several reasons.

- First and foremost, they give us a better empirical approach to an otherwise elusive reality, one that has long been ignored by scientists precisely because of its unspeakable nature.
- Second, it does an excellent job of helping us assess when and where creativity occurs, which is the first necessary step in studying the antecedents and associations of creative expression.
- Third, focusing on results does not necessarily preclude interest in the process (or other dimensions of creativity). Many researchers use this definition to identify pieces of creativity and then analyze them in process terms.

The problem, especially with the third point, is that processes are not easy to infer from results, especially from their relatively static nature. However, here we take a cultural-psychological perspective, arguing that creativity transcends any of the four Ps of people, processes, products, and press (Rhodes, 1961). More specifically, the focus on creativity as an experience is based on a pragmatic philosophical way of thinking (Frasier, 1991). Much of the work of early pragmatists such as William James, John Dewey, and Charles S. Pierce demonstrated that human experience marked man's encounter with the world. Therefore, one of the benefits of individual experience as a perspective to understand creativity is that it must integrate people with external environments and anchor them both in actual people's lives. In fact, by focusing only on the results, it is almost impossible to tell who is creating and how. The study of individual differences (extrapolating people and processes by studying products) also fails to embed creativity in the broader living environment of real, concrete individuals.

The emphasis on the experience process rather than the outcome is based on a prospective standpoint rather than a retrospective interpretation (Hallam & Ingold, 2016). Therefore, we draw on the perspective of cultural studies that emphasizes experience as creativity which is an encounter of a person to connect with the world. Such relationships are actions and interactions with other social and material subjects. Nevertheless, the focus is on the interaction between the individual and the external world, and the individual here mainly refers to the designer engaged in craft design. Glăveanu et al.(2019) claimed the multiple characteristics of creative experiences include openness, nonlinear, perspective, and future; creative practice is intentional in a broad range. However, the exact nature of one's intention and goal is defined in and through encounters.

2.1.2 Defining the creative expression

Learning from Epstein's work in the late 1970s argued for developing the generative theory, a formal theory of individual creative expression. The theory and related studies show that as previously established behaviors are linked, new behaviors emerge, and the connecting process is orderly and predictable. In his lab, equations and computer models derived from the theory are used to predict new human and animal behavior at every moment.

According to this theory, creative expression can be accelerated and guided in various ways by changing the number and nature of the repertoire available to the behavior and arranging the conditions that may occur concerning each other(Epstein, 1998). In addition, Epstein

shows that people can be thoughtful about acquiring relevant repertoire and arranging the conditions under which fascinating interconnections occur.

More importantly, four essential competencies have been defined involving the core competencies of creative expression, which enable people to take control of the process and thus increase their creative expression. The four competencies including

Capture (save them in the presence of new ideas, find new ideas that can be easily observed in place and time, and will dream and dream as a source of ideas),

Challenge (undertake a difficult task, set the goal of open mode, effective management is associated with failure of fear and pressure),

Expanding (seeking outside of the existing professional training, experience and knowledge), **The surrounding environment** (regularly changing the physical and social environment, looking for unusual stimuli or combinations of stimuli).

As mentioned earlier, creative expression is marked by multiple perspectives with care about what exists, what is possible, and even what only exists in people's imagination. People can focus on the past, present, or future. Nevertheless, for all creative experiences, the future's appeal is embedded in the structure of the actions and interactions that make it up. The psychological function is generally future-oriented (Valsiner, 2007), even though creative expression always adopts experience. It combines it in new ways (Lubart, 2018); one of its fundamental goals is to connect the past and the future by utilizing the present.

Standing on this discussion, in the design practice, designers can begin to generate responses (develop solutions) with a basic understanding of the problems. On the other hand, they can also wait until they have fully explored the challenges through logic before starting to develop ideas. We should note that the underlying or triggered factor may only be noticed on the periphery and may not even be consciously recorded when it is collected. Thus, in this study, the creative expression represents dynamic and uncertain contact with a wide variety of life experiences, including artifacts and outcomes, situations and contexts, and all life events that may not have a clear trajectory. Under this premise, creative expression has been activated in the contact and entanglement of people, ideas, objects, projects, situations, uncertainties, and actions in everyday life.

2.1.3 From the creative process to creative design

After the discussion of creativity and creative expression, the creative process as a series of ideas and actions to produce a novel and adaptive production has always been one of the critical themes in creativity research. As early as Wallas (1926) formalized a four-stage model of the creative process, including (a) preparation, (b) incubation, (c) inspiration, and (d) validation. Preparation involves an initial analysis of the problem, defining and setting up the issue. Then conscious work is done and draws on one's education, analytical skills, and knowledge related to the problem. In the 1950s, Guilford (1950) pointed out the shortcomings of this process and even considered it a superficial analysis because it did not reveal the mental activity in the creative process. Subsequently, he identified creativity-related abilities, including sensitivity to problems, the ability to generate multiple ideas (fluency), the ability to change thinking patterns (flexibility), the ability to reorganize, the ability to deal with complex problems, and the ability to evaluate.

Meanwhile, Eindhoven and Winaker (1952) criticized Wallace's (1926) concept of the creative process. In their study, the researchers observed artists and non-artists creating a painting while drawing a poem displayed at the study's beginning. Eindhoven and Winaker found no evidence to support the four separate stages of the creative process; they recursively described the creative process throughout their work. Moreover, the creative process differs for each individual.

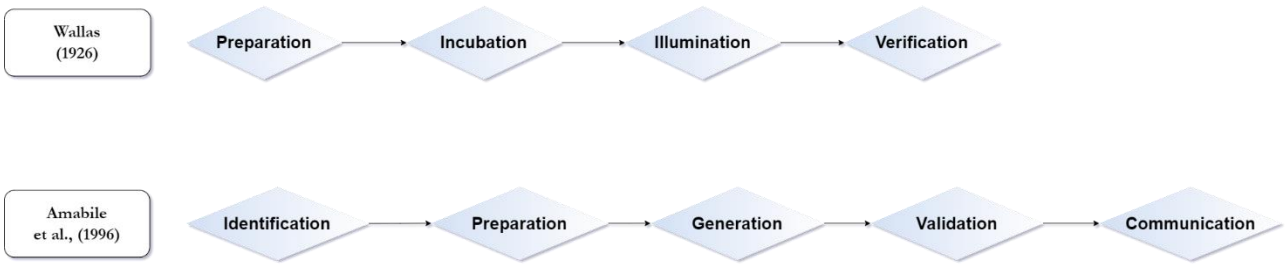


Figure 2 The evolution of the creative process

Nevertheless, for many researchers, the four-stage model or its variants have been and continue to be the basis for understanding the creative process (Busse & Mansfield, 1980; Gift, 1985; 1990; Taylor, Austin & Sutton, 1974). Amabile (Amabile, Conti, Coon, Lazenby, & Herron, 1996) then added a version of the essential stages model to her model of the components of creativity in a proposal to develop the steps of the creative process as (a)

identification (problem or task0, (b) preparation (gathering and reactivating relevant information and resources); (c) response generation (discovering and developing expected responses); and (d) response validation and communication (possible testing responses against criteria responses)(see Figure 2). Further, the creator may stop work based on a good performance of the results of response validation and communication, stop work due to failure, or return to one or more phases of the process for additional work. These stages do not necessarily occur in a predetermined order, and incubation may occur during the creative process and may involve a shift in motivation or selective forgetting (Amabile, 1988). Furthermore, Amabile(Amabile et al. 1996) notes that in many models of the creative process defined in problem-solving, the term problem refers to any task the individual desires to accomplish. Thus, artists who strive to express emotions, scientists who attempt to understand complex phenomena, and individuals who seek to resolve disputes in their daily lives are considered problem solvers (Runco & Dow, 1999). Relatedly, Isaksen and Treffinger (1983) suggested that creative problem solving begins with a chaotic discovery phase from which problems are defined. A person may consciously work on other problems or relax and take a break from the problem. However, the brain unconsciously continues to process the problem, forming a chain of associations. Many associations or combinations of ideas are thought to occur during incubation.

Regarding other stages of the creative process, some authors suggest that the frustration stage occurs after the preparation stage when the analytical mind reaches its limit in processing the problem. In other words, frustration may trigger incubation (Goleman, Kaufman, & Ray, 1992). Tharp (1992) suggested that there is often a point of creative frustration between incubation and epiphany (p. 24). During the incubation process, a person may be blocked or unable to find creative ideas. The creative process received considerable attention and generated numerous detailed analyses in the following studies. Ghiselin (1985) abandoned superficial stage descriptions of the creative process in favor of an integrated approach. Many other studies have evoked this more complex view of the creative process. Based on interviews with fiction writers, Doyle (1998) describes the creative process of creating a novel as beginning with a seed event that arouses the author's interest or excitement. The creative process moves between constant practice and revision patterns when moving between different areas of experience to develop a story. Studies of the creative process in art, through introspection, interviews, observation, and examination of sketchbooks and completed works, have shown that the creative process involves a series of rapid and transient

interactions, including interactions between productive and critical modes of thinking, as well as planning and compensatory behavior. Goldschmidt (1991) investigated the architectural students' creative process and declared that new designs are formed in deleted, transformed parts, a dialectical movement between the overall design quality and the problems in specific tasks, and a mixture of active sketching moments and contemplative moments.

Then new questions arise, what factors in the creative process lead to differences in final performance? If there are two forms of work, creative and non-creative, how can we explain the different levels of creativity (from highly creative to least creative) in the creative process? An examination of the literature shows that proponents of the four-stage model do not take a clear position on this issue. Another possibility is that the order of the stages in the creative, less creative, and non-creative problem-solving processes is different. Finally, creative and non-creative processes may contain the same steps in the same sequence, with the same amount of time devoted to each step, the only difference being the quality of execution of each stage. Thus, the prevailing view is that being prepared, brewing effectively, and validating the quality of one's ideas will result in creativity. In contrast, it is simply a matter of categorizing experience into tight, comfortable mental spaces for the uncreative.

In problem-solving, information is recalled and understood using existing category structures. Thus, the combination and reorganization of category information and the core process of problem construction distinguish creative problem-solving from normative problem-solving. The different levels of creativity in the creative process depend partly on the skill or quality of the subprocesses performed by each involved. Weisberg(2006) explored the nature of the creative process using introspective reports, laboratory experiments, and case studies of artists, scientists, and inventors. He found that innovative products can be explained by normal cognitive processes, such as analogical thinking.

In addition, some authors have suggested that the nature of the particular sub-processes involved in the creative process may vary depending on the field of work. For example, Côté (1994) describes problem discovery in art as the internal effort to adapt to a subject, express an emotion, point to a new social reality, or externalize an inner state. In contrast, problem discovery in science is described as the discovery of gaps or discrepancies in existing knowledge, difficulties when expectations are not met, and difficulties when observations do not match the mental model of existing phenomena (Ochs,1990). Thus, the problem-finding processes may vary considerably depending on the task type. Other differences between tasks may also lead to differences in the creative process.

Design research primarily focuses on the creative process to explore the designerly way of knowing(Cross, 1982). The designer's activity is often thought of as an iterative process in which the mental representation of the problems gradually becomes more focused on the problem-solving process (Chase & Simon, 1973). Zeisel's (1981) spiral metaphor best illustrates the dynamic nature of the design problem-solving process and the conceptual jumps between iterative cycles. Schon(1987) discusses the design as a reflective dialogue between the designer and the designed object. In this process, the designer makes unexpected discoveries that may be beneficial, harmful, or innovative. Notably, Glaveanu(2013) reinforces the theoretical development of creative methodologies and suggests that the creative process is built on the relationship between the individual and their surroundings and is intrinsically linked to human interaction with the world (see V. P. Glăveanu, 2012). Glaveanu (2013)further defines activity as a continuous cycle of doing (environmental behavior) and experiencing (response to the received environment). Through these interrelated processes, action can advance to the point of completion. As society evolves and the design process changes, the design process becomes a complex process involving countless stages of inquiry. Innumerable models and generic strategies were used to define and support design activities. Although early approaches were linear, most design processes today either contain feedback loops or appear circular(Thomke & Fujimoto, 2000).

With this consideration, we noticed the Unified Innovation Process model(Skogstad, Steinert, Gumerlock, & Leifer, 2009) （Figure3） , which emphasizes the iterative nature of design based on multiple input sources and the potential tension between review and learning. The model emphasizes the iterative nature of designs based on multiple feedback and illustrates the inherent tension between assessment and learning. It combines the process's iterative and rapid prototyping nature with the learning cycle and possible instances of review and approval. While this cycle has been observed and reported by many scientists from different teams and projects, it is essential to note that the revolution may be fractal. It can easily be extended to the macro level of technology, process, and the design industry, or it can be used as a reference to study the micro level, such as the individual designer's creative process.

In addition, this model represents the core of the design process and shows the potential risk of interrupting the process. Moreover, it can be used as a communication tool by designers and managers and a tool that benefits design researchers. Three activities within the process are planning, execution, and synthesis. All phases of the design process can be abstracted into these three activities. At the micro-level, the three active functions of planning, execution,

and synthesis are repeated at every stage of the design process. At the macro level, planning is associated with finding needs, generating ideas, brainstorming, and methods (Skogstad et al., 2009). All phases of design activity can be abstracted into these three basic steps. Designers create new concepts by considering new knowledge or combinations of existing knowledge. However, designers need at least one valuable insight to go beyond the known or obvious. Therefore, the designer must maximize the probability of gaining the necessary insight and, thus the probability of success. Therefore, this study adopted this model as a summary of the creative process and used it in the subsequent survey of craft designers.

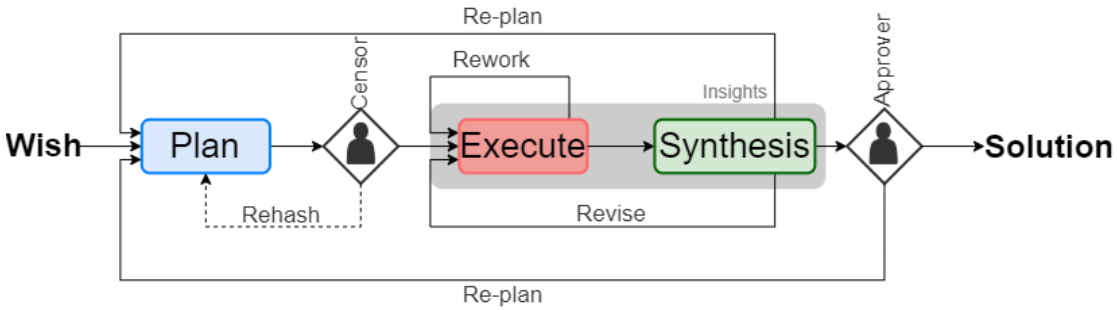


Figure 3 Unified Innovation Process Model (Skogstad& Leifer, 2011)

2.2 Craft as a creative design area

Finkral (1994) defines design as a planned, changeable process. Even with such a simple definition, design is often considered only in design-based professions such as architecture, industrial design, graphic design, engineering design, painting, sculpture, and many other technical and artistic fields. "Craft" remains a nebulous concept, which can be used as a noun to denote an activity that requires experience and training to distinguish it from machine making or as a verb to refer to a skilled gesture of training and experiential knowledge, a tenuous connection to creative practice.

Pye (1968) believes that design is ubiquitous for human beings to transform the world: the art of design, which chooses what we use, should look like its influence is more extensive and continuous than anyone, and everyone is exposed to it all day long. As the predecessor of design, "craft" has become a vague concept. It can be used as a noun to denote an activity that requires experience and training to distinguish it from machine making or as a verb to refer to a skilled gesture of training and experiential knowledge associated with creative practice. However, there is no question that we are discussing design as a creative field,

and there is room for discussion about craft creativity or as a creative field. Much depends on the perspective from which creative practice is viewed.

In the discourse 'craft as design', the craft is used to provide a sense of authenticity to functional objects (Stevens & Mazanti, 2011), mainly through the 'feeling' of 'hands,' which can mean' uniqueness, "time investment,' and therefore more socially participatory. Designers have visual and conceptual ideas that lead to design. However, if the designer has practical experience in working and processing materials, then he/she will be better informed about this process of creative imagination((Pye, 1968). Craft is directly related to the masterful performance of hands to work with tangible materials. It is a product of hand, pure technical competence but can have several degrees of craft quality. While the design student nowadays does not need to be a skilled craftsman, she/he still needs practical experience working with material issues. Not only is it essential to understand the process, but also to be able to distinguish the properties and qualities of materials and understand how to use this knowledge in the design process. Currently, only a few designers have a practical background, and design education is increasingly focused on theoretical skills and the ability to manage a studio. This kind of work style leaves the students without experience and knowledge of production. The relationship between craft and the modern design profession is dividing. However, the interconnectedness of technical mastery, historical awareness, and artistic nerve remains a prerequisite for good design. Unfortunately, when we evaluate the creative expression of a process, we evaluate novelty only in terms of the result and ignore the process that led to the result, making it harder for the craft to gain a place in the creative domain.

Further probing into the roots, the relationship between creative design and craftsmanship also depends on a cognitive perspective. In psychology, creativity is often defined as the process of producing novel/original and beneficial products(Amabile et al., 1996). This psychological view defines creativity in terms of the output of the process rather than the process itself. Since1950s cognitivism denounced not only behaviorism but functionalism in general. Thus, over the past 50 years, cognitive science has become firmly rooted in the structuralist paradigm, which models information processing in the brain compared to the computer process. The brain has been likened to a computer that processes data and organizes it into a world representation. This understanding of cognition has profoundly impacted how we think about creativity. In the cognitivist view, the craft is hard to consider as a creative practice and even opposite to novelty and innovation. While one would expect most

handmade products to be helpful in some way, determining their originality and uniqueness is much more difficult.

However, it further defines the scope and nature of design as "collecting the material culture of experience, and collecting the experience, skills, and understanding embodied in the planning art of the body, invention, manufacture, and practice." Cross's analysis of the report found that

Here are four characteristics of development design:

• The core of the design is "conceptualizing and implementing" new things.

• It includes an appreciation of "material culture," the art of planning, inventing, and making

• The core is the "language" of design; It is possible to develop students' talents in "language" equivalent to the "language" in science (computing) and other humanities "language" (reading and writing).

• Design has its own unique "things to know and ways to know" and ways to learn about them. (Cross, 2004)

Cross's analysis led him to develop a new term that better describes the nature of design thinking and doing. The word is "designerly" (p. 17). The designer approach to cognition, which takes the concept of "doing" deeply rooted in the human psyche, includes how we behave biologically as a species and how we have evolved as human constructs of culture. Such generalization brings the craft practice into the research sight of the design field. It helps the craft design to show the comprehensive and three-dimensional advantage, which has become a vital practice project linking the material culture and spiritual needs of human beings in design research.

Indeed, the concept of creative craft cannot be reduced to its cognitive component alone; instead, craft creativity should be described as the act of making(Ingold, 2013). According to Glaveanu(2015), it is a process that entails cognition, impact, and meaningful action or behavior during an activity. Creative craft is not primarily concerned with the generation of novel or innovative ideas but rather with the reinvention of cultural practices and traditions. This term connects with the concept of craft in sustainable design (Mullagh, Walker, & Evans, 2019). Additionally, because of this creative property, the craft can remain a vital part of the culture. It is a form of culture, diversified, dynamic, and adaptable to new social and material situations. Tradition, in this sense, is not merely a continuation; instead, each tradition is a new tradition.

On the other hand, creative practice demands adaptability, intersubjectivity, and value from the pragmatist's position (Joas, 1996). Thus, at the fundamental level, we can widen our view of craft's creative performance as our capacity for survival, adaptation, and growth in an ever-changing world. Alternating motions of immersion and transcendence characterize the process of creative practice. A creative individual has the capacity for transcendence and reflection, for utilizing cultural materials to comprehend oneself and co-construct culture(Glăveanu, 2015). Finally, when evaluating process creativity, most research has focused on how creativity is exhibited in the process rather than on the level of creativity in the process results. Due to the range of craft kinds, it is not easy to get a consensus on an evaluation criterion. Breaking the work down into quantifiable objects does not provide further knowledge or comprehension, exacerbated by the difficulty locating authorized specialists. However, there should be a fundamental understanding that craft pervades every aspect of our life and that everyone may appreciate the allure of handicrafts in their cultural context and experience. The creative expression in craft design not only requires unique, dispersed, and new forms, but an awareness of the practitioner's body-based engagement, unexpected encounters, improvisation, and ongoing adaptation to changing conditions. When craft practices are integrated into public events and education, the new practitioner will retain a professional identity due to his or her creative practice.

2.2.1 The main findings and potential direction in craft research

A review of the literature on creative expression and craft reveals a dearth of study in this field and that the research that exists is heavily biased toward creative action rather than creative individuals. Interestingly, researchers discovered that practitioners of traditional crafts do not continuously pursue creative expression. Their primary focus is typically on personal relaxation or conquering personal obstacles. This remark highlights the multiple characteristics of craft and the fact that creative understanding expression is one of these elements. Additionally, it emphasizes the need to examine the practitioner's views on his or her work. The research on craft creation encompasses a variety of dimensions, from cognitive to social and material. The first category contains a study by Junaidy (Junaidy, Kaner, Ioras, & Nagai, 2016), which examined the depth of cognition at the early stages of idea generation by conducting a comparative analysis of artisans and designers. Four individuals from Indonesia were included in this study: two craftspeople and two designers. The method employed was voiced thinking, which was then examined using the conceptual network

technique. The study discovered that craftspeople activate lower weighted associative conceptions with fewer multiple meanings than designers.

Yokochi (Yokochi & Okada, 2005) examined the cognitive processes of ink painters in the creative process by conducting a case study using observations, interviews, and field experiments. The research topics focused on the artisan's image-making process, the relationship between current and previous works, and the relationship between creativity and body movement. The study's findings indicated that the painter begins by painting with a local image in mind rather than a global image. Images are drawn somewhat simply during this procedure, and any new lines impose limits on the painter's inventiveness. While this study meticulously analyzes the artisan's creative behavior across time, it does not discuss or give information about the artisan's broader social and cultural background.

Glaveanu (2010) undertook a comprehensive study of Easter egg decoration techniques in northern Romania(Glăveanu, 2010, 2013) to capture the micro-level (i.e., immediate action modifications) of craft in socio-material expression. From a developmental perspective, the study examined the link between creative activities and beliefs. The methodology employed observation, which included filmed observations (with a subjective camera/sub-camera), interviews, and mapping exercises. When discussing the relationship between "doing" (acting on the world) and "experiencing" (being affected by the world), observations can be made about the general stages of egg decorating and the micro-processes that occur during each stage; these stages and processes typically alternate between immersion and detachment, engagement and reflection.

Kozbelt and Durmysheva (2007) investigate Japanese ukiyo-e (pictures of the floating world) prints, a traditional art that flourished between 1670 and 1865. These woodcut prints and paintings represent various subjects (landscapes, historical and folk tales, people, and occupations). They have significantly influenced European art, particularly painters such as Degas, Manet, and Van Gogh. (Simonton, 1999)Mäkelä (2016) adopted the documentary as a lens to discuss the accidental and intentional aspects of the personal creative process. However, not every practitioner can naturally use reflection for self-exploration, or reflection occurs without the practitioner fully realizing the tangible changes it brings to practice. Through a video named "The Path to Tacit Knowledge," Seiler (Seiler et al., 2021) reflects on and communicates various knowledge elements in handicrafts, frequently referred to as tacit knowledge. Using an autoethnographic style, the video documents and management

practices in filming and editing exemplify an intellectual discourse in which the filmmakers explain their sensory-based judgments about the craft. Wuon-Gean HO (2021) uses three short videos with varying frames to explain the process of planning, cutting, and printing Japanese woodblock prints. The researcher demonstrated the creative process by altering the video's practical foundation and sound processing and then by altering the camera position to reveal the artist's emotions and impart tactile knowledge. The findings imply that creating a hands-on scene might convey a more focused message.

2.2.2 Inquiring craft design process associated with Material Engagement Theory

Over the last 30 years, art and design research scholars have extensively studied craft design as a practice-oriented design study. However, the shift from production methods to artistic expression has expanded the scope of craft study. On the subject of craft, research has established the importance of thinking through making(Mäkelä, 2006) and thinking through the material (Nimkulrat, 2007). Mäkelä (2007) proposes the concept of thinking through making positioning artwork to be a vehicle for the knowledge generated during the process. Nimkulrat (2011), a textile artist, conducted a Ph.D. study on the expressive capacity of paper strings and her thoughts through material craft and expanded on this topic in subsequent academic contributions.

Recent research has cast a new light on this. Shanks (2016) argues that the emergence of technology through stone tools represents a profound shift in how humans think. It is worth noting that the creative act of making stone tools did not just happen out of thin air. There must have been many precedents for the manufacture of the first stone tools, and earlier tools were made of less durable materials such as wood and other plant materials, as well as animal bones and horns. However, for any of these creative tool-making behaviors to occur, biological changes in the body structure of our ancestors were required in the first place.

In his book <The Theory of Craft Function and Aesthetic Expression>, Risatti(2009) emphasized the importance of function as the essential element of process characteristics. As he claims, the craft is around function, form, material, and technology around a series of elements necessary to make craft objects a reality. Risatti (2009) further suggested that the boundaries between different design fields could be blurred by bringing together craft students and students from other professional fields in an academic, intellectual setting to share artistic attitudes. However, colleges and universities craft and art departments represent a dramatic and fundamental shift in the studio system (p.283-285). According to Risatti's

view, when a craft object is on the conceptual level, it can be categorized as the critical technology of the object (p.285). However, when work has the craft object without conceptual links to the technology, it is a contemporary sculpture instead of the technology field (p.289).

The series of findings from different perspectives discuss the relationship between materials and human practice. It is worth considering an approach to provide new insight between material and practice.

Although the existing research contributed to the craft design and provided diverse valuable views to explain the nature of craft practice, there is still space left that concerns how to explain how skills, hands, instruments, and materials intertwine and produce new objects. Most habitual behaviors (mental or physical) are experienced and formed where the brain, body, and culture merge. However, finding good ways to describe this fusion, even in the case of simple line-making, is a great challenge. When we describe drawing a line with our hands, how do we define it? The first way is to think of it as an action: drawing a line. The second way is to imagine it as an object: a paper-drawn line. The third way is to see the line as a sign: an index of our moving hand, or perhaps the trace of a creative plant from an ontological perspective, these three ways of seeing the line are inseparable. Each way supports, informs, constraints causes, and complements the other.

Often, however, we seem to resist this perception. The general analytical convention is to break down the cognitive life of the line into several parts: first, separating ourselves from the line and then seeing the line as an external product of the internal processes of perception. As modern human observers, we have learned to see the line where movement stops and painting ends. We have also developed the belief that specific preformed ideas or mental representations of the line in our minds precede and lead to the materialization of the line in the external world. Anthropologist Tim Ingold has called this representational tendency an inversion. We should not forget that when we use the word "mind," what we are trying to express can be better described as a verb. There is no universal mind but rather a variety of human (or, by extension, non-human) ways of thinking formulated by a particular body in a particular context (historical, social, or cultural).

Mindfulness is a process consisting of the continuous circulation and reorganization of mental things, i.e., the generation of cognition. Thinking and creating exist in a state of perpetual motion. The mind never stops thinking. This view applies to every sentient

organism, especially humans, because of the profound plasticity and diversity of the material forms we make (Ihde & Malafouris, 2019; Ingold, 2013). Material Engagement Theory (MET) proposes that we can only understand humans (what it is to be human) by understanding the patterns of human cognitive formation (how the human mind is formed)(P. R. Wright & Pascoe, 2015).

With this standing, the Material Engagement Theory (MET) supplied a fresh perspective to help us describe the practice process and the creative things. In this regard, the MET makes the specific argument that the way we think is usually better described as the pattern of things. Expressly, thinking is generally understood as what we do with things without things. In other words, use the word "thing" for the energy mix of form and matter and the word "thing" for flow: the continuous movement and transformation of thought matter. Things should not be understood as a mental process of internalization or representation, through which things become objects of consciousness. Instead, the thing itself should be seen as an act of consciousness. Frequently the pattern of things is the best approach to describe how we think. With MET, the "thing" refers to the materiality of things and artifacts and the materiality of spaces and constructed environments. Things should not be viewed as a mental process of internalization or representation by which they become conscious objects. Instead, the thing itself should be viewed as a deliberate act.

