

Inexplicit Learning:

Transferring Knowledge through Visual and Emulative practices

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Abstract

The central concern of this study is to develop a body of knowledge to understand how expert knowledge is transmitted in the absence or lack of explicit and formal means of knowledge acquisition, with particular interest in the evolved pedagogical practices of craft communities that centres around a master-apprentice relationship. The ethnographic study based on content analysis of the transcriptions of members of a craft community from Varanasi, India has been used to strengthen the undermined pedagogical role of observation and emulation in the transfer of inexplicit knowledge. It is argued that in-situ observation and emulation fosters situations for facilitating co-production of knowledge, further implying co-authorship. Therefore, gaining community membership in craft communities is not merely a matter of gaining a professional degree, but is a slow process of enculturation.

Keywords: Observation, Emulation, Inexplicit learning, Master-apprentice

Introduction: Pedagogy of the Tacit

The central concern of this study is to develop a body of knowledge to understand how expert knowledge is transmitted in the absence or lack of explicit and formal means of knowledge acquisition, with particular interest in the evolved pedagogical practices of craft communities that centres around a master-apprentice relationship. Polyani (1958) defines the apprenticing relationship in terms of a master/novice relationship where the theoretical, generative as well as the evaluative principles of the practice are controlled by the master and not by the novice. However, the pedagogical enquiry still remains open.

According to Thaplyal (1996), traditionally a craftsman was born in a family as well as in a profession where he inherits the capital, credit and accumulated experience of his father. Inheritance of capital and credit does not require learning, but imbibing 'accumulated experience' in the absence or lack of explicit means of transfer requires long apprenticeship consisting of tacit interaction between the master and the learner. The apprenticeship tradition was the main source of formal vocational training for craftspeople for centuries (Wolf, 2002). This curricular mode, considered mainstream prior to the industrial revolution has today become an alternative system. In modern workplaces, such learning is often treated as a residual category to describe any kind of learning which does not take place within, or follow from, a formally organised learning programme or event (Eraut, 2000). Nevertheless, craft apprenticeship remains a rich curriculum resource, not despite but because of the current emphasis on flexible specialisation where knowledge practices are tacit, extensive, distributed and dispersed, developing in a co-ordinated network of people, tools and technologies, serving multiple, integrated and overlapping functions (Gamble, 2004). Furthermore, tacit knowledge accrued by the long practice of craft and instrumental practice, of 'doing the job', in itself can suggest new ways of doing things. (Muller, 2012)

Recently, concepts of intuitive expertise and tacit knowledge have become increasingly important factors in discussions concerning knowledge and learning in practice of skill acquisition as well as its application (Nielsen, 2002).

According to Nonaka (1995), knowledge is created through the interaction between tacit and explicit practices that postulate four different modes of knowledge conversion- (a) Tacit-to-Explicit is the process of externalisation to articulate tacit knowledge into explicit concepts, (b) Explicit-to-Tacit is the internalisation of explicit knowledge into tacit knowledge, (c) Explicit-to-Explicit is the combination of systematising concepts into a knowledge system, and (d) Tacit-to-Tacit is the socialisation of sharing experiences and thereby creating tacit knowledge such as shared mental models and technical skills. Pedagogical methods for knowledge conversion, from, and to explicit practices are fairly well known. However, studies on methods of transfer and acquisition of tacit knowledge are limited, often speculative, and rarely of a generative nature. The 'tacit' has become a stumbling block, both practically and conceptually. (Gamble, 2004)

Learning a skill involving bodily actions that reflects the mind, requires not only dexterity of the hand, but also body-mind coordination facilitated by sensory stimuli. The design process takes place inside the designer's head, (Lawson, 2006), and perhaps body, as well as outside in the observable outer world (Reitan, 2014) making it difficult to externalise it into a tangible or verbal form. Tacit knowledge is not easily conveyed by short courses or by non-apprenticeship modes such as distance education (Muller, 2000). Therefore, teaching theoretical concepts is not the same as teaching-hand skills. The latter demands the regulation and manipulation of many more senses than the mind alone.

In the absence or lack of any explicit communication, how does the master hand down his knowledge to the apprentice, and in turn, how does the apprentice imbibe this tacit knowledge? How is craftsmanly knowledge transferred from one craftsman to another, retained, improvised, and changed over a period of time? In Nonaka's terms, this paper enquires into the pedagogical methods that enable the completion of the knowledge spiral in craft communities.

Practice makes a Community: Banarasi toymakers

Against the theoretical background of tacit knowledge, in this paper, I have placed emphasis on the 'invisible pedagogy' of transmitting knowledge through observation and emulation, obtained through the 'thick descriptions' of the master-apprentice system of a craft community in India. Brown et al. (1989) elucidate that craft apprenticeship enables apprentices to acquire and develop the tools and skills of their craft through authentic work and membership in their trade. So the term apprenticeship helps to emphasize the centrality of activity in learning and knowledge building and highlights the inherently context-dependent, situated, and enculturating nature of learning.

