Interventions in the artisanal process

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Abstract

A handicraft artisan starts learning how to make from childhood, from his or her elders who have been practising the same process for their entire life. So, handicraft has a unique value and cultural identity to it, since it has been there for generations, but due to the demands of the consumer market, an artisan has to keep coming uo with novel designs, to earn his or her livelihood. But, it is tough to manage both, working on earning a livelihood as well as innovating on new designs. Hence, designers and/or entrepreneurs can conduct interventions in the artisan's making processes to improve their products. So, here we are working on creating a model to predict the impact of interventions on an artisan and his or her production process, so that we can reduce the impact of the inefficiencies that are caused while learning something new and in turn, improve the artisan's production process.

Keywords

Behaviour, Flow theory, Habit, Habit Discontinuity, Habit formation, Hebbian learning theory, Theory of planned behaviour, Twill.

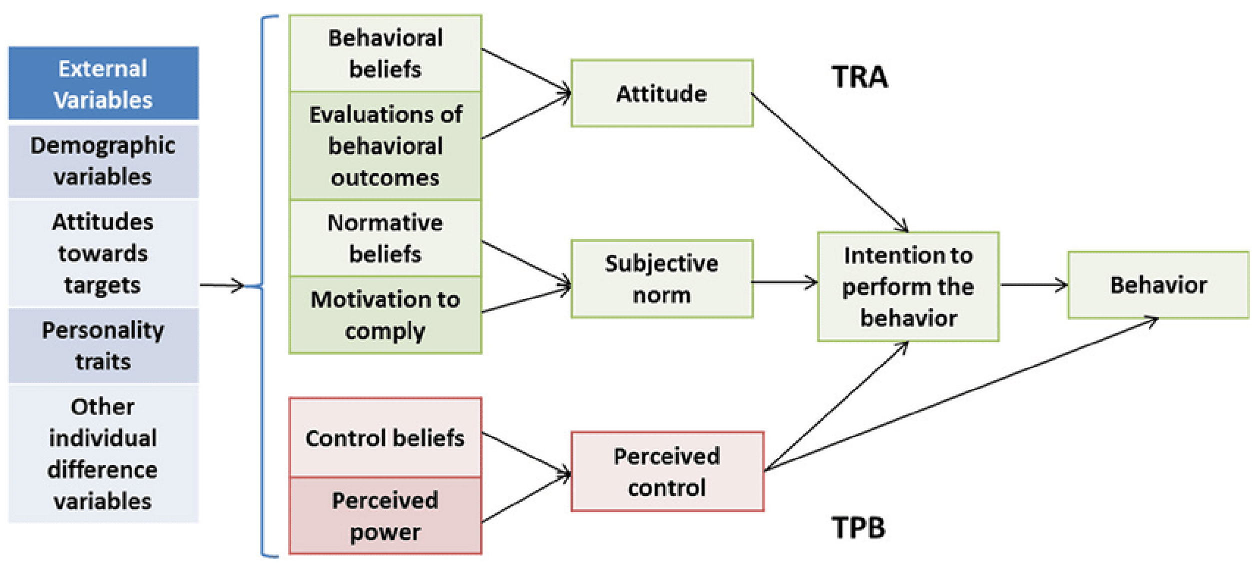
Introduction

The handicraft making process requires years of experimentation and practising to achieve proficiency. Over time, the process of making becomes second nature for the artisan. If an artisan does not keep evolving his or her process and/or product, the innate value of the handicraft stays the same and market demand decreases due to a lack of innovation. This is the point where designers and/or entrepreneurs can come into play, for improving the system and to increase the market value of the product. There is a need for sustainable interventions that can be brought into this traditional system, so that the cultural identity of the handicraft is not lost for the artisans and it can become a viable source of income.