Craft design, as a typical practice-oriented subject, entails complex material interactions and investigating both traditional and contemporary design concepts. Comparing artisans to designers, on the other hand, leads to a forced separation of design and craft practice, implying a disconnect between artisans' subjective cognitive capacities and current design needs while simultaneously reducing the creative value of craft works. It is worth mentioning that traditional artisans embody more than just expert craftsmanship and a little restricted sense of style. This misconception stems from the fact that craft has a considerably longer history than design and suggests that comparing two distinct production methods from different eras constricts the study perspective. Awareness of the breadth of craft design requires understanding who is looking at it, what stages of practice to focus on, and what approaches to examine. Mäkelä and Latva (2011), two craft researchers who are also artists, showed in their research that the maker's background and experience strongly influence the creative process and outcome. Design is one of the vehicles for process creation, and an artifact can have a broader function, such as an object created during research by an artist-

researcher or as a technique of collecting and storing information and understanding. Nigel Cross, a pioneer of design theory, stated that designers should prioritize essential types of knowledge, particularly for themselves, and ascribed this knowledge to design practice, which he referred to as the designer's style of knowing, thinking, and doing. The designer's awareness and ability are of particular importance when studying the forms of such knowledge. He asserts that design knowledge is in the individual (i.e., the designer), the process, and the product itself (Cross, 1990); a portion of this information is inherent in the design activity itself: it can be learned by participation in and reflection on the design activity. Additionally, knowledge is embedded in the artifact's form and material. A certain amount of this knowledge is ingrained in the creative process.

Thus, adopting the ontological perspective， the craft practice refers to a process that echoes the functionalism and pragmatism view. The book <Making> (Ingold,2013a) does not view drawing as a cognitive event or a tangle of manipulated mental space; instead, he believes that focusing on the movement of the pencil on the page allows for the possibility of envisioning design. Pye (1968) discusses the degree to which industrial manufacturing processes are entirely predictable in their design, which is regarded as a "deterministic" process. Compared to a "risky" process, the outcome of each operation in process practice heavily relies on the practitioner's sound technique, judgment, and dexterity (p.52). He also uses the phrase "risk" to imply that the artisan's experience is creative anticipation with no predictable outcome. The process, not the product, determines the future. The artisan perceives material as a collaborator in an innovative system rather than a burden to be overcome. From this vantage point, it is impossible to characterize Materials as lacking in dynamism once the world's objects become a part of the mind's creative activity. Material Engagement Theory (MET) (Ihde & Malafouris, 2019) is based on this perspective. It provides new ways of understanding the cognitive ways in which practitioners explicitly connect with materials, the meaning of material change, and the transformation of the relationship between people and materials from a cognitive archaeological and anthropological perspective(Dix & Gongora, 2011). The MET introduces a new method of comprehending the practitioner's explicit connection to materials, the meaning of material change, and a new way of recognizing the alteration of human-material interaction. A critical tenet of "material contact" theory is that there is no such thing as a universal mind but rather a range of human modes of thought displayed by particular bodies in particular circumstances (historical, social, or cultural) (Malafouris, 2015). As with modeling, thinking is a continuous

thought circulation and restructuring process. Moreover, reflection, as a critical component of this movement, should not be interpreted exclusively in terms of standing in the future and looking back, but rather as envisioning the possibility of standing in past scenarios to look forward. The fixed link between human and material interaction is pried open using the theoretical reference provided by the theory of material contact. Man shapes matter while being shaped by it but ultimately shapes himself. Thus, this study's emphasis on reflections on the process of craft practice establishes a theoretical framework for further examination of the craft design creative process.

2.3 Reflection issues in the design research

Reflection is widely defined as a cognitive process that involves self-inquiry and interaction with others to learn from experience (J. Dewey, 1933)(Figure 4). According to Moon (2004), reflection results in deeper learning, developing more sophisticated and integrated knowledge structures, and producing more accessible and useable knowledge (Billing, 2007). Enhancing this higher level of cognitive abilities is necessary for various areas, including teacher education, health, social work, and arts education. The great significance and inclusivity of reflection across multiple teaching techniques in higher education indicate that the concept is well defined and arranged in the literature. However, some authors (e.g., Griffiths, 2000; Smith, Harré, & Van Langenhove, 1995; Van Manen, 1995) argue that the concept of reflection is imprecise and ill-defined and that the literature provides scant guidance on how to identify, promote, and evaluate reflection in practice. The term "reflection" embraces a range of different and sometimes contradictory thoughts and practices. For instance, Loughran (2002) believes that adequate reflection should be a process of comprehending practice from various viewpoints and contexts; Korthagen (2001) views reflection as a movement between many types of knowledge from a specific whole to a bigger picture. Davis (2006) defines reflection as integrating ideas across multiple facets of teaching and learning. Postholm (2008)argues that the effectiveness of reflection is measured by one's ability to think in novel ways or see things from new perspectives. Gelfuso and Dennis(2014) define reflection as the process of generating a convinced assertion.

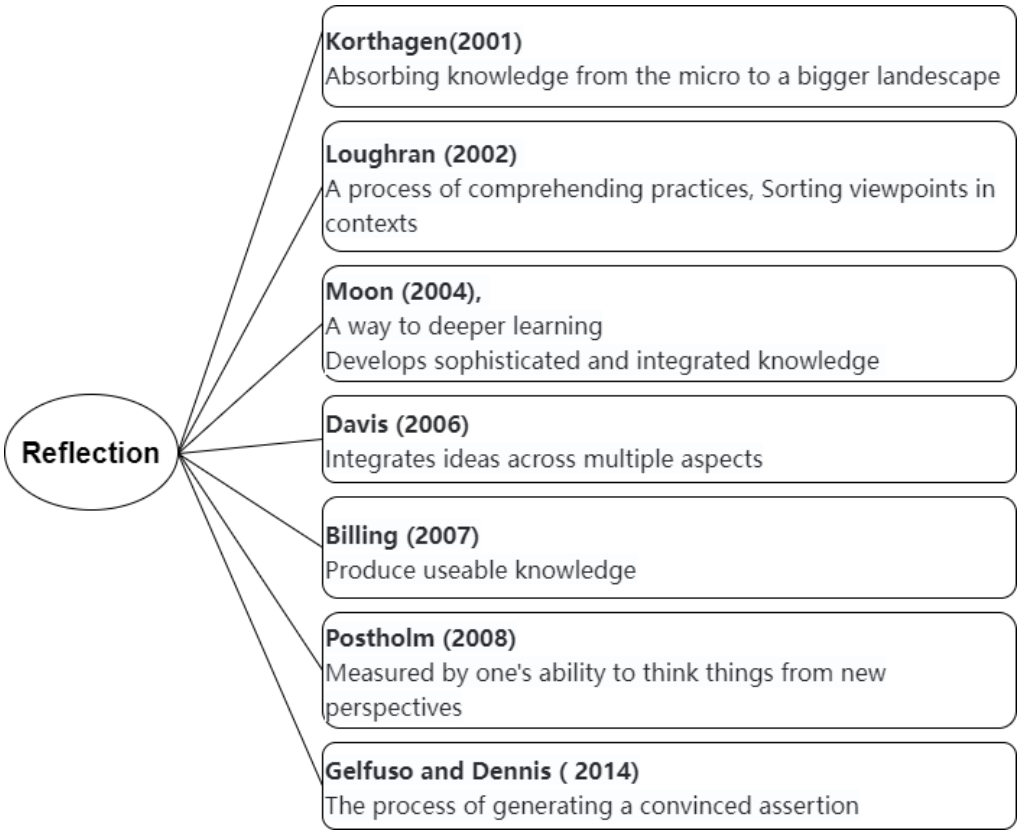


Figure 4 The definition of reflection from diverse viewpoints

Nonetheless, one of the remarkable developments in recent years in the study of reflective practices is that the overwhelming majority of research approaches are based on the same theoretical sources: Dewey and Schön (1979, 1983). For Dewey, reflection refers to a natural and highly prevalent psychological phenomenon constantly occurring in all spheres of life. It is critical to note that Dewey's objective in How We Think (1933) is to observe and attempt to comprehend this phenomenon (in the setting of science and common sense). Similarly, Schon (1983) proposed a structure for the reflex action thought process in two situations (architects and psychologists) and subsequently validated it through observation of several additional cases (engineers, scientists, city planners, and business directors). Schon(1979) did not attempt to define a professional's thinking process; instead, his primary objective was to show how these professionals' thinking processes function. Indeed, this is the central critique of technological rationality advanced by Schon (1983, 1987). It would be detrimental to the model if the model of technical rationality were imperfect, as it would be unable to account for the model's actual capabilities in various scenarios. Rather than that, let us seek an implicit epistemology of practice in the artistic, intuitive process, where certain

practitioners do introduce ambiguity, instability, uniqueness, and clashing values into the scenario. (P.49) It is worth noting that according to Schon, the concept of tacit knowledge introduced by Polanyi is extensively propagated in the theory of reflective practice. Schon borrowed from his classic book The Silent Dimension(2017) and developed the idea that designers talk to objects more in practice than they let on. Thus human creative practice, especially that of designers, contains a black box of tacit knowledge and can be seen as a unique model of reflection.

Thus, with Dewey and Schön, the concept of reflection argues that reflective practice is spontaneous, standard, and, unlike some prescriptions, rather a contemplative as well as a process of cultivating contemplation, a kind of judgment and thoughtful consideration of ideas and the status quo. According to Jensen and Joy(2005), reflection and internal mental activity provides a window into what works and what does not and can often serve as an effective tool for analyzing the true nature of the challenges we face. Some struggles embody a dilemma that can provide a rich source of information about the conflict between our values and our approach to getting something done. Reflecting on the experience of uncertainty helps to illuminate areas where our working methods are not yet fully defined.

Returning to Dewey (1933), reflection is a progressive impulse in concrete practice. This pragmatic philosophical perspective has a strong influence on design research. As design researcher Nigel Cross (2001) argues, design knowledge is essentially concerned with human-made artifacts, with the links that emerge during the processes of self-reflection, production, and usage with the artificial environment. While design as a way of thinking, particularly designers' self-reflection, as a practical process that is not easily taught or clearly defined, should be aided by adding more diverse, rich theoretical and practical approaches in addition to interviews. A literature review reveals two distinct study streams on reflective practice in the design field.

2.3.1Reflective-practice paradigm

Design reflection describes the process of reflecting on the design process and addresses some fundamental questions, like: did my design address the primary concerns? Is the outcome adequate, or might it be improved further? Reflection on design is critical since it can help enhance both the design process and the final result (Isabelle M M J Reymen, 2003). Additionally, it can assist designers in developing their professional competence by allowing them to learn from their own experiences, i.e., thoughts and feelings. Recent design research

has recognized the importance of encouraging reflection, which includes the development of support tools ((Naicker & van Rensburg, 2018; Reymen, 2003, 2001; Schön, 1983; and Dong, Klinsmann, & Valkenburg, 2009).

Donald Schön (Schon,1987,1983, 1990) is widely recognized as the "founder" of the design literature about reflective practice. He deduces the following processes in the design process, dubbed reflective practice mechanisms, based on his observations of professionals: identifying, framing, acting, and assessing. Schön's website views design as a "reflective conversation with context" in which designers frame problems in a particular way, progress toward solutions by naming the contextually essential aspects, and then evaluate their activities. Schön distinguishes three distinct types of reflection and explains each (Isabelle M M J Reymen, 2003):

-***Reflection in action*** is a form of reflection that occurs throughout the action. Designers occasionally consider their actions as they are performing them. When performance results in surprise (when something falls short of our expectations), pleasure, or displeasure, the designer may react by reflecting on the experience, affecting the following step.

- ***Reflection on action*** might occur quietly after the event or during the action to "stop and think." To reflect on their actions and better understand how the assignment was completed.

-***Reflection on practice*** entails sharing and criticizing the tacit knowledge that has formed through time due to repeated design experiences. For instance, individuals may become aware that they have developed an unpleasant pattern of conduct or even a stereotype. Reflection can assist in shattering this preconception to enhance the design process.

2.3.2 Rational problem-solving paradigm

This model is based primarily on a sizeable descriptive study of the team design process, the development of conceptually critical situations, and an investigation of the many influences on the design process and their interrelationships. It uses diary forms and contingency tables. Kester (Griffin, Hultink, & Lauche, 2011) describes reflection as part of a prescriptive model that includes prudent action, reflexes, and transference. She combines the psychological action theory of quality management and goal-directed behavior with design research. She notes that milestones in design projects can be used for post hoc analysis of teams and that executed actions can be reviewed, visualized, evaluated, and translated into actions to be taken. In Reymen's (I. M.M.J. Reymen et al., 2006) study, reflection on the design process

refers to the designer's perception of the design situation and the design activity in memory. He means that it is an independent process that evaluates its thoughts and experiences. She describes the reflection process as consisting of three main activities: preparation, image formation, and conclusion drawing. She developed a prescriptive model to support structured reflection of the design process and integrate structured reflection into the design process. Structured reflection is defined as a combination of reflection that takes place regularly during the design process and reflection that systematically takes place.

Both of the above reflective practice paradigms imply that reflection in design may be best studied not as a disembodied concept but in the context of reflective practice. Since we cannot get inside the designer's head (and this becomes a black box problem), a more practical way to understand the reflection cycle is through the activities that occur in reflection, which we call reflection practices. We study reflective practice by observing and analyzing the behavior of designers and the artifacts they produce. Reflective practice is any activity that leads designers to reflect, not necessarily on the action itself, but through the action to reflect on the design task, process, or goal. In this context, reflection refers to getting the mind to focus on the purpose of the design task, which usually involves creative thinking. Reflective practice can be motivated either intentionally or unintentionally by recalling and considering memories of past experiences or observing and considering things in the current environment. According to the literature review, the reflection in this study has been defined as looking back, observing, attentively, and indirectly expressing to capture the meaning of acting from the perspective of memory and observation. In general, reflection is a positive process of observing one's own experience and experiencing it personally in the process of practice. Sometimes it is simply to draw attention to it, but often it is to explore it more deeply. Reflection can be done as an activity or as an activity itself. However, the core of the reflective practice is always to examine the connection between external environment perception and internal environment as a personal experience. In other words, reflection is the memory of adventures and exploration as the incubation of new experiences. Open up the possibility of more flexible learning by developing the ability and curiosity to explore experiences. This kind of learning does not come from books or experts but from individual practice.

2.3.3 The role of reflection in the creative design process

In summary, reflective practice creates a habit, structure, or routine around examining experience. Reflection can have different effects on the design process according to the frequency, frequency, and cause of reflection. At the same time, the individual can reflect very frequently, bring a high level of awareness to their thoughts and actions, and consider what she can learn by exploring her thought patterns in different situations. Therefore, the construction of high-quality reflective practice can be practiced through different forms of reflection. Moreover, depth reflection, from simply noting the present situation to critical thinking of past events and the many purposes they can serve, such as examining thought patterns, recording learning, adjusting daily activities with deeper values, developing shared thinking, and many other goals. Designing a reflective practice means clarifying the purpose it needs to serve and finding opportunities to find realistic reflections in our work that occur at the proper intervals and in sufficient depth to be meaningful. Maintaining a reflective practice, no matter how constructed, will translate the possibilities of learning from our work into reality.

Empirical research from Stanford University shows that the dual characteristics of memory and aggregation can be used to describe reflective design practices(Currano, Steinert, & Leifer, 2011). There is a relationship between background activities and ideas in the practice of design thinking. This survey provides evidence that environment and mental preoccupation play an essential role in the reflective process of creative thinking. 14 of the 18 participants reported that they were engaged in reflective activities out of work at the time they had the idea. For the most part, creativity takes place outside the traditional work situation, concerning the location and background activities. The subjects were almost as likely to be inspired when they were not looking as when they were. These findings support the idea that reflective practices can be meaningfully classified as' extra-action reflection 'and' context reflection, 'in addition to the more common categories of reflection, such as Schon's 'in-action reflection.' These findings support "reflection in action" and "context reflection" as meaningful distinctions that encompass a wider range of reflective practices than Schon's concept of "reflection in action" encompasses, with out-of-action reflection occurring outside the workplace and the context of work activities. This study provides empirical support for the further exploration of this research to explore the other reflective practice and their influence on the creative process.

To better understand designers' reflective practices in the craft design process, we adopted the Three-dimensional reflective framework (Figure 5) from Hong (2011) that is identified in the model to assist designers in their knowledge of reflective thinking during the design process: (1) time, which refers to the point at which the reflective thinking process occurs; (2) object, which refers to the various types of objects on which designers may reflect; and (3) level, which refers to the various levels at which designers reflect. This model highlights significant components of reflective thinking throughout the design process and can assist educators and instructional designers in establishing appropriate learning environments that foster reflective thinking in design education because design serves as the foundation for creating, constructing, and developing objects or systems (Fleischer & Liker, 1992). While design ability is frequently cited nowadays, it is evident that it is not a natural ability. Solving design difficulties in any industry may be difficult and exhausting for designers and considerably more so for inexperienced designers. As a result, engaging novice designers in reflective practice is regarded as a critical component of developing their professional competence through practice(Heywood, 2005) (Richey, Fields, & Foxon, 2001) et al. 2001; Schon, 1983). Additionally, designers adept at reflecting are more likely to create higher-quality designs (Adams & Pandey, 2003; Roland, 1993). Additionally, numerous scholars have stressed the value of reflective practice throughout the design process (Adams & Pandey, 2003); (Kalma, Ploderer, Sitbon, & Brereton, 2019).

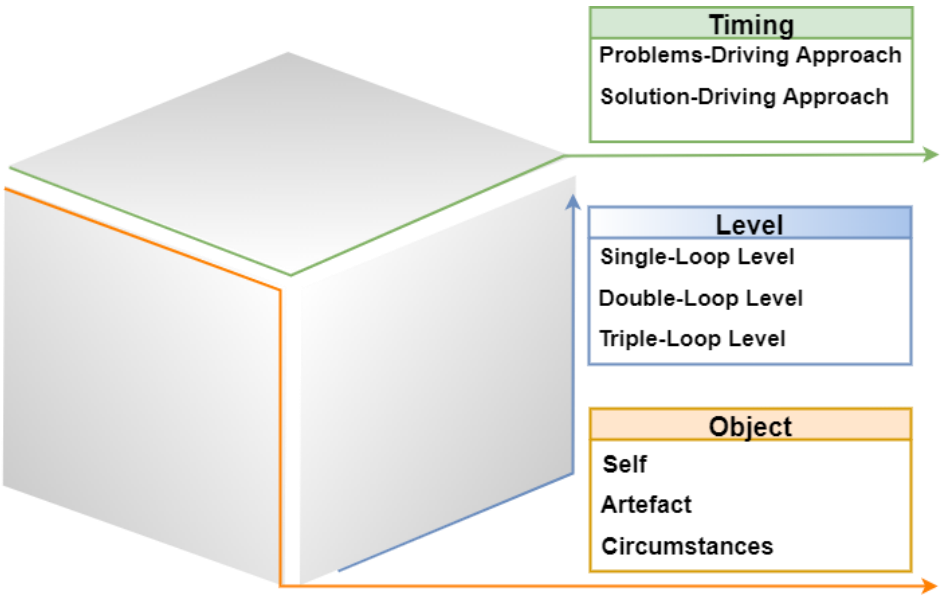


Figure 5 Re-created Three-Dimensional model of reflection in the design process.

Additionally, this conceptual model provided tactics and guidelines that would help educators and instructional designers. In this work, we will employ a three-dimensional model to support educators and instructional designers in creating more reflective learning environments that aid novices in defining and solving design challenges. Additionally, the model can focus on the reflection component of many design methods based on the model. Second, the many subject categories can prompt novices to think about various items, including the self, an artifact, and the environment, for instance, by posing prompt questions, including learners in peer feedback sessions, and eliciting video descriptions of learners' observations and design processes from learners. According to Norman (1986), even end consumers cannot describe their wants. Thus, beginners can obtain insights from a broader range of flexibility, investigate contextual restrictions, and so forth through observation.

Finally, Hong and Choi (2011) asserted that beginners exhibit the highest single-loop reflection frequency and the lowest three-loop reflection frequency. Different strategies should be used to facilitate designers' reflection, such as providing an environment where designers can engage in a dialogue with diverse social groups (e.g., cultural, religious, or professional groups) and where they can challenge the underlying assumptions about broader issues.(Chen, Cheng, Hummels, & Koskinen, 2016, Visscher-Voerman & Procee, 2007), which can facilitate a high level of reflection.

2.4 Summary

This chapter begins with a review of the nature of creativity, focusing on the characteristics of the creative process and process design, and approaching reflective practice in process design with the MET theory. This part summarizes the influence of reflective practice on the creative process in literature and lists relevant research and exploration perspectives. Therefore, the theoretical background of this study is that craft is a particular field of creative design, and the influence of its reflective practice on creative expression is explored as a phenomenon. There is no accepted definition of reflective practice, but common themes can be extracted from all definitions. They all refer to the initial question or feeling of doubt that makes people want to know more. They all advocate the development of knowledge but do

not define it, whether prior knowledge or new knowledge. They both conclude that time is critical for adequate reflection to occur.

Reflective practice and creative expression are considered separate processes in the design process, so the designer's reflection usually represents rational examination and distant criticism. However, from the practical and experiential characteristics of process design, reflection is constantly generated in the practice process. In contrast, the creative expression of the craft work is highly embedded in the practice process and is considered related and co-evolved. In international Craft research, Glenn Adamson expressed a concern in his seminal book Thinking through Craft (Adamson, 2019). In highly industrialized and globalized production, how do we avoid knowledge falling into the hands of others? How do we transfer knowledge from humans to the industry? How do we grasp new possibilities without losing the sense of the intimate connection between body and matter? Therefore, I believe that exploring the reflective practice of process design from the designer's internal perspective will provide a more coherent basis for describing the reflective practice as a phenomenon capable of understanding the creative nature of process design and the management and expansion of practical knowledge. The core problem with describing reflection as an experience is that designers know more than they realize during reflection, but they need to increase that awareness.

There are challenges for broader concepts such as creative expression and creativity, regardless of which definition you choose to accept. These challenges inspire us to find solutions through a hands-on process and respond to challenges by exploring and defining more flexible creative expressions. This paper discusses the different forms of reflection on the practice of contemporary technological design reflecting the creative experience of process design development, with the creative process as the main line, is focused on the designer's subjective experience, to a different derived from the perspective of existing external way to explain the concept of practice as a dynamic process of material experience impact on creative performance.

Chapter 3 Methodology

3.1 Introduction

Husserl (Husserl & Gibson, 1983) claimed that the transition from the individual life to the ordinary world of humankind is accomplished through the so-called intersubjective body of

relations. It broadly impacted the phenomenology that inaugurated the existential turn initiated by Heidegger, further developed by Sartre, Beauvoir, and Merlet-Ponti, and then further developed by Gadamer and Lycoeur, whose efforts were all concerned with interpretation. This brief overview reveals that phenomenology is a catch-all for various disciplines(Langdridge, 2008). Dewey (1933), an American exponent of pragmatic philosophy, argued that art is an experience that builds his or her own expertise to achieve perception. The artist's original making, conceptualization, and arrangement of every aspect of the work cannot be recreated in the artistic product experience of the audience; nonetheless, the potential form of these experiences allows the audience to grasp and comprehend the creative experience. Individuals' close relationships with these unique and intelligible objects are based on their actions and experiences with the objects in the world(Dewey, 1933). These arguments demonstrate that Dewey's examination of experience focuses on reform than elucidation. In other words, no experience is restricted to a locked closet and is therefore available to others, not in terms of the experience's specific content but terms of a comparable relational structure. This viewpoint parallels the phenomenology idea and provides a theoretical foundation for this study's technique.

This study aims to comprehend reflective practice and creative expression in craft designers' creative process and define it as a phenomenon to give design students valuable suggestions. However, a single method cannot accomplish such a challenging objective. Moreover, based on the theoretical foundation of phenomenology, we have integrated various methodologies to enhance the comprehension and formulation of research aims.

The main focus of phenomenological research is human experience and awareness of experience. The insight that human develops through practice establishes the capacity to be aware of the experience and distinguish each experience as a consciousness of a particular thing. Generally, our consciousness is primarily internal rather than external, significantly impacting the exploration of creative experience in design research. Design cognition is commonly viewed as the designer's psychological activities (Terzidis, 2007). Furthermore, design reflection is a crucial aspect of design cognition, focusing on designers' perceptions described in a mirror of design activities, allowing designers to recognize their behavior and thought processes. In the meantime, philosophers have discovered internal self-confrontation(Sokolowski, 2000). Any situation that forces the separation of body and mind, subject and object, cannot constitute an ordinary cognition. Consequently, intentionality

provides a space for studying designers' experiences and drives us to pay attention to both the substance of practice and the experience of the practice process(Langdridge, 2008).

Reflective practice is any inquiry-based endeavor that commits time to contemplation to create mental space and increase problem visibility. Therefore, reflection becomes a powerful method for evaluating experience and reasoning. With this understanding, the reflective practice has become obligatory understanding of the design knowledge and experience of the concealed within constrains the research methodologies used in practice. Through the efforts of several researchers, reflective experience is the most influential technological tale (account of experience) and dialogue (building on the experience of thinking aloud) in the study of personal experience due to the complex cognitive process and conversation within the creative process. This process reflects practitioners' thoughts, feelings, experiences, and contact ways. Examining the practitioners' reflective practice enables them to convey the meaning of experience and reveal the critical quality of their works. Keeping this in mind, the method adopted in this study is to develop an understanding of contemporary craft design from the designer's perspective by engaging in a conversation and situating the craft design within the context of more considerable academic research. Moreover, in the depth reflection, it could be explicit that reflective thinking benefits the craft designer's ability to acquire knowledge and experience that promote creative expression.

The viewpoint above could be summarized in the argument that experience is profoundly distinct, individual, and frequently inexplicable. Therefore, we may comprehend designers' reflections in an explorable public realm of experience. Inspired by phenomenon methodology (Husserl, 2001; Sokolowski, 2000) that provided the following description: "Phenomenology is the study of human experience and of the ways things present themselves in and through such experience" (p. 2). With this basis, the present study adopted multi-qualitative methods involving interview, observation, video recording, visual diaries, and reflective writing to access the reflective practice in the craft design process.

Before we start to present the specific methods, the techniques, including content analysis and thematic analysis, were discussed in advance, which may contribute to clarifying the consideration in methodology.

3.1.2 Content analysis and Thematic analysis in the qualitative study

Qualitative methods share a common purpose: to comprehend a particular phenomenon through the perceptions of who is experiencing it. As an outcome, the researcher must decide

which research approach best addresses their study issues(Streubert-Speziale & Carpenter, 2007). There is considerable overlap in the methodologies, procedures, and strategies used by available qualitative approaches.

The term "content analysis" refers to a methodology for analyzing text data (Shumack, 2007& Brown et al., 2006)through systematic coding and categorization to explore the trends and patterns in the text(Heindl, Bachlechner, Nydahl, & Egerod, 2019). The objective of content analysis is to characterize the content of a document by determining who says what, to whom, and with what effect (Bloor & Wood, 2006). On the other hand, thematic analysis is frequently viewed as an unbranded approach, as it does not appear to exist as a named mode of analysis in the same way content analysis does. Thematic analysis is primarily defined as a "technique for detecting, analyzing, and reporting patterns (themes) within data" as an independent qualitative descriptive approach (Braun & Clarke, 2006). Additionally, it has been introduced as a qualitative descriptive method that teaches researchers the fundamental skills necessary to undertake various types of qualitative analysis. In this regard, qualitative researchers should familiarize themselves with thematic analysis as an independent and dependable method of qualitative analysis(Figure 6).

Both content analysis and thematic analysis appear to have the same objective: to examine narrative materials from life stories analytically by dividing the text into relatively small content units and subjecting them to descriptive treatment. When undertaking exploratory work in an area where little has known, the content analysis may be appropriate for the straightforward reporting of often cited difficulties in data (Lutz, Roling, Berger, Edelhäuser, & Scheffer, 2016). As a versatile and practical research tool, thematic analysis has been suggested to produce a rich and detailed, although complex, description of the data (Braun & Clarke, 2006). Thematic analysis entails identifying and elucidating common threads that run across an interview or series of interviews (DeSantis & Ugarriza, 2000). It should be emphasized that both these two methodologies enable qualitative data analysis. Doing a qualitative examination of data while quantifying it using content analysis is feasible. Both the coding of the data and the interpretation of the quantitative counts of the codes are carried out using a descriptive technique in content analysis (Fischer, 2007). And the thematic analysis presents qualitative, detailed, and nuanced data (Braun & Clarke, 2006). The comparison between these two analysis methods has been visualized in Figure 6.