I have been participating in the community practice of making Banarasi wooden toys for last eight years. This community of Banarasi toymakers consists of more than a thousand practitioners with varying skill sets settled on the banks of the river Ganga in the holy city of Varanasi, India. The workshops or Karkhanas have sporadically spread across Varanasi, but the most dense clusters can be found at Khojwa, Kashmiriganj and Laksha. The Karkhanas take the labor of the apprentice, either from within or outside the family in exchange of the opportunity to learn the craftsmanship (Lave & Wenger, 1991). Interestingly, every Karkhana triples up as an institution of learning, factory floor for designing and production, as well as a living space. Therefore, under a single roof, it is common to find multiple kinships- Master - apprentice, Employer- employee, and Head of the family- family members (XYZ, in press).

An ethnographic study (XYZ & XYZ, 2015) further revealed that in the Banarasi community, every craftsman specializes in a single skill set, making all craftspeople mutually dependent on each other for completing a product. The craftspeople very often do not follow a hierarchy where a few lead the others. For any given order by the client, the craftspeople associated with each other according to the skills required for the order such as that of carving, assembling templates or turning on the lathe

machine, followed by painting. Every member of the group completes a task and hands over the artefact to the next craftsperson. In case any changes are made to the artefact, the next craftsperson is expected to coherently compliment the same with his skill even in the absence or lack of explicit instructions regarding the method of doing so. Such groups of different skill sets were formed for every order anew. Many such groups of craftspeople working in the same technology, material and design were formed and broken as and when the demand for an artefact was raised. For a detailed workflow followed in the community, please refer to Fig.1 (XYZ, in press)

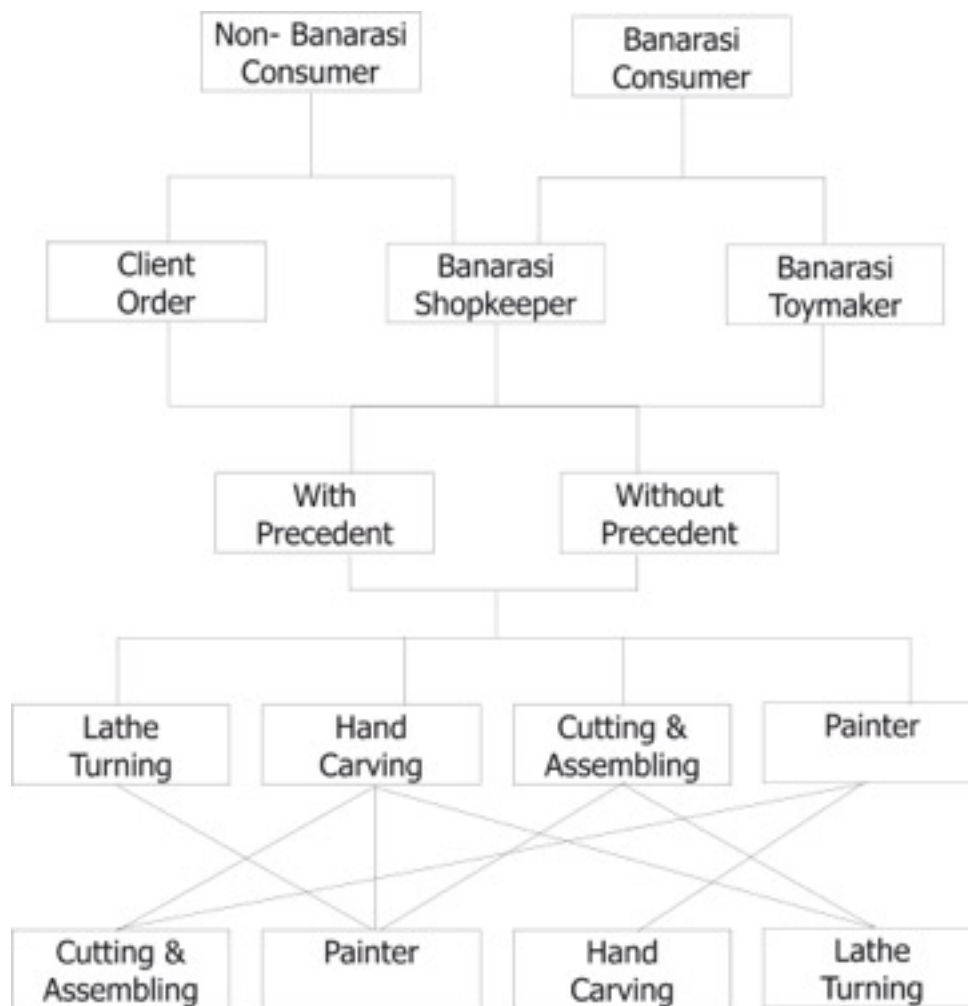


Figure 1: Work flow of all community stakeholders involved in designing a toy.