Literature Review

The definition of habit can be as simple as an action or a set of actions taken in response to a cue and/or precondition, but the relation between a cue and a response is not as direct as the definition states. It is different for different kinds of individuals because of their lifestyles, their immediate environment, their culture and so on. So, the question is about how to determine the predictors of a habit, and hence, how to tweak these predictors in order to stop unhealthy habits and develop healthy habits for an individual. (Gardner, Arden, Brown, Eves, Green, Hamilton, Hankonen 2021, 1-23)

That is where the theory of the planned behaviour comes in, which was developed by Icek Ajzen and Martin Fishbein. They proposed the following model:



It was found that “behavioural intention” is a major factor in predicting “behavioural action”. The factors that affect behavioural intention include attitude towards that behaviour, “Subjective norms” - one’s social beliefs and “perceived control” - the perception of the difficulty of that task. This model has been very effective in predicting behaviours. (Armitage, Christopher J., and Christian 2003, 187-195)

Now, let's look at how habits are created. Every habit has contextual cues that trigger the habitual behaviour. Habits are formed by deliberate goal-directed actions. When a new habit is started, there is a state of apathy towards the habit action. An individual requires continuous deliberate practice in which a goal - directed action that is a response to a natural cue or an artificially created cue becomes a habit, over time, through repetition. (Nakamura, and Csikszentmihalyi 2014, 239-263)

This continuous practice creates better and better association between the cue and the response. A satisfactory execution of these actions helps in creating better links between a cue and the resulting response. This brings the deliberate effort into an automatic association and a habit is formed. (Kempter, Gerstner, and Hemmen 1999, 4498)

An example can be, when an individual starts learning how to drive, every action they make is very deliberate, meaning, they have to remind themselves to check their blind spots, turn their indicator on and so on. However, after years of experience, these processes become automatic, in a way that the individual can perform them without thinking. (The Decision Lab, n.d.) (Kempter, Gerstner, and Hemmen 1999, 4498)

The example above is showing a flow from a state of apathy to a state of automatic action. This is a neuroscientific concept known as Hebbian learning theory, introduced by Donald Hebb, in his publication "The organisation of behaviour”. The basis of this concept is, when our brain learns something new, neurons are activated and connected with other neurons, forming a neural network. These connections are weak at first, but they grow stronger, each time the stimulus is repeated. Making the response and/or action more intuitive. This concept is also known as Hebb's law. (The Decision Lab, n.d.) (Kempter, Gerstner, and Hemmen 1999, 4498)

Now, to break a habit or to improve a habit, we need to bring an intervention in the current process. That is where the habit discontinuity hypothesis comes in. To break a habit, one needs to bring a discontinuation in the current flow.

This hypothesis was introduced by Verplanken et. al 2008, where he mentions that bringing an abrupt discontinuation in the flow state, brings the process back to a conscious goal - oriented effort from the subconscious automation of actions. This discontinuation interval becomes the opportunity to learn and improve the habits that have been formed a long time ago, the cues that triggered the old habits will now have to trigger new habits. This unlearning of old habits and learning of new habits is a chaotic state, where a conscious struggles to avoid old habituated actions and mindfully apply the new action that is needed by the cue. This increases the anxiety of the subject while performing the task, hence reducing the efficiency of it. (Verplanken, Roy, and Whitmarsh 2018, 189-205)

Gap identification

There are two main gaps we identified in our literature review were, firstly, all of these experiments weren't conducted in an Indian context and secondly, none of the experiments were conducted on an artisanal process.

Objective

To investigate the work process of a handloom artisan and check the impact of introducing a discontinuity by changing their usual process and to confirm the Habit discontinuity hypothesis. Also, to check the reduction in efficiency of the artisan during a discontinuity, and to find a model for predicting how this efficiency increases with continuous practice.