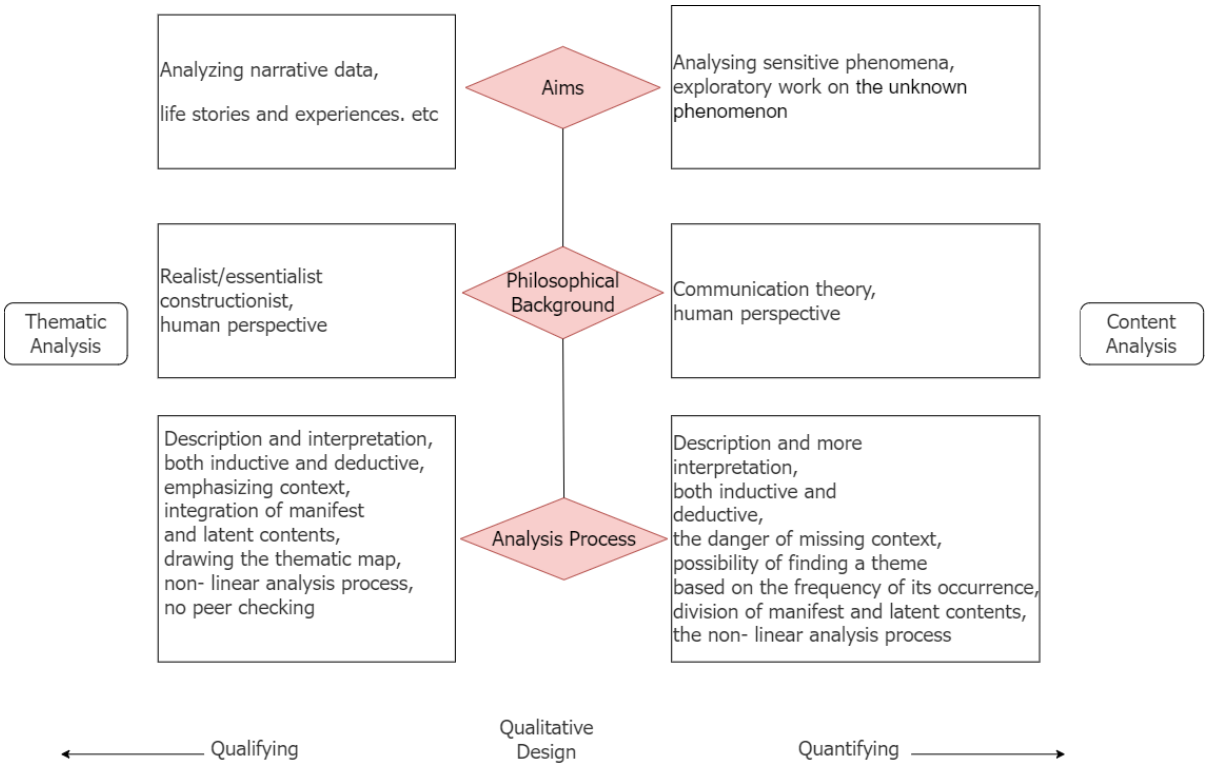


Figure 6. Compare Content analysis and Thematic Analysis in Qualitative Research

3.1.3 Evaluation of analysis process

One complaint about all qualitative approaches is that they lack the scientific rigor and credibility associated with more established quantitative techniques. This consideration implies that quantitative inquiry is predicated on a value-free framework based on quantifying and studying causal links between variables (Horsburgh, 2003). Qualitative research must produce accurate results, so the research effort should be open to close inspection, and any following assertions should be sustained in the face of independently available data (Krippendorff, 2004). As a necessary component of any qualitative methodologies, both researchers and readers should be assisted in seeking alternate interpretations. The most frequent measures of rigor in qualitative research are credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985). While assessing severity in content and theme analysis has many parallels, some distinctions highlight each approach's distinct and distinctive characteristics. For example, intercoder reliability refers to the degree to which several coders independently classify material similarly to peer researchers. It is frequently used in content analysis and was introduced to increase the technique's reliability (Cavanagh, 1997). However, due to the theme analysis's pure

qualitative nature, peer assessment of intercoder reliability is not always achievable due to skepticism regarding such testing. It has been suggested that one researcher just instructs another to think the same way she or he does while examining a text fragment. Thus, the dependability check does not establish the objectivity of codes, and only two persons may view the text from the same subjective standpoint (Joffe & Yardley, 2003). Researchers are encouraged to keep a personal research diary as a practical technique to increase the rigor of both approaches. To be cautious, the position of these supplementary resources concerning raw data or field notes is frequently ambiguous, as is their expected contribution to any interpretation. Personal memoranda are included and coded alongside field notes on purpose, and the same coding scheme is utilized for both data types (Ballinger, 2004). Finally, one of the best indicators of the study's quality is whether new insights into the studied phenomenon are supplied; if so, the study should have expanded understanding of specific phenomena or informed practical actions (Krippendorff, 2004).

Based on the research purpose, content analysis will be adopted to analyze the interview to generate meaningful nodes that are then sorted into the discussion of the forms of reflections. To digest visual data, Ellingson (2017) advised using thematic analysis to explicit diverse aspects of the data. To confirm the consistency and reproducibility of the coding analysis, both forms of data, raw, and memo, were then coded using the same coding system (Ballinger, 2004). A full explanation of each participant, data collection, and analysis phase is provided. A specific discussion about each method will be presented below.

3.2. Qualitative research adopted multi-methods.

3.2.1 The use of interviews

An interview is a tool that is frequently adopted in qualitative research to survey participants' experiences that make it easy to understand (Rogoff, 2003). According to Gaskell (Gaskell, 2000), qualitative interview studies people's views, attitudes, and values and their motives for acting in a particular social situation. In light of these significant benefits, the interview is a crucial component of qualitative methods and the practical foundation of this research methodology. In innovative research such as design creativity, interviews are typically used to study widely recognized creators, such as managers of outstanding design firms and experienced designers (Crilly & Cardoso, 2017), to reveal their working conditions and experience. Chapter 4 analyzes the primary forms of designers' reflections qualitatively. Due

to the close observation and interaction between craft design and material in the concrete execution process, in chapter 5, we ask participants to generate active reflection through post-interview reflection to explain the execution process that promotes the creative process.
At the same time, the participants were encouraged to investigate the themes, and the open-ending questions allowed for further study of contemporary craft-making themes. All the interviews in this research followed a warm-up to introduce participants to a significant event and reflect on the creative process. As a result, the interviews did not establish hypotheses in advance.

3.2.2 The use of observation and camera records

In this research, only adopting interviews cannot satisfy the goals, especially regarding the execution of the creative process. According to Becker (Becker & Sempik, 2008), it is difficult for artists to articulate the general concepts that guide their decision-making, let alone provide explanations. As a result, direct observation of creative practice becomes crucial, and at the same time, it can broaden researchers' understanding of the practice and facilitate more objective research subject analysis. To promote the research of reflective practice and creativity, we implement a new method for observing designers: recording the practice process with a camera and inviting the practitioners to contribute to the comments and analysis. Evidence supports this subjective ethnographic method (Lahlou, 2011). Thus, it is a method designed to capture a personal account of an activity, including movement and the environment, from the practitioner's views. The a vital phase in craft practice since the practitioner's conduct constantly changes to accomplish the effect attained by earlier behavior. This dynamic cannot be easily obtained from an external viewpoint. The camera lens comprehensively documents the creative process of practitioners, including the entire process of contact with material materials, captures the activities of practitioners, and prompts participants to recollect and reflect on the situation during the later return visit. We invited participants to review the videos and collect personal experiences through evidence-based, controlled, and analytical reconstruction, allowing respondents to explain what he or she was thinking at the time of action and discuss the final reflection on the process. Each procedure has significant advantages when implemented (Lahlou, 2011). First, cameras allow researchers to access participants' experiences, namely their phenomenal pathways, which are uniquely structured perception-action chains. Second, by displaying interviewees' video footage, we enabled them to provide 'informed' and thorough accounts of their activities,

intentions, and experiences without interrupting the activity (Cranach & Harré, 1982). Observing one's action from an individual's perspective requires an intersubjective approach due to the interaction between researcher and participant and a subjective method based on objective recording. Moreover, the videos reorient participants to re-experience the journey to access episodic memory (Tulving, 1972, 2002), which makes an accurate reconstruction of mental states feasible.

Last but not least, the participant provides his or her view and jointly builds and evaluates the interpretation of "what happened," allowing triangulation and the validation of various perspectives. In the social sciences, where researchers are accustomed to constructing theories about human behavior in isolation, regardless of the reactions and insights of their "subjects," this is extremely rare and vital. Therefore, the last phase of this process is not only an acceptable description of the theme provided but also an acceptable description of the guest.

3.2.3 The use of photo diary and self-reports

Self-report is the most used method for investigating the educational practice. Generally, a well-structured self-report allows instructors to comprehend students' systematic thought processes in a standard format for reflective journals. Nonetheless, reflective practice outside of speech is still given scant consideration. On the one hand, using language and generating data for relevant quantitative studies is more accessible. On the other hand, language is an externalization of thought and can provide adequate current political evidence to support hypotheses and ideas. Based on this research paradigm, we continue to utilize self-report as one of our data sources. In addition, we utilized a unique approach, integrating visual logs to broaden the scope of students' reflective practice and providing more perceptual levels by combining images and texts. Piaget was not the primary data source for this study. Piaget once stated that visuals and thoughts are comparable (Piaget, 1928) and defined them as a visual manifestation of the mind.

Consequently, the visual data are utilized to assess intellectual development in education research. Psychometry also relies on the traditional usage of visual data today (Goodenough, 1926; Harris, 1963). Similarly, visual data is a method of communication in educational settings and facilitates a greater comprehension of participant subjectivity. Thus, we find our position in the combination of several data types. This variety of data can be regarded as several degrees of student perception and their concurrent expressive, project-narrative, and

symbolic meanings (Minulescu, 2013). The design research rarely utilizes participants' photographs as data sources out of the creative action. Chapter 6 presented a portion of the video works with the participants' remarks to establish personal connections with the setting. In this instance, the findings of picture analysis with a specific task are closely tied to the context and its related social and cultural meaning and noticed from comments and reports required for creative expression rather than to evaluate the level of originality. They were evaluated based on how they facilitate creative expression as opposed to how creative they are.

3.3 Research Settings

3.3.1 Studio setting

In the second study, we recruited a participant who was a graduate student majoring in ceramics at the Art College of Kanazawa. The research site of the studio was shared by students who could have a personal space to work, while the machines were shared and managed by the College. To avoid interfering with other student's work, we visited participants during non-working hours; after obtaining informed consent and elaborating on the study topic, photographs of the workspace were taken (Figure 8.), followed by an observational warm-up. The camera equipment's location settings were discussed with the interviewee, followed by a video recording according to the operating table's maximum landscape. To guarantee other studio users' privacy and adhere to the participants' work plan and progress, the participants mastered the recording period and framing position. The interviews' condition and process when creating alone were captured in an immersive practice method. This study adopted video documentation and content analysis to explore the craft-making process by combining observation and participant interviews to create a synergistic reflection on the creative process with explicit empirical knowledge.

Figure 7 The ceramic studio setting in participant observation

3.3.2 Creative course associated with multi-cultural environment

The fieldwork was conducted in Dunhuang, Gansu Province, northwest China. The students visited the Maogao, and Yulin Grottoes managed by the Dunhuang Academy. These grottoes contain a rich cultural history of ancient China. Numerous renowned artworks such as colored sculptures and murals have also become vital evidence of cultural communication between Eastern and Western people in ancient times. Moreover, the grottoes are located in the desert, where the arid climate helps preserve the artifacts, which is mainly different from the institute located in the south of China (Figure 8). Various techniques like stone carving and wet color painting can still be observed in the grottoes. Some classic paintings and figures have been included in the craft, art, and design textbook. In addition to the cultural artifacts, the rock textures, desert hills, and saline lakes all form a unique geographical landscape that could impact the fieldwork experience.

The fieldwork at Dunhuang Grottoes described herein should serve as preparatory work for participants to start their graduation projects later that year. The subjective perspective is essential in flexible craft design education. It potentially unlocks curiosity about an unfamiliar environment that may inspire reflection on personal creation linked to a comprehensive range of social and cultural problems. Thus, it provides an opportunity for students to engage in an authentic cultural environment as professionals by exploring what they are feeling and seeing. It potentially extends their previous views and encourages their creative practice.

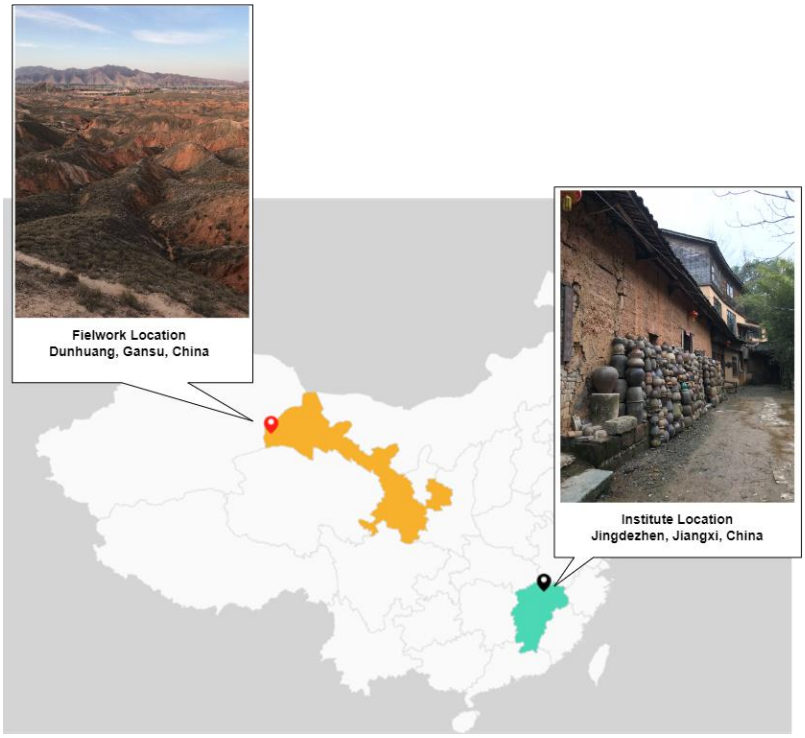


Figure 8 The location of the fieldwork setting (yellow part)

3.4 Overall design

This paper's research is guided by the phenomenology principle and considers the particulars of craft design. This research examines the reflective practice and its impact on the relationship between creative expression, focusing primarily on the form of reflection in the process of creation, how different forms of reflection can affect creation, and how novice designers can benefit from reflection. According to Glăveanu (2012), craft creativity consists

of self and others. Selecting ceramic production as the focus of process design research reflects an event against the backdrop of the entire human community. It is the appropriate method to investigate creative technology and material culture as it is the most prevalent kind of creative practice. Ceramic technology vividly depicts many phenomena of human work and continues to do so today; it demonstrates the interaction between individuals, communities, and material objects. Therefore, this study follows the phenomenological interpretation spirit in methodology and investigates the practical process and reflective activities of contemporary craft design through observation from various vantage points to enhance the understanding of creative craft activities. It is also necessary to select independent designers and senior students as research samples to bridge the gap between practice and idealized learning and evaluate the rationality of the aspects reflected in the data and the viability of the suggested framework. The research presented here is exploratory and employs qualitative methods ideally adapted to hypothesis generation (D. Wright, 2008). The practical design's rationale refers to the overall framework proposed in Chapter 1 (see Figure 1), which outlines a phenomenology-guided research framework with a reference frame for data generation supplied by professional designers to compare and generate referential reflective strategies. The three studies below try to investigate the different meanings of reflection by concentrating on the connection between reflective practice and creative objectives in the creative process. The central concern of phenomenology is the interweaving and interaction between the individual's practical experience and its connected social situation.

3.4.1 Pilot study: Interview professional designers

Data Collection

This study aims to identify the forms of reflection on the creative process and contribution to creative expression focusing on craft designers' perceptions. While craft creation has a well-defined process, the actual practice is difficult to predict. The tools like the Thinking Out Loud protocol (Junaidy et al., 2016) to capture implicit thinking leads to outputs that have visible flaws; there has been no standardized and unified methodology for studying the creative process and expression in the craft. For instance, the participants' thoughts were not fully developed, and it was not easy to have space for contemplation in an experimental environment that was relatively fixed and explicit. Yokochi and Okada (2005)(2010) studied a painter for an extended period and conducted a return visit to investigate the creative

process; the rich data indicated diverse impacts on the artist's creative process and the density of his creative behavior over time. The visits were conducted solely for the conditioned creative process to deconstruct the baffling aspects, and the obligations placed on both participants and researchers were substantial. In addition, the complex process design process includes a significant amount of jargon. Researchers must comprehend the jargon designers use to study the creative process effectively.

In the pilot study, we interviewed twelve experienced ceramic designers working in independent studios with professional educational backgrounds (Table 2) through semi-structured interview. It is obvious that experience is an essential element to being a good designer in common fields. However, once a particular level of experience has been achieved, other factors become more important(Sonnentag, 1998). The period necessary to become experienced, defined as having attained an international level in fields such as chess, arts, sports, and sciences, is thought to be 10 years. By selecting experienced designers with over 8 years of experience, it was assumed that the novice designers had not reached the level of experience required to be good designers. Therefore, the participants in this research were selected based on the number of years of relevant industrial experience and were not evaluated on their design skills. The initial participant was chosen via personal contact with the author and a snowballing procedure of seeking referrals from informants and securing initially informed permission. This procedure entails thoroughly examining the participant's creative field, background information, and a preliminary assessment of what one hopes to discover there (Strauss & Corbin, 1994). They live in Jingdezhen, a traditional porcelain-making region in China, have their own autonomous creative space, and have been working with ceramics for five to ten years. Independent designers were chosen as participants based on the evolving role of designers in companies (Björklund, Keipi, & Maula, 2020), where the demand for creative design necessitates designers to be more personal and professional to play a role in the broader organization. Additionally, even when working in teams, designers must solve problems independently, and reflective practice is a critical experience that informs creative activity. The conversation topics revolved around what impressed them about the process in their creative practice, prompting them to reflect on and describe the specific considerations that went into the creative process, such as why they needed to achieve this effect or why they chose this form over another.

INTERVIEWEE	AGE	EDUCATION BACKGROUND	YEARS OF WORKING	CREATIVE OBJECTS
IW1	**33**	**Ceramic art**	**13**	**Tableware, teapot**
IX2	**32**	**Industrial design**	**9**	**Decoration design**
IG3	**35**	**Sculpture**	**14**	**Ceramic sculpture**
IW4	**35**	**Ceramic art**	**14**	**Ceramic painting**
IY5	**35**	**Sculpture**	**12**	**Tableware, vase**
IR6	**33**	**Industrial design**	**12**	**Tea-bowl, Furniture**
IW7	**34**	**Ceramic art**	**12**	**Tea-bowl, Jar**
IH8	**35**	**Ceramic art**	**14**	**Tableware**
IS9	**32**	**Ceramic art**	**10**	**Tableware**
IW10	**33**	**Ceramic art**	**10**	**Tableware**
IL11	**33**	**Ceramic art**	**11**	**Sculpture**
IT12	**34**	**Public design**	**10**	**Tableware**

Table 2 Basic information of Interviewees

The interviews lasted between 40 and 80 minutes (56,789 Chinese transcribed words in total). Because tacit knowledge is difficult to articulate explicitly (see Dormer 1994), participants were given time and encouragement to elicit as much description and reflection as feasible. As a result, the interviews with the participants resembled discussions rather than being tightly organized (Bailey, 1994). The researcher approached three participants and then recruited them directly, with the interview cycle lasting from July 2019 to December 2020. Five key interviews were done online due to the outbreak of the new crown disease. The participants were encouraged to start dialogue from crucial feelings (Burnard, 2012)) in their creative experiences.

Additionally, it was acknowledged that this interview could have some drawbacks; designers may be unable to recall unconscious habits or completely articulate their clear ideas in words. The researcher's comprehensive memo writing during the interview, based on personal context and as additional evidence, provides the raw data for analysis and reporting in this work. The specific questions start with three main concerns, including the current working state as a warm-up and entry, the key events or creation stage as a call for attention to the creation process, and then put forward questions about the reflection of the creation process

for in-depth discussion. Designers can expand on questions they are interested in or have more personal ideas. The researcher's practical background can help the conversation transition naturally without stopping to explain specific terms or steps. Moreover, the researcher memos are also used for the analysis phase to ensure the consistency and credibility of the results.

An example of the interview outline can be found in Table 3. A sample of an extract of transcription from a group interview is provided in Table 4.

A brief introduction to the study As ceramic designers and craft & design researchers, I have been studying the design and design reflection and the creative performance in craft art. According to my practical experience, the craft design is based on material knowledge that was the booth side of the craft work involved fantastic version and a huge challenge. I'm interested in what is the creative process in craft design? How do designers understand their creation or exploration? And more, how do craft designers think about their work based on their experience and further promote it? This is not only a question of creative performance. Instead, I want to explore designers' internal perspectives, attitudes, judgments and the influence of these reflections on their creative practice. Therefore, I hope to understand the experiences through interviews. Your specific description will be helpful to my research and also promote reflection on my works. Thank you very much for your cooperation and support. About the interview: This semi-structured interview will be recorded and transcribed. The data will be used anonymously. The purpose of the interview is (omitted in the version distributed to respondents): to identify specific forms of reflection by the craft designers on the creative process. Reflection is a subjective mental experience. Explore the reflective space in craft design, including the designer's practice, attitudes, creative processes and experiences as a phenomenon within design research. At the same time, it explores the potential influence of the diverse forms of reflection on creative expression in craft design and provides a reference for design practice and education.
The interview questions

	No.		Questions
The current situation of your work	**Q1**	♦	**Talk about your present job?**
	Q2	♦	**What is the main purpose of creation? How did it get there?**
	Q3	♦	**What do you think of your present job?**
Key incidence	**Q4**	♦	**What was the most impressive part of the creative process?**
	Q5	♦	**How has it affected your practice?**
Deal with skills and expression	**Q6**	♦	**How do you understand the relationship between the mind and the hand?**
	Q7	♦	**Which skills do you use most or like best? Why?**
Reflection on the creative practice	**Q8**	♦	**Do you often reflect on your creative process? When do you reflect most?**
	Q9	♦	**How has the reflective experience influenced your work?**

Table 3 Interview Outline

Data analysis

Qualitative content analysis was adopted in the interview transcript analysis aims to arrange and condense a great volume of material into a succinct summary of significant results. The process of categorizing raw data from verbatim interviews is refining the data at each stage of analysis, from the evident and literal to the underlying meaning. We read over the data to acquire an initial comprehension of the interview material and then performed a verbatim transcription. We next examined the data phrase by sentence to ensure that the significant meaning was retained. Upon rereading the data, it is possible to discern the designers' skill and perception of the creative process through the language they employ. The meaning of these concepts, reflective statements, and the language utilized are articulated as part of a practical process. The second stage involved developing code to label the condensed units of meaning and then classifying them by type of reflection. After that, we began segmenting the text into meaningful chunks. As Erlingsson (2017) notes, researchers must exercise intuition while still retaining a reflexive awareness of how prior information affects the analysis. It is critical to retain a vigilant attention of one's prior knowledge when using qualitative

approaches to guarantee that it does not influence the analysis and results. It is a delicate balancing to maintain a firm grasp on the preconceptions, ideas, and personal values and avoid allowing them to impact the research process while intentionally leveraging the preconceptions to help understand the material more deeply. In other words, content analysis, like any qualitative analysis, is a reflective process. With this in mind, we wrote memos while carefully analyzing the data and examining the context to aid in the dissection of the interview data and boost the analysis's validity, as well as keep a sufficient distance from the data provided by the participants. Following the initial analysis phase, certain reflexive statements required adjustment due to the requirement to split a unit of meaning into two units of meaning or to capture an additional meaning. We prioritized reflexive statements as entire semantic textual utterances, resulting in 177 reflexive statements with content lengths ranging from small phrases to over 150 words. It is critical to remember that the conclusion of a statement unit is decided by the change in the reflection's content and form. Naturally, the shift from content to form is more explicit than the transfer from form to content because the practice process tends to spiral, and the formal expression of reflection is frequently inextricably linked to the structure of reflection. The following step is to codify the emergent units of meaning and develop themes that contain the designer's observations on creative work.

After the initial analysis phase, some reflective statements need to be adjusted due to the need to split a unit of meaning into two units of meaning or to capture an additional meaning. The following steps are to sort through the emerging units of meaning and develop themes that contain the designer's observations on creative work. In these 177 units of meaning (see Appedexi 1), we compress the central meaning of each unit, encode them according to the research questions, and extract the forms of reflection on the craft design process.

Researcher:	**What do you think of your present job?**
Designer:	*About my work……my work is to use the fragile properties of ceramic materials and the thin and transparent feeling of paper to express the fragile nature of materials and the conquest of people to overcome the weakness of materials. This creative process is full of risks and makes me feel pure beauty. This process of challenging*

	fascinates me very because I feel there is a stereotype, that's a sense of control, when I felt able to grasp a piece of work, my thinking is slow, a lot of people think it is skilled, but I feel this is a kind of tired, I need to keep the enthusiasm of the introspection and the challenge.
Researcher:	**What was the most impressive part of the creative process?**
Designer:	*I should say, the uncertainty is absolutely attractive to me. To be honest, in the new series, there are some partial lines of red halo spread out, which is a green glaze that I prepared. It has no fluidity in itself, and it is a formula that I want to use as the basic colour. I overlayed it with different glazes. One day, the green and a small portion of grass and wood ash burned a faint red. And it's spread out. It's a natural reaction! I loved it, and I repeated the process for months and months and finally, the green and the red stayed. It became the new collection this year.*
Researcher:	**How do you understand the relationship between the mind and the hand?**
Designer:	*It is difficult to divis the mind and hand that control the process, especially in the making phase. Each kind of clay has its unique property. Before making a vessel, you will consider the state you want to present in your mind and then consider which kind of clay material is suitable for this state. After selecting the appropriate clay, you have to touch and consider what techniques to use and what glaze would be. Your hands are working and your minds are too. It's not means you can always have excellent work. Mostly it is bare as you wish, but the process is joyful not only do you make the things with your hands but also the things influence your perception of the practice.*

Table 4 The sample interview transcript

The analysis sample with the researcher's memo		
Original description	**Codes**	**Researcher memos**
InterviweeIW7: The creative process is rational and rigorous planning. In 2015, I especially wanted to break the rules. I grabbed a clay strip and glued it to form a most natural state, freeing the limitation of clay. because you can't make every artefact always satisfy your initial idea.	*Rigorous practice;* *Break the rules;* *Material nature* *Material limitation*	Creative expression is mainly reflected in the formation. Breaking down the traditional views but developing a new concept rooted in traditional spirit is a way to produce a new style. The unconscious practice leaves more space for uncertain situations. Due to the material nature. It may be conducive to enhancing creative expression by concerning self-expression rather than completing a quality work
IntervieweeIX2: Chaozhou has an intangible cultural heritage: FengXi porcelain. There is a special skill called cut-through porcelain ***The traditional way of making this kind of porcelain is a skilful work in that craftsmen digs the holes one by one.*** ***I think the traditional formation is valuable for the modern creation but needs to be changed in some***	**Culture;** **Traditional making;** **Combined modern style;** **New concept;** **Skill challenge**	Learning how to iterate on creation with the times going on constantly is an effective way to unite technology and materials. Designers need to be more sensitive to perceive the wick problems. The cultural heritage is highly abstract and condensed. Restructuring is a path to

part or combined new concept. At this point, I put two objects on top of each other and connected them with bamboo. The final work is not good because the skills still were the main challenge for the craft work.		maintain cultural value, but should further realize that deconstruction is aimed to construct new expressions rather than disassembling the past.
InterviweeIW1: Learning to see the object is played a crucial role in practice. The authenticity of the handmade traces like a book without words in front of you. Making things mainly lies in intuition and the consciousness of the body. I can feel the strength of the artisans' fingers movement, the rhythm adopted, and the speed and mentality of foot repairing even out of the action. When I see the old artefact in a museum, it made me reflect on my own experience and the meaning of making with clay.	**Learning from others' work;** **Embodied cognition;** **Reflecting on classic work**	To see objects, especially classic works even more important than practising several times to enhance expression. Learning from others' work could evoke reflection and promote understanding of the uncertainty in the process when you met it. Craft design calls for high-quality works that require designers to know as well as know how to deal with the problems.

Table 5 The analysis samples involved the researcher's memo.

3.4.2 Main study 1: Observing & interviewing

Data Collection

We conducted the observation and video recording in the data collection between November 9 and November 23, 2020. Three pieces in total of 95 minutes of video data were collected during the creative process.

Traditionally, video data is examined, and themes are derived using a combination of action and vocal material, such as the thinking aloud technique. However, in professional practice, thinking aloud can interfere with participants' practice processes and immersion activities. This data collection in this study is highly beneficial for researchers with a background in practice who wish to watch and reflect. It creates a larger space for connecting the researcher, practitioner, and practice process to gain a deeper understanding of the observed practice. Ellingson (2017) adds additional non-verbal categories for such analysis and classification, including body language, posture, space, sound, time, clothes, and physical environment. Period, dress, the physical surroundings in which it is situated, the adornment.

Adopting the video data as an advantage is frequently replayed, particularly with dynamic material. It can even be encoded many times to obtain in-depth details, in the form of replaying the file with different features focused on each pass (Heath, Gilchrist, & Ydenberg, 2010). On the other hand, advocate against encoding and categorizing videos, instead an inductive analytical method emphasizing the interplay of talks in social activities and interactions. Visual data analysis is already widely used in sociology, particularly ethnography and anthropology, due to the wealth of information that images and videos can contain. However, it also requires more from the researcher, most notably a detailed insight immersed in the data content and a meticulous attitude. Notably, the researcher's stance is also questioned in various ways, including delegating additional flexibility to the participant to oppose a more tense analysis and rationally merging participant and researcher perspectives to fill out the research content.

