

Mindsets of Craftsman:

From barrier to lever

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Abstract—This study discovered that Indonesian master craftsmen's conceptual process is highly influenced by Typical mindsets of Object-attribute that underlines Rationale and Mastery that thus stimulate a pragmatic perspective. We observed that traditional design education is difficult to be conceived by individuals with conservative viewpoint. Consequently, we make a model of the design training that fits with their conventional mindsets. This model utilizes traditional craftsman's previous knowledge at extraordinary levels in order for them further experiencing dialectical-beliefs of new thoughts. To further develop this model we investigate their knowledge acquisition of mindset during conceptual process.

Keywords—Indonesian; craftsman; mindsets; education

I. INTRODUCTION

Most study in creative thinking process have focused on the part of creative stimulus that boost creative solutions rather than hindrances. These studies have concluded conventional mentality as a driving force of mental constructs that disallow ability to develop creative mind. There is limited study attempts to mitigate barriers in creative process, (i.e., design fixation), almost no consideration has been given to identify to utilize barrier as positive side [1, 2]. Therefore, we carefully give attention to the conventional mindsets that known as barrier that leads craftsman's mentality to be trapped in less attractive ideas. Conventional curricula of design education strictly avoids perceptual obstructions, however it is necessary to acknowledging a particular potential of conservative viewpoint as an special stimuli to enhance creative skills of traditional craftsman.

Glăveanu (2011) clarifies that one crucial characteristic intrinsically exist in creativity is socio-cultural practice that is studied as a lifetime progress and long-term activity [3]. This explains that socio-cultural perspective creativity is a natural aspect that integrate in the space 'in between' self consciousness and others. This implies that this point of view accept the issue of individual mindset is exist in the realm of socio-cultural expertise.

An artisan's cognitive resource is highly affected by his/her prior knowledge, such as beliefs, culture, and insights. Those mentioned attributes are regarded both as an advantage and limitation at the same time. Traditional and conventional ways

of thinking and responding is known as a main resource of perceptual barrier [4]. When an individual performs repeated-type experience, this would shape his/her an ability to exploit with very subtle ways. Learning from craft tradition, a craftsman has no theoretical background of understanding of how these effects could be achieved [5]. The conceptual ideation process was generated from mindsets and stimulus that intertwined. Mindset and stimulus has a role either as potential or barrier.

Junaidy and Nagai (2013) studied the in-depth cognitive levels of artisan and design trainers as they observed design problems within creative process (in the early stage of idea generation). Their study proves shallow or in-depth cognitive levels (mindsets and stimulus) that occurred during design training is associated with conceptual thought correlated between closely and remotely association [6]. However, design trainers do not have adequate knowledge on the craftsmen' distinctive creative cognition and how to empower it. Therefore, we aim to conduct an analysis of known studies of craftsman to identify the typical mindsets of a craftsman and to feature design education delivery that fits craftsman's conventional mindsets

II. METHOD

Eight subjects were chosen to involve in this investigation. Eight Indonesian master craftsmen are skilled workers specialized in producing craftwork. We carefully select the participants with consideration that all of them have extraordinary abilities in artistry work mainly from woodcarving, woodturning and bamboo weaving. Their extraordinary mastery has been passed down from one generation and so on. Only master craftsmen with more than 25 years involvement in craftsmanship were selected in this research. We surveyed the participants' level of ability, which were chosen by building up their acknowledgment from peer colleagues concerned in the craftsmanship.

Subjects were requested to conduct a protocol of verbal process known as think-aloud protocol. This procedure is intended to acquire new ideas by imagining and expressing verbally what they experience during conceptualization. We set no limitations on time when they verbally communicated their thoughts naturally. We set up rather free guideline about sorts

of the new design, market, or details of design to maintain a strategic distance from exorbitant data that may be confusing and unfair. The loose direction and instruction might create a neutral process of acquiring information from self-experience. The verbalized process convention examination was done independently with every member to abstain from mirroring or replicating of thoughts. The instruction be given as follow: *'please think of a new artifact design, and you are free to verbally express the thoughts.'*

We set some conditions that verbalization is defined as acquiring ideas derived from verbal expression such as utterances during activity involvement engagement in creative conceptualization at the eay stage of concept generation. The whole conceptualization process was recorded, where the ideas that communicated verbally was then transcribed and sorted to follow some set rule. We set the required content related to the idea generation issue, so utterances were sorted and transcribed to follow the required content.

