

BEYOND ETHNIC FOOTWEAR: ACTION RESEARCH GENERATING NEW EDUCATIONAL INSIGHTS ON DESIGN PROCESSES

Catherine WILLEMS¹, Dirk VAN GOGH^{1,2} and Hendrik PINXTEN³

¹University College Ghent, School of Arts, Ghent, Belgium

²Artesis University College Antwerp, Product Development, Antwerp, Belgium

³Ghent University, Belgium

ABSTRACT

The paper explores the use of indigenous knowledge – in this case the knowledge on two types of ethnic footwear - in combination with a more abstract design model – “integration-ideation model” - to improve idea generation for design students. We report on fieldwork done in South India and in Northern Finland. After explaining the input – the abstract “i-ideation model” and the two concrete cases - we report on a practice-based exercise with students at the Fashion Department of the School of Arts in Ghent. Through the student exercise, we investigated the improvement of idea generation during the design process when using the input. The strength lies in combining the abstract model with the concrete cases in which the comparative aspect is of main importance. We demonstrate how a frame, we can best identify as a “Unity in Diversity Frame”, came into existence and how it can contribute to design education.

Keywords: Culture and knowledge, comparative design practice, design education, footwear, biomechanics

1 INTRODUCTION

The paper explores the use of indigenous knowledge – in this case based on two types of ethnic footwear - in combination with a more abstract design model – the i-ideation model [1] – to improve idea generation for design students. As a part of a larger study on ethnic footwear¹ we are studying the creation process and the use of two types of ethnic footwear. The human foot is the first point of contact between the body and the external environment, and it is ideally positioned to provide information about gait patterns in a certain environment and on the footwear designed to walk in this environment.

In the first part of this paper we report on fieldwork in the South of India and in the North of Finland to gain insight in the artisanal practice of creating footwear and in the patterns of walking. In winter, the inhabitants of Northern Finland use ‘Nuvttohat’, fur boots made entirely from reindeer skin. In summer Kolhapur footwear, sandals made entirely from buffalo skin, are regularly used in India. Through action research we investigated the relation between the craftsman, the material and the tools used in their surroundings. We look at the processes of formation starting with the tanning of the raw hides and the properties of the raw material and not with the finished product as is. The results of this research are used as input for a design exercise with fashion student.

Inspired by Tim Ingold [2] we reread creativity “as an ontology that assigns primacy to processes of formation as against their final products, and to flows and transformations of materials as against states of matter ... this is to read creativity ‘forwards’, as an improvisatory joining in with formative processes, rather than ‘backwards’, as an abduction from a finished object to an intention in the mind

¹ ‘Future Footwear’ is a six-year PhD project in the arts funded by the University College Ghent. Two cases on ethnic footwear, one in South India on Kolhapur footwear, one in Northern Europe on Saami boots deliver the necessary data to develop a toolbox for the efficient creation of footwear. The artistic output of this project and thus the main objective is the creation of a collection of contemporary footwear based on the developed toolbox.

of an agent.” The relation with the environment and the natural resources available in the surroundings are in both cases studied of main importance. We consider design as a result of cultural interaction between the subjects and the environment and therefore this should be incorporated in the design models as they are taught in design education.

Taking into account the readings of Kees Dorst [3] we look at the fundamental reasoning pattern behind design. By connecting the ethnographic and biomechanical output of the research with the more abstract “i-ideation model” we develop a frame that can be applied for educating design practice by students in the field of fashion design, studio shoe development.

In the second part of the paper, we report on a practice-based exercise with students of the fashion department at the School of Arts in Ghent. Through the student exercise, we investigated the improvement of idea generation of design processes.

2 METHODS

We describe the methods over two levels. Under 2.1 we give a summary of the methods used to gain insight in the creation process and the use of the two types of ethnic footwear. Under 2.2 we describe the methods used for the design exercise.

2.1 The study of the ethnic footwear, ‘Future Footwear’.

The conceptual framework we use to analyze gait and footwear offers a synthesis between biological and social-cultural aspects of human beings. Both quantitative and qualitative methods of research are used to analyze the data. The set-up of the research is interdisciplinary with input from (a) design sciences, (b) biomechanics and (3) anthropology. The specific methods for the critical ethnography are: interviews with the artisans and other members of the community, action research among the artisans and apprenticeship with the artisans. We use these qualitative methods to gain insight on the skills of making the footwear and the relation the community has with the environment.