Data analysis

The video data were analyzed by classification suggested by Ellingson, in which three coding categories of body posture, space, and environment were mainly adopted as the focus of observation. In the first stage, researchers carefully watched the data first. After viewing the video, play the general view at an average speed. The researchers then made detailed observations based on her experience, with pauses, postures, tool changes, and the onset of

new movements as points of observation. Write the memo (Appendix 2) when the node appears, parse it according to the knowledge researcher has mastered, and save the screenshot and video screenshot at that time. The videos are then coded and associated with the memos. Then the videos were reviewed again to ensure each category had been thoroughly analyzed, and the memos were grouped for meaning points.

In the second stage, an open-ended interview was conducted based on video analysis and induction of personal reflective notes. The interview was set one month after the completion of the work. Firstly, participants are invited to watch the video content and freely communicate with each other about the critical points in the video. The researchers further discussed the memo with the respondents based on their reflections. The interview content and the researcher's memo are translated verbatim into text content. Through meticulous content analysis, mainly including video analysis and return visits, we believe that the reflective practice in the creation process of the participants is a process of immersion and transition.

3.4.3 Main study 2: Facilitating reflection in craft education

The third study explored students' reflective practice in the early stages of creation using photographs and self-reports during fieldwork.

A series of photographs taken by the students and their comprehensive self-reports were collected as the study data. Students took photos daily and selected valuable photos at the end of the course to document and reflect on their experiences. Furthermore, reflective writing contributes to deeper reflection and metacognition, allowing one to recall experiences better to understand specific information. In this regard, self-reports were used to reflect fieldwork from an integrative perspective. We conducted a qualitative content analysis to explore the participants' perceptions of fieldwork (Ayres & Paas, 2007) by examining the subtle aspects of reflection generated by the participants, which provides a reference for further research on reflective practice in craft design education and design practice.

Data Collection

The participants in this study were senior students recruited from the School of Ceramic Art and Design at a ceramic institute in China. Considering that senior students have acquired essential expertise at both the theoretical and practical levels, it was ensured that they possessed the capacity to deal with the fieldwork by actively exploring the specific situation

to obtain valuable insights to fuel their creative experience. Moreover, reflective practice assisted by observing, recording, and reflecting contributed to promoting their understanding of the material world through immersive experiences. After communicating with the teacher in charge of the senior course that year, the author proposed the reflective task, and 20 of the undergraduate students (N = 20) eventually joined the creative course and provided photographs and reports after the fieldwork.

The creative course was conducted from October 10, 2020, to October 24, 2020, for a total of 14 days. The main investigation sites were the Mogao and Yulin grottoes and the surrounding landscape. In the first week, we confirmed that the teacher had assigned the task to students who would participate in the investigatory trip from October 14, 2020, to October 24, 2020. It is worth noting that the teacher who accompanied the students took a tutorial role during the trip to avoid intervening in the students' observations. The students engaged in fieldwork to investigate what they had seen and perceived and were interested in obtaining distinguished experiences and reflections in the cultural environment.

There were no specific requirements for the photographs' size, frame, or subject. Participants were allowed a flexible space to create photos but were asked to include 3–10 photos daily. Participants selected the most impressive pictures and took notes to explain the content by recalling their perceptions and reflecting on their experiences.

The orientation instructions were announced by the teacher during the preparation phase of the course and were as follows:

1)Enjoy this fieldwork as your professional designer and try to focus on objects that inspire you, including but not limited to your creative practice. This can be recorded in words and photographs.

2)Note any feelings that are particularly meaningful to you or any new ideas that arise in the field.

We constructed these instructions according to a reflective thinking framework (Hong and Choi 2011) that involves multiple dimensions of reflection in a creative process that is adopted to explore students' reflections on the fieldwork.

After the fieldwork, students had one week to document their files and accomplish the following two tasks:

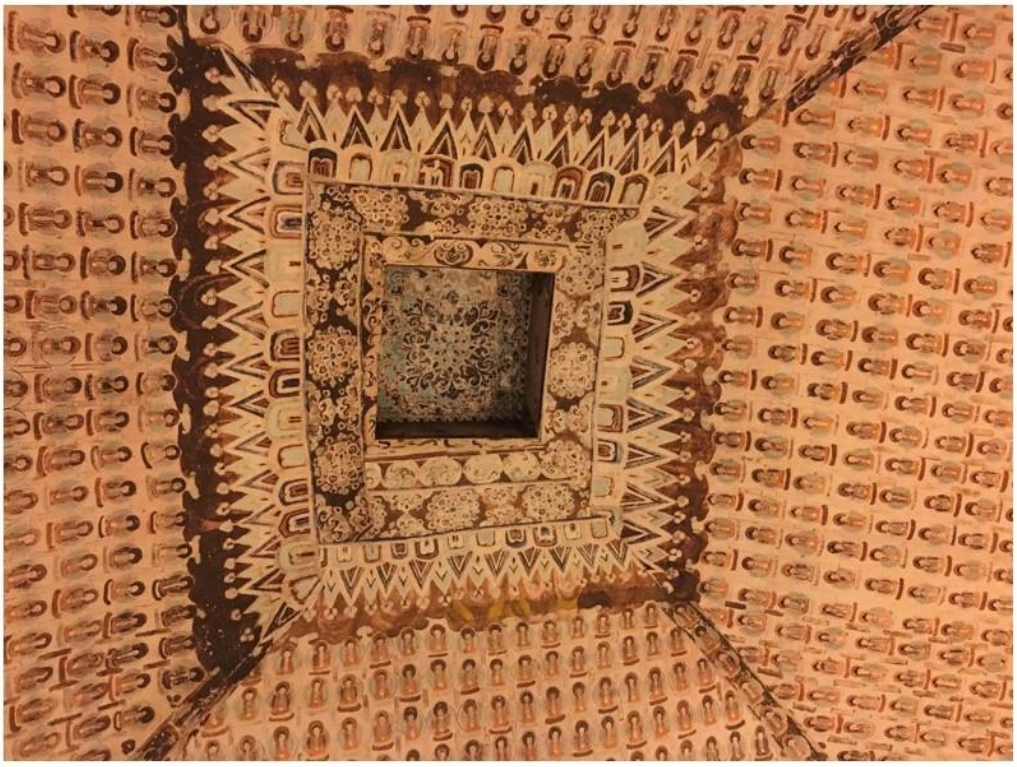
1)Please review and select pictures to write about what inspires you or is meaningful.

2)Please write a self-reflection synthesis about your experience during the fieldwork.

Data collection was completed within two weeks. We received 20 reflective reports and 583 photographs. Some photos were documented in a group with a single note. All photographs were taken with the approval of Dunhuang Academy. The teachers preliminarily reviewed the data and confirmed that they qualified for the goal of this investigation. The data were then transferred to the author via e-mail and prepared for analysis.

Data Analysis

We conducted a multi-phase qualitative content analysis of the photos and self-reports. First, the self-reports were read, and descriptive coding was conducted to synthesize the content based on the student's experiences to explore what they experienced. In this phase, descriptive coding performed as the basis of qualitative inquiry is primarily aimed at enabling the researcher to understand what the participants saw and perceived. In the second phase, the photo logs were reviewed separately using researcher jottings (Saldaña, 2016) according to the principles of picture analysis. We then examined the photo logs in conjunction with the participants' annotations (Figure 9). Finally, the participants' self-reports and photo annotations were synthesized as text content, reread, and sorted into categories based on the initial coding until themes emerged (Satu & Kyngäs, 2008).



17 October 2020

The Thousand Buddha fulfill the roof of grottoes.
The dome is filled with countless buddhas, painted in warm and bright colors. The Buddhist lotus has been arranged at the top of the center. The progressive composition creates a solemn vision, and even the gaps are filled with rigorous pictures. It reflects the devotion of the painters, as well as the exquisite skills of ancient artisans and the challenges to the creative environment.(by author)

"I suddenly realized that thousands of Buddha statues were painted on the dome when I looking up. This image impressed me so deeply that took this picture. The flat composition and repetitive patterns give people a sense of mystery and repression. It is hard to imagine how the creators could have accomplished such a work."(by Participant)

Figure 9 Sample of the photo analysis, including jotting from the author compared with annotation from a participant.

Original descriptions transcript	**Codes**	**Categories**	**Themes**
The murals were created over a long period with different skills and backgrounds. However, the mixed works are surprisingly harmoniously displayed. If you look closely, you can	*different skills* *over a long period*	*Co-creative Work*	*Knowledge Extension*

see that the lines of different styles complement each other.	*Closely observation* *different styles*		
What attracted me most was the lines and the colour of the murals. The various lines of different intensities were carefully rendered and positioned to show the different textures. I realized that the different types of lines expressed emotions by the ancient artisans, and the colors further built the spatial sense. *I suddenly realized that thousands of Buddha statues were painted on the dome when I looked up. This image impressed me so deeply that I took this picture. The flat composition and repetitive patterns give people a sense of mystery and repression. It is hard to imagine how the creators could have accomplished such a work.* ***(the photo annotation by the participant)***	*lines and colors* *position* *spatial sense built* *expressed emotion* *composition* *repetitive patterns* *Mystery* *Incredible artwork*	*Field Knowledge*	
I noticed some details that surprised me. A seated Buddha was very well dressed. Although carved in stone, the softness and drape of the clothes are vivid. I could not perceive such details in books before, so I tried to repeat the steps of carving the clothes carefully in	*Details: well-dressed* *Delicate carved* *Replay the process in mind* *Knowledge of the book*		

my mind. It seems to be reproducing the creative process in front of me.			

Table 6 The coding sample of self-reports combined with photo annotations.

3.5 Summary

The above discussion provides a discussion and justification to support the research method adopted in this study. First, descriptive data comes from the interview and involves interpreting the interview content. The two are unified in human experience because there is no empirical infrastructure that cannot explain the meaning. In addition, the rich exploration and investigation of human experience are conducive to the in-depth excavation of the meaning behind experience, which is the advantage of qualitative data and the spiritual core of phenomenological research methods. Observing, questioning, generating descriptions and explaining the reflective practice and creative process through different specific means are all efforts to analyze the creative process from a subjective perspective as objectively and in detail as possible.

Secondly, the combination of description and explanation conforms to the nature of design reflection and the design process as inquiry. Suppose reflective practice is related to the experience of the creative process. In that case, reflective practice can provide a lens through which to explore the question of how to promote creative expression because reflection is also part of the creative process. Therefore, descriptive data can allow researchers with a practical background to expand their original knowledge and explain more about the creative experience in a fundamental way of understanding life experience (Giorgi, 2008).

Third, the interpretative involvement of researchers is inevitably included in the development of descriptive analysis of research. The subject of this study determines this. It is worth noting that the experience of exploring the reflective practice and creative process echoes the experience of the researcher's creative process. As one of the supports of the data set, the

researcher not only expands the diversity of limited data but also increases the opportunity to reveal more meanings through rich discourse.

In addition, the participant was invited to reflect on his or her creative process and experience. He or she may be inclined to dig deep into the reflective layers of personal experience and strive to construct meaning. In this case, each attempt to elaborate on reflection begins at a specific point in the process and diverges to a more abstract level. On the one hand, the researcher's background can receive subjective feelings and professional concepts of line management beyond the practice itself. On the other hand, the nature of evolution with critical reflection is considered. The researcher's interpretation is a facilitative and complementary means of understanding the reflected experience. The roles of study participants (designers) and researchers in the study cycle are shown in Figure 10. In the process of understanding and clarifying more reflective practices, researchers continue to abstract out units of meaning to construct reflective forms. In such a process, the researchers benefit, but more importantly, it provides a valuable reference for designers and design novices in practice. They may not be aware that their reflective practice is having a subtle impact on the practice itself or that they urgently need a framework in the educational scene to recognize the vital role of reflective practice in the creative process.

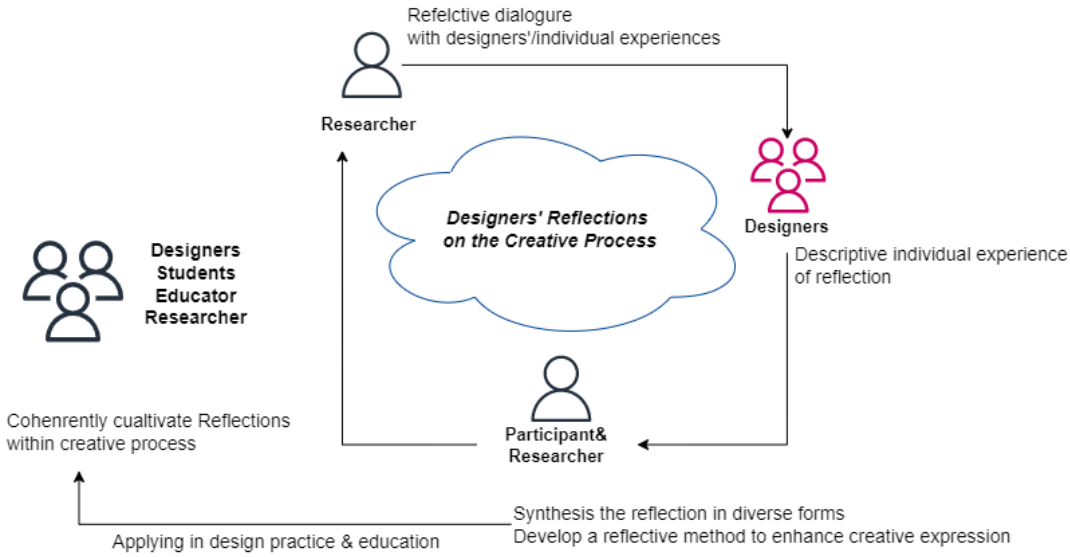


Figure 10 The involved roles in the studies

3.5.1 Evaluation

In this study, the appropriate way to evaluate the findings of these studies is to apply them to real-time scenarios where the framework of reflective practice and different forms of reflective practice can provide practical references for specific practice projects. The concept, dimension and form of reflective practice, and the promotion of the practice process, can constantly compare designers' real reflective experience with researchers' understanding of designers' reflective experience to promote the dialogue between theoretical inquiry and practical experience. Interview memos and visual data annotations can be essential in data analysis. It provides a reference for describing the subject's experience coherently and further promotes the exploration of the subject. According to The definition of inquiry by Dewey(1933), the essence of inquiry is to transform an uncertain situation into a decisive situation in terms of its constituent differences and relations in a controlled or directed manner, thus transforming the elements of the original situation into a unified whole. This definition also applies to the influence of reflection on process design as an inquiry into material experience on creative expression. In addition, what emerges from the research process is used to guide the research further and can be understood as a process from uncertainty to relative certainty. The process includes constantly comparing the newly emerged reflection content with the reflection of different creative stages. To see if the reflective experiences of different individuals can fit into the known framework, enriching the construction, or modification, of meaning, or enriching the reflective forms within the framework to compensate for meaning not revealed. Adaptability, relevance, and operability are criteria for phenomenological research with validity, reliability, and objectivity. This comparison and evaluation process also involves the researchers' introspection of theoretical research and practical experience. In essence, this exposition echoes the reflective practice of any other design practitioner in attempting to understand, develop and evaluate their creations. Finally, the interaction between various research methods and data forms the researcher's convenient identity as a practitioner. At the same time uses different methods to dissolve the researcher's position and introduce the variability and diversity of interpretation.

3.5.2 Reflexivity

Regarding reflexivity, researchers are constantly thinking about research practice and carefully considering the limitations of each study. At a broader level, the main concern is not to impose personal interpretations of phenomena but always to check them against the

data, thus allowing views inconsistent with subjective experience to emerge. The data were re-coded at various stages of the study, particularly the interview data. This process provides an excellent opportunity to reflect on the analytical framework and any deviations that may be associated with applying it. Finally, after completing the first manuscript, the researcher went to the pottery studio to create and carry out the handicraft practice again by himself. It also provides a unique opportunity to reflect on the researcher's creative process and experience and supports further approaching the ideas of the test and increasing one's ability to reflect. The expertise of re-engaging in practice not only tests the rationality of the research framework on the personal level but also highlights that the reflective practice in the actual creation process is highly embedded in the process of material contact and challenging to be noticed. Because of the habitual and frequent occurrence of reflective practice, reflection in the process design process needs to be recognized and emphasized to enhance practitioners' thinking ability and become more creative.

Chapter 4 What forms of reflection do craft designers do?

4.1 Overview of this study

This study identified the forms of reflection in the craft design process that presents a constructivist account of craft design knowledge through a detailed analysis of the various forms of reflection by interviewing 12 experienced craft designers. The main purpose of this study is to better understand the creative process and expression of modern craft design through designers' reflective practice. As a result, seven forms of reflections combined with the innovation process model dissect the specific patterns of craft designers' reflections that impact the creative expression. The seven forms including1) Introspection, 2) Validation, 3) Association,4) Integration,5) Appropriation,6) Transformation, 7) Habituation. According to the results, reflection in the creative process has a crucial impact on creative expression presented in deep reflections about previous experiences and generating new insight. Therefore, the diverse forms of reflections have been framed and discussed with Material Engagement Theory to go beyond mere practical problems.

4.2 Research Context

According to Bronner (2011), as an essential practice of humans, craftwork sustained social and psychological function in daily life. A fresh view from Dillon and Kokko (2017), crafts are frequently a locally specific form that expresses traditional production techniques in a particular production location to support peoples' basic needs while exhibiting the cultural traditions, beliefs, and identity of the place. Individual creations were deeply buried in the overall production practice and challenging to examine in ancient times, according to the characteristics of the craft practitioner as a productive profession. Creations only had

significance when high skill became highly productive by adhering to the laws of nature, master and disciple transmission, and production rules. We examine how do craft designers with modern education view their creative activity and how they develop creative expression in this environment through the perspective of practitioners' reflections. As mentioned in the literature review, reflection is a crucial tool for encouraging designers to adapt their approach to creativity. The question of how designers derive meaning from their work remains, despite the inherent complexity of craft design and the creative process. It also contains ineffable empirical knowledge and constant negotiation between practitioners and materials, traditions, and creative expressions. Any reflection does not occur in a vacuum, and it may be challenging to reflect on experience alone in a vacuum(Thies-Sprinthall, 1984; Zeichner, 1996; Reiman, 1999).

This study explores independent ceramic designers, focusing on whom lived in Jingdezhen, a ceramic capital city with a long history and essentially impacted the ceramic technique development in the global range. Under the imperial kiln system, Jingdezhen in antiquity, exemplified the most advanced and best porcelain-making skills of its day and the aesthetic preferences of ancient China for hundreds of years. In its current state, Jingdezhen remains the most prestigious and prosperous, energetic capital of ceramics. In the contemporary, when art is no longer dominated by political ideology, there has been an infusion of modern art concepts and design thinking into all areas of art and design. A creative, exploratory collegiate aesthetic in craft and design replaced the aristocratic aesthetic. Practitioners with higher education and professional education became the primary creative force in ceramic art and contributed significantly to the flourishing of various creative styles. In addition, influenced by modern pottery and European creative industries, the emergence of creative markets provided a new stage for ceramic creation. Creative expression became ceramic design's new objective to meet modern life's diverse needs. Jingdezhen became a hub for artisans, particularly ceramic handicrafts.

We address the issues confronted by contemporary craft production in the pursuit of creative expression by stressing the designer's insight into specific creative experiences and processes. By investigating the forms of designers' reflection, we promote understanding the creative expression of craft practice and the possibilities for negotiation in the quest for creative expression.

Moreover, the reflections in craft practice encompass various activities that interconnect and influence the designer's creative expressions. As a prism for understanding craft creation, we

explored the practitioner's reflections on the creative process expected to give a valuable reference for explaining the modern craft designers interacting with their surroundings to enhance creative performance and construct a new identity.

4.4 Seven Forms of Reflections within Creative Process

Schon() claims that it is unlikely for problem solvers to be able to handle all possible situations in a new challenge by carefully adhering to theoretical, technical, or systematic processes. Instead, problem-solvers rely on "a strategy of improvisation, innovation, and testing"(Schon 1983). As Treacy and Gaunt (2021) point out, reflective practice makes designers aware of their decisions during the design process. Designers in any field should be able to reflect on their actions to help them generate the following appropriate action based on the situation and feedback from their previous actions. The practitioner must perform a reflective role throughout the cycle of improvising, developing, and testing techniques. Among the two categories of expertise identified by Hatano and Inagaki (1992), adaptive experts pay great attention to the effect of their actions on the circumstance and build strategies for their next steps based on the scenario. Adaptive specialists can guarantee equivalently satisfying outcomes even when confronted with novel situations through thinking. Similarly, reflective designers are more likely to succeed when confronted with new design difficulties if they examine uncertain or novel conditions and if their reflections extend beyond their prior experiences(Bransford & Nitsch, 1978). Reflective designers will be better able to build plans to address new issues as they continue to learn more about the scenario.

After careful data analysis, we abstract seven forms of craft designers' reflections on the creative process, including**1) (Habituation, 2) Introspection, 3) Validation,4) Association,5) Integration,6) Appropriation, and 7) Transformation**.

4.4.1 Forms of Reflections from Designers

As we found that the detailed description of reflection of the creative process, the reflection on the professional practice is not an isolated staged activity, and the content contained in each theme is not an independent factor. We should see the relationship between the different elements better to analyze the reflective characteristics of the process designer. Next, we will

refer to the characteristics of the generated themes and reflective types for a detailed explanation.

Habituation consists of the evaluation and description of behavior. This form of reflection involves an automatic performance that designers think about the process unconsciously and even is not defined as rigorous reflection. However, in our analysis, designers made many habitual comments, especially when evaluating their work, in conjunction with personal reflections on its development. They also showed a habitual critique of earlier works. Moreover, the designers not only describe their own experiences but also provide some reasons for the specific problems that arose in the process and realize that it was almost impossible to cope with them under the circumstances.

> *Interviewee(IR6) My reflection on the creative process is that too many technical problems are emerging, and it takes time and ability to solve them. If I give up exploring new forms to make a sound object, I think it is easy, but I am unwilling to give in easily. Challenge is always there in the creative process.*

Introspection refers to reflection and introspection on a practical issue. This position emphasizes the personal significance of the situation described in the creative process. When designers attempt to explain their creative behaviors, many statements contain biographical links between personal and professional experiences. In this form of reflection, the typically expressive designer will use emotional descriptions of their decisions when describing the most moving parts of the creation. Serendipity becomes the most critical point in the craft design process that provokes reflection and passion. If a unique expression is successfully captured in a serendipitous event, it can lead to a thoughtful reflection that is flexible and personal.

> *Interviewee(IT12): The process of making ceramics has some surprises that can make a difference in a single creation. In this process, there are surprises and mistakes. I have the habit of keeping a record of my work, writing down the steps, and each time I find some mistakes in these iterations, I eventually correct my mistakes little by little to achieve the final result I want, and I like this way of working.*

Validation means testing old and new ways of thinking and acting in the process of practice. In this type of reflexivity, designers often weigh the pros and cons of their current practice against how they have done things before. Validation requires the application of some new, practice-tested knowledge. In this type of reflexivity, designers typically describe what they

do in their creative work and contrast it with their preconceptions, biases, concerns, risk assessments, and doubts about the practice itself. In their reports, designers intertwine practice and validation to describe an effective way to a new state of learning, the necessary steps added to the work, and the expectation that further iterations in creation will confirm this new experience and state.

Interviewee(IH8): As a designer and producer, I judge whether an item is good or not by whether it can fit in with the environment to give full play to its value. Good utensils make people feel harmonious, calm and happy. My creative process is a process of continuous improvement but also a process of absolute commitment. I need to do, repeat, adjust, repeat.

Association refers to linking prior knowledge, feelings or attitudes to new knowledge and insights. This form of reflection mainly manifests in the remote review of one's creative experience. Examples include the state of being when one was a learner, the experience of learning techniques, the influence of teachers, and the influence of established designers. They will actively use what they consider excellent and mature works and designers as an essential fulcrum in the pursuit of creative expression and constantly compare them to find a way of working and creative direction with which they agree. This kind of reflection is relatively rational but closely related to the designer's upbringing, learning experience, depth of introspection, and daily life. More importantly, it allows new ideas to be linked to past classics and gives way to new perspectives and creative inspiration.

AsBeghetto and Kaufman (2007) suggest, craft practices have a profound social impact on individuals and entire communities. These practices maintain and transform cultural identities as they distinguish groups of artisans living in the same society. Even reproduction is an activity that plays multiple creative roles in craftsmanship. This leads to the production of reproductions that ensure the best possible craft results and stimulate future development.

Interviewee(IX2): I'm super engaging in finding the possible in the impossible. In the early creation, I always thought that the craft was an insurmountable fact. Now I think it was my mindset and accepted this fixation. Craft design can be very creative and always bring people to look forward to and surprise. No matter how to go, there are many detours; simultaneously, the exploration process lets people become very attached.

Integration includes a reflective stance in which the designer can actively seek out the data provided in the practice process. During the interviews, these reflective statements varied. Some statements linked collective expertise to the creative experience, while others included reflective statements that analyzed the practice process as uncertain, unique, and often conflicting issues. Designers also use reflection as an expanded learning process that integrates issues in practice with broader experiences. This form of reflection shows curiosity and experimentation with more multicultural, diverse perspectives and strives to integrate personal reflection and practice into a more realistic practice plan.

Appropriation refers to the designer's ability to expand the temporal environment to a broader area and to utilize it as an opportunity for personal learning. Not all learning lends itself to this approach, which designers say significantly impacts their expertise and actions. Our data contains reflective statements that have the same solid and positive tone. Designers describe this form of reflection as a personal learning experience, professional understanding, and insight. These insights have substantially impacted their behavior as craft practitioners and the development of their professional creations toward greater flexibility. We interpret them as a sense of professional identity for craft designers and see them as a significant force in the professional self.

I*nterviewee(IW7): Look at the picture, collect ceramics is one of the crucial lessons I creation starting, especially ceramics, let me feel the very concept of value, feelings, make the process even imagine when the status of the fingers, rhythm, speed, and technology at that time, all this speculation is a kind of identity*

Transformation refers to experiences reported to affect designers' personal and professional foundations. The transformation descriptions in our data are spread across almost every unit of meaning, but there are no typical prominent descriptions. We consider reflection an iterative transformation of ideas, a statement of the designer's preparatory actions for change in future practice. This type of reflection motivates designers on a broader level to be more aware of their actions and concerns in action and to highlight challenges. They can pay attention to their personal experience and creative practice at any time and place, transforming the elements needed to develop into new understandings. This attention is not only to specific operations but also to self-development. Through this reflection, designers

gain a new experience of classical constraints and traditional work habits and even transcend these.

Overall, our interviews with 12 craft designers. 177 reflexive statements have been condensed from description data and 65 themes generated, as shown in the seven forms of reflection described above. **Figure 11** gives the version of the reflection forms in a synthesis version.

Interviewee(IY5): Another of my works is to use the fragile properties of ceramic materials and the thin and transparent feeling of paper to express the fragile nature of materials and the conquest of people to overcome the weakness of materials. This creative process is full of risks and makes me feel pure beauty. This process of challenging fascinates me very much because I feel there is a stereotype that is a sense of control when I felt able to grasp a piece of work, my thinking is slow, a lot of people think it is skilled, but I feel this is tired, I need to keep the enthusiasm of the introspection and the challenge.

4.4.2 Characterize the forms of reflection

In the designer reflection of this study, a total of 65 theme codes were obtained from 7 types of reflection. According to the theme content (Figure11), four main themes are drawn and highlighted with different colors: material, skill, risk and tradition. Specifically, introspective reflection and habitual reflection obtained more thematic coding. To some extent, this is understandable. Because of the characteristics of data collection methods, designers describe their daily practice in the interview and reflect on their creative process naturally with evaluative statements. In addition, the personal habits of designers formed in daily practice make them more impressed with the frequently occurring problem-solving process, which is mainly rooted in the process of craft design as a unique working mode and also has an impact on the learning and living mode of designers.

However, on the other hand, habitual reflection tends to create a dependency on problem-solving or a mindset. In all seven types of reflection, material properties, material experiences and multi-angle thinking about materials are described without exception. Material engagement is the essential content of process design practice and plays a decisive role in the following action. The following action is related to how to conduct more in-depth and accurate reflection. Whether to define practical problems and avoid falling into mediocre practice is a real challenge facing process design and research.