Next, to create network graphs that shows structure of thoughts derived from utterances we apply a two mode matrix equation as follows:

- a. The framework contained of X and Y pivot, where the X pivot describes 'conceptual stimulus' and the Y hub describes to typical mindsets that resulted from In-Degree Centrality (IDC). The quantity of binds coordinated to vertices that represent IDC (typical mindsets). Here, conceptual stimulus affect the structure of typical mindsets that represent by IDC.
- b. The lattice included X and Y hub, where the X hub describes the typical mindsets and the Y hub describes 'conceptual stimulus' amid catching the Out-Degree Centrality (ODC). ODC describes how much conceptual stimulus shapes convictions or typical mindsets. The ODC is the quantity of ties that the vertex coordinates to others. Information were broke down as indicated by the idea organize strategy on the premise of the USF free lexicon. The representation gives recognizable theoretical system that show low or very weighted affiliated ideas as demonstrated by the out-degree centrality score (ODC).

At last, the lattice condition of ODC and IDC arrange diagrams will show frail and solid associations between the two factors, which will be recognized and deciphered to demonstrate our speculation that either an obstruction or potential seeds exist in cognitive dissonance.

We ran a design training evaluation during 20 days, and the following steps were employed:

1. First stage of experiment to generate idea:
 - Pushing craftsmen's strong conservatism.
 - Identifying sketches and verbalization from conceptual sketches.
2. Second stage of experiment to generate idea:
 - Redeveloping past ideas by utilizing obtained stimuli
 - Assessing changes that happened amid the challenge of their extreme conservatism.

III. MINDSETS

Four primary books were utilized; firstly, Pye (1968) mostly discussed skilled worker's workmanship performance

[7]. Secondly, Yanagi (1989) profoundly discussed about the meaning of craftspeople, the curiosity and its rationality with exceptional consideration given to the indigenous people [8]. Thirdly, the content gives a more present day perspective, where Sennett (2008) talks about more realization of skilled worker in the contemporary time from a sociological viewpoint [9]. Last, Adamson (2007) highlights and investigates the significance of the idea originality of the very routine of art aptitude, which he proposes as social relationship of art – the "peaceful" and "novice" [10]. Despite the fact that, every writer has an alternate foundation and outlook, there are ongoing themes that can be drawn upon. We explored this subjectively. On the off chance that a trademark related issue was examined seriously by no less than two creators, this issue was resolved as a typical mindset (see Table 1). At last, nine average attitudes of specialist were recognized as follows:

TABLE I. TYPICAL MINDSETS IDENTIFIED LIST

No	Typical Mindsets	Typical characteristic-related Issues	Literature
1	Mastery	Workmanship; Craftsmanship; Tools	Pye, 1968; Yanagi, 1989; Sennet, 2011; Adamson, 2007
2	Object-attribute	Dimension; Material; Shape	Pye, 1968; Yanagi, 1989; Sennet, 2011
3	Rationale	Market; Users, Buyers; Pricing	Yanagi, 1989; Sennet, 2011;
4	Nostalgic	Nostalgic; Historic	Pye, 1968; Yanagi, 1989; Sennet, 2011; Adamson, 2007
5	Passionate	Pride; Satisfaction, Self-achievement;	Pye, 1968; Yanagi, 1989; Sennet, 2011; Adamson, 2007
6	Wisdom	Beliefs; Commitment; Philosophy	Pye, 1968; Yanagi, 1989; Sennet, 2011; Adamson, 2007
7	Modest	Naive; Sincerity	Yanagi, 1989; Sennet, 2011,
8	Uncompromising	Unwavering; Firm; Rigid; Ego	Yanagi, 1989; Sennet, 2011; Adamson, 2007
9	Sentimental	Romantic; Solidarity; Yearning	Yanagi, 1989; Sennet, 2011; Adamson, 2007

Here, the typical mindsets was used as an independent variable, Here, the normal attitudes was utilized as a free factor, from this point forward alluded to as 'typical mindsets.'