For analyzing gait patterns we compare four conditions: (1) walking barefoot on a natural substrate, (2) shod walking on a natural substrate, (3) walking barefoot on a hard substrate and (4) shod walking on a hard substrate. To measure the differences we use (a) plantar pressure recordings (RSscan Footscan), (b) videography of the gait and standardized photography of the footwear, (c) registration of anthropometric variables, (d) surface EMG (electromyography) measuring muscle activity and (e) accelerometry (feet-ground impact). To record the data Biometrics DataLOG is used. DataLOG is a fully portable subject worn programmable Data Acquisition Unit allowing the user to collect data from a wide range of sensors including Biometrics goniometers and EMG sensors.



Figure 1. Biomechanical assessment of, in this example, barefoot walking on a natural substrate. Note the hip-mounted datalogger

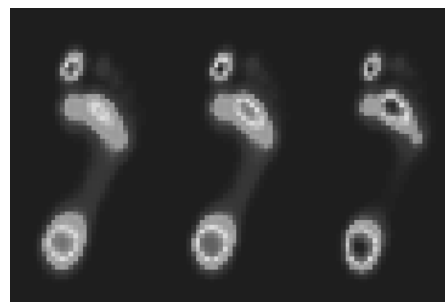


Figure 2. Plantar pressure recordings. Hotter colours indicate relatively higher plantar pressure

2.2 Input for the design exercise

We selected nine students for participation. All students are enrolled as third year bachelor at the Fashion Department of the School of Arts in Ghent. During a first session of four hours an introduction on the “i-ideation model” - which we describe in the next section- and on the fieldwork, is

given. We present the results of the fieldwork of the two cases. The lecture is visually documented with materials, photography and videography. With this input, the students have to redesign the two types of footwear mentioned. After seven sessions of four hours they show their prototype and hand over a written reflection on their work. An atelier to work on the footwear was available. The study was executed between October 2011 and December 2011.

(1) One model

The "integration ideation model", (i-ideation model), leads to the development of new concepts. This model simulates and helps the designer through prototypical, solution typical and behaviour typical characteristics to analyze a product, in this case a shoe, and to re-design it in an innovative way. By linking prototypical with solution-typical characteristics the chance of form renewal increases. By combining solution-typical and behaviour-typical features the renewal of use is encouraged. When combining prototypical with behaviour typical features function innovation is likely to happen.

The added value of this innovation is contained in the countless possibilities for combination between each of these characteristics. This awakens a different appearance, manner of use and function around the archetype of the 'shoe'. After explaining the "i-ideation model" to the students, they were able to rethink, in a more profound manner, the aspects of the conceptual design and to formulate and restructure their thought-renewal. The following section illustrates to what extent this level of understanding of their design activity was increased, and which aspect of the design process was optimized.

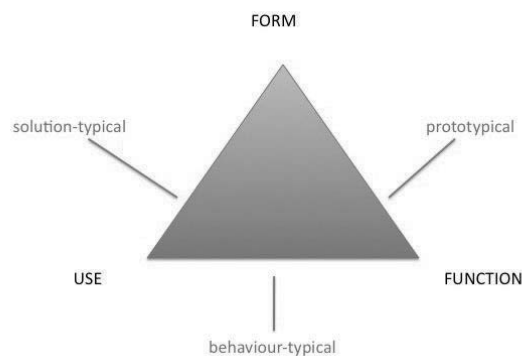


Figure 3. I-ideation model

(2) Action research: Two cases

Beside the more abstract "i-ideation model" we offer the students a full ethnographic report on the action research in all its details, in the two cases. Once more we refer to the anthropologist Tim Ingold who reads creativity forward, emphasizing the continuous trajectory of 'becoming' and not starting from an outcome in the form of an object and tracing it backwards to an idea in the mind of an agent [2]. Because of the length of the reports and the exploratory character of this paper we give a summary of what was described during the introduction lecture and not the full report. We believe that both in the comparison and in the offering of specific information lies the strength to rethink design. This complex makes for differences and for universal aspects along a line we can best identify as 'unity in diversity'[4].