This changes the role of learning in communities of practice from the acquisition of propositional knowledge, to learning situated in the community specific form of co-participation. Therefore, it is more essential to question what kinds of social engagements provide a context for learning, rather than delve into the kinds of cognitive processes and conceptual structures involved (Lave & Wenger, 1991). Despite multiple members making multiple changes lacking explicit knowledge transfer, the Banarasi artifacts were not only coherent but also manifested a Banarasi identity. Manifestation of coherence or identity is not surprising in design where artifacts are mostly produced under a single vision; but a Banarasi artefact lacks both- the supervision of a single decision maker and a centralized plan. This increased my curiosity regarding the collective disposition of the community members which facilitated coherent inferences or consensus of design decisions amongst multiple members of the

community. How is this collective disposition acquired and transferred amongst the Banarasi specific forms of co-participation between the craftspeople?

Watch out!

I watched my father and learned. Nobody can learn in a hurry. The one who teaches you will allow you to only watch for one or two months. Then he might give you a saw. Later he will show you how to use a chisel.

Extract 1: Subhash Chandra Maurya- Craftsperson, Khojwa

I learned to shape wood in Banaras. I used to work in the house of another craftsperson. Watching the craftsperson shape wood, I also slowly learned how to copy the same.

Extract 2: Chendilal Kunder- Craftsperson, Khojwa

According to Bandura (1971), traditional theories of learning generally depict behaviour as the product of directly experienced response consequences, but in actual practice, all learning phenomena can be a result of vicarious observation. He elucidates man's capacity to learn by observation that enables him to acquire large, integrated units of behaviour by example without having to build up the patterns gradually by tedious trial and error. Polanyi (1958) concurs that by watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself. Tacit discourses of such kind entail a set of strategies which are local, segmentally organised, context specific and dependent, for maximising encounters with persons and habitats. Such knowledge is not acquired by learning 'procedures of investigation and instruments of observation and understanding of the theory', but by acquiring a 'gaze', a particular mode or style of recognizing and realizing what counts as reality (Bernstein, 1999).

Observant watching can result into a sense of knowing and memorisation of particular sequences. In the local language, this intelligence of the eye is called 'Andaz' that is an approximate understanding of the act being observed. The optical nature of the human eye as well as the continuously changing external situation due to light or movement limits the ability of the eye to process sensory signals. However, the eye is intelligent, therefore, perception is understood as a cognitive and not a sensory phenomena alone. Perceptions are predictive, never entirely certain hypothesis of what might be out there (Gregory, 2015). Therefore, visual information of experiential knowledge like weight, force, or temperature can often mislead an observer of a craft process. Accurate or precise information about the action and sequence of activities can be fully ascertained only if watching is aided orally with questions or descriptions of the activity. Nevertheless, Bandura (1971) claims that most learning phenomena resulting from direct experiences can occur on a vicarious basis through the observation of other people's behaviour and its consequences on them. Social learning theories state that observational learning assists in building symbolic representations of modelled activities, which in craft is enacted by the master craftsperson for the learner or the apprentice in the *Karkhana*. Craftspeople within the cluster also emphasise that they begin learning to watch in childhood itself. Children start watching at a very young age as they are born and brought up in the *Karkhana*, that also serves as the family home. (Refer to Extract 3).

Children learn by themselves. They just come, sit, and watch.

Extract 3: Chendilal Kunder- Craftsperson, Khojwa

In the cluster, craftspeople watch artefacts all the time from designs to other paraphernalia on the television, and they also watch each other. Craftspeople watch each other when a young apprentice

watches his master to learn, or when an experienced craftsperson or artisan watches another craftsperson at work for up-grading his expertise. Depending on who is watching whom, the result of the act of seeing varies.

-When an apprentice watches his master, he learns in order to be a member of a community with shared conventions, canons, and beliefs.

-When the master watches an apprentice, he corrects, rectifies or applauds in order to assist the student to become a member of his community.

-When a practiced artisan watches another, he learns in order to add on knowledge to a community of which he is already a member.

Despite the wide use of observational learning in craft and craft like practices, Reitan (2006) believes that learning-by-watching is undervalued in learning theories. She describes its significance through several instances in which young and adult seamstresses in Kaktovik watch each other. It is even expected of debutant seamstress to be able to design and make the whole garment alone, with a satisfactory result by simply watching the adult skilled seamstresses without any form of explicit instruction or help. But certainly, it would be an exaggeration to conclude that watching alone can help in mastering the complete know-how of a craft. Then, what aspects of craft knowledge can an apprentice imbibe when given the opportunity to watch the master, in the absence or lack of any corresponding know-how of hand-skills?

Watching conventions, canons and beliefs

Conventions of production, canons of representation, and beliefs held by the community with reference to a toy is intangible knowledge that resides either in the hand or in the mind of the member (Refer to Table-1). It is seldom made verbally explicit, but is visible in the tangible artefact as well as in its use (For a detailed analysis refer to XYZ, in press). On several occasions, watching alone may give an insight about them.