A. Concept Network of the Typical Mindsets

The strong domain of the Typical Mindsets (Indonesia)
 (1) Object-attribute 0.59 point.
 (2a) Rationale with 0.41 point, and (2b) Mastery 0.38 point.
 (3a) Sentimental 0.19 point, (3b) Modest 0.11 point, and (3c) Wisdom 0.09 point.

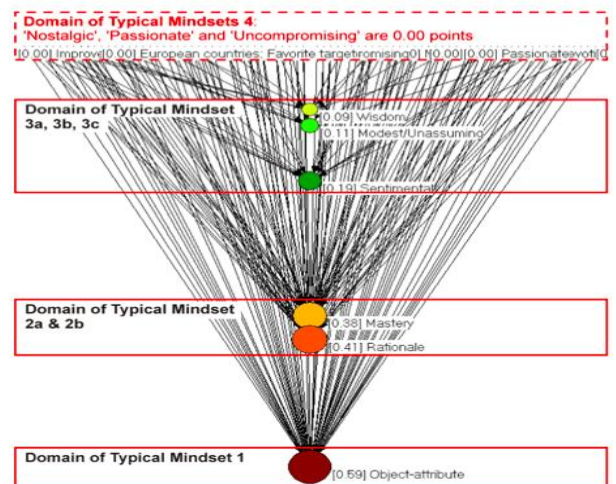


Fig. 1. Conceptual stimulus from Domain of typical mindsets.

Cultural background may contribute in one's thought mainly for responding and considering. On account of the Indonesian master craftsman, a large portion of their expressions were unequivocal issues, i.e., clients' inclination, purchasers, aptitudes and protest properties (i.e., shape, measurement, sort). Different expressions that were voiced less were identified with certain issues, i.e., organization, sharing and desires for regular common advantage. The articulations mirror their shallow articulation of renunciation and humble.

The IDC frames three areas of ordinary attitudes in view of their solid connection between's typical mindsets and the conceptual stimulus. The most grounded space is (1) protest trait with an IDC score of 0.59 point. The second solid area of average outlooks is (2a) method of reasoning with 0.41 point and (2b) dominance 0.38 point. The third area of run of the mill mentalities is (3a) wistful 0.19 point, (3b) unassuming 0.11 point and (3c) astuteness 0.09 point which is viewed as frail. The run of the mill attitudes of nostalgic, enthusiastic and uncompromising were observed to be 0.00 point, which implies that no connection was found. These three run of the mill attitudes of Indonesian skilled workers;

- 1 object-attribute
- 2a mastery
- 2b rationale
- 3a sentimental
- 3b modest
- 3c knowledge likely influences their psychological procedure amid conceptualizing process. (Fig. 1).

B. Networks of the Conceptual Stimulus

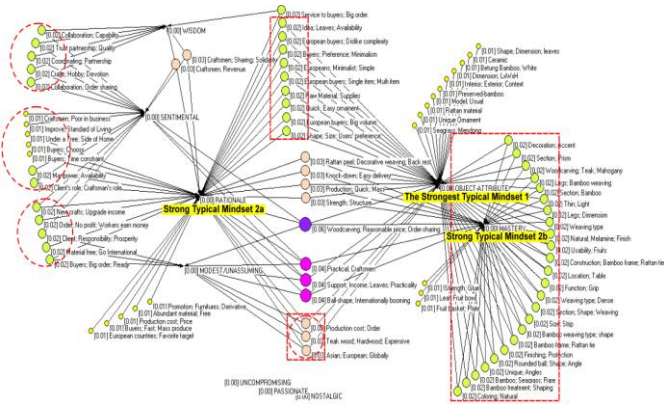


Fig. 2. The Conceptual Stimulus and Typical Mindsets network structure of Indonesian master craftsmen.

The extricated 82 sorted words or Conceptual Stimulus got from master craftsman were then imagined to catch its associations (ties) with Typical Mindsets. The Conceptual Stimulus are how much a Typical Mindset frames convictions or Typical Mindsets. Conceptual stimuli may add to more than one Typical Mindset, the more prominent the quantity of ties (multi association) from one conceptual stimuli (a vertex) connotes a powerful benefactor. Only vertex with numerous ties that are joined by significant number of contributors are characterized as strong contributor, i.e., cluster of Conceptual Stimulus 3 and 4 show a significant number of vertices. Cluster of Conceptual Stimulus 1 and 2 are less important, and cluster of Conceptual Stimulus 5 represent a minimum of only a single tie that described as weak donor. Conceptual Stimulus 1, 2 and 5 are not considered important (see, Figure 2).