Research Methodology

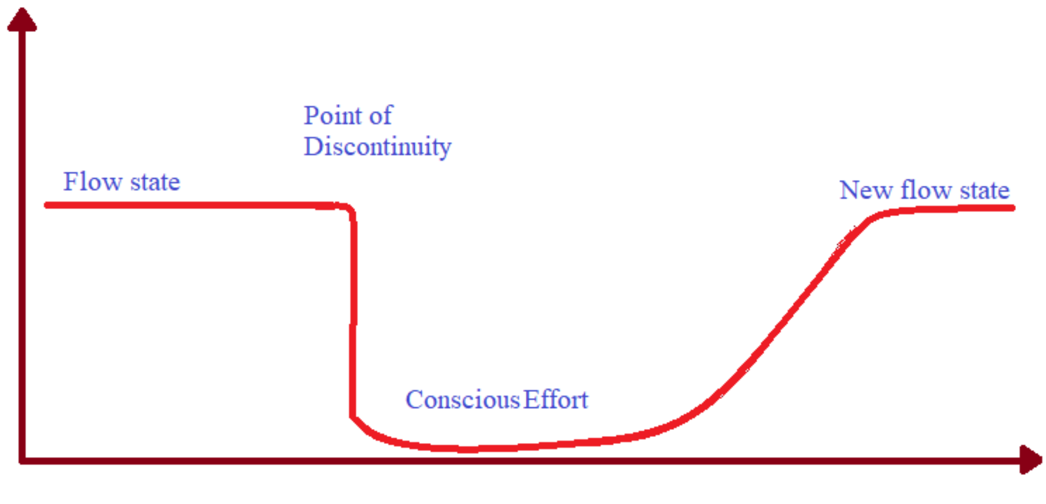
We first took an artisan (Hanumanthappa) who worked with a Table loom. To investigate the work process of the artisan, we asked questions about the process and what it does, before any making work was started. The processes and workflow were documented for understanding the possible interventions that can be made in future experiments. Next, the artisan was geared up with a single - channel EEG machine and was asked to start his work. The concentration graph d ata was recorded, and simultaneously observed with the ongoing process to relate concentration patterns and the actions being done at that instant.

The same process was repeated and observed for an artisan who was working on a production work, using a floor loom.

Using the documented work processes and different types of weaves, a basic type of discontinuity was ideated, which included giving an artisan a certain type of pattern to weave, once he achieves a flow state, a different type of weave was introduced in the same cloth and the concentration data was observed with the ongoing actions. The data and the workflow were compared to check the effects of discontinuity on the efficiency of the workflow.

Since a small number of experiments were conducted, the data found is not meant as a conclusion, but only used as a representative data set to create a model process to study the habit discontinuity and measure its impact on the production process of the cottage industry.

The hypothesised graph is as shown below (efficiency vs. time), where the curve before the discontinuity is introduced, shows flow state. The efficiency goes to a minimum just after the point of discontinuity, as the time passes, the artisan gets accustomed with this new process and starts getting back into a flow state.



There are two ways to calculate efficiency of a handloom artisan. First, the number of weaves per second can be counted, which is difficult to calculate during conducting the experiment itself. It is easy to calculate the rate of weaves, once the artisan is in a flow state, because it can be an average of the number of weaves over a bigger time interval. For a table loom, the process of weaving is relatively slow. So, it will be easier to count.

Artisanal process -

Warp: lengthwise (vertical) threads
Weft: Threads that go across the Warp, (horizontal threads)
Shed stick: It separates every other warp strand to create an opening where it can be passed through the weft threads.

The process:
Fasten the warp onto the loom
> Prepare the weft yarn
> Insert the shed stick into the warp thread
> Create a basic weaving pattern
> Push the each new row of the weft thread down
> Maintain even tension

> Leave a few inches of unwoven warp at the end, which can be sewn and/or tucked as required.

The Experiment Design

Requirements and/or apparatus:
Single channel EEG machine, EEG reader app, Screen recorder app, sanitizer, etc.

Procedure:
1) Sterilise the anodes of the EEG machine and put the EEG machine on the head of the subject (artisan), ensuring the anodes are on the forehead. Note down the initial body language and/or reaction of the subject.
2) Setup for the EEG graph reading: Connect the EEG machine with the EEG reader app, simultaneously, start recording the screen and start the EEG data collection.
3) Instruct the subject (artisan) to start working on their craft practice. Once the subject is in a state of flow, observe the patterns of the concentration graph according to the activity being done. Note down the distractions, events or changes in the process, during the workflow.

Finding and Discussion

Observations:

Test 1

Subject: Hanumanthappa

The subject was doing the task of weaving during the experiments as can be seen below. The task comprised of actions such as -

1) Arranging the twills for specific weaving,
2) Moving the shuttle through the warps for making wefts.
3) Using the harness to compress the wefts.
4) Releasing the twills, and changing them for the next weave.

This can be considered as one cycle. The concentration graph during weaving was observed, and was correlated with the action that was going on at that moment.

Fig. 1, The graph in red is representative of the concentration of the subject. We can see that, when the task starts, the concentration is going from low to high continuously, which shows that he is not in the flow state.