In addition, reflection is a habitually used tool in the practice-led creation process to guide the next step of action. Only when the action has ended are you more likely to distance yourself from the creative process and engage in deeper reflection. Although the behavioral goal of reflection is the same, that is to create a higher quality product. However, the impact of the differences in reflective forms on the practice changes over time. So introspective reflection is more about deep, abstract concepts or, even more significant, older memories in the present moment. In introspection, it is a common expression for designers to relate their professional problems to their problems. This is closely related to the material property of process design and the characteristics of hands-on practice. Designers must learn to think with their hands, thus generating more perceptive descriptions of body cognition. Concrete feelings lead to in-depth thinking, mainly about personal internal perspectives and work beliefs. This has been demonstrated in other research areas, where deep reflection brings people face to face with the difficulty of going beyond themselves. Emotional, rapid retrospective reflection is often easy to solve the specific problems of practice. Therefore, the development and training of reflective consciousness in daily life are worth considering, especially in improving the form, time and level of reflection.

Skill problem is one of the fundamental challenges of process design. Skill is the skill of using hands to make things and the attitude of challenging and transcending physical limitations. If the material attribute lays the foundation of the technology of process design, then the skill is the core link to achieving transcendence. Therefore, all challenges in the process of design can be considered technical challenges. However, in the associative form, no topics about skills are highlighted, and material characteristics and risks are coded accordingly. We think this is an excellent part to understand. What is interesting is the emergence of associative reflection of the encoding of time concepts, such as eternity, new and old. These are two very abstract concepts, but many descriptions are worth marking up in the data.

Through the designer's description, we can conclude that the abstract concept is not emphasized in the traditional process design. At least in China, all patterns and decorations are passed on and polished countless times and eventually become working patterns to serve the product's function. When the conceptual expression of modern art intrudes into craft design, connecting different perspectives across the dimension of time becomes a meaningful way to construct meaning and find inspiration because personal expression is reinforced. At the same time, the individual's daily practice becomes the focus of the designer's attention.

How to extract universal creative thinking from their daily practice and better balance the limitations of materials and the growth of concepts is an essential challenge to process design. However, during the process designer's reflection on the creative process, the designer can deeply and universally think about the practical problems in the creative process. Integrating theory into practice is a challenge in any design field, and our results show this. Even designers who have worked independently for nearly a decade often think about theory's role, purpose, and definition in a practical context. One problem that becomes apparent is how to theoretically understand the emergence of other forms of reflection, such as Integration (Form 3) and Appropriation (Form 6).

Integrated reflection, on the whole, shows a positive attitude to determine the direction of creation from a macro perspective. It is mainly reflected in the recognition of tradition, consideration of curiosity, and the balance between practice and concept, which reflects the complexity and period of technological design creation. In interviews with designers, designers have different understandings of the concept of time and explain the material attributes of the attributes of time. For example, fragility and toughness; fragility is one of the properties of ceramics; an item can be destroyed instantly. Furthermore, toughness is the other side of ceramics, which can last a thousand years. Such a period is difficult to understand from a micro perspective. We can have multiple perspectives in the creation process through accumulation, integration of experience and professional knowledge, and extension of learning.

Appropriation obtained the minor thematic coding in the seven types of reflection, and similar to the association, there were no themes directly related to skills. Nevertheless, there is one unhighlighted theme worth discussing here: shell borrowing. Borrowed shell means to use forms and techniques from other craft types for new creation. For example, in the early days of porcelain, primary forms were borrowed from the shapes of gold, silver, and bronze to make new products. This behavior demonstrates the traditional DNA of process design. Use reflection to gain insight into the experience and expand learning. Through such practices, designers push the boundaries of practice and promote new material experiences while learning from different areas of knowledge to enhance cognition, resulting in more creative performance. From this point of view, misappropriation reflection is an essential psychological activity to expand the practice boundary.

Interviewee(IH8): My inspiration comes from African woodcarving, a sense of strength in the natural wilderness. The pattern is butterflies and plants. Strangulation, a metaphorical story, finally kills the butterfly, and the work begins to have a narrative. The creation process is efficient; everyone chooses the expression volume by measuring his body. The boundary of contemporary ceramic creation blurs the product and work, which is the personal spiritual expression of the creator. However, it is straightforward to express the original, and it is not easy to express it continuously.

In addition, confirmatory and transformational reflections simultaneously cover the four themes highlighted in the data, showing more flexibility. Confirmatory reflection is more related to the risky practice of process design, mainly reflected in the exploration of material in practical operation, the challenge of technology and the verification of personal experience. More importantly, confirmatory reflection is a short-path reflection that can occur in a short time and get timely feedback. Confirmatory reflection, though, is a dynamic, exploratory process. However, most show limitations in the temporal dimension. Transformational reflection is just the opposite. Transformational reflection is based on many verified or unverified experiences, which can be reflected and iterated at any time, but it is not easy to be realized immediately in practice. Thus transformational reflection is based on the deeper considerations of verified experience. This consideration includes the accumulation of personal experience, the attitude to deal with problems, and the ability to be sensitive and reflective at all times. Alternatively, confirmatory reflection distributes the new knowledge developed in any form of reflection to facilitate creative expression.

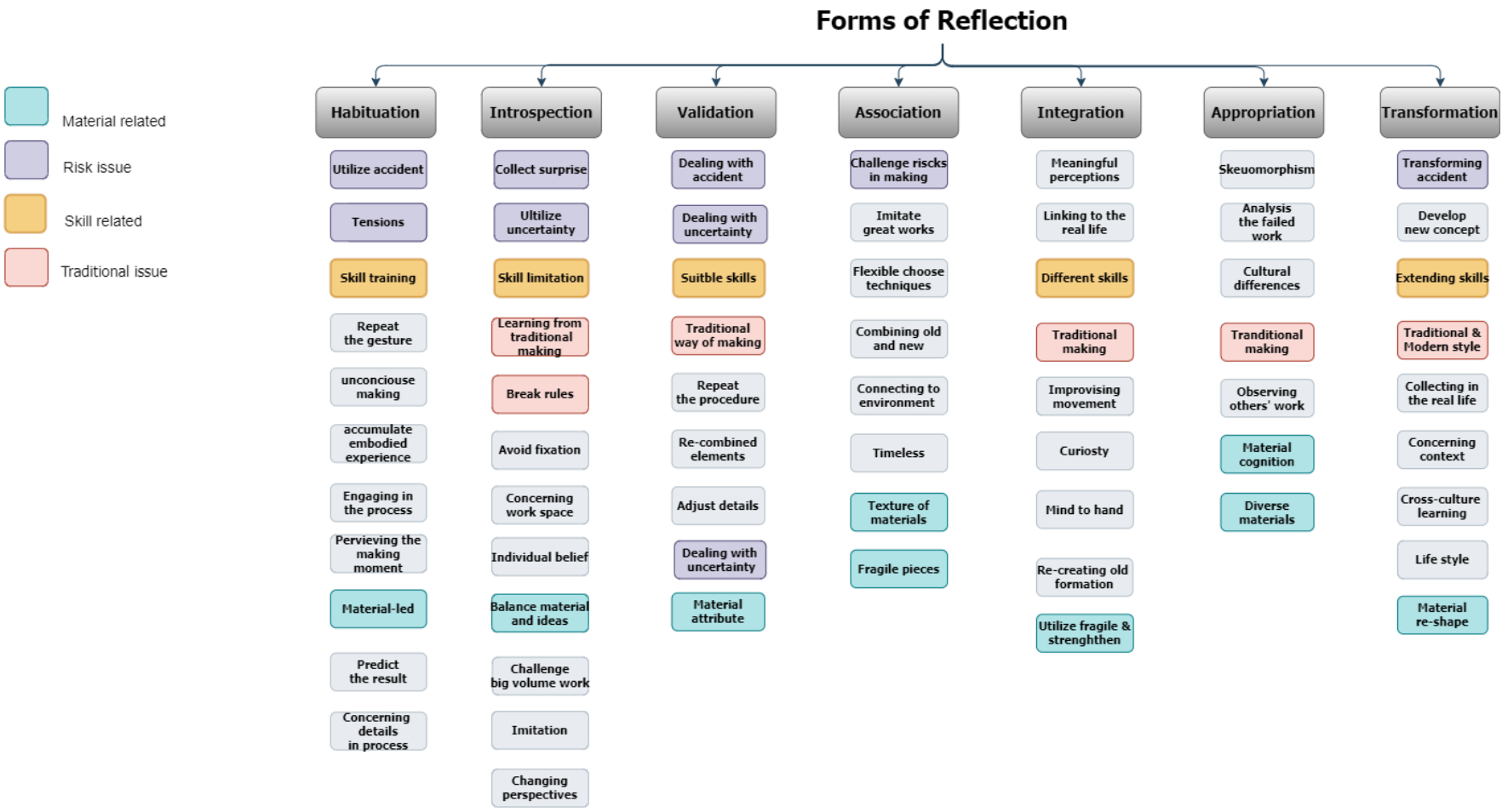

Material related
Risk issue
Skill related
Traditional issue
Forms of Reflection
Habituation
Utilize accident
Tensions
Skill training
Repeat the gesture
unconciouse making
accumulate embodied experience
Engaging in the process
Pervieving the making moment
Material-led
Predict the result
Concerning details in process
Introspection
Collect surprise
Ultilize uncertainty
Skill limitation
Learning from traditional making
Break rules
Avoid fixation
Concerning work space
Individual belief
Balance material and ideas
Challenge big volume work
Imitation
Changing perspectives
Validation
Dealing with accident
Dealing with uncertainty
Suitble skills
Traditional way of making
Repeat the procedure
Re-combined elements
Adjust details
Dealing with uncertainty
Material attribute
Association
Challenge riscks in making
Imitate great works
Flexible choose techniques
Combining old and new
Connecting to environment
Timeless
Texture of materials
Fragile pieces
Integration
Meaningful perceptions
Linking to the real life
Different skills
Traditional making
Improvising movement
Curiosty
Mind to hand
Re-creating old formation
Utilize fragile & strenghthen
Appropriation
Skeuomorphism
Analysis the failed work
Cultural differences
Tranditional making
Observing others' work
Material cognition
Diverse materials
Transformation
Transforming accident
Develop new concept
Extending skills
Traditional & Modern style
Collecting in the real life
Concerning context
Cross-culture learning
Life style
Material re-shape

Figure 11 The main themes within Seven Reflections forms from craft designers' interviews

Through the above discussion and analysis, we classify data content in 177 meaning units in a new way, focusing on practical actions. Based on the United Innovation process model and combined with the characteristics of process practice, we defined the reflection on practical operation details as in-action. In contrast, the reflection beyond functional operation was defined as out-of-action (Figure12). Experience is divided into traditional knowledge/personal experience and experimental/accumulating new experience. A coordinate system is constructed to classify reflective forms. Thus, an exciting scene is generated (Figure14): the a-o quadrant contains all seven forms of reflection, while the p-i quadrant has minor types of reflection. In addition, four forms of reflection are more comprehensive: Valid, Associate, Item, and Appro. This is consistent with our previous content analysis results. This phenomenon is understandable because the form of the interview itself is outside the action, and the designer will consciously evaluate the description process and show a relatively calm, cognitive and complex reflection. This is also consistent with Buchanan's (2001) suggestion that experience and environment are places where reconstruction takes place, fusing the pluralism of past life with the possibility of future in the mobile present. It seems natural for an observer and researcher to see new scenarios from an emerging reflective map. However, designers need to make a considerable effort to tease out their ongoing experiences and start to reflect on their considerations. Due to the complexity of the process of craft creation, the overlap and disconnection of time, reflection needs to act as a capacity to be aroused at any time to support each stage of creation. Experienced designers demonstrate fluent and rational reflection and constantly strengthen the recognition of professional knowledge and accumulated experience in the reflection.

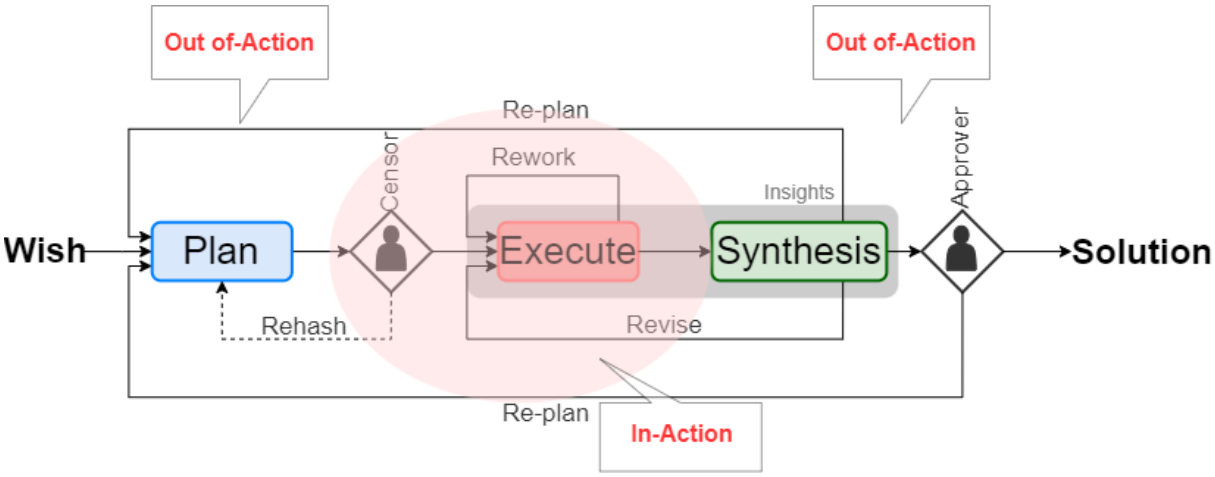


Figure 12 Distinguish the In-Action & Out of-Action in the Creative process

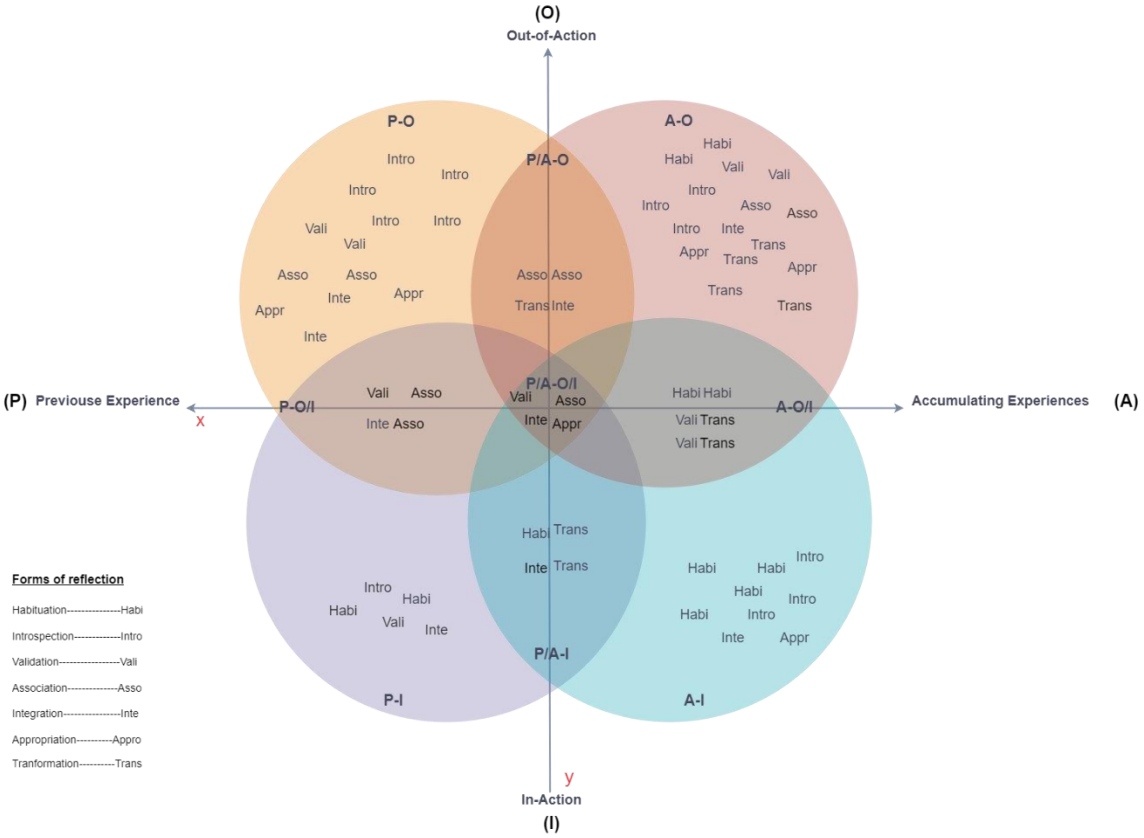


Figure 13 General framework for reflection on creative process showing two dimensions for characterizing reflective practice: (1) x-axis: Previous experiences vs. Accumulating experiences; and (2) y-axis: in-action vs. out-of-action, populated by Themes coded from designer interviews.

Character of Reflection	Habituation	Introspection	Validation	Association	Integration	Appropriation	Transformation
A-O	2	3	3	3	1	2	4
P-O	0	5	2	1	2	3	0
P-I	2	1	1	0	1	0	0
A-I	4	3	0	0	1	1	0
P/A-O/I	0	0	1	1	1	1	0
A-O/I	2	0	2	0	0	0	2
P-O/I	0	0	1	2	1	0	0
P/A-O	0	0	0	2	1	0	1
P/A-I	1	0	0	0	1	0	2

Table 7 The number of reflection forms in each characteristic

From an empirical point of view, it is essential to promote reflection in the creative process of craft on a large scale. Habitual, introspective, and validating forms of reflection are necessary for everyday practice. Nevertheless, designers need the ability to integrate theoretical knowledge into practice, which requires them to develop more holistic, general skills of future-oriented reflection and abstract positions to support creative expression. In this sense, our analysis provides some food for thought. According to our preliminary results, process designers are good at and able to reflect on their practice from multiple perspectives. Good design arises from the communication between our ability to understand something and our ability to possess skills. The experience of living in this world, combined with the knowledge that multiple reflections can accumulate, and the skill of transforming materials from matter into meaningful structures and objects, generally promotes creative expression.

4.5 Implications in Pilot Study

This study explores the primary forms of process designers' reflection on creative practice and contributes to creative expression.

While all participants were invited to consider similar themes, the loose structure of the questions provided space for further exploration of themes surrounding contemporary craft creation. This process is based on the theoretical ideas of reflection, especially from the

perspective of Dewey, which includes individual creative intention, thinking in design and interaction with the environment as its central concern.

The pragmatist philosopher Dewey (1933) reminds us that reflection is a complex, rigorous, rational and emotional enterprise that takes time to do well. Rodgers(2002) argues that Dewey gave us a more precise way of looking at reflection and reflective practice, including the following four guidelines. Firstly, reflection is a meaning-making process that allows the learner to move from one experience to the next, to a deeper understanding of relationships and connections to the experiences and ideas of others. Secondly, reflection is a systematic and disciplined way of thinking. Spontaneous interpretation of experience needs to be preceded by accepting the existence of problems, identifying issues and questions that arise in the experience, and formulating possible explanations for the issues raised. Again, reflection needs to occur in interaction. This is crucial because getting feedback from the outside world can make the strengths and weaknesses of one's ideas more precise and easier to convey.

Through content analysis, we finally abstracted seven forms of reflection in the creative process, from defining units of meaning to developing theme codes. From the perspective of practice, material and humans are deeply interactive partners. The technique, in a way, becomes the constraint itself. However, in the final analysis, the practitioner is still at the boundary of the scale.

Material engagement theory proposes a way of looking at the intermediate space where brain, body, and culture merge and suggests a possible pathway (Malafouris, 2014). Rooted in the anthropological archaeology of spirituality (Malafouris, 2008; Colin Renfrew, 1998; Iliopoulos, 2019), the material participation approach is dedicated to observing and describing our cognitive lives as we find them. People in different places and times (past and present) are formulated within the world. Humans think and feel through the saturated, situated materials of things and generative forms (Malafouris, 2014), 144 italics in original), which are creative expressions. Malafouris(2019) broadly refers to this process as the creative thing. This process is at the heart of human evolution, from the earliest stone ecologies to the latest digital ontologies.

From phenomenology, mental events do not occur in a vacuum or some a priori metaphysical space. More precisely, they are an integral part of our lived experience, the skills, and capacities of our bodies. Here we adopted the (Malafouris, 2019) Material Engagement

Theory (MET) that provides a new argument precisely to change our view of the relationship between cognition, emotion, and materiality, or the co-constitution of people and things. We are used to thinking of things as inert and passive. MET sees things as dynamic, perturbed, mediating means whose existence has the potential to change the relationship between humans and their environment. New artifacts create new relationships and understandings of the world. New substances bring about new patterns of behavior and thinking. In other words, the material does the same thing to us when we shape the material world. In the next section, we will focus on the designer's process to further understand the designer's reflections on the creative process.

Chapter 5 How to frame craft designers' reflection in the creative process

5.1 Overview

This study explored reflection in the creative process that focuses on the execution stage in craft design. The research was set in a ceramic studio, and a graduate student who majored in ceramic design participated in this study. We adopted the observation, camera recording and post-interview to collect the data and stimulate participants to reflect on the execution stage by reviewing the video record. Despite only one participant in this study, the researcher's position was carefully considered throughout the data collection and analysis due to the background.

The main findings were combined with the proposed framework in Chapter 4 but further completed by exploring the execution stage to synthesize the framework. Over results in both Chapter 4 and Chapter5 were shown that the reflection in the creative process is mainly generated out of action performed inductively to interact with previous experience and keep forward to accumulate new experiences. Specifically, the reflection in execution generally regards the problem at hand and solves it in a short path by recalling the experience. The reflection out of action evokes more introspective reflection concerning the broad issues related to practice. Moreover, deep reflection also emerged out of action. These results indicate that reflection on the creative process potentially affects designers thinking and is directly influenced by the capacity to deal with material and subjective experiences. The survey in the literature clarified that creative expression in craft design is an ongoing

experience, and reflection on the creative process is worth highlighting in the craft and design research as well as a reference for design education.

5.2 Research context

Concentration and expertise are observable behaviors, but the implicit information underlying expertise has become a popular word for unconscious gestures, habits, and skillful actions. There is widespread agreement that the core of most practices, or activities that utilize the body to focus on the material world and comprise cultural life, consists of repetitive behaviors that appear monotonous (Mukerji, 2014). In the present, despite the advanced strategy or technology obtaining knowledge at a lower cost, the awareness to cultivate creative learning and practicing is still urgent across the domain. Likewise, the craft design also needs to clarify that the tacit knowledge embedded in the creative process has less been explored from subjective reflection to construct new views. Considering the previous findings in Chapter 4, this study has been set in a ceramic studio in Kanazawa Art college, Japan. A master's student Miss Zhang. LY participated in the research and volunteered to record the execution stage of her graduate work. The daily activity of the studio without embellishment appears in the viewfinder to illustrate the working condition.

In contrast to the logic of film editing, participants reveal their creative process and work environment in this research. Standing on the findings in Chapter 4, we analyze the reflection in this study. We reference the seven generated reflection forms to consistently explore the reflection in the creative process to bridge the craft design process.

5.3 Understanding the Reflection forms in the execution phase adopted Material Engagement Theory

With watching the video data and take notes **(Appendix 2),** we pause at each important video node. The criterion of the node is that the participant performs the following action or suspends the hand action. Finally, 29 meaning nodes were obtained and used in the post-interview to extract the reflection forms in the execution phase **(Figure 15).** Moreover, screenshots were saved for the video **(Figure 16).** Although informed consent was obtained, the video data showed only the non-positive parts of the action due to the privacy protection of the participants. Three are three key themes from our analysis **1) adjust the state of the**

work, 2) check the quality of practice, and 3) Shape the figure(Figure 18), also discussed in the following section.

Through careful analysis, six forms of reflection were mentioned in the operational phase, obtaining 29 pauses and 35 codes. Among them, habitual reflection is more prominent, with 16 encoding times, followed by confirmatory reflection, with eight encoding times. **Habituation** consists of the evaluation and description of behavior. This form of reflection involves an automatic performance that designers think about the process unconsciously and even is not defined as rigorous reflection. **Validation** means testing old and new ways of thinking and acting in the process of practice. In this type of reflexivity, designers often weigh the pros and cons of their current practice against how they have done things before.

In the observation and analysis of video data, we found that participants did not follow strict procedures in the execution process but used whole-body action, observation and re-action as repeated negotiation with materials, environment, body and tools. In subsequent interviews, we allowed participants to pause freely to elaborate on current reflections, and material materials were undoubtedly the most mentioned aspect. The materials here naturally extend into the working environment. Many materials, such as wood and newspaper, were adopted naturally and were essential in promoting the creation. However, uncertainty is an immediate challenge. If the design is to solve ill-defined problems, then the practice of process design is to negotiate progress in reflection due to uncertain risks constantly. We use two colored lines to highlight the interlinked thematic coding worth discussing in different reflective themes.

The blue line is about the negotiation of materials and techniques, and the material leads the idea in the production, which is hard to resist even compared to the sketch page, which can be seen as a lack of skill. So the loop controls the process to achieve the ideal material exploration and skill improvement situation. Linked by red lines are abstract associations caused by material attributes in the process. We believe that reflection in this respect is time-bound. Fragility and tenacity are not only material attributes but also represent the timeliness of creation. It can be destroyed in an instant, or it can last a thousand years. Therefore, the thinking is that it has the potential to influence the designer's attitude towards risk and uncertainty, thus producing unexpected expressions.

Combining the visual and interview analysis, the materials are profoundly malleable and diverse (Malafouris, 2019)(Iliopoulos, 2019) (Ingold, 2013b) 2013), so the reflective plane is based on the plasticity and diversity of things through the things of the thinking of the hand

things. According to Schon, reflective practice has been recognized as a continuous nonlinear occurrence in the creative process. Its specific performance in actual interaction with material materials can be further analyzed. Through participatory observation, video recording and post-event interviews. Were repeated to watch video data and by observing the volunteers' action, gesture, pause and observation of the surrounding environment; the memo was found through the analysis of the recorded 29 recorded important node; these identified key nodes were also used in a later interview with the participants to discuss and utilized the theme analysis code eventually formed a Thematic map (Figure 17) mainly includes three clear themes: 1) adjust the state of the work, 2) check the quality of practice, 3) Shaping the Figure. Next, report and discuss one by one according to the specific content of each topic. We understand this process by adopting the Material Engagement Theory (MET) perspective, using the individual actor's trajectory and the behavior's content as the object of observation. This process benefits from thematic analysis combined with qualitative content analysis(Royston & Palmon, 2019), which allows us to continuously review and compare the cause and effect of the preceding and following behaviors and the resulting subsequent actions during the observation. Video data was also used to support the analysis. We identified transcribed patterns and repeated elements(Weiner, 2000), generated codes for each activity involved in the practice and filtered a behavioral map based on a summary of the environmental interactions involved in the specific action. In Figure 15, the arrow points to the encoding of the topic and the number of times it is encoded in each form of reflection. The blue and pink lines point out two types of relations: "Fragile piece and Uncertainty" and the "Materials and Accident." Specifically, these relations have been found within "Integrating Reflection and Associated Reflection"; "Habitual Reflection and Validation Reflection." However, it could be abstracted in the dynamic process within the execution phase.

According to Sennett (2014) (2008: 20), artisans possess intuition and a desire to produce high-quality work. This unwavering commitment may be the core of artisans continuing to create. Moreover, the design process is a conversation between designers and projects (Schon, 1983). How to develop a depth understanding of the execution phase that involves these interactions between designer and materials in craft design? Based on the data analysis and literature reviews, we argue that the conflict between execution and uncertainty is the leading activity designers engage in the creative process. In other word, craft designers creating the

meaning through interweaving between certainty and uncertainty. More specifically, the interweaving is material-led but reflects human capability.

Adopting the Material Engagement Theory to explain the interaction between material and human, A key aspect is a proposition that sense and form are recursively co-dependent, creating an experience unmediated by language, what Malafouris called “enactive signification (Nowell, 2015). This definition liberates the craft practice from expressing the conception but generates conception by practicing. Moving back to our data, the participants conducted more habitual reflection, and validation reflection performed practice of collecting the information from the touch the clay, and also adjust the further step according to the touching movement. She reflected on the process described in the unconscious action followed by the material change.

“You cannot refuse the process because the clay always communicates with my hand, and I cannot come up with more ideas except moving until it is too soft and hard to go on. If I go a little bit further, it would be destroyed.”—Participant Zhang

If we forced the exploration of the execution, we could naturally find that validation reflection is highly related to the material quality. The quality of clay determined the creative process and the result. It may crack or collapse during the making process. in this sense, selecting clay is a technique issue, and the practitioner is in an active position to determine what kind of clay they would like to use. However, according to the practitioner's reflections in this study, we claimed that the relationship between designers and materials are same weight in the creative process. They are not connected to express what designers want to do but express themselves to each other in the process. That also explained the interviews in Chapter 4 with experience designers that respect nature and learn to see the object before making it.

The designers intentionally handled the material enjoyed in the negotiating process by hand movement, which seems to be the creative process's control. However, although the participant expresses the feeling of driving the clay, it does not mean they controlled the process. from the screenshot of the video, we can find the body movement of the practitioner in different gestures. She is engaged in the execution phase but also changed, followed by the clay change. At this point, who controls the creative process?