Table 1: Example of Banarasi conventions, canons, and beliefs used in the practice of toymaking

Convention	In Banarasi toys, birds are represented not with <i>Kamalnayani</i> , but round eyes. Proper eyes of toys are <i>Kamalnayani</i> .
Canon	
a	<i>Kamalnayani</i> eyes are often a big white boat shaped form, with a black full or half circle representing a pupil, spotted with a highlight sometimes. Eyebrow is marked in a single curved black stroke above the eye.
b	Eyes of an elephant and a peacock have an extra swirling line similar to the body decoration of living animals during festivals.
c	Animals will often have <i>Kamalnayani</i> eyes.
d	Expressions of a <i>Play-Thing</i> are stoic or neutral without any cues indicating its emotional status. Smiling or drooping lips, tearful or squinting eyes, contorted eyebrows and other similar features indicating the mood are absent
Belief	Banarasi community considers <i>Kamalnayani</i> eyes beautiful, so do the <i>Shastras</i> -Hindu texts.

Watching methods of production

It is possible to understand the sequential occurrence of tasks and sub-tasks of a manufacturing convention that build upon each other consecutively to complete a product. Often an apprentice is able to approximately judge the method of tracing drawings, cutting samples, operating machines, using tools, measurements or application of colours and varnish by watching alone. Some gross tasks are easy to observe such as the way tools are held and operated for different tasks and its consequence on the wood. However, some tasks are very subtle and small, which can only be seen but not performed by watching alone. For instance, the distance between two holes that determines the oscillation of the head and tail in a pecking toy can be learned only by doing. By watching, the apprentice achieves a heuristic understanding of the measurement between the two holes. (Refer to Fig.2)

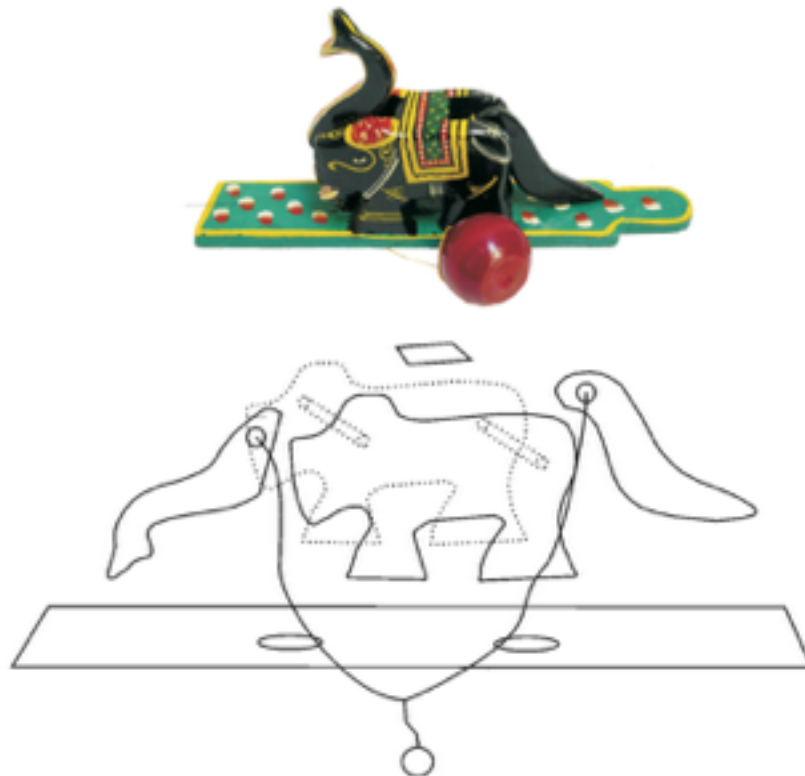


Figure 2: Exploded view of the pecking toy

Moreover, when the apprentice is given the opportunity to learn, the offer is not limited to a single Karkhana, but is deemed legitimate across the community. The apprentice is allowed access to other Karkhanas which further lengthens the period of watching, as well as adds a rich variety of visual stimulus to his visual exposure. Therefore, learning is not limited to a particular skill, but to divergent skills mastered by other members of the community also. This introduces a holistic approach towards the craftsmanship and the knowledge of interdependencies between various skills and the skill holder.

Watching contexts of representation

In the *Banarasi Toy* motifs are represented in particular shapes, forms and colours either for purely ornamental reasons or to explicate a belief such as the *Tilak* on the forehead. It is fairly simple to learn the use of these Canons and the particular time and space in which they are used by merely watching the teacher. However, the skill of making them is achieved only in practice later.