IV. ANALYSIS OF THE CONCEPT NETWORKS

The Structure of Typical Mindset 1 of Object-attribute (0.59 point) was the strongest structure (see, Figure 1), further strong structure is shown at Typical Mindset 2 (2a and 2b) Rationale (0.41 point) and also Mastery (0.38 point). Here, the concept network displays that Conceptual Stimulus such as Respond to buyers, Significant order; Buyers from Europe, Unfavorable complexity; Raw material, Supplies; Form, Size, Users' preference; Knock-down, Easy delivery; Support, Income, Leaves, Moderate; Production cost, Expensive; Asian, European, Globally; etc. significantly contribute to the two strongest domains of Typical Mindsets 1 and 2: Object-attribute; which is Rationale and Mastery (see, Figure 1; and Figure 2). We believe that these strong Typical Mindsets: Object-attribute, Rationale and Mastery showed explicit viewpoint that significantly affects conceptual generation of Indonesian master craftsmen.

Hereinafter, the structure of Typical Mindsets 3 were observed, it comprised of Sentimental, Modest and Wisdom that the difference indirectly display a low Typical Stimulus. This exhibits quite differences from the previous Typical Mindsets. The structure of weak Typical Mindsets comprised of Sentimental (0.19 point), Modest (0.11 point) and Wisdom (0.09 point). Those structure are produced through stimulus of conceptual, for example, Partnership, Coordinating, Collaboration, Order sharing; Collaboration, Craftsman, Sharing, Solidarity; Solidarity, Sharing and so forth. This displays uniqueness of cultural issue to the idea generation process. The Typical Mindsets that correlate explicitly are Object-attribute, Mastery and Rationale that strife with the weak category of Typical Mindset that comprised of Modest, Wisdom and Sentimental. These three issues related of Typical Mindsets in all probability delineate that a master craftsman experience psychological discrepancy of conceptualization. This contention can be seen by looking that their conceptualization which are attached to at least one of the poor Typical Mindset, however in the meantime it also connected or disconnected at least one of the strong Typical Mindset as shown by the red spotted circles in Figure 2. Briefly, Typical Mindsets of Object-property that accentuates Rationale and Mastery incredibly affect master craftsman's conceptual process at some point generate logical perspective. However, in the meantime this condition shows conflict between a typical mindset of Sentimental that also consider Solidarity. The cases of craftsman's desire to get to a more verifiable domain such solidarity is as per the following (italic texts):

- *"I wish to help our group, there's possibility of utilizing leaves for craft idea, which is very functional"*
- *"As a whole, we need to take care other craftsman as a group of family"*
- *"If it is for collective needs, I am fine, so that all craftsmen have work and earn money"*
- *"All craftsmen have to share as partner"*
- *"A customer ought to indirectly increase of a craftsman's welfare."*
- *Etc.*

The red and dotted line display vertices and arcs (conceptual stimulus) that are connected to one or a number of the three Typical Mindsets that strong (object-attribute, rationale and mastery) and these are interwoven straightforwardly inside those three in number ordinary

attitudes (see, Figure 2). This implies, each applied jolt inside the red specked squares unquestionably adds to frame a solid normal outlook. The red specked circle speaks to vertices and curves (applied boost) that are attached straightforwardly to at least one of the three frail commonplace mentalities (insight, unassuming and nostalgic) and these are likewise fixing or loosened to at least one of the three in number run of the mill outlooks (question characteristic, method of reasoning and dominance). Those speaking to calculated jolt inside the red dabbed circle are perused as a feeble hope that may bring about troubles or clashes of insight with the solid convictions of applied boost. Those contentions of applied boost are: *capacity, cooperation; association, trust, quality; coordinated effort, arrange sharing; labor, accessibility; enhance, standard living; specialists procure cash, arrange, no benefit; success, customer, duty.*

Hereinafter, the covered red spotted square and red dabbed circle mirrors a covering solid and powerless tie (reasonable boost). This covering tie means shared discernment and no event of contention or psychological discord (see Figure 2).