“I have to make this gesture because the figure was curved and cannot continue with other positions. I realized that the shape had changed even though I continued checking the sketch.

I think it is a skill issue. I should practice more to be able to handle the clay in my way."--- Participant Zhang

During the hands pinched the clay to deal with uncertainty, the tools played a crucial role in the process. In Figure 16, we took a picture of the tools that participant frequently uses. She highly emphasized the knife on the left side, a dental knife, the most frequent tool utilized in her daily work. There is an exciting story about the knife obtained when she walked outside. *"It is a surprise for me to obtain it on the sideway. I guess it is left by a student majoring in dental science from the university beside my college. I picked it up without hesitation because many ways to use it emerged in my mind. I love this knife because it can be used in many ways and textured the clay in different strengths without harming the figure. Moreover, it can cut the clay gently compared to other professional pooter knives. And nobody could guess what I made that."--- Participant Zhang*

From this description, we realized that the reflection is not only conducted to check or recall the experience. It also supports associating and formulating new experiences no matter the time or phases. It is a habitual activity of the designers at any inspired time in their life. Thus, they dealt with the accidents or uncertainties extended in the broader practice. In other words, the designers utilize reflective practice to build the meaning experiences that support their creative works. These findings also echo Candy's proposed conception of the reflective, creative practitioner(Candy, 2019).

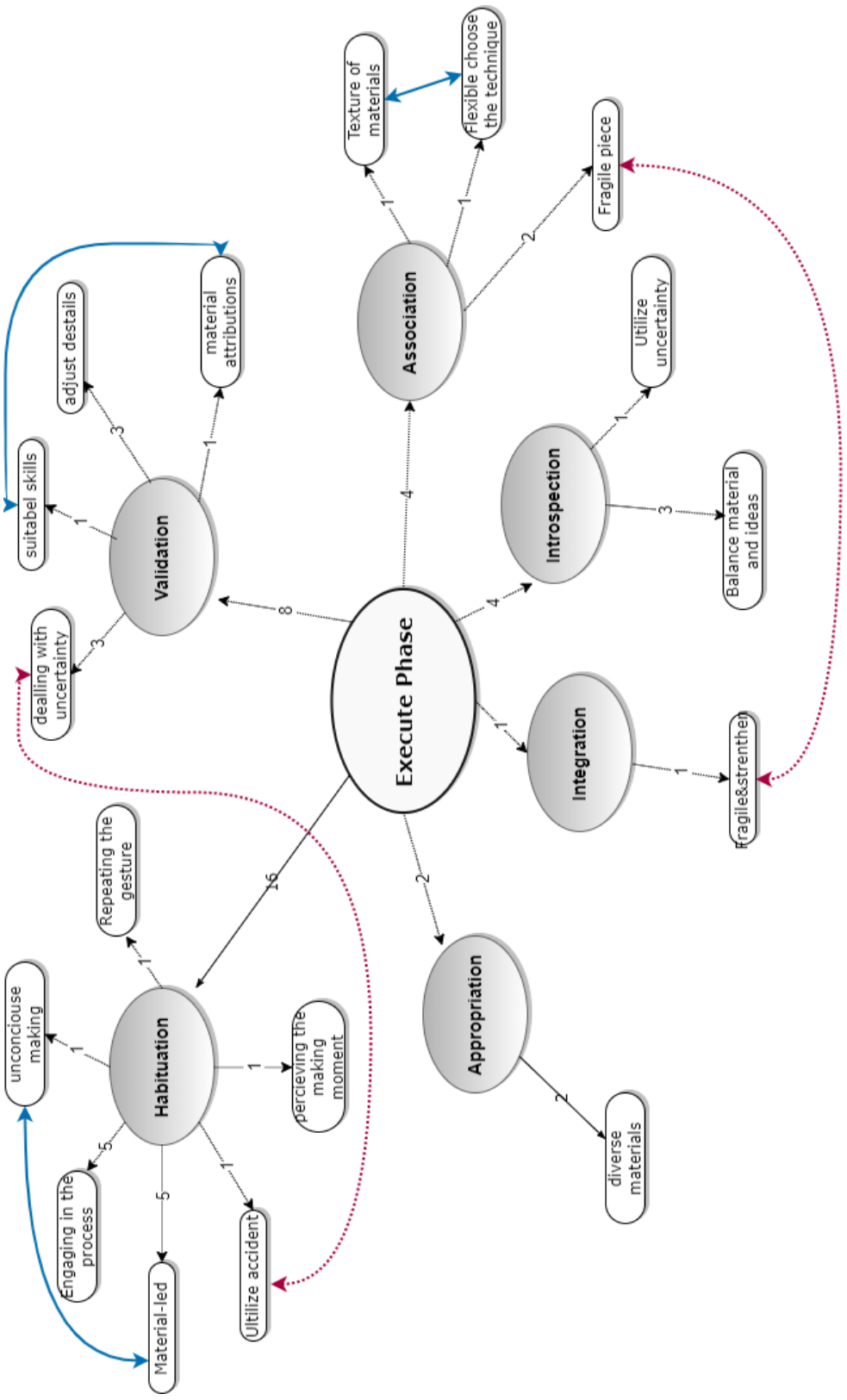


Figure 14 Forms of reflection in the execution phase

Figure 15 Screenshot of the working moment from video record

Figure 16 The workspace and tools in the studio

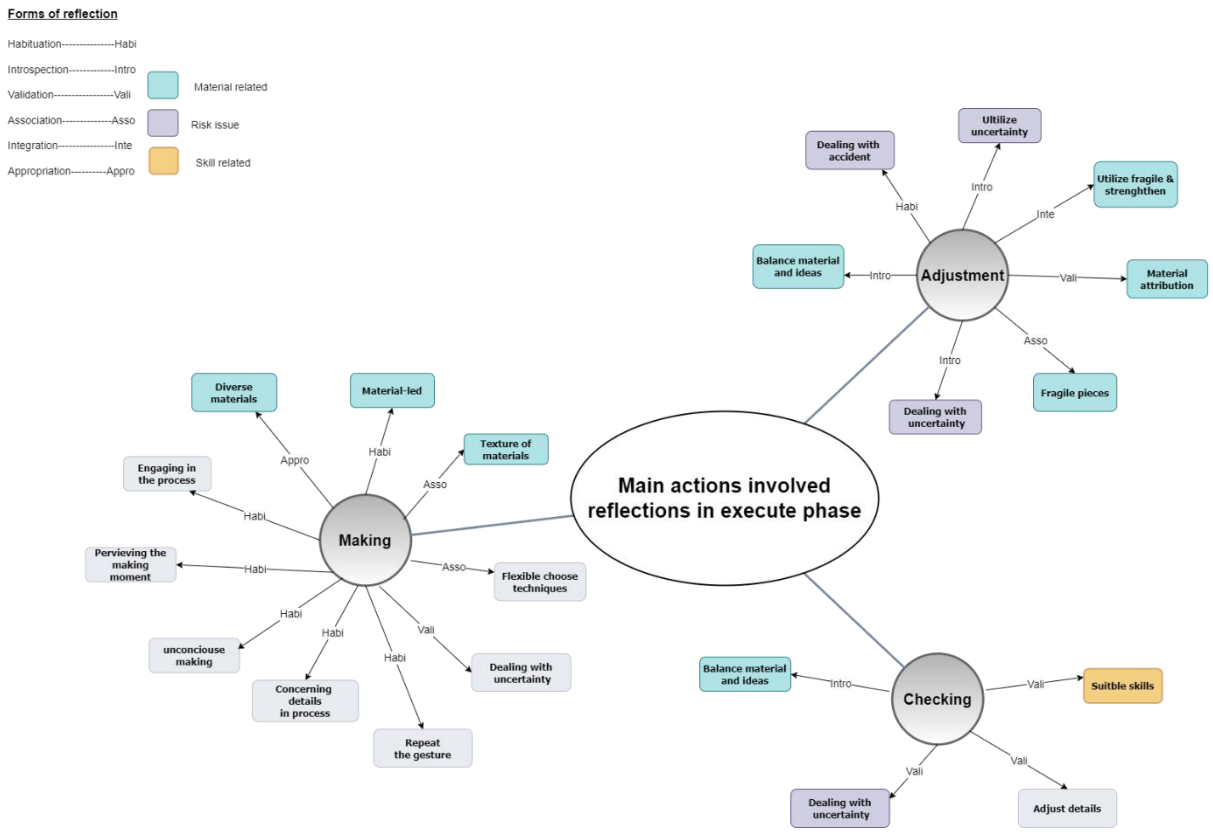


Figure 17 Main actions involved diverse reflections in execute phase.

In the further analysis, we categorize the execution process into three main themes to present the actions: Making, Checking and Adjustment. As Figure 18 shows, habitual reflection clustered in the "Makin" g process, and the material-related themes collected in "Adjustment" and "Checking" received the broadest themes. With this finding, we claim that, in the execution phase, short path reflection mostly recalls the previous experience to deal with the uncertainty or risks carefully. Checking is a mediate action that goes through the process to take care of each part of the work to guarantee quality. That is why Sennet(2008) claimed the craftsman also desires quality work because it is a kind of attitude in craft design no matter what kind of work you prefer.

Taking a step back to consider the findings, the reflection occurs countless times during production. However, there is no escaping the deviation of the shape, which the craft designer generally accepts. However, on the other hand, the concentration of the creation allows the designer to achieve flow and get it after the conclusion. However, the audition also emphasized that if she had a second chance, she would be confident presenting the best effect

of this work perfectly because she would reflect on her process after the end to sum up, which link went wrong. It can be found here that reflection in action and reflection for action alternate throughout the creative process. However, we notice that the specific aspects of reflection are closely related to the material. As shown in Figure 18, each node contains actions, tools and inspection items closely associated with the material's properties. Therefore, we have reason to reflect here, is it us or matter, who is the created party? Based on the interviews and discussions of participants and researchers, the absolute centrality of matter in process design has been agreed upon. Reflecting on the form of the creative process, in the habitual reflection, the change of material is the core orientation of the creative behavior. Once the state of matter changes, so does the flow of the entire working scene. Here, we want to further explain the observation and harvest of this study by referring to the three principles in Material Engagement Theory (MET) (Malafouris, 2019) to emphasize further the findings and how reflection in the execution phase affects creative expression.

Extensive thinking: cognition does not occur in mind but in where people come into contact with objects. Alternatively, cognition comes about through a positive relationship between man and matter. In this study, subjects concentrated on every moment of production. Only when they took a step back to check could they find the deviation in the form, which we believe is a materialized form of cognitive variation. Moreover, I am confident I can do better next time because I have effectively reflected on the behavior after the first cognition and put forward the matters needing attention for the following action.

Activating meaning: If we view practices as exploratory rather than representative, they have physical properties. In this sense, visual perception is not an information processing task but a physical sense-generating experience in an environment not regulated by language. In this case, when reviewing and reflecting on her creation process, the participant emphasized the changes she experienced in the development of the form and deviated step by step from the sample, even though she often took it for reference in the production process. Thus, the representation and meaning of the practice are carried out through the continuous action itself, rather than repeated inspection. In this sense, reflective practice ceases to have a practical purpose once it is separated from concrete actions.

Creative Things: (Malafouris, 2014) links creativity with thinking, using the term to refer to extended thinking activities that arise from the relationship between man and matter. Although there are similarities, creative thinking differs from the epistemological behavior we mentioned earlier. Epistemological perspectives refer to human behavior, while creative

thinking describes the activities of a temporary creative system (including people). We can think of creative thinking as a systematic expression of "thinking while doing." In this study, the researchers described the process as "playing with mud" because of the pleasurable sensation of squeezing clay between the palms of their hands. Because her gestures are combined with familiar material and well-adapted tools to form a temporary cognitive unit that is developed through the improvisational expansion of the practitioner at the moment, in this way, a change in customary working practice is envisaged through sensitive contact with materials that will enable us to graphically illustrate the extent to which the physical properties of matter shape thinking.

5.5 Implications and Discussion

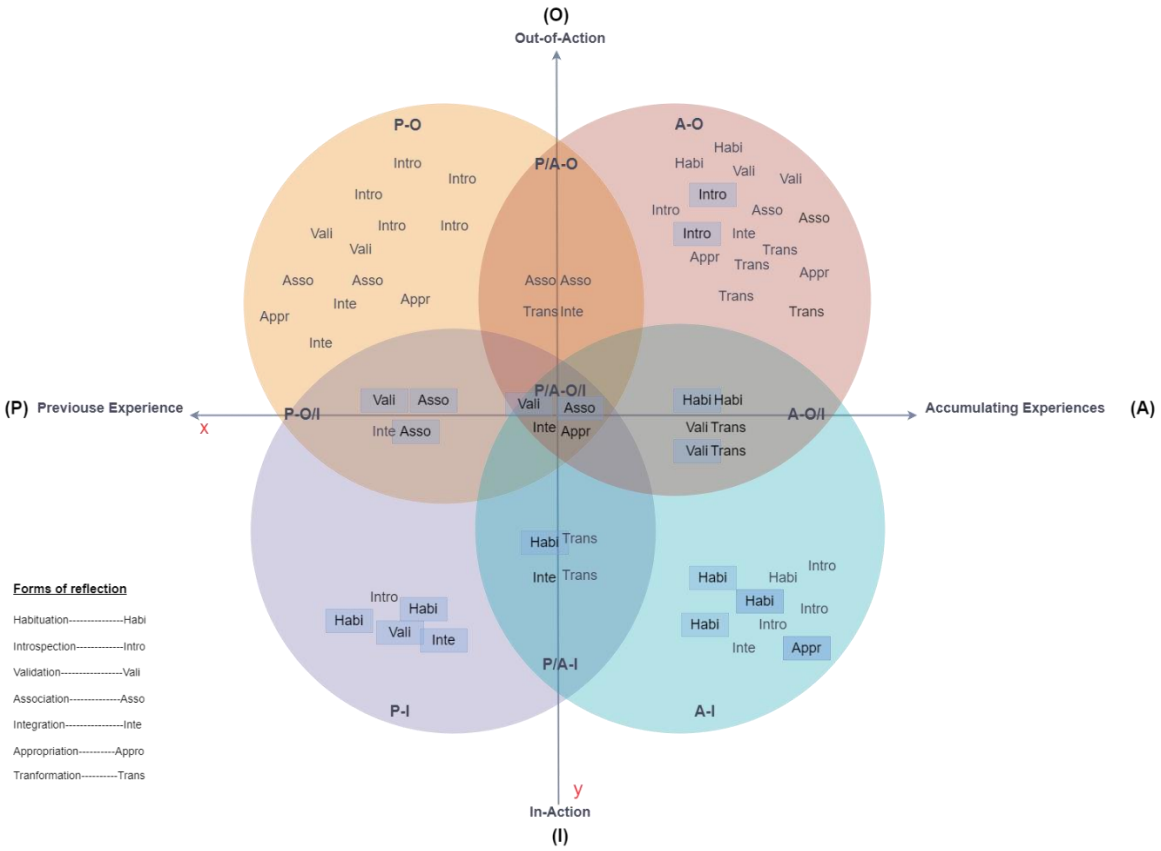


Figure 18 The framework that synthesis the forms of reflection and characterized within the pilot study and main study

The framework shows that the blue squares are the primary forms of reflection presented in the execution phase. It is easy to find that the reflection in the execution phase mainly focuses on the internal world to recall the experiences. Different forms of reflection interweaved in a creative process that promotes designers learning from both in /out of creation. Suppose reflective practice is thought of as learning from an internal perspective. In that case, each reflective mode has a different orientation according to the purpose of a particular learning need. However, each reflective form relies on preserving the complexity of group differences. While both of these processes revolve around exploring experiences for learning, each creates different types of questions. Reflection on individual experience often generates questions related to the development of practitioner thinking.

Dewey emphasizes the link between conscious reflection and intelligent behavior, a theme found in the work of Schon, who further suggests that professional practice may reveal a cognition that does not originate from primary intellectual operations (Eraut, 1995). Drawing on Polanyi's (1967) concept, he uses general examples of tacit knowledge to convey an alternative to intentional, rational reflection. He emphasizes tacit knowledge as an example of irrational, intuitive knowledge, which he believes is essential to effective performance. Ryle (2009)distinction between knowing-how and knowing that, as well as his argument that intelligence is revealed in ways beyond propositional knowledge, also has essential epistemological significance in Schon's theory. Since both tacit knowledge and knowledge are linked to the physical behavior of individual practitioners, I think they can be characterized as an embodied mode of reflection. In design practice, especially in craft design, if one believes that mind and body are separate, then learning skills appeal to cognitive understanding. However, if mind and body are seen as one, then the concept of practice takes on much more profound implications. Through a two-stage study of designers, we generated a framework to lay out the different manifestations of design reflection in the process of craft practice. According to the findings in these two studies, the reflection out of action to accumulate the new experience fundamentally impacts the creative expression in the creative process. In the next step, we focus on craft education and explore how to promote students' creative expression through creative, reflective practice.

About experienced designers and the methods and biases they use to describe themselves, the general ideas they express in reflective practice lay the foundation for more powerful reflective practice research. However, the impact of reflective practice on creativity remains at the fuzzy front end of design, underdeveloped, and less tested. At this point, we want to

encourage educators and students to reflect consciously. Our constraint framework can provide a guideline. We hope to deepen our understanding of the role of reflection in creative conception by observing and listening to designers' reflective practices in more detail. Ultimately, our goal is to develop a way to connect different reflective practices with different individuals at the creative stage.

Chapter 6 Facilitating craft students' creative expression by reflecting on the creative process

6.1 Overview

Contemporary craft design features interactions between human intelligence, skills, and the material world that reflects creative expressions and the unique style of an artefact. Thus, craft design education comprises courses in design and technology (Drew, Bailey, & Shreeve, 2002) that are aimed at promoting technical knowledge and aesthetic appreciation along with skills and design ability(Barlex, 2007). However, a drawback of this approach is that it does not emphasize the cultural and historical understanding that is essential to cultivate creative practitioners who are attuned to complex environments and who can actively construct meanings for human lives. Taking students to participate in fieldwork(Innes, 2006) reflects the ambition of craft design education to integrate perceptions of experience and rational criticism to promote students' critical thinking in a synthesis environment.

In this light, incorporating reflective practice into the craft design education guides students to explore fieldwork by evoking meaningful perceptions while promoting a combination of individual, social, and cultural learning (Hunter, Aprill, Hill, & Emery, 2018) for creative performance. Nonetheless, widely used reflective practices like journal writing sometimes limit creative reflection, especially when reflecting on practical experiences involving multiple perceptions.

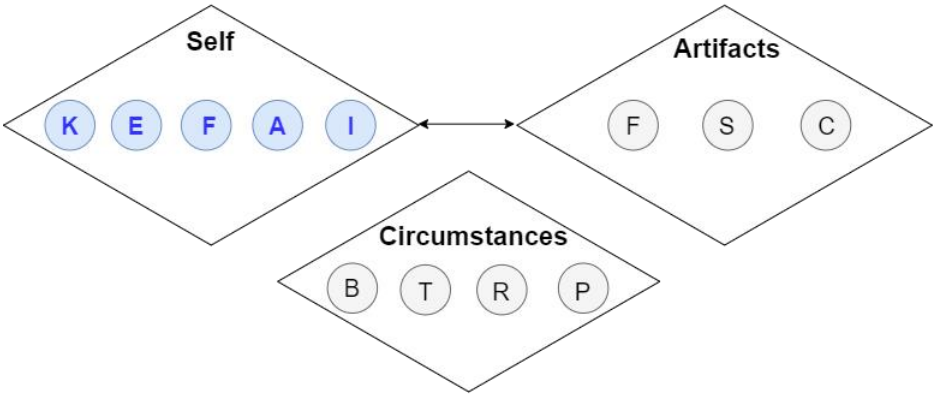
This study explored students' perceptions by adopting visual data like photographs generated in fieldwork as a part of reflective practice. Twenty students majoring in ceramic art design participated in fieldwork at the Dunhuang Grottoes in northwestern China. These grottoes contain numerous coloured murals and sculptures made of stone and clay. This skilful and

expressive artwork is expected to enrich the subjective experience and foster students' creativity. The data also include students' self-reports.

The research context, data collection, and analysis will be described in the following parts. Finally, we present the main findings and conclude the article with an extended discussion of the reflective practice in craft and design education and the application of visual data in future research.

6.3. Results

Based on this analysis, we adopted the object dimension illustrated in the three-dimensional framework of reflection proposed by Hong and Choi (2011) to highlight the focus on self-reflection, including feelings, knowledge, and value (Figure 2). Design students usually take a problem-led or solution-led approach in the design process to generate creative ideas and ignore the role of reflection in improving the quality of creation. However, most design projects are contextual and domain-specific (Nielsen et al., 1997)(Jonassen 2000). Most of the problems designers face in the real world are not limited to the expertise they learned from textbooks or lectures. Craft design in particular, which is not just about skill acquisition and inheritance, also clarifies the experience, belief, and value of practice (Zhan & Walker, 2018). Through our careful analysis, we found that the students' reflections in the immersive cultural environment included three themes: (1) material experience exploration, (2) knowledge extension, and (3) subjective perception inspired by critical reflection.



Object of Reflection		
Self	**Artifacts**	**Circumstances**
Knowledge	Functions	Budget
Experiences	Stakeholders	Timeline
Feelings	Contexts	Resources
Attitudes		Politics
Ingrained beliefs		

Figure 19Object of reflection in the three-dimensional framework of reflective thinking in the design process

6.3.1 Material Experiences Exploration

At the start of the fieldwork, climate change was highlighted, indicating an interaction between the participants and the environment. Fresh sensory experiences reflected their keen perceptions of the unfamiliar environment through detailed descriptions. We noticed that a series of descriptions that presented creative rhetoric like "the air tasted salty" emerged in the data, and such physical perceptions inspired the students to engage with the local environment. In other words, both the unique climate and geographical landscape potentially motivated the students in the fieldwork.

Student A) I never felt such dryness, and surprisingly, the sand blowing on my face had a salty taste. My sense of smell told me that the northwest is mainly different from where I stayed here. This is an excellent starting point for this journey.

Student D) When I arrived in the field, I took off my shoes to feel the sand which turned out to be cold, refined, and smooth. Standing in the wind, I could even hear the sound of sand and imagine the wind shaping the hills like an artisan creates their work.

Craft design is a specific domain within material culture. Material experience (Giaccardi & Karana, 2015) plays a crucial role in the craft and design discipline; this term primarily refers to the physical interaction between humans and materials. Traditionally, exploring materials is embedded in skill training and rarely emphasized in expanded sensual experiences, which is critical in perceiving tangible material. The participants presented creative synesthetic descriptions of the feeling of the sand, air, and rocks. Therefore, we highlighted descriptions of the feeling of the materials and categorized them into material exploration.

Furthermore, we considered that the participants started to formulate the new experience by perceiving the surroundings as a way of accumulating material experiences. According to Glăveanu (Glăveanu & Tanggaard, 2014), creative practice is a dynamic socio-cultural phenomenon that develops beyond the individual artist's work. During the fieldwork, we found that the immersion experience enhanced the participants' comprehensive understanding of the cultural environment from different perspectives. For instance, the following descriptions from two participants describe the texture of a house in the desert and focus on its rounded corners and lack of eaves.

Student B) I had never seen a house built of loess with no eaves in the desert. The corners of the wall were round and appeared very soft. It should be designed to resist wind in the desert. I saw that the loess had been shaped into a house and, on the other hand, the loess still existed as a house.

The participant soon began to speculate on the reason for this form regarding the physical properties of local building materials. On the one hand, loess is a material that is easily eroded by the wind. On the other hand, the house was created using this character to ensure it existed as a house and could benefit the local people for a long time.

Another participant observed the texture of the rock and compared it to the process of shaping clay on a wheel, which helped him to understand the crustal movement. He interpreted the changes in both as moving because he felt the power of nature.

Student F) With wind power, the rock presented different textures that reflected the process of crustal movement. This reminded me of the process of shaping clay on a wheel. I was shocked by such an incredible landscape and understood why creative practices rooted in nature are touching.

The data suggested that geographical change stimulated associative perception, catalyzing both physical and cross-cultural experiences. Along with environmental changes, new experiences emerged, focusing on materials in nature, while new feelings were generated

concerning personal experiences. This process allowed the students to actively perceive their surroundings.

Additionally, the photographs provide another lens that is difficult to describe. We found many works portraying natural material forms in the collection, as shown in Figure 3, where the participants arranged different textures and performed rhythmic visual presentation in the images. The researcher has highlighted the details from the data analysis (see Figure 3).

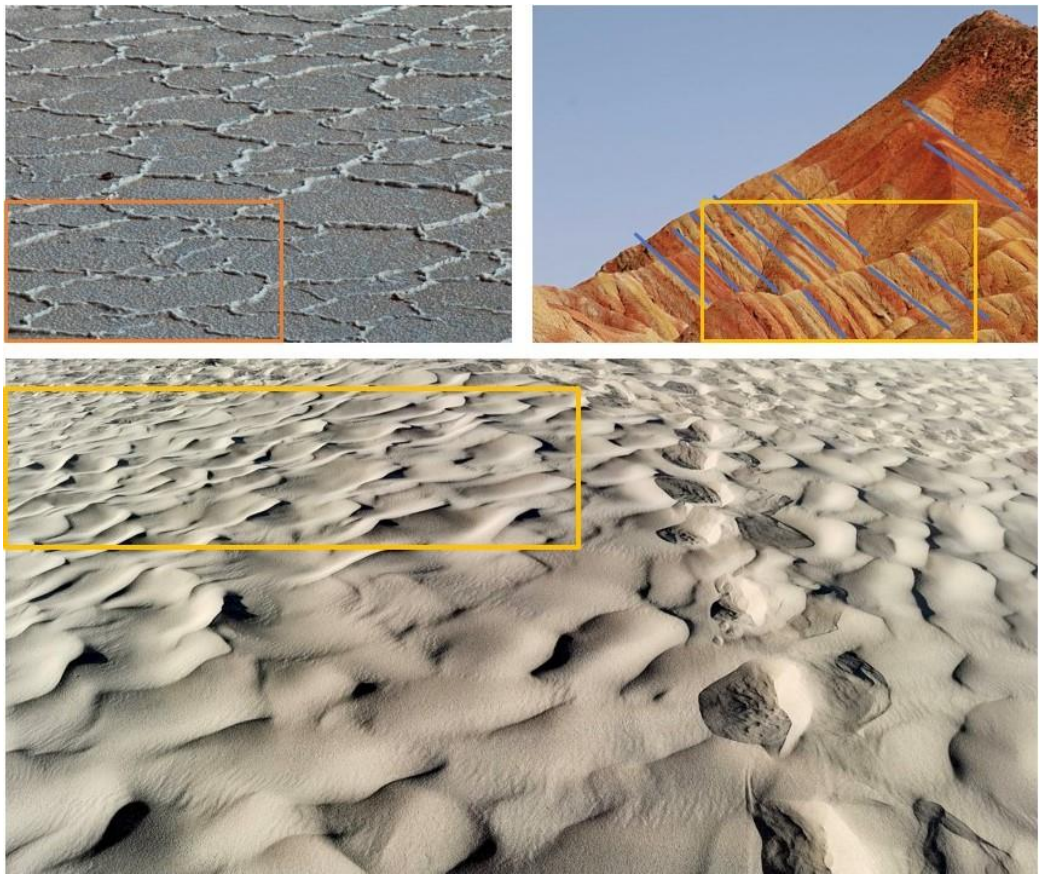


Figure 20 Photos that were taken by the participants with rhythmic visuals highlighted by the author

From the content of the text and images that complemented each other, the participants tried to experience the environment as a material situation from different perspectives to extend their personal experiences. Finding a sense of rhythm or pattern in materials is a conscious perception and mastery of the environment. Therefore, exploring, recording, and reflecting on personal feelings to accumulate material experience becomes a prominent theme in students' reflective practice in fieldwork. As Kant (1855) argues, experience and concept always complement each other. Students look back on their experiences (Ahmed & Rafiq, 2003) to accumulate new experiences, and reflecting on the psychological conditions

elicited(Schon, 1987) can potentially construct a new concept. Boud and Walker (1993) also emphasized that allowing people to reflect on previous experiences and express their feelings authentically can positively impact their ability to design.

6.3.2 Knowledge Extension

The design principles and expertise of traditional crafts are embedded in various artefacts that have been honed and inherited over generations. These results are expected to be of high quality and convey value. Examining outstanding artistic achievements in the learning process is necessary to authenticate details through the lens of history and engage in an artistic dialogue that is not limited by time.

Student C) The murals were created using different skills and backgrounds over a long period. However, surprisingly, the mixed works are displayed harmoniously. If you look closely, you can see that the lines of the different styles complement each other.