Watching beliefs of production and consumption

Communities are threaded together by intricate, socially constructed webs of belief, which are essential to understanding what they do (Geertz, 1983). Rites and rituals are generally community practices, visible and accessible in public spaces. They also include festivals and ceremonies or in-house customs followed everyday such as prayers offered to Lord Vishwakarma before starting work. Many rituals and rites are performed by adults or particular castes alone, watching is the only method of internalising such customs of who performs which rituals, at what time, in which space, and with whom. For instance, a craftsperson himself is prohibited from applying the same *Tilak* on his forehead as that of a Brahmin, but nevertheless he can recognise, differentiate, and later with skill also reproduce the *Tilak* that a Brahmin wears, by watching alone.

It is interesting to note, that which is not watched is also not made in the toys. For instance an owl has not been watched, therefore seldom represented (Refer to Extract 4). According to Bandura, (1971) learning may rarely be activated into overt performance if it is negatively sanctioned or otherwise unfavourably received. For instance,

I have never made an owl because owl is the vehicle of Lakshmi. No one keeps it in the house. It is considered inauspicious for business.

Extract 4: Shyam Sundar Vishwakarma

Watching to kindle an aspiration for the complex or the valuable

By watching the master struggle to make a particular toy or the effortlessness with which he completes another, the apprentice can clearly recognize the complexity of an endeavour. The value of a toy and its worth can be known by not only its market price, but also by watching the care with which it is made by the master and used by the consumer. If he does not, later when the apprentice practices making an artefact, the *watchful* eye of the master can correct him.

I stop my children when I see them making too many local toys (low-skilled-low-paying). I want them to make fancy work (high skilled-high paying).

Extract 5: Chendilal Kunder- Craftsperson, Khojwa

Here, the apprentice realises the benchmarks on which his work will be evaluated in future while the craftsperson constantly tries to stretch these parameters through his own work.

Watching the relationship between stakeholders in the community

As discussed earlier, multiple experts are required to design a single toy. This requires every craftsperson to negotiate with others to complete a consignment. Skilful negotiations are open for observation to the apprentice as he watches the master holding conversations, bargaining payments, as well as modifying his practice to satisfy the other stakeholders or clients. Apprentices can quickly draw an implicit sense from the ambient culture of what is suitable diction, what makes a relevant question, what is legitimate or illegitimate behavior in a particular activity (Brown et.al, 1989). Apart from the power equations visible in such negotiations, the dynamics of control, shifting social boundaries, and terms of negotiation are also interpreted while learning to make sense of the communication between two masters, master-client, master-apprentice, master- community, and master-kin. According to Lave and Wenger (1991) such observation by an apprentice increases his understanding of how, when, and about what masters collaborate, collude, and collide in a negotiation to strengthen their own membership or challenge another.

Such learning trajectories are long and demand a very keen and patient eye from the apprentice. The onus of filtering the relevant information from the irrelevant ones, self assessing how much has been learned and what yet remains in the absence of any knowledge on the quantum of the syllabus, and analysing the observed parts and fitting it into a sequence with others lies completely on the apprentice. The learner dominates the learning situation, either peripherally or centrally. Observant watching is peripheral learning, when practiced consciously or unconsciously, as soon as a novice is given the opportunity to 'absorb and being absorbed in the culture of the practice' (Lave and Wenger, 1991). Alternately, observant watching is used by members who have gained central membership of the community, to legitimise their ownership on all community based knowledge, skill, and resources.

Copies are not made by cats alone: Doing by Emulation

But, watching only permits approximate comprehension of the activity. Therefore, Lave and Wenger (1991) propose that in relation to a single craft that is taught through "hands-on" legitimate peripheral participation, the ability to learn would develop in close relation to the ability to perform tasks. They further argue that a training program that consists of instructional settings separated from actual performance would tend to split the learner's ability to manage the learning situation apart from his ability to perform the skill. This can lead to a master who can manage the learning situation, but who never actually learns the performance skill. In an apprentice relationship, where the learner is routinely performing, such a situation is easily averted.

The sequentiality of the observational and emulation learning levels was established by Zimmerman (2000). He argued that learners who acquire a high level of emulation accuracy with the support of a model form a motorically detailed representational standard to guide and self monitor their practice efforts and experience a heightened sense of self efficacy. This enables them to practice more effectively on their own, than learners who had acquired only an observational level of skill.

Sennett (2008) elucidates that about ten thousand hours of experience are required to produce a master carpenter or musician. As the skill of the apprentice progresses over the hours, it becomes more problem-attuned, whereas novices struggle more exclusively on getting the mechanism to work. This skill of problem solving is based on how apprentices and masters learn to practice, and to learn from practice, that is reflect-on and in-action.

But, reflection-on and in-action is exceedingly difficult to achieve for a novice who is attempting to observe actions of a master that are not easily observed, or to identify the corrective adjustments needed to achieve a close match of symbolic model and overt performance. In most everyday learning, people usually achieve rough approximation of new patterns of behaviour by modelling, and refine them through self corrective adjustments on the basis of informative feedback from performance (Bandura, 1971). Thus, before problem solving, apprentices practice to emulate the master correctly. Reflection-on and during emulation confirms and validates the approximate knowledge gathered during observation into a habit of the hand. Doing-by-Emulation is the process of imitating the explicit experience of the master (expertise of the master accessible for imitation) into the explicit skills of making an artefact by the apprentice (learning of the apprentice accessible for evaluation).