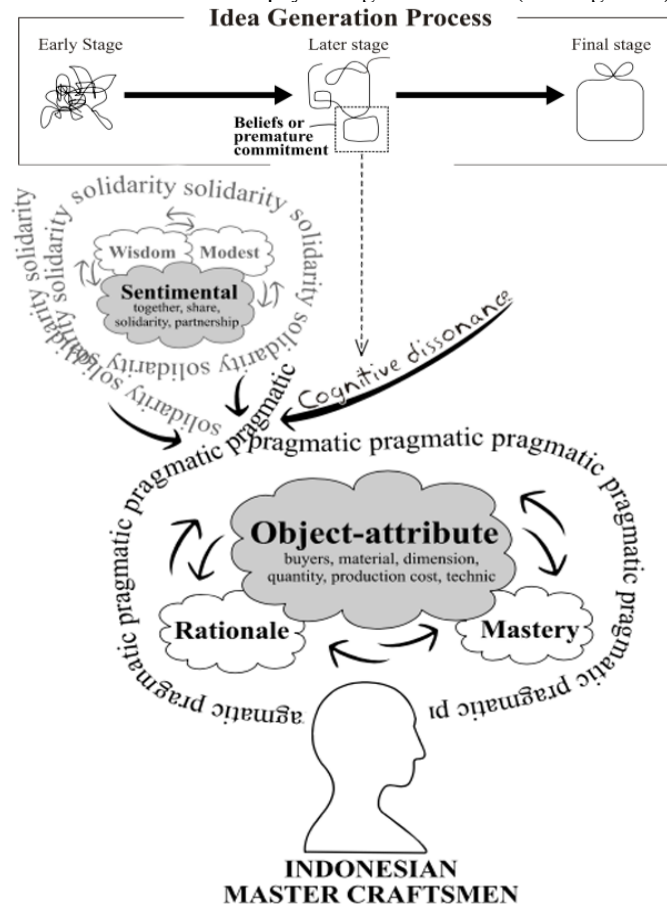


Fig. 3. Illustration of a craftsman’s cognitive dissonance in conceptual process.

We find that craftsman’s Conceptual Stimulus i.e., Dislike multifaceted nature, European purchasers; Service to purchasers, Big request; Raw material, Supplies; Shape, Size, Users’ inclination; Knock-down, Easy conveyance; Income, Support, Leaves, Practicality; Expensive, Production cost; Asian, European, Globally; and so on (see, Figure 3) has built a Typical Mindset which incites a common sense perspective. This Typical Mindset might be viewed as subjective assets

utilized as a part of conceptualizing that keep up express contemplations. These express contemplations lead their consciousness to be cliché and caught in recognition to react to issues of purchasers, measurement, material, amount, generation cost and strategy. This makes their calculated contemplations routinely, which evade any radical changes. Nonetheless, their feeble Typical Mindsets (Sentimental, Modest and Wisdom) that creates Conceptual Stimulus, for example, Collaboration, Collaboration, Order, Sharing, Solidarity Partnership, Sharing, Coordinating; and so forth show understood domains such solidarity, truthfulness, responsibility. We persuade, at this phase a master craftsman experiences conflict comprehensions to hold solid Typical Mindsets (convictions) from different random Conceptual Stimulus.

V. LEVERAGING CONVENTIONAL MINDSETS

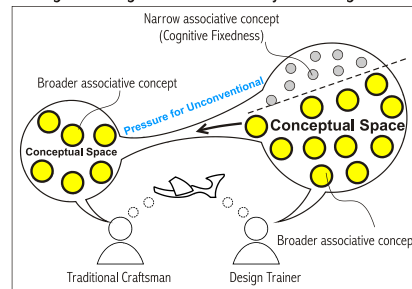
There are a few spaces of strong mindset that are intrinsic in extreme authority, while in the meantime it limits different areas of typical mindset. The solid typical mindsets are things that a craftsman knows about which keep up their convictions and traditional thought, which might be known as an obstruction. These mindsets produce the conceptual stimulus. These unrecognized stimuli exhibit how craftsman answer to and translate the capacity, client, and convictions. The more ordinary the thoughts the more they are being advantageous inside the strong typical mindsets. Seemingly, there is reliably minor consideration given to different areas of common attitude, which is potentially to be opposing. This minor consideration might be viewed as a unfamiliar stimuli that can possibly adjust a strong typical mindsets. A genuine imaginative process allow conflicts to happen, and this contention can be positively contributed, i.e., ‘familiarization’ or ‘bisociation’ hypothesis [11, 12]. The existence of poor conceptual stimulus allegedly conflicts towards strong typical mindsets, somehow provides positive to lead an unconventional way of thinking. Curiosity towards unfamiliarity is one way of a creative individual conceptualizing.