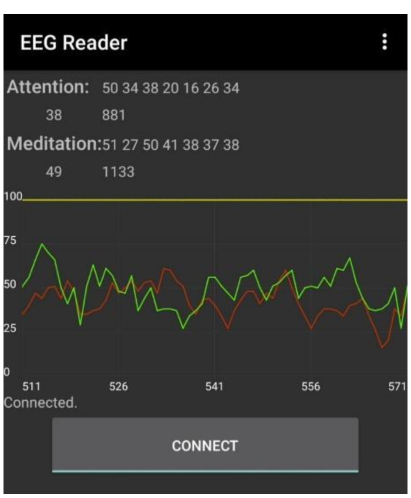


Fig. 2, It was observed that the task of deciding the twills was a tough one so, there was a sudden dip when the previous twills were released and spikes were seen before the next twills were pulled.

Fig. 3, This is the concentration graph when the task was going on for almost 6-7 minutes, so the subject was in a flow state which can be seen from the very small variation in the highs and lows of concentration.

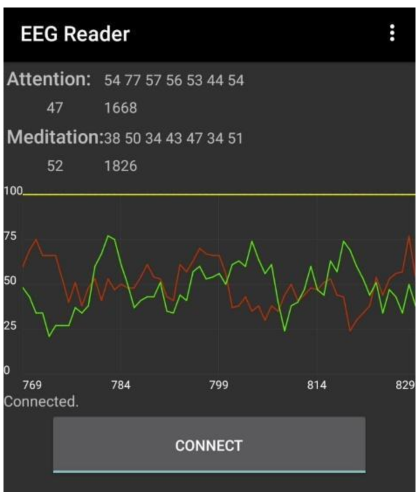


Fig.4, This image was taken when the artisan was asked to change the pattern he was weaving and a different combination of twills needed to be pulled. So, we can see that the variation in the troughs and peaks is now more than the variation during the flow state but still less than the initial variation when the task had just started.

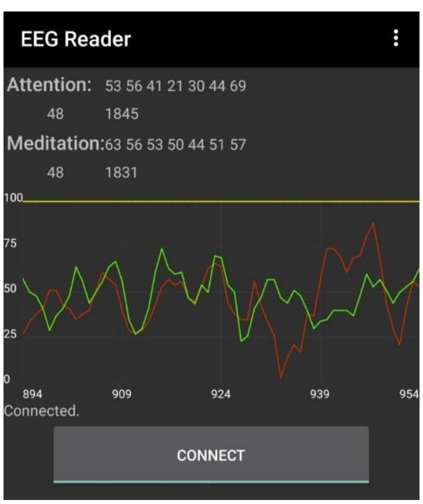


Fig. 5, This was the image of the reader when the task was finished. We can see the concentration went to the lowest trough when the task was concluded and went to almost the maximum when the subject had stopped completely.

1) It was seen that; the concentration was minimum when the twills were released, and increased to the local maximum when the artisan wanted to change the twills for the next weave. The concentration reduced for the moving of the shuttle through the warps, and went to a lower peak and reduced to the local minimum for the next action, which was, releasing the twills.

2) The difference between peak concentration and lowest concentration during the initial phase when the task started, was more than the difference observed in the later phases of the process. This infers that after the initial phase the artisan got into a flow and was distracted less when a discontinuity occurred.

3) The discontinuity was introduced when the flow state was observed during the first task, before that, in the flow state the difference between heights of troughs and peaks was low. After the discontinuity was introduced, in the form of giving the task of weaving new patterns, it disturbed the initial flow state, which can be seen through the increased height difference of the troughs and peaks in this stage, then after a while we can see the difference starts to decrease again and reaches almost to a constant gap, and we can conclude that a flow state is achieved.

4) The concentration reached a global minimum just before the process was stopped and went to global maximum as the process was completely stopped.