The term 'Emulation' is introduced in this study in lieu of copying or imitation; latter hold a derogatory connotation today, therefore, it was necessary to reinterpret 'Copying' from a cultural perspective. Guth (2010) explains the role of copying in Japanese culture as a form of production, interpretation and dissemination through which cultural values are shared. Within ancient law, no evidence of an ownership of an invention, knowledge of craft process or textual expression seems to have existed similar to the recent copyright movement. Therefore, they were replicated without any lawful violation, as copying was an acceptable form of production. On the other hand, recent cultural

values not only look down upon the author of a copy but also lawfully challenge the existence of a copy through copyright laws.

In the Indian craft tradition too, emulation is a way of learning, iterating, transferring and retaining knowledge in the community. In the Banarasi lexicon, copying is referred to as '*Nakal karna*' or '*Nakal utarana*'. 'Doing-by-Emulation' confirms and validates the sense of practice acquired through watching into concrete knowledge. After an apprentice watches the master, he is slowly initiated into the handling of tools for making *toys*¹. Doing-by-Emulation helps the craftsperson to repeat traditional designs made even over a century ago, in the absence of oral, written, or visual records. Members of the community watch the actions of each other and memorise patterns of *toys* over incessant repetitions; thus tacitly transferring designs and know-how to the whole community. Craft evolution depends on repositories of such genetic codes (Jones, 1980). Hence, community known knowledge is collectively practiced, and therefore collectively owned.

The members of the community- apprentices and masters, emulate the prototype assigned to them from either an old sample preserved for reference, a prototype made by the master, or a design given by a client, largely to meet the production demands of the market. Craftspeople emulate designs of each other, either to transfer know-how from an apprentice to a craftsperson for learning, or between master craftspeople for up-gradation. Besides each other, craftspeople also emulate designs from client orders for livelihood. Emulation of a client order restricts dissemination of knowledge between craftspeople, as clients closely guard their designs against any possible 'leak' to the competitors. These three kinds of emulation viz. from masters to apprentices, between two or more masters, and from a client order to craftspeople are discussed below.

Emulation between Masters and Apprentices

Banarasi toymakers not only emulate to learn, but also teach to emulate. Producing to learn or to replicate makes Doing-by-Emulation a method of learning as well as teaching where an apprentice not only tries to replicate the actions of the master but the master himself, in the lack of any overt instructions makes his actions available to be emulated. Therefore, skills are learned by emulating the master's hand movements, errors are caught early, and corrected by disapproval or rebuke while emulating.

They are first taught to cut wood. New apprentices are then taught to turn a spinning top or file wood with a scraper.

Extract 6: Chendilal Kunder, Craftsperson

For teaching skills related to Kharad (turning), a spinning top is often used by the masters. It is one of the oldest toys made in the community and played by the children in every nook and corner. The spinning top is replaced by a nested doll as the apprentice gains skill. Similarly, Pattern toymakers, often ask an apprentice to cut simple shapes of birds to make a pecking toy, and the Gadhwra craftspeople (carvers) introduce small body parts like the torso or the leg of an animal figurine to a novice. Details of the eyes or the lips of a human figurine are handled only by adept apprentices or masters.

Then, what is common between a spinning top, pecking toy, and an animal figurine? Why have they been selected to be observed, practiced, and evaluated upon? There are several features common to this triad. They are ideal members of the community held categories not only in terms of typicality,

but also in terms of their perceived or actual benefits or value to the community (XYZ, 2014). All three artefacts represent *Banarasipan* (local dialect) or Banarasi-ness, therefore exemplify the identity of the Banarasi toys as well as the community. From the point of view of situated learning, this indicates that the learning of the apprentice is geared towards not only attainment of skill but also towards obtaining membership in the community of practice by sharing the skill of making those artefacts that form the identity of the practice. (Lave & Wenger, 1991) They are small in size and have large plain surfaces that do not require very fine and controlled motor skills. This facilitates experimentation and provides buffer time for modelling a new piece, if the learning assignment was a part of a client order. The pieces require less raw material, reducing the expenditure on trial and error. Moreover, these pieces enjoy a high market demand, therefore, the apprentice supports the income of the family or Karkhana as soon as he becomes adept at making them. According to Brown et.al (1989) these objects are a part of the 'authentic' culture. Their meaning and purpose are socially constructed through negotiations among present and past members. Authentic activities enable practitioners to act meaningfully and purposefully and shapes or hone their tools.