1. Level 1: FORM of the foot

The anatomy of the foot and its universal constraints is discussed. The human foot has a very complex structure, with 26 skeletal elements and numerous ligaments, tendons, intrinsic and extrinsic muscles. The habitual use of footwear from early childhood may influence the shape, and probably the function of the foot^[2]. Traditional Chinese foot binding is an extreme example showing that the human foot is a highly plastic structure, but even everyday footwear influences the foot.

2. Level 2: FORM of the artifact, two product descriptions:

Kolhapur Chappal (sandal with open structure at the back), Northwest India (Figure 4):

- Full leather manually made chappal out of vegetable tanned buffalo hides.
- The vegetable leather is bag tanned with babul bark and myrobalan fruits.
- No nails or synthetic adhesives are used.
- The outsole, insole, upper and heel are sewn with leather threads from the tail of the buffalo.

- The traditional chappal features a leather sole, two side flaps (kanwali), an instep band and a toe strap.
- When new the entire chappal is rather stiff.



Figure 4. Kolhapur chappal

Nuvttohat, Saami Footwear, Northern Finland (Figure 5):

- Full leather manually made boot out of vegetable tanned reindeer hides.
- For the tanning willow bark is used.
- No nails or adhesives are used.
- The sewing of the different pieces is traditionally done with the tendons of the reindeer.
- The lifted nose is traditionally used to connect with the ski.
- The opposite hair direction on the outsole provides a natural anti-slip.
- To close the boot woven laces are used.
- Very flexible outsole.



Figure 5. Nuvttohat, reindeer boots

3. Level 3: USE of the footwear and its particularities in the environment.

Where, why and how do people wear this type of footwear? We described differences in climate and geographical conditions starting by exploring the meaning of ground.

Kolhapur footwear originates from the districts of Karnataka and Maharashtra and is worn all over India. Characteristic of this vegetable tanned leather is the initial stiffness of the outsole. Only the parts touching the ground become less stiff. The other parts retain their stiffness and ensure protection of the foot on the clayish rocky terrain. Traditionally footwear is not used in the house nor in the Hindu temples. The open sandal - no back strap – is a good solution. The people interviewed also claimed that given the heat and the moisture of the climate the bag-tanned leather helps to absorb the heat.

The Saami people in Sápmi mainly wear the nuvttohat during wintertime when the temperature is below -10 C. The Saami, living in the northern parts of Scandinavia and Finland and in the Kola Peninsula (Sápmi), are the only indigenous people in the EU to have their own language, culture, means of livelihood and identity. During interviews, subjects reported preferring these boots to factory-made boots especially at extremely low temperatures. Inside the boot traditionally 'kinkaheina' (dried grass) is used instead of socks because of the good insulation. Woven laces are used to keep the snow out of the boot. The patterns of the laces refer to the different Saami communities, the gender and the use of the boot, e.g. for festivity or for daily work. The same accounts for the chappals, ceremonial footwear is highly decorated and has a thinner outsole. Both cases do not have a heel path in or under the shoe, and still people do not have over pressure on the heel. Preliminary analysis of the data suggests that plantar pressure distribution differ relatively little between barefoot and shod walking. This means that the traditional footwear has little impact on the normal foot biomechanics and can be called minimal footwear 'avant la lettre'. These shoes do not interfere with the natural anatomy of our feet. Several subjects reported less lower back pain when

using their own footwear. Further research is needed to compare injuries when walking with this traditional footwear compared to more supportive footwear.

4. *Level 4: the ART of making footwear, some solution typical characteristics.*

We start from the raw material. The buffalo dies a natural death, the reindeer is slaughtered for the meat and only the legs are used for the shoes. For a single pair of reindeer boots the leg skins of one reindeer are used. In both cases the footwear is handmade and no mass production is possible. In India the footwear industry is followed by the traditional cobbler caste locally known as chamars (lowest caste). The men own the skill for the soles and the women are in charge of the uppers. Between the Saami even today some people believe that it is the job of the women to work with soft materials and thus they own the skill of making the fur boots. The lifted nose - once functional for holding the ski - is disappearing because of the use of snow scooters. This proves that even useful objects have a lifecycle and need to evolve. Patterns are not used, this is only for the novice, e.g. a foreign researcher wanting to learn the skill. The material and the hand have to communicate. They grow together, meaning that form is not imposed on the material. By merging body and tool people develop skills. A skill is learned individually in one's own environment. In this research we go away from the textual perspective and focus on the tacit knowledge. This kind of knowledge, tacit knowledge is learned through applied practice and is often underestimated. However, besides descriptive language there are also expressions, nonverbal knowledge and communication based on practical skills, which again are generated in the practices of locality. Making knowledge is a dynamic process arising directly from the relations that exist between minds, bodies and environments.