To manage craftsman’s closely associated concepts, we held a design training as an experiment. Wooden sandal craftsmen were requested to deliver new design idea of sandal. We focus on two phases of thought stages, at the initial stage; craftsman were tested to produce their thoughts at maximum possible of their assumed extraordinary idea. Furthermore, designer analyzed craftsman’s conceptual sketches and oftenly verbalization derived from unfamiliarity. Apparently, the unrecognized stimuli “upside-down,” “painful,” and “broken,” and were outputs of extreme level of design fixedness. At the second stage, craftsmen were requested to redevelop and were pushed to take those keywords into account. During the second stage, craftsman tried to redevelop and were pushed to use this unrecognized stimulus. Eventually, the examination exhibited that the capacity to catch and use unfamiliar stimuli during to test of extreme levels of outline obsession would prompt to unconventional idea, for instance, an up-side down wooden shoe. We understood that craftsman’s unrecognized stimuli that created at outrageous level of plan obsession (i.e., agonizing shape, broken shape, upside down shape) are the remotely related ideas that possibility to be acknowledged for for unconventional ideas.

The test showed that the ability to comprehend and use unfamiliar stimuli (i.e., upside-down shape, broken shape, agonizing shape) amid outrageous levels of plan obsession might prompt to whimsical methods for considering. Eventually, this analysis exhibited that, probably, when craftsman's conservatism is pushed to some extraordinary levels, they will turn out to be more open to be unusual amid their inventive exercises and ready to adapt the plan obsession. Investigation of ethnography characterizes that local know-how is frequently alluded to as aggregated keen and psychological encounters that happen among group of individuals. Nevertheless, a commitment is required to make conditions that test outline obsession. A program inside a tourism-based art workshop-like setting with guests, shoppers are the information contributors that co-create with craftsman. Difficulties are result from the presence of information benefactors that permits unique recreational experience, i.e., mood, stylistic and interest. At last, the contributors will persistently challenge plan obsession to get to remotely related ideas. Supporters, for example, creators, customers that push them to enter extraordinary levels of their earlier learning [13]. In this manner, a model is important to make circumstance that permit enabling plan obsession happen. The enabled plan obsession is encouraged with enhanced model of configuration preparing and this disallows limited conceptualization to happen in the past model of configuration preparing (see, Figure 5).

We understood that craftsmen's unrecognized stimuli that created at extraordinary level of fixation (i.e., broken shape, excruciating shape, up-side down shape) are the remotely related ideas that possibility to be further produced for offbeat thoughts. This demonstrates in the condition of extraordinary of outline obsession, craftsman unwittingly drew in persuasive conviction, a state where their earlier conviction and conservatism turned out to be free. This implies they are considering property and detail issue as well as speculation more theoretical and more extensive issues (i.e., claim or scene). In any case, with a specific end goal to keep away from restricted or nearly related ideas and to create more rich idea that get to remotely related ideas at the top to bottom psychological level, specialists must experience the rationalistic confidence in commonplace way. Persuasive conviction is a feedback stage where one starts to scrutinizing his/her untimely responsibility; consequently, the individual may get to be distinctly inquisitive about various exist conviction frameworks. The enhanced strategy to challenge customary skilled worker to use their moderate thoughts at extraordinary level can adapt plan obsession. To encourage successful outline preparing we proposed a program that installed with tourism-based specialty workshop-like setting. The guests, customers are the learning contributors that co-create together in the action of outlining with the craftsman

PREVIOUS MODEL OF DESIGN TRAINING
Typical Design Thinking Process that Strictly Avoid Cognitive Fixedness



PROPOSED MODEL OF DESIGN TRAINING
Design thinking process to overcome cognitive fixedness