The participant observed the artwork in the grottoes, surprised to find that the different styles of expression within one work displayed coherence. Such an artwork presents an intergenerational collaboration that transcends individual perspectives and time dimensions. Immersive observation facilitates judgment and understanding of the knowledge involved in the artwork. Another example explored the details of the clothing of the Buddha sculpture:

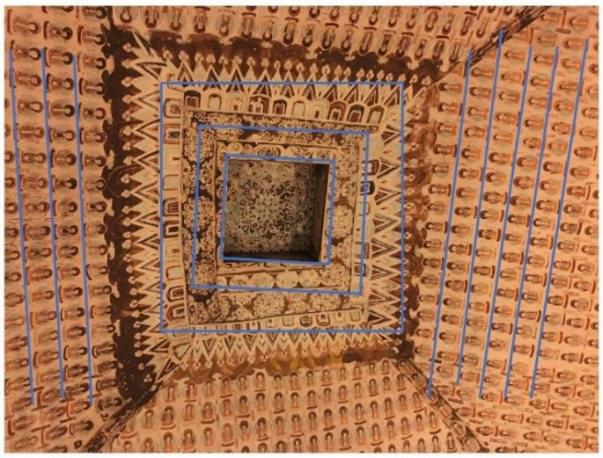
Student K) I noticed some details that surprised me. The seated Buddha was very well-dressed. Although carved in stone, the softness and drape of the clothes were vivid. I could not perceive such details in books before, so I tried to carefully repeat carving clothes in my mind. It seemed to be reproducing my creative process in front of me.

The detail of the sculpture's clothing was made of stone but showed the soft texture of the fabric, which reflected the precise control of the materials by the ancient artisan. Attention to the details of the artefacts indicated that professional knowledge fostered the understanding of what they discovered and what they had learned before the participant observation. They were not just seeing and then describing but reflecting on what was observed and getting a unique perspective on what it felt like to experience the dynamics of ancient artisans as they created.

It is an invaluable opportunity to appreciate artefacts in textbooks. Therefore, students establish a strong connection with the object as they gain new insights by referencing previous knowledge to explore the current situation (Springer, Stanne, & Donovan, 1999).

The active process implies reflecting on previous knowledge, thereby extending knowledge from observation rather than passively receiving information(Whitehead, 1967).

Additionally, the annotation of the picture describes and shows the interior landscapes of the grottoes that emphasize the composition of the artwork. Student D provided a photograph of what he had seen at the time (see Figure 4).



Annotation: The mini size Buddhas that one by one line the rock wall with neat rigour bring a mystery feeling. There is a special atmosphere in the grottoes, a kind of calm and awe of religion brought about by this repetitive order. (by participants)

Jotting: Drawing on the roof a tough work. Michelangelo had suffered physical deformities from painting <Genesis>. The power of faith is measureless, and the exact identity of these ancient artisans is difficult to ascertain today, but their creations show astonishing aplomb and patience. The repeated and balanced arrangement is a manifestation of order and an aesthetic form.(by author)

Figure 21 Photo taken by a participant -"Grotto with Thousands of Buddhas."

Student D) The mini-sized Buddhas that lined the rock wall with neat rigour one by one brought about a mysterious feeling. There was a unique atmosphere in the grottoes, a kind of calm and religious awe brought about by this repetitive order.

The following is a description by participant M:

Student M) What attracted me most was the lines and colours of the murals. Various lines of different intensities were carefully rendered and positioned to show different textures. I realized that the different lines of ancient artisans expressed emotions, and the colours further built their spatial sense **(Figure 5).**

Annotation: What attracted me most was the lines and colours of the murals. The various lines of different intensities were carefully rendered and positioned to show the different textures. I realized that the different types of lines expressed emotions by the ancient artisans, and the colours further built the spatial sense.(by participants)

Jotting :The use of the shading drawing is mainly reflected in the haloed lines and the control of the amount of water in the paint. Despite years of oxidation and corrosion, the Buddha statues in the murals still present a sense of devotion and calmness. The shades of color and the thickness of the lines distinguishing the relationship between front and back, which is an extremely smooth expression both artistically and technically. This is a great test of the artisan's skill, but also of the emotion and scenic depiction they gave to the whole landscape. (by author)

Figure 22 Photo taken by a participant in Dunhuang Museum.

The displayed colour, composition, and lines with different strengths framed several Buddhas' sense of space in the proposed order. More importantly, the participants developed empathy with the creators and the artistic conception created in the situation. This point of view further echoes the idea that creative activity is essentially a sociocultural activity(Glăveanu, 2012) that receives different affordances over time.

Therefore, we claim that learning from fantastic artwork might be an embodied knowledge process, not only seeing with the eyes but also requiring more effort to perceive through a series of actions. The visual logs provided a different path to complete the text report by showing the action taken during the fieldwork. Once the participants were close to the murals, they could even replay the creative process in their minds. When they looked up at the roof, they experienced the artwork like an ancient audience. In other words, they made not only participant observations but active reflections as well. They explored outstanding achievements by rebuilding the experience in a spatial dimension. Based on this point,

reflecting on artwork like the Dunhuang Grottoes is an effort to construct the individual experience through knowledge consolidation associated with extended imagination.

6.3.3 Subjective Perception Inspired by Critical Reflection

In addition to exploring the materials and knowledge extension, critical reflection from a broader perspective implied a connection between personal perception and sociocultural issues, which is embodied in practitioners' exploration of subjective consciousness and the development of professional identity. As Dewey (Dewey & Zugsmith, 1933) argued, a sense of responsibility and openness are essential qualities for professionals. Thus, designers with substantial responsibility may help overcome obstacles while considering the consequences of the creation at hand, and cultivating new ideas from a different perspective means countless possibilities. Such a professional attitude includes self-management in the moral dimension. Based on this attitude, practitioners are more inclined to develop opportunities for creative expression through deep thinking about the external world.

In the following example, the participants described a series of movements during the observation. From looking down from a high place to feeling the vast desert, and then looking up at the grottoes built on the mountain's surface, spatial perception facilitated the critical reflection of the spiritual symbolism of the grottoes, and depression and anxiety emerged. Finally, the special feeling was linked to individual work that drew on such macroscopic scenes to create a solemn atmosphere.

Student F) When I looked down from the top of the mountain, the elongated shadows of the people reflected the vast depth of the desert. Then, I looked up at the mountain where the grottoes were built, which made me very anxious. At that moment, I felt pressure from ancient rulers trying to convey to the people. On the other hand, could the form of the landscape convey a sense of solemnity and respect in my work?

Nevertheless, it is challenging for craft design students to re-examine the beliefs, values, and expertise they have learned through conventional creative practice, but reflection can be stimulated when participating in a multicultural context(Mezirow, 1990). Conducting reflective practice at a cultural site also encourages students to examine their attitudes from a subjective perspective regarding the broader issues involved in critical thinking about values and beliefs with an open mind.

Student E) I have often wondered if, in addition to artistic achievement, carving in stone might have been an excellent challenge for ancient artisans from a technical point of view. How did they do it? How did they create such beautiful artworks? This question has always confused me. I think they were motivated by faith and the spirit of practice because this task was everything in their lives. I am not sure if this is the answer, but it has made me think about what artisans can be in contemporary society.

As stated above, the understanding of creative practice no longer rests solely on negotiating with materials or using materials to express emotion, but rather on asking more essential questions, such as how is such great work done? Such questioning proposed a critical examination in the current creative environment, including materials constantly enriched alongside advanced technologies, while significant work still touches people because it sustains their belief in the artefacts.

Another topic illuminates reflections on Buddhist culture. The Dunhuang Grottoes were a testament to the communication between the East and West in ancient times. As Buddhism was introduced to China, relevant stories were created as murals and sculptures to convey the Buddhist view of life. During this fieldwork, the religious vignettes presented in the grottoes provoked a series of critical questions.

Student B) In our daily lives, we rarely talk about death. Design usually involves planning for a better life. During this field trip, I saw death as a crucial topic in these artworks that emphasized spiritual well-being beyond everyday life. Perhaps these claims involved political interventions suited to social situations. Modern humans have developed an excellent understanding of this significant proposition. Can the design also address these huge but important propositions? Rather than hovering between production and function?

Through a critical examination of beliefs and values through deep thinking, designers may develop a better understanding of people from different backgrounds, even helping to generate appropriate expressions and better decisions in the creation that benefit larger populations and minorities.

Therefore, we claim that reflective practice can be a powerful activity that encourages designers to actively explore the real world. In specific areas, such as craft design, a creative reflective practice may not be able to evoke creative work at the moment, but it makes particular sense in educational programs to cultivate reflective designers with individual views who can make contributions in a broader range. Moreover, compared to traditional

reflection in lectures or reflective writing, visual data indicate rich content that is worth the attention of educators and researchers in the craft design field. This is not meant to weaken the technology in material practice; rather, it will be a chance to reconstruct the landscape of material cultures by reflecting in the multicultural environment and embedding the reflective practice to nourish an open, critical perspective to develop an attitude toward lifelong learning.

6.4 Summary

In this study, we explored students' perceptions through reflective practice using photographs and self-reports. The results indicated that multimethod reflective practice enriched the appreciation of great work and stimulated critical thinking related to personal experiences.

Generally, sensitivity to fieldwork is necessary to encourage students to explore as professionals. In this study, photos were considered a data source that reflected the students' perceptions, including rich material experience and knowledge extension. They were associated with subjective critical thinking in a multicultural environment. Although the reflective practice is a broad concept (Visscher-Voerman & Procee, 2007), it is still challenging to identify specific patterns in different practices.

In craft design, reflection combined with professional knowledge is rooted in traditional culture with a progressive way of thinking that indicates the value of the inner world of human beings. Excellent craft and art are usually expected to be distinguished expressions of culture, etiquette, identity, and morality in everyday life (Zhan & Walker, 2018). Remembering outstanding achievements that reflect on the current situation can enhance critical thinking and influence the desire to apply knowledge. Therefore, the use of artefacts and cultural sites to stimulate reflective practice can support students' ability to deal with creative expressions in their practices(Persad & Sofaer, 2018). On the other hand, shedding light on the reflective practice in craft design would be valuable to cultivate craft designers who are capable of constructing valuable concepts to create links with the traditions of the past, thereby building new traditions in the present.

Furthermore, drawing upon outstanding artistic achievements involves constructing a solid understanding of skill knowledge, and encouraging students' creative expression through reflective practice is a promising target for practitioners and educators.

We encourage students to explore individual perceptions in a multicultural environment not only to guide them toward active learning but also to stimulate communication between practical knowledge and reflection by emersion in cultural heritage. Therefore, more effort is necessary to highlight soft skills such as sensitivity and to combine different materials and storytelling methods to communicate the creative and experiential knowledge of a product. However, the sample size and resources in the fieldwork limited this research to a specific design area, and more effort is required to conduct research in an expanded range that compares students' reflections across different majors and explores the patterns.

Based on the discussion above, we suggest that facilitating students' reflection in diverse ways in craft and art design is an effective way to evoke richer perceptions that educators and researchers should pay attention to, and involve craft knowledge in a broader community to benefit society.

Finally, photo data from the participants played an essential role in this study as a part of the reflective practice used to demonstrate perceptions that are difficult to express in words. Nevertheless, we still relied on language to interpret and articulate what these photographs suggested. Other visual analysis approaches such as ethnography (Marcus Banks, 2007) will benefit design studies, especially in organizational and cross-cultural contexts. Future research on craft and design should use visual data generated in everyday life as a lens to interpret what designers feel and see. In this regard, the question arises as to how designers reflect on creative practices through visual documents.

Conclusion

We investigated students' perceptions of fieldwork at the Dunhuang Grottoes through their creative and reflective practice using both photo logs and self-reports. Twenty senior undergraduate craft design students were recruited to participate in an exploratory trip to cultural sites in Dunhuang. Their photographs and self-reports constituted reflective data and indicated that three themes were involved: (1) material experience exploration, (2) knowledge extension, and (3) subjective perception inspired by critical reflection.

First, the theme of material experience exploration started with the geographical change that stimulated fresh feelings and made the participants engage in the fieldwork. The students spontaneously attempted to capture their arrangements and rhythms by taking notes and photos. Second, based on their immersive experience in the fieldwork, the participants

explored the grottoes through careful observation; this represented a superior learning experience compared to learning from books or lectures, thereby extending their professional knowledge. Moreover, reflective practice in fieldwork encourages participants to develop a deep understanding of traditional art and to not only perceive outstanding achievements but also know and inquire about them in the natural environment. Third, we found that the critical reflection generated in a sociocultural context referred to contemporary values, attitudes toward professional practice, and identity as a craft designer.

Conducting serendipitous and spontaneous exploration through reflective practice is a crucial step in practice-led design that allows the practitioner to take time to immerse in, record, and absorb what has inspired, and what is fascinating and meaningful to humankind. In other words, the point is not what they are looking at but what they see and how they see it(Yousif et al., 2018).

Finally, we extended the research to a discussion and made suggestions for further research. Overall, a reflective practice not only enables the cultivation of thinking skills but also supports practitioners in developing capacities that support them in confidently dealing with uncertainty, making decisions, and enjoying professional work in any situation.

Chapter 7 Discussion and Conclusion

7.1 Summary of findings

In this paper, we first investigate the creativity of creative process and performance in craft design and creative design and reflection through a detailed literature review. Through three studies, this paper explores the influence of reflective practice on creative expression in craft design creation. It proposes a two-dimensional framework to define seven forms of reflection on the practice process as a kind of experience review and accumulation. This framework is structured to understand the diverse forms of reflection in the creative process of craft design, both in action and out of action, re-called previous experiences and accumulated new experiences through in-depth interviews with 12 experienced ceramic designers. Based on the qualitative research, seven forms of reflections on the creative process have been identified. Referring to the United Innovation Process, we further explored the specific execution process by observation and video recording in a design studio to clarify the reflections in the execution phase that mapped in the proposed framework and carried out discussions related to MET theory. Finally, we propose suggestions for craft design education that guide students' reflection in the early stage of the creative process that is out-

of-action by collecting self-reports and visual logs as data sources. According to our analysis, three themes generated in the data show the students' reflection in a multi-culture environment and actively looking for deep connections to social-culture issues inspiring the new perceptions. At the same time, we use Hong's three-dimensional reflection framework to explain students' reflections on personal experience and knowledge and potential creative expression in the objective dimension. Finally, we propose a frame structure to improve creative expression through reflection to provide a reference for design practice and education. This chapter will highlight the main viewpoints, the vital discussion topic, and method suggestions in this research. On this basis, the research framework, significance and limitations for design education, design practice and design knowledge base are summarized, and suggestions for future research are put forward.

In craft design, knowledge is rooted in traditional culture with a progressive way of thinking that reflects the value of the inner world of human beings. Remembering outstanding achievements to reflect on a current situation can enhance critical thinking and influence the desire to apply knowledge. Therefore, using artifacts and cultural sites to stimulate reflective practice can support students' abilities to deal with creative expressions in their practices(Persad & Sofaer, 2018). However, drawing upon outstanding artistic achievements is insufficient for craft creation and education. Future craft design and education should consider the practitioner for constructing valuable concepts to link with traditions, thereby building new traditions in the present.

Excellent craft and art are usually expected to be distinguished expressions of culture, etiquette, identity, and morality in everyday life(Zhan & Walker, 2019). Accordingly, we argue that encouraging students to explore individual perceptions of cultural heritage would subtly guide them toward active learning that differs from passively accepted technology-oriented expertise. Therefore, imitation and practice can help students acquire skills. More effort is necessary to highlight soft skills like sensitivity and combine different materials and storytelling methods to communicate a product's creative and experiential knowledge.

Ultimately, we extended the research with a discussion and informed further research. Overall, reflective practice enables cultivating thinking skills and sufficiently supports practitioners in developing the capacities that support them in confidently dealing with uncertainty, making decisions, and enjoying professional work in any situation.

About these three studies, we propose a suggestion to promote reflection in the creative process from the participants' perspective. According to Ingold and Pye, creativity is not seeking the pure original idea or something extremely new, even not the creative concept space developed by excellent divergent thinking. Instead, it should be the body's action under the unpredicted situation. Such a description was fully qualified by craft design that rich body language and thinking during the creative process. We suggest encouraging students in a broad, complicated environment and creatively learning and reflecting will benefit learning from the inside, rather than accepting knowledge passively.

Moreover, creative action sometimes seems to come almost automatically from deep within, perhaps from emotional or aesthetic forces. For most practitioners, this is a very familiar experience. The word "intuition" is often used to describe our ability to understand or take action without analytical reasoning. Intuition is the bridge between our brain's conscious and unconscious parts, through which we can make successful decisions without thought. Humans are learning about an organism that absorbs information for a specific purpose, and this information is implicit in its behavior and thinking. The high level of knowledge gained from experience leads to expertise that, though challenging to express explicitly, is applied in practice.

In this dissertation, we attempt to sketch a preliminary framework for understanding the cognitive underpinnings of the mind's engagement with the material world by proposing an assumption, contrary to some of our most entrenched assumptions, that the boundaries of human cognition extend much further than our initial assumptions(Braun & Clarke, 2006). Far from being a simple logical shift in terminology, the assumption of extended thinking has significant implications for how we continue to study human cognition in the past or present. Most importantly, it qualifies material culture as an object of analysis for cognitive science, making methods and experimental procedures once used for internal mental phenomena available for external and extra-skin phenomena. We no longer need to separate thought from concrete activity because we no longer need to adopt a methodological individualistic stance that reduces the complexity of extended and distributed cognitive systems into the isolated brain of a segregated human individual. Physical involvement can provide an optimal point to perceive what has remained blurred or invisible for years, namely the image of a mind unconstrained by the body (Bateson, Manstead, Rieber, & Oatley, 1989).

7.2 Reflection and creativity in craft and design research

7.2.1 Materials, Skills and Learning Matter

Relationship with Materials

The properties of materials become the primary constraint of creation and the stage for designers to reflect and negotiate with materials. Through ongoing trials and polishing, designers can accumulate new knowledge through unsuccessful experiences. The ideal standard here is not unique but exploring a suitable scale that can meet the technical requirements of safe production based on describing the ideal state. Therefore, the reflection of the designer during the practice reflects the expectation of the completion of the work rather than purely creative expression. We believe this is a way of compromising each other through dialogue between reflection and material, represented in the coding categories as balance, challenge, uncertainty and embodied cognition.

Craft design is always prone to failure because of the complexity of materials and manufacturing processes. As a result, designers need much creative reflection to solve problems on the spot, imagine new possibilities, and even turn surprises into opportunities. This point of reflection on the transmission of respectful material action can be defined as thinking about one thing after doing one thing to influence the following action. The goal of reflective action may be to evaluate past and current design situations to adjust to the following situation. This can be done by answering questions about the past, such as "What are the key situations?" "And" What are the factors that influence an emergency?

At the beginning of the interview, we naturally start with the current work. The designer usually opens up a personal narrative about the experience in the creative process and the process of constant adjustment, such as why the work details are handled this way or how the current work is progressing towards the desired expectations. The content of each step of reflection shows the designer's obsession with materials, which can be understood as most of the scenes of the craft can only happen with the participation of materials.

In long-term practice, the relationship between man and matter can be defined in many ways, and material can also be understood as the substance in technological creation. By balancing the qualities of the materials, the designers actively construct a relatively equal relationship to support their expression. Balance is a relatively fair attitude towards getting along with one's work rather than blind confidence. It should be noted. However, that challenge is essential for creative expression, not just balance. Challenge and uncertainty often go together, and the object of the challenge means there is much uncertainty. The treatment of

uncertainty in traditional design projects is often seen as an ill-defined problem, a hidden adverse danger that needs to be removed from a creative standpoint. The uncertainty of process design is accompanied by the whole creation cycle. Designers have to get used to choosing between dealing with challenge and uncertainty, so the emergence of balance is a product of constant uncertainty and challenge. In continuous negotiation, balance neutralizes the negative aspects of the challenge, tries to deal with the uncertainty, and creates a space for reflection to drive further practice.

Embodied cognition, and then we are going to talk about embodied cognition. This is an old and young topic about who is more spiritual, body or mind. Regarding the importance of touch and tactile experience in decision-making, designers often acquire manual skills and tacit knowledge through practice and shape themselves as practitioners through practice. However, we should also be aware that manipulating materials may be a way of influencing the world, using the limited ability of the hand to compete with the robust material and then constructing individual cognition, so to speak, in the material-making process, body cognition determines most of the risk assessment and decision-making issues. Previous physical experiences are stored and reactivated in the following practice. Similar experiences can help designers deal with and overcome challenges when encountering new materials or the perception of materials is evoked. In addition, through physical cognition, we can smoothly transition into another category, technical mastery.

Skill issue

In technical matters, thinking by hand seems to be the consensus of all craft design. Categories under the technology theme include questioning traditional standards, clarifying constraints, technology performance and technology innovation. Technology is no less critical than hand-in-process design. In conventional crafts, technology is the foundation of a craftsman, and it is a technology that constructs a craftsman's identity and working form. It has not changed to this day. Designers question technology's limitations and evaluate its singleness in their reflection on practice. During the interview, skills were the subject of intense scrutiny. It is easy to understand that the relationship with matter is achieved by hand. It makes no sense to say that there is a need to balance the relationship between designer and material without discussing technology. Traditional tools have expanded people's subjective initiative.

In contrast, new technologies have expanded the boundaries of production to be both incentives and restrictions, learning about material shaping and hindering current creative

expression. If the craftsman wants to complete high-quality work, it is not easy to talk about technical excellence in an actual situation. By condensing the units of meaning, we summarize several subcategories of technical problems in terms of the strength and cause of connection, among which the more frequent one is the questioning of traditional technology. It should be noted that the question here is not to deny the value of technology but to question the standards by which technology is judged. What is expected in technology has different personalities in the hands of designers.

Critical reflection on traditional technology is a necessary step of innovation, and blind inheritance is irrational behavior. So what about the designer's view of technology as a constraint? Here we argue that technological constraints accompany an expansion of ideas and paranoia about creative expression. This phenomenon shows that process design, as a work form, has fundamentally broken away from the craft tradition and moved towards a more comprehensive and personalized expression. However, it is hard to carry out creative expression without combining it with the current social and cultural situation, or creative expression is deeply linked to the social and cultural context. In hindsight, designers often begin to reflect on why their technology has improved, but their creativity has weakened, primarily by becoming less sensitive to the creative process. People understanding the common phenomenon from a different perspective can lead to new thinking. Too much emphasis on craftsmanship can turn to learn into mechanical imitation, and too much emphasis on creativity can lead to strange products. A single exploration of the limits of material is a single line in the creative expression category, with the era and technology of new combined practice to expand the possibilities of creative expression. Within the same subcategory, the questioning of tradition seems to lead to the following theme: the response to the rule. Before moving on, we must clarify that technology's sense of control is a vigilant part of creative expression and an important moment of growth for designers. In the previous article, we defined the cultural meaning of creative expression, namely one's ability to reflect, challenge, and adapt to societal growth.

The satisfaction of technological mastery increases the risk of going into a rut. In designers' reflections on the action, the sense of accomplishment and emptiness brought by technology is almost always mentioned, like two sides of the same coin. Once a technique is mastered, it becomes desensitized in mastery, turning the creation into an actual series of meaningless actions. Of course, we can argue about the beauty of repetitive work in terms of gestures. Here, we believe that the reflection on technical issues shows designers' challenge to

traditional standards and critical reflection on technical performance. Discussing the relationship between technology and ideas shows that designers' reflection has always maintained a rational and reasonable distance from materials and technologies. Now we are going to look at responses to tradition.

Extended learning

So far, we can make it clear that designers can rationally view the interaction with material, technology and tradition through reflection on practice. However, I think the significance of reflection is just emerging when the last theme comes up, which is to expand the boundaries of learning. Design reflection is critical because it can not only improve the design process and the product is designed (Reymen, 2003). It can also help designers learn from their own experiences, i.e., thoughts and feelings, and improve their professional abilities. In reflective practice, the practitioner defines her or his aspirations and the purpose of follow-up actions. Since the creative practice of designers usually does not follow a strictly linear development, the occurrence of reflection can be regarded as a continuous reflective process centering on self-discovery before, during and after the practice. As Ingold (2004) pointed out, learning from the inside, not just from the inside, but from a self-review to reconfirm how you interact with the outside world.

Cultivating an open mind requires an attitude of questioning, but also learning to observe closely, connect with others, and make room for thoughtful reflection is a tall order. The first thing we want to emphasize is everyday observation. From the meaning unit, we developed three codes that relate to everyday life, curiosity, observation and intimacy. People are often urged to learn to think outside the box to generate more ideas. However, how do we do this? One approach that seems to be important is learning to look sideways, but in practice, how is that different from learning general techniques? One way to stimulate more thinking is to deliberately adopt a perspective relevant to your field of knowledge, expertise, or everyday practice. In this study, we can capture designers' curiosity and concern for the world during distance reflection while maintaining their sensitivity based on professional knowledge and experience. The reflection on the individual goes beyond the practice itself and the scope of individual activities and shows the desire and open attitude to expand outwardly. Bringing design sensitivity to observing, noticing and understanding the world's people, places, and things means actively creating a creative practice space. They explore, observe and perceive the world in their way, extend the creation itself to the world of life, strive to explore and

accept more variables and uncertainties, and then realize the accumulation of personal experience through careful reflection.

At the same time, their learning in practice becomes flexible, and the learning in practice is greatly expanded to every opportunity to bring new feelings.

7.2.2 Craft design as a creative, reflective practice

In the first study, we proposed seven forms of reflection in the process of craft design creation through in-depth interviews. Design practices do not put the investigation probe into whether the practice is effectively developed. Two types of support are provided: cumulative reflection and contextual reflection commonly practiced and applied in production thinking. We think this is because direct practice focuses more closely on the design problem at hand and is less likely to let the mind wander to more distant associations or memories. Indirect exercises focus more loosely on the present design task and more explicitly allow the mind to wander in context and time. They expose the senses to more mundane stimuli and thus relate to a broader experience. To illustrate this point, we organized and guided students in a kind of indirect reflective practice in our third study, encouraging students to become aware of their surroundings, the landscape, the conversations that take place around them, the air, the light, and the trees, and the cityscape. These, or similar environmental aspects, are a common part of the experience but often without conscious notice. Perceiving them during reflexes stimulates the brain to connect ecological features and the design task at hand in a mode of clustered reflexes. In addition, it may open channels for dormant memories, thus exemplifying the mnemonic reflection model as a link between past experiences and current tasks.

Driven by the desire to understand the individual, reflective design cycle, we have identified and demonstrated evidence of reflection in the design practice of the ideal log by adopting a different perspective and technology. We determined and built these activities, showed some very unexpected and rich attribute space, and in an exciting and is currently studying space: reflection may occur in the early days of the creation, exert a subtle influence on the accumulation of experience. In addition, the designer may focus on the design task in action or approach it in an engaging, non-action way. Moreover, we can draw inspiration from the inside through memory and from the outside. This framework allows us to now systematically identify and place reflective design activities. The results should allow us to identify and better understand different reflective practices and their place in creative product

development and design. Our ultimate goal is to use and integrate reflective exercises to improve thinking consciously. The following steps in our research will include observing and analyzing reflective practices of designers in laboratory work and collecting additional survey and interview data from a larger sample of designers from multiple subgroups, such as design students, industry practitioners, and design professors. We hope to deepen further our understanding of the role of reflection in creative expression by observing the occurrence of reflection in the creative process involved in projects in a more complex and extensive context and by more detailed descriptions of reflective practices by designers in different fields.