Test 2

Subject: Chandrashekhar

Activities	Time interval (min)	Data no. (sec)	Remarks on concentration curve
Work started	00:32	0 - 63	Dip then rise
Thread change	1:35 - 2:33	63 - 122	High concentration
Spooling	3:36 - 4:04	184 - 212	Rise and dip
Measuring the weft	4:33	240	Not much change

length			observed
Shuttle change for thread change	4:53 - 5:19	262 - 288	Rise - dip
Checking thread	5:44	312	Not much change
Shuttle change	6:30- 7:00	359 - 389	Rise then dip and no change
Spooling	8:00 - 8:20	449 - 469	Not much change
Thread change and spoken with us	9:09 - 9:25	519-536	Not much change
Spool	9:55	564	Dip
Thread broken	10:30 - 11:10	598 - 638	Dip then Rise
Thread broke	11:25 - 12:40	654 - 729	Little rise and then more rise
Thread removed and spooled	13:40 - 14:10	789 - 818	Rise and dip then rise again
Shuttle Check	14:22	831	High concentration
Shuttle Change	14:55 - 15:20	864	Little dip then normal rise
Thread cut	16:28	958	No change
spooling	16:40 - 16:55	969	Dip
Stopped to find a thread reel	18:00 - 18:25	999 - 1024	Rise and dip then rise
Stopped to reconnect the reed	19:08 - 19:53	1966 - 1163	Low concentration
Shuttle change	20:10 - stoppage	1179 -1206	Slight rise and then low concentration

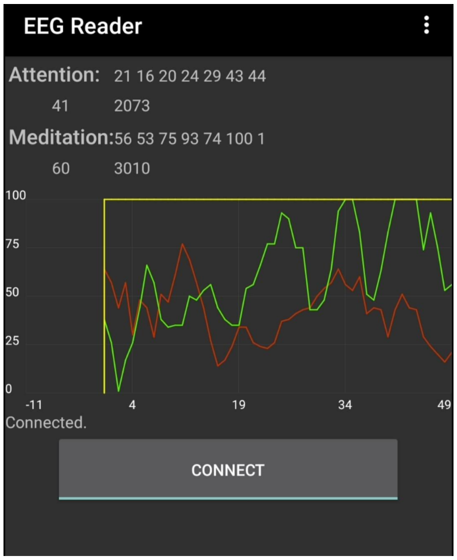


Fig. 6, Since, the second artisan was working on the production, he was working quite fast and was involved in multiple simultaneous processes, so it was tough to observe and correlate the dips and rises of the concentration curve with the corresponding action. Although, the points which were observed, at different instances showed requirements of high concentration for the tasks being performed.

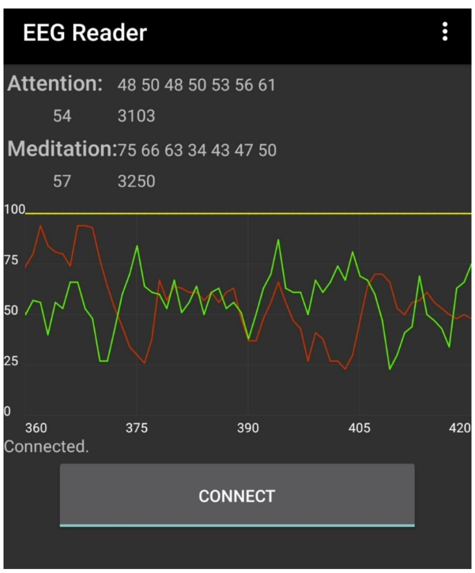


Fig. 7, The flow state in the case of Artisan 2, looked very different from the flow state of Artisan 1, the reason can be that since the artisan has a more complex workflow, there are more peaks and troughs in the graphs.

So, we decided to focus on the data collected from artisan 1 (Hanumanthappa) who worked on a Table loom.

Conclusion

After investigating the work process of multiple handloom artisans, we found that by changing certain aspects of the regular process of these artisans, a discontinuity was formed and there was a decrease in the efficiency of their process but, overtime the efficiency increases, as the artisan becomes familiar with and gets used to this new process. As justified by the theoretical model we proposed where the efficiency vs. time graph follows the same pattern.

Practical Implications

Through our findings, we can say that, after studying and understanding a particular artisanal process, one can bring in appropriate interventions and use the model we have developed to optimise the integration of said inventions and in turn, make that artisanal process more efficient.

Scope of Future research

Since we only had time to test our hypothesis on a single kind of artisanal process (weaving), the data we have gathered is very contextual. In order to further validate this hypothesis, more experiments need to be conducted with more varied interventions and on different kinds of artisanal processes as well.

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Appendix