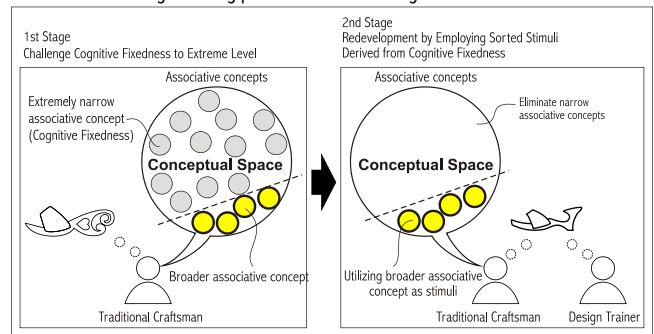


Fig. 4. The comparison between previous model and the proposed improved design training.

We propose a new model of design training that differs from previous approach:

The past model of configuration preparing:

- One-way information exchange (weight to be offbeat).
- Giving more consideration regarding driven issue.
- Depending on the program availability

The new proposed model of configuration preparing:

- Two-way information exchange (performed with their custom, propensity or conviction).
- Bringing argumentative conviction.
- Involving wide information donors.

Conservative craftsmen who gain the ability to capture and utilize these unfamiliar stimuli may develop increasingly unconventional ways of thinking. Craftsmen have traditionally learned craftsmanship through apprenticeships in which they acquire traditional creative know-how. We suspected that this traditional know-how contains certain unfamiliar stimuli that become activated during creative cognition is stimulated. They continue to cause inhibition deep within traditional craftsmen's minds. This study also affirms that utilizing barriers (design fixation) during transfer of knowledge of design training delivery to the traditional craftsman who hold strong beliefs or with conservative viewpoint offer broader and potential unpredictable result (see, Figure 5).

Traditional craftsmen who picks up the capacity to catch and use these unrecognized stimuli may grow progressively unusual approach in creative thinking. Experts have generally learned craftsmanship through apprenticeships in which they

gain customary innovative know-how. We presumed that this customary know-how contains certain unfamiliar stimuli that get to be distinctly enacted amid creative cognition. They keep on causing hindrance profound inside traditional craftsmen's minds. This review likewise asserts that using boundaries (plan obsession) amid exchange of information of configuration preparing conveyance to the traditional craftsmen who hold solid convictions or with traditionalist perspective offer more extensive and potential eccentric outcome (see, Figure 5).

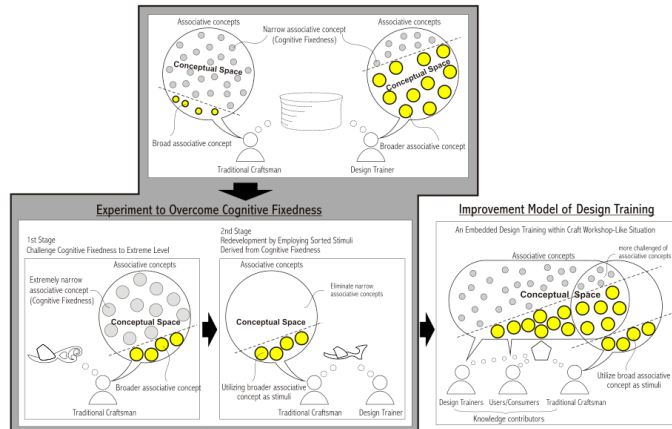


Fig. 5. The improved Model of Design Training featuring craftsman's conventional mindsets

VI. CONCLUSION

We have revealed the obstruction that happened in psychological discord amid conceptualization at the early phase of thought era is covered up to be exploited. The refinement of an innovative individual is his/her capacity to oversee new things, for example, assets, making them turn into preference, rather than staying away from new things however joining perceptual, experiential and calculated parts of various ideas subliminally to produce new experiences. On account of individuals with a customary perspective, for example, a master craftsman, our review demonstrates weak conceptual stimulus exists as a challenge of uncertainty and unfamiliarity. This challenge is an unconventional resource that provides an

opportunity to be developed through targeted design education. Local government and design trainers who create and deliver design training need to concern of certain specific differences (cultural uniqueness) that exist as cognitive resources. The design trainer must enable the craftsperson to identify and utilize these potential cognitive resources.

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