It is notable in these instances that the apprentice is not taught to emulate a principle, paradigm, or a general practice of making, but the skill of making a particular toy. It is by making a particular pecking toy or figurine that the apprentice learns the conventions and canons of making and representing a body part, and the beliefs that render them acceptability in the community. The apprentice emulated the practice of making a particular toy in order to gain the general skill of assembling templates, cutting wooden pieces etc. It is through emulating a particular Banarasi toy that an apprentice learns the skill of cutting, assembling and making the rotatory mechanism. Even when the apprentice watches or emulates the craftspeople using a machine, he watches the use of the machine for producing a particular toy. On the other hand, in formal or schooled education, the student learns the general principles from which a particular artefact is later derived. Therefore, the foundation studies in most design institutes consists of an exploratory phase where the students are introduced to all commonly used thumb rules, principles, techniques and materials. The students later apply these general principles to derive new artefacts.

Within a *Karkhana* when a particular *Toy* is produced, community held conventions, canons and beliefs are largely preserved because they are emulated with little or no change at all in toys designated for religious purposes (*Moortis*), in most toys designed for ludic purposes (*Khelne ka toys*), and some toys reserved for clients from outside the community (*Decoration ka toys*) (XYZ,2014). It is in the absence or lack of any other method of change that *Banarasipan* or Banarasi-ness is emulated and passed on from generation to generation from masters to apprentices, despite changes in technology. For instance, the convention of drawing *Kamalnayani* (lotus-like) eyes on all human and animal figures is being emulated since early 1900s in the Banarasi toys. The community is unable to give a reason for its existence, but emulates the feature nevertheless. This should not be misunderstood as mindless copying because emulation does allow change and improvisation from the source to the copy. Therefore, though *Kamalnayani* eyes are conventionally made, the canon of making them can be improvised over time (Refer to Extract 7).

Older craftspeople did not make eyebrows of the Kamalanayan. But my teacher made it, so I also make it. It looks beautiful.

Extract 7: Baicchan Ram Maurya, Craftspeople, Khojwa

Emulation between Craftspeople

Behari Lal Agarwal, an entrepreneur, recalls that the idea of designing earrings out of small wooden birds commonly made in the community today was first given to him by a foreign client. Based on Beharilal's oral instruction, his craftspeople taught themselves, the skill of making earrings, hitherto

unknown. They learned to craft very small birds on the fret saw, colour them and pierce the same with a thin wire. About 8 years back, only a few craftspeople could supply these designs. But, today the whole community makes similar designs with variations of birds and animals and supplies them to various clients. Here, the other community members learned from emulating the craftspeople, who completed the production order of Beharilal. Craftspeople were able to openly emulate the design due to absence of copyrights in the community. Thus, emulation is an accepted form of 'producing' an artefact. Here, the community refers to production in two ways: production as a method of making a toy with multiple or single members, and production as a method of making a toy to meet the client demand of quantity (Refer to Extract 8, 9).

Traditional designs are often copied. Copying is permitted because a new artefact is learned by only one person. When others copy, everyone has a sample, and that is how everyone learns.

Extract 8: Parsuramji Vishwakarma

All this on display is what I have made. It was made first in our Karkhana. But now it is made outside too. After all they (client) want production. Even if they give the order to me, I will not be able to complete it. Making a single piece is different. But if you have to make a thousand pieces, no one can make it alone.

Extract 9: Ratanlal Prajapati

Some forms of emulation, such as the one required for production discussed above demand exactitude or imitation without change. While others, demand the master or more adept apprentices to modify the object of emulation. These modifications are sometimes wilfully made either for the sake of change, introduction of new or cheaper material substitutes, or to cater to changing consumer preferences. For instance, carved animals used to decorate the *Jhanki* (decorative tableau displaying stories of Lord Krishna) are also given to children as toys. Traditionally, these animals were painted in sober colours and polished with eucalyptus oil. But with the introduction of industrialised enamel colours, the same animal are painted in bright hues and varnished with a glossy finish. (Refer to Fig.3)



Figure 3: Use of Lacquer and Enamel paint on wooden animal

Some modifications can also be mistakes. Modifications are errors if they affect the defining feature of the toy, but if they are emulated in subsequent designs by other craftspeople, they may also become acceptable. For instance, the three petal flower motif, emulated from one toy to another, has loosened

into three individual circles over time, thus changing the design (Refer to Fig.4). However this change is noticeable in not one, but all *Banarasi toys*, implying that it has been emulated within the community, further affecting the Banarasi identity of the toy.



Figure 4: Changing 3-dot pattern

On the other hand, all features of emulation do not come from precedents alone. Some emulation retains and transforms the borrowed features from sources outside the Banarasi practice of making toys. For instance, the elements of the *Mehendi* designs on the feet made by the *Sharmas*, who are barbers and not craftspeople, are emulated in the toys (Refer to Extract 10).

The ritual of coloring the feet with *Bhukni* is carried out by the women of the Sharma (*Nayi* or the barber in Banaras are called *Sharmas*) families before any auspicious occasion such as a marriage or *paath* (reading of a holy book). The *Payal* (anklet worn in the feet by women) like decoration on the wooden toy-elephants is borrowed from these *mehendi* designs made by the Sharma community.