7.2.3 The method of enhancing creative expression through reflection

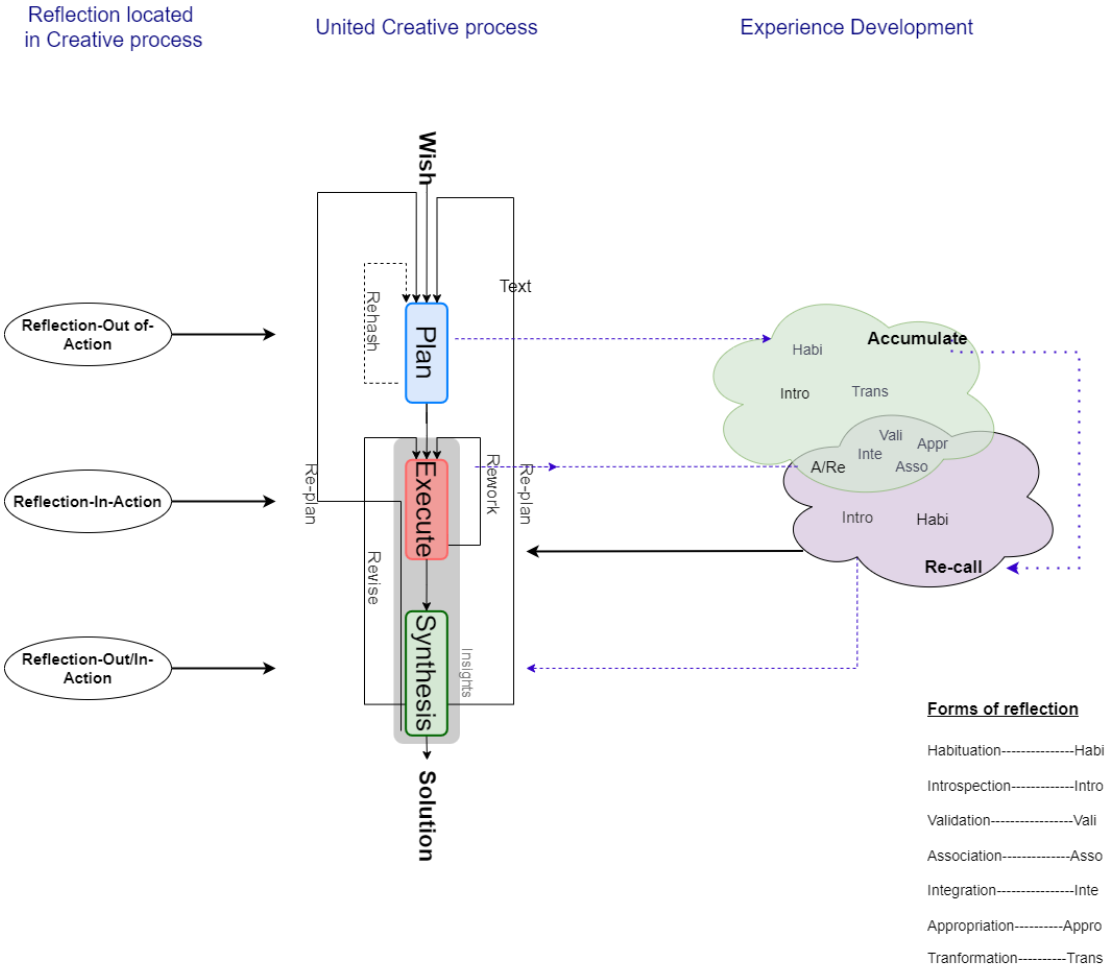


Figure 23 The RLPE Reflection method for enhancing creative expression

In the first study, we proposed seven forms of reflection in the process of craft design creation through in-depth interviews. Design practices do not put the investigation probe into whether the practice is effectively developed. Two types of reflection practices are defined, including accumulating new experience and re-called the previous reflection, which is commonly practiced and applied in production thinking. We think this is because direct practice focuses more closely on the design problem at hand and is less likely to let the mind wander to more distant associations or memories. Indirect exercises focus more loosely on the present design task and more explicitly allow the mind to wander in context and time. They expose the senses to more mundane stimuli and thus relate to a broader experience. To illustrate this point, we organized and guided students in a kind of indirect reflective practice in our third study, encouraging students to become aware of their surroundings, the landscape, the conversations that take place around them, the air, the light, and the trees, and the cityscape. These, or similar environmental aspects, are a common part of the experience but often without conscious notice. Perceiving them during reflexes stimulates the brain to connect environmental features and the design task at hand in a mode of clustered reflexes. In addition, it may open channels for dormant memories, thus exemplifying the mnemonic reflection model as a link between past experiences and current tasks.

Driven by the desire to understand the individual, reflective design cycle, we have identified and demonstrated evidence of reflection in the design practice of the ideal log. Using a different perspective and technology, compared with the method based on theory, we have determined and built these activities showed some very unexpected and rich attribute space, and in a very interesting and is currently studying space: reflection may occur in the early days of the creation, exert a subtle influence on the accumulation of experience. In addition, the designer may focus on the design task at hand in action or approach it in an interesting, non-action way. Moreover, we can draw inspiration from the inside through memory and from the outside. This framework allows us to now systematically identify and place reflective design activities. The results should allow us to identify and better understand different reflective practices and their place in creative product development and design. In Figure 23, the Refelction out/in the Action and Experience (RoiAE) framework has been proposed to guide the reflection in the creative process to facilitate creative expression. Our ultimate goal is to use and integrate reflective exercises to improve thinking consciously. The following steps in our research will include observing and analyzing contemplative practices of designers in laboratory work and collecting additional survey and interview data from a

larger sample of designers from multiple subgroups, such as design students, industry practitioners, and design professors. We hope to deepen our understanding of the role of reflection in creative expression by observing the occurrence of reflection in the creative process involved in projects in a more complex and extensive context and by more detailed descriptions of reflective practices by designers in different fields.

7.3 Contributions

7.3.1 Implications for Craft design

Respond to traditional making

As part of the intensive preparation required for certain types of action, reflective practice before present action involves thinking about previous actions, thoughts, and achievements to understand the impact of what has happened and how and where to move forward. This is a pattern that permeates individual practice, not just in the present. Practitioners are constantly aware of their process and how it changes and evolves. Past processes are pushed into the present project, and adaptations based on previous learning are incorporated. A key element of reflection for action is the ability to identify the constraints that will impact the expected work. There is an inherent tradition in any field of creation, and craftsmanship is even more so. Unlike the reflection on skills constrained by its inability to produce action, traditional constraints are manifested in a stable form of work that is hard to overturn, a model that has been tested for a long time. Reflection on tradition and skills show critical sub-code, including breaking tradition, questioning standards, reshaping tradition, etc. In this subcode about reshaping the expression of a basic attitude reflects the designer, the creation of that is now still in the shadow of traditional has a strong foundation for the creative engine, are proposed to reshape and breaking of desire, need to consider the nature of a problem, that's what we understand the traditional? Perhaps nothing else represents the image of tradition except for its ability to produce good and cheap goods and the magnificence of court ceramics. However, the result of the reflective action is not simply to walk back and forth on the individual action point, but more importantly, through reflection, we can see what else, and how far we can see. This awareness makes it possible to reflect and learn from the results of the past and to prepare for future action, and in the case of creative work, it is a significant preparatory activity before the highly intensive action taken at present.

Of course, in addition to reshaping and breaking, being able to recognize the constraints of tradition is a subject worthy of careful study. Based on the craft and design education model, learning often begins by imitating traditional or classic works. Japanese researchers have studied the ability to learn the same style by mimicking a painter's painting. So in the process of design, imitate tradition and learn the tradition. Much work is failed, mainly from molding, material processing, and expression. How to redefine traditional expression? Able to control not only material characteristics but also different personalities from individuals, early practice, immersion research because of skilled and firm. Then it is essential to show your thinking, to interpret the meaning of the moment, with a sense of The Times. Innovation now is the tradition of the future. Therefore, we appeal to find our point of view in reflecting on the tradition to understand that craft tradition is more important than innovation. The first step is to understand how you are different from others and how you are different from the past. It is a process of finding links between the present and the past through reflection and collation.

7.3.2 Implications for Design Education

In an educational context, the framework of this research will help teachers and students communicate reflective experiences more explicitly. These frameworks will help them reveal silent understanding and action through discussion and communication. The teacher can expound more on her or his insights into the results of student reflection, rather than wallowing in her or his identification with tacit knowledge without explaining why. Teachers and students can collaborate more consciously to create a reflective experience and develop it. Developing more flexible reflective practices with oneself as the subject will help to reveal more hidden aspects of existing craft design, thus opening up opportunities to develop into a more coherent creative unity. These frameworks help students understand how personal experiences can achieve more meaningful links to external Spaces.

In the early stages of design, the teacher's design critique is to understand and clarify the design impasse that students encounter. Enlightening students in traditional ways and making them see their thought process is a natural way to break the ice because the process is fundamentally based on having a reflective personal experience infrastructure. The personal "meaning" provides a chance to embrace the design knowledge that novice designers are exposed to in their education. Given the internal perspective, there is no reason to think that

theory is forced away from experience. On the contrary, theory can be actively applied to any reflective expertise, especially in the replanning stage, and described as meaning in the name of principle.

About these three studies, we propose a suggestion to promote reflection in the creative process from the participants' perspective. According to Ingold(2013) and Pye(1968), craft creativity is not seeking the pure original idea or something extremely new, even not the creative concept space developed by excellent divergent thinking. Instead, it should be the body's action under the unpredicted situation. Such a description was fully qualified by craft design that rich body language and thinking during the creative process. We suggest encouraging students in a broad, complicated environment and creatively learning and reflecting will benefit learning from the inside, rather than accepting knowledge passively.

7.3.3 Implications for the Knowledge Foundation of Design

Knowledge management is a promising approach to effectively using/applying organizational knowledge by acquiring/creating and sharing/transferring knowledge(Dalkir, 2013). This study contributes to KM in creating and capturing knowledge in craft and design practice. The exploration of the underlying structure of reflective experience in the creative process is intended to prompt designers to speak more about their experiences with this phenomenon and how reflective experience in the creative process has influenced their work. Explaining what reflection means to them can bring more design experience to the table and help consolidate the knowledge base of craft and design in different aspects.

Through research reflection and creative expression, this study deepens the understanding of an important design

The phenomenon of reflection has long been seen as either an unspeakable moment of self-reflection and criticism or reduced to a process of examination in which the individual designer element is largely absent. Placing the process designer's subjective reflective experience as the subject and interrogator of the creative process provides a more coherent way to explain the construction process of different meanings and to describe the phenomenon of the reflective experience of the creative process rather than focusing on results-oriented criticism. This cognitive structure reveals more about the experience of process design.

In addition, the meaning gained in the reflective experience can be revisited, revised, and reconstructed

Gain new meaning in new reflections. This is why experience is often thought of as part of an individual's knowledge base. The reflective framework also provides a place for the designer's reflective practice to be examined based on the experience in the review. The natural attitude contains the knowledge and skills designers have developed. Reflective practice as an attitude reveals a way of capturing old knowledge and creating perceptions that conflict with emerging new understandings, thus making it possible to gain more coherent meaning even when problems arise. Therefore, I suggest that reflective experience should be fully utilized as a kind of hermeneutics to consolidate the knowledge base of craft and design, just as Husserl originally conceived phenomenology to complete the epistemological foundation of science by observing human experience. This reflective framework provides a coherent basis for designers to say more about what is already known, thus exploring more of the internal and external world in a unified way.

Visual data and relevant research

In recent years, ethnographic observations have shown the potential to inspire and serve as a basis for innovation in a wide range of social research.

Many researchers are beginning to use cameras to document issues in social research. For designers, habitual observations often inform and inspire their work in subtle ways by making them sensitive to what is happening around them. In this regard, the need to incorporate images' documentation and analysis into research needs to be clarified. Banks (2007) noted that images are ubiquitous in society, so the consideration of visual representations may be included in all social research. Moreover, incorporating ideas in creating and collecting data may reveal some sociological insights that cannot be obtained by any other method. Pink argued that visual data could emphasize focus and mitigate basis and are crucial in actions taken to observe and review the conditions of others and even their responses to a synthesis environment to express their views and perspectives through a reflective lens. (Pink, 2001)

As a result, various studies have introduced visual data (e.g., photographs, scans, videos) in education, healthcare, and other disciplines focusing on human perception and experience. Bezemer (2017) explored what might be obtained from visual data (e.g., photographs, scans, paintings) collected and analyzed in the workplace, simulation centers, and other venues in clinical education research. Ultimately, he clarified the meaning implied by specific visible actions of clinicians, multiple communication styles, and the complex relationship between trainee performance and supervisor feedback. Hollingsworth and Clarke (2017) explored the use of video recordings to motivate teachers to self-reflect. Both teachers and researchers

examined the videotaped sessions. Then, they engaged in feedback conversations to examine their practice and seek feedback to find a way to facilitate teacher reflection.

In the fields of craft, art, and design, Bartlett et al. (2019) discussed the creation of a reflective space online to observe students' performance to promote teachers' reflection. However, further study is needed to utilize the visual document to understand students' perceptions in a broader context. In this study, exploring craft students' perceptions by encouraging them to describe what they see in fieldwork to stimulate personal experiences and professional knowledge, thereby developing views of the sociocultural environment(Bartlett et al., 2019), is also crucial for design practice.

Moreover, utilizing visual data in fieldwork under the premise that reflection is recognized as a psychological phenomenon attributed to everyday practice rather than a strictly pedagogical tool can help break the fixed pattern in craft and design education that actively fosters students' interpretation and imagination(Greene, Freed, & Sawyer, 2019).

7.5 Limitations

This research is conducted under a craft design and education background because I mainly study the form and influence of designers' reflective experience in the creation process. The sample size is relatively small but enough to make a discovery. I conducted in-depth interviews with 12 experienced independent designers with modern educational backgrounds. If the experience of more experienced design experts is tested in a practical environment, the infrastructure and meaning framework for research experience may be enriched and improved. The design cases studied in this study are relatively simple and small-scale. Although the participating designers are experienced craft design practitioners and teachers, their participation is to teach new knowledge, which limits the emphasis on inward-learning experiences in education.

This study explores a primarily individual-based reflective phenomenon in process design. An internal perspective has been developed. However, experiences with other design phenomena (such as systems evaluation, decision making, implementation, and commercial or social innovation) merit specific relevant approaches. An individual-based internal perspective might be better included in an approach suited to more complex collaborations. This study is located in the background of Design research in China, and the research results

mainly focus on the reflective experience of Chinese designers. Further research can be done within a cross-cultural design team.

7.6 Suggestions for future research

The changing social environment requires more people to be involved in the design reflection process, which makes developing an understanding of people's experiences sound and a timely project. With the attention paid to design reflection, it is of great practical significance to use multiple reflections to communicate the common experience of human beings and conceptual design frameworks in the context of social co-creation and professional collaboration. The reflective framework proposed in this study is open. Future research may identify new themes relevant to the experience being studied in a different context. The applicability of these theoretical results needs to be further tested and developed in practice. In addition, the insights gained in this study about process design and reflective practice also require the development of a design methodology. Specific tools, processes, and methods can inspire, understand, and develop a quality reflective experience for the designer, and the underlying structure and meaning framework can inform this development.

Phenomenology serves as a vantage point for understanding experience in various ways to restore relationships that have been interrupted or ignored by many other scientific studies affecting design, and the field is developing as a discipline. The theoretical perspective of phenomenology is one of the triggers of this study, and MET provides a fresh perspective for further explaining material cultural phenomena and exploring the process of mutual shaping between man and the world. However, exploring the relationship between design research and phenomenology can be a long and complex project. This research aims not to control or predict creative performance but to understand dynamic and unified design reflection phenomena that cannot be coherently described from an external perspective. This study provides a way to understand the connection between the internal world and the external world through reflection and the ability to reflect as an aspect of creativity to accumulate experience and stimulate the construction of meaning to better deal with the relationship between designers and materials in craft design. In future work, the innovative evaluation framework could be a promising direction to explore the reflective loops and levels that impact the craft and design process.

Appendix 1: Meaning units in Pilot study

Forms of Reflection	Condensed Meaning Unites
Validation	1. material qualities, uncertainty, technique, classification, combination as creative accumulation 2. problem solving, refusal of slippers, concentration, devotion to detail, repetition, immersion 3. teacher's words, amplifying the process, leaving behind constraints, unconsciousness, repetition, breaking safety, leaving for a while 4. understanding material properties, pragmatic, process limitations are part of design 5. traditional influences, proven styles, being brought in, four-way 6. repetition, practice repetition, balancing materials and techniques, thinking with the hands 7. material, combination, balance of individuality and commonality, fixed generation and cultural relevance, trade-off between craft and art 8. moment and eternity, guiding materials, arrangement, selection, caution 9. creative environment change, allowing coexistence 10. use of defects, bottom line of material handling 11. overlaying glaze, operating accidentally, pursuing unexpected surprises to get stability, repeated trial firing 12. repeated experiments, active trial and error, adjustment of different dimensions, sense of balance 13. using defects, breaking uniformity, using nature

Introspection	14. envisioning the target state, material, suitable process flow, non-deliberate continuation 15. accidental collapse, heartbreak, use of defects accidentally, crippling beauty 16. process, capturing the feeling 17. traditional influences, proven style, expanded function, form, experience 18. essence, creating space, through one's own understanding 19. subtle variations, unstable clay plus stable glaze, universality, process uncertainty leading to new experiences 20. appropriate technique, active experimentation, service to personal expression 21. sketches, scale calculations, adjusting plans 22. public kiln, uncertainty, social properties 23. improving traditions, cycles of use and reflection, adjusting scales, value of the hand, balancing scales 24. imitation, reflection, detail adjustment, following 25. respect for traditional experience, rejection of the strange 26. concept emphasis, reflection, dissemination, focus on real life 27. process determination, detail control, observation 28. obsession, iteration, incubation, turning point 29. superposition, substitution, reorganization, grafting, disorder to order 30. Seeking the right, balance. Interpretive work 31. repetition of concepts, actions, processes, reflections 32. language of matter, balance of glaze, exploration of material form, loss

	33. traditional style, process, breakthrough material language, innovative process combination, repetition, combination, transformation 34. reflection, capturing casual interest, understanding craft, design thinking 35. reflecting on the essence, refocusing on the value of the hand, design and culture 36. language of creation including environment and perception, subtle experience, emotional dialogue, nature and the individual 37. repetitive action, process, reflection, complex cycles, interlocking, human energy and time 38. hand-brain integration, style as limitation, stereotype 39. following material laws, individual expression, form, following collective consciousness, reflective questioning 40. craft imperfection, hand not a machine, body self-conscious, consciousness self-conscious, return to real environment for reflection, traditional position 41. robust and self-consistent expression, balancing human and material 42. clay making, repetition, tedium, making connections, intimacy 43. balancing time, making is life 44. standard of thinness, balance of hand and technique, scale, predicting volume before and after firing 45. volume, transformation of decoration, reflecting on meaning after failure 46. materials outside the intention, avoiding difficulties

Habituation	47. using materials, setting procedures, stable fluctuations, as a holistic concept, balancing nature to maintain certainty, then amplifying uncertainty 48. shift in perspective, change in standards of good, creativity is breaking out of the moment 49. immersion in the everyday, observation of details, feedback on creation 50. the position of the person, the perspective of examination, the daily questioning, combined with the present moment to solve 51. personal expression 52. personal understanding of local knowledge, evaluation criteria, reinterpretation of tradition 53. professional background binding, doing and then learning, according to the need of expression 54. emphasis on conceptual expression 55. rational rigorous process, want to break through, grow, liberate bondage 56. no thinking, improvisation, disorder, superposition, cross spatial changes 57. balance of sensibility and rationality, avoidance of over-reflection, the 58. material aesthetics, reconceptualizing imperfections 59. initial phase of reflection, revision, overcoming negativity 60. reflection without imitation, combining with the current situation, conforming to the current life aesthetics 61. fixation resolution, use of uncertainty, conceptual rigor, experience, reflection

	62. improving iteration, repetition, adjusting details, proficiency, avoiding addiction to proficiency, observing oneself 63. traditional classics, limitations, learning, breakthrough 64. independent thinking, unconventional, emphasize overall feeling, balance 65. think with your hands, focus, polish, creative understanding Repetition awakens intuition, fills in the gaps, trusts the practice of the hand to avoid staleness 66. looking after the end, expressing space, detail, uncertainty 67. talking with materials, material perception, translating intentions, tracing brain sensations 68. skipping sketches and doing it directly, new discoveries, experiences 69. rigorous, focused, rational, critical thinking 70. unconscious thinking, state of concentration, immersion 71. mastering technique, sense of balance, layout, structure, sense of rhythm, cutting different techniques, stitching 72. Respect for experience, responding to unexpected ideas, improvisation 73. accidental collapse, mistake, surprise, use of defects accidentally, repeated attempts 74. trying different materials, refining proportions, reflecting on reasons for failure 75. reluctance, repeated experiments, proportional adjustment, substitution 76. ideas in the process, inspired by materials 77. technical characteristics, repeatedly debugging the proportion, detail adjustment

Association	78. reference to mature works, learning, sharing 79. using materials to hold each other, anticipating changes 80. enjoyment of concentration, intimate interaction, eternal time 81. audience feedback, motivation 82. borrowing from other processes, hand texture, materials expressing concepts, time 83. hand kneading, allowing time for reaction, repeated experimentation to determine effect 84. feeling the moisture of the clay, determining the timing of the next step 85. adjust traditional patterns, use, observe to reflect on the next step 86. not set limits, actively leave room for reflection, balance creativity and commonality 87. learning tradition combined with the present, material combination, physical rejection 88. proportional adjustment, combination of processes, interpolation 89. craft as material production, conceptual freedom 90. adjustment of dimensions, proportions, echoes of decoration 91. difficulty of consistency within a combination, defined components, infinite ways of combination, decision of the moment 92. fragility, moment and eternity, sense of time 93. the characteristics of the raw material and the firing process influence the unique expression 94. learning tradition combined with the present, reflecting on the volume and impact of materials 95. shift the perspective to look at

Integration	96. associate details with the state of production and reflect on the causes 97. reflecting on the national tradition, borrowing, changing 98. abstract symbolic meaning, eternity 99. The unexpected state of collapse, homeopathy, state of balance 100. structure tradition rather than imitation, design thinking, form borrowing 101. Properties of clay, handling techniques, visual differences create concepts, reverence for nature 102. state of material and life experience 103. needs, process change, looking at the past 104. material properties, the process of change in the hand causes material perception training 105. Letting go of the standard process, respecting the suggestion of nature, associating in nature, observation 106. control material properties, balance technique and expression, the ideal is to achieve natural association 107. initial materials, easy access, unexpected experimentation 108. Repeatedly making connections, deciding in the moment 109. flexibility and change, technique maintenance, technique is not new or old 110. finding possibility in impossibility, early slackness helps innovation, craft is also creativity 111. thinking about causes in relation to ancient life 112. exploit the nature of vulnerability 113. fixed solutions, using uncertainty, conceptual rigor, experience, reflection

Appropriation	114. process of rational rigor, wanting to break through, growth, liberation from bondage 115. total commitment, understanding ideals and displays, respecting the tradition of creation 116. local materials combined with new materials 117. nodes, tradition is innovation, reorganization 118. hand work as a prerequisite, complementary to design 119 Material language and form 120. traditional craft borrowing, form, and 121. hands before brain, learning by doing, convenience of environmental immersion 122. curiosity drives exploration, not being bothered by technique 123. mastering techniques, sense of balance, layout, structure, sense of rhythm, cutting different techniques, stitching 124. material has no meaning, talent is the meaning, explore your own perception in tradition, deconstruct and reorganize 125. cross-disciplinary knowledge, feeding pottery 126. consider different perspectives to present materials 127. relationship between practice and life, hands close to the heart The critical consideration of identity perception, the 128. the relationship between heart and hand, convergence and relaxation, the rhythm of the hand controls the relationship between reality and imagination 129. creative process, control of out-breath, control of uncertainty 130. reflecting on the concept of identity, obsession, mature techniques for developing personal expression 131. dealing with uncertainty, balance, shifting perspective, exploring perceptions on one's own to avoid stereotypes

	132. avoid process difficulty, reflect on personal weaknesses, then compromise solutions 133. Limitations of technical ability, measure and combine with personal background 134. innovation rooted in cultural traditions 135. eyeballing tradition, drawing on it and then inspiring innovation, craft is the concept of the future 136. technique is not innovation, personal detail polishing, focused personal expression 137. creative material awareness, craft and design are not separate, weighing materials and concepts 138. Environment influences perception, rebellion against tradition is not innovation, to combine culture, thinking of material expression 139. diversity, creativity, simple beauty rather than speculation 140. be cautiously creative, responsible, deep in life 141. to remain reflective, observant, down-to-earth, and calmly restrained in life 142. professional identity, clear concept, adjustment to change, style innovation 143. tradition and innovation, the relationship between human and material
Transformation	144. the relationship between mind and hand 145. life style, sense of responsibility 146. early reconsideration, focus at the beginning 147. technique pure is not innovation, thinking outside the box 148. knowing oneself is part of the practice, sincerity 149. improvisation, looseness in strict procedures

	150. gesture of traditional craftsmanship 151. Childhood experience 152. idea in front, material behind, windfall to improve idea 153. The scrutiny of traditional standards 154. observation and collection of materials, feeling the traces, reflecting on the experience of those who have gone before, reflection as a grip 155. ancient trace understanding, leap of caution, instant improvisation, relaxation 156. purity, risky beauty, fixation as sense of mastery, skilled to burnout, keep reflecting 157. traditional to modern divide 158. emotional repetition, attachment, frustrated process 159. cultural differences reflection, flawed acceptance 160. reluctance to reproduce 161. cultural differences reflection 162. collapse, accident, inspiring new perspectives, childhood scenarios, purity 163. creative spatial awareness, combining color, volume 164. reflecting on functional structure, form 165. honing process, childhood experiences 166. reflection from others, combined with personal practice reflection, revelation of predecessors 167. reflection from others, combined with life scenes 168. accumulation of basic practice, training in craft techniques, traditional nourishment

	169. practice, introduction of new concepts, sense of light, material qualities, perception of innovation 170. pause for creation, re-examination of style 171. environment influences perception 172. daily accumulation, maintaining sensitivity 173. skilled confidence, challenge oneself to enhance reflective experience 174. body perception, collecting, observing as a dialogue with the material 175. identity perception, writer, creative repetition 176. uncertainty, integration of cultural cognition, childhood memories, traces 177. reflection on context, culture, universality, intimacy

Appendix 2

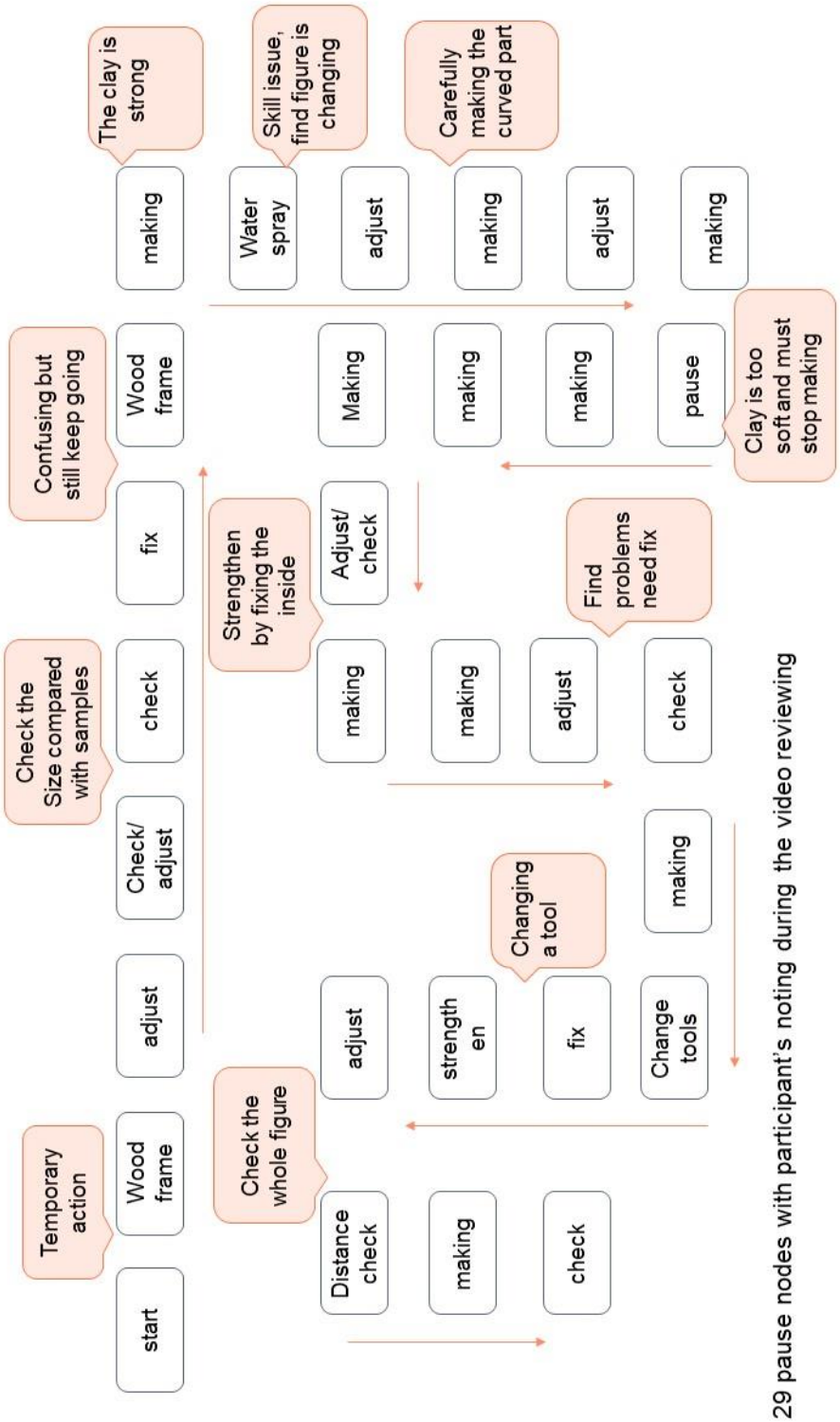


Figure 24 The key nodes in Video analysis in the Execution phase in the craft creative process.

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