Extract 10- Ajit Kumar Vishwakarma

Apart from visual features, the community also emulates written and oral stories into a 3D form from the *Puranas* (ancient holy texts) and epics like *Mahabharat* in the *toys* designed for the *Jhanki*. Characters and events of stories from religious texts require emulation of a text or verbal narration into 3D *toys*. This challenges the toymaker to interpret at and transform words into images. Some stories have been traditionally emulated such as *Putna vadh* or *Nag nathiya*, but others have also been

recently added such as *Krishna* stealing the clothes of the *Gopis*. This adaptation of stories that are already a part of the worldview perpetuates of *Banarasipan* (Refer to Fig.5).



Figure 5: Depiction of the *Kaliya Mardan* story in wood

Emulation between Craftspeople and Clients

Besides preserving the *Banarasipan* of artefacts, emulation also assists established craftspeople to earn their livelihood by producing new designs given either by the client or through interventions of agencies like the NGOs or the government. The craftsperson is appreciated by the Non-Banarasi client for the exactitude with which he can emulate the master design given to him, and is paid essentially for imitation and not innovation. Client orders often do not conform to the worldview, therefore, even though the toymakers excel in copying the designs of the client, they consciously do not emulate the non-Banarasi features of such designs in their own toys.

In most instances, client orders include a 2D design that has to be manufactured in wood (3-D) without any changes. Though no changes are required, the toymaker needs to interpret the 2D surface on a 3-dimensional curve, which requires substantial skill and judgment. Sometimes dimensions, back profile and the mechanism may be specified, but there are also instances in which incomplete information is left to the judgment of the toymaker alone. In the latter case, toymakers are expected to imaginatively reconstruct the missing information. For instance, the client in his first set of instructions had asked Ram Khelawan Singh- a craftsperson to emulate the paper design given in Fig.4 without any changes in wood. Only the height of the design was provided (Height= 10cms). The rest

of the dimensions were left to be calculated by the craftsperson himself. Despite the lack of design information, Ram Khelawan Singh made the toy as seen in Fig.6.



Figure 6: Visualising a 2D design given by a client into 3D a shape

Most client orders do not allow any deviation from the design at all. But in this case, unsatisfied with his own design, the client further asked Ram Khelawan Singh to improvise the 2D paper design with a lighter textured shade, besides correcting the alignment of the eyes and the borders. No instructions were given about the nature of the 'textured shade'. The craftsperson was required to use his own

judgment, and decide a suitable colour and texture as seen in Fig.7. Here, emulation required the craftsperson to take decisions on improvisation too.



Figure 7: Iterations created by the Craftsperson while emulating the client design

Emulation from 2D to 3D involves not only problems of visualization, but also that of reverse engineering, if a mechanism of any kind is involved. For instance, the original design of the pecking toy introduced in the *Banarasi* market from East Europe in the early 1930s required substantial cognitive effort to learn to decode and reconstruct the rotary mechanism of movement and synchronization of all body parts for not a single but multiple birds. Such mechanical movements are rarely seen in *Banarasi toys*, and yet the craftspeople were able to emulate it.

Interestingly, irrespective of the authorship of the original craftsperson/men, who reverse-engineered the mechanism of the pecking toy, it is important to note that the knowledge and skill once acquired was freely left open for all others to emulate. This led to up-gradation of all craftspeople in terms of skill and knowledge. Up-gradation of other craftspeople was important not only because multiple members are required to produce the same, but also because a new artefact needs community approval. In a community without any records of origin or trajectories, a feature that is not emulated dies. Therefore, in the absence of any copyright laws, wilful emulation of a feature is the community sanction for making it.

A sanctioned design is emulated for dissemination, but every member also claims the design as his own not in an attempt to hide its origin, but to unselfconsciously claim the collective knowledge and skill that produced and preserved the *Toy*. This ensures that irrespective of authorship, the community collectively owns all designs including modified features or a new artefact. Therefore, emulation is a sign of community acceptance of a convention, canon or belief resulting into their preservation, improvisation and dissemination.

Given the range of decision making involved in the emulation of artefacts for situated as well as unsituated consumption, it is possible to argue that emulation unlike copying is not a skill governed activity alone. It requires decision making and is a habit that can be acquired only through intelligent practice.

Discussion

This paper delves upon two lesser discussed aspects of learning in a community of practice, viz. learning through observation and learning through emulation. These pedagogical tools are followed with learning-by-doing, however ‘doing’ being a reflective practice, limited to self-learning by an individual, and not between individuals, falls beyond the scope of this paper. Tacit knowledge embedded in the practice of a master is internalised by the apprentice not through explicitly externalised principles, but through inexplicit situated practice. In-situ observation and emulation fosters situations for facilitating co-production of knowledge, further implying co-authorship. Gaining community membership in craft communities is not merely a matter of gaining a professional degree, but is a slow process of enculturation.

Short bio

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