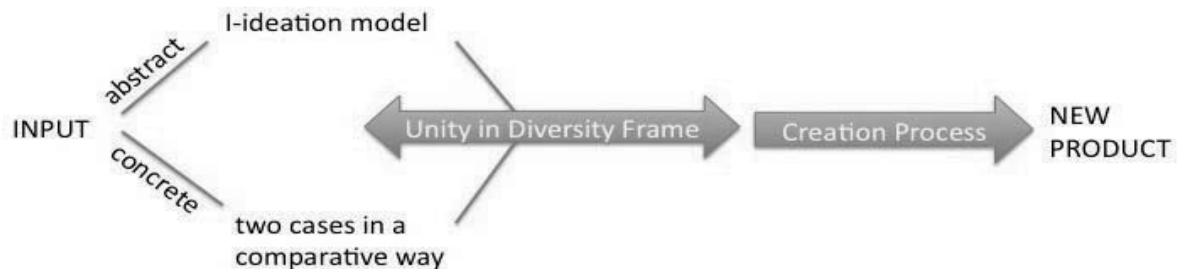


Figure 6. Frame for the exercise

3 RESULTS

With the input (2.2) the students (n=9) redesigned the ethnic shoes and rebuild them for another environment. The students scaled their finished prototypes from 1 to 5 over the given features: behaviour typical, prototypical and solution typical features (1 = no impact, 5 = high impact) and indicated their main inspiration, being the nuvttohat or the Kolhapur chappal or a mixture of the two. The results show that emphasizing - during design processes - the way people walk in connection with the environment, generates more creative ideas towards and a focus on the behaviour typical features (sum = 37), followed by the prototypical features (sum = 26) and by the solution typical features (sum = 23). Each combination having an effect on the use, function and/or the form. We describe three prototypes:



Figure 7. Inspiration: Kolhapur chappal. Main feature: focus on behaviour and solution typical aspect of the shoe



Figure 8. Inspiration: the lifted nose of the nuvttohat. Main feature: focus on behaviour and prototypical aspect of the shoe



Figure 9. Inspiration: nuvttohat. Main feature: focus on solution typical and prototypical aspect of the shoe. Note the different height of the heels

1. **In combining solution typical with behaviour typical features the renewal of use is encouraged, Figure 7.** This Kolhapuri inspired model focuses both on the behaviour (=5) and on the solution (=4) typical aspects of footwear. Not having heel support, the side flaps (kanwali) and the open structure are three aspects of the chappal that inspired the shoe. The shoe refers to a sneaker with a non-permanent heel. The heel part can be removed. An artificial heel is placed under the toes to emphasize the lack of heel pressure, resulting in a change of body posture.
2. **In combining prototypical with behaviour typical features changes in function occurs, Figure 8.** This 'object' changes the gait pattern (behaviour typical aspect = 5) and wants to imitate the difficult walk in the snow by using heavy metals. The model deviates from the usefulness and efficiency of the stereotypical shoe (prototypical aspect = 4). The shoe becomes a sculpture. The used materials are: leather straps, wood and metal.
3. **By linking prototypical with solution typical features form renewal increases, Figure 9.** The functionality and the lightness of the nuvttohat inspired this design. The design is portable for different occasions with a minimum of adjustments. The shoe consists of separate elements (prototypical = 4), not as in a typical shoe, which can be combined, you can easily change (solution = 5) the height of the heel and different uppers are attachable. The used materials are: pliable plywood and bicycle tires.

4 CONCLUSIONS

How people design their footwear and use it is very much connected to the environment. What makes artifacts innovative is where they are situated and will be situated in the future. We propose a design method that respects the locality and improves idea generation of global product design. Putting the comparative action research – a reflective process of problem solving - in an educational context and connecting it with the abstract 'i-ideation' model generates more inspiration and a more accurate way to give feedback on the design exercise.

Through the exercise we demonstrate how indigenous knowledge can be studied in a thorough way, and at the same time can be recognized as genuine and relevant knowledge. The universal frame offered allows at the same time to be particular. Non-obvious aspects are placed against a broader background and are more likely to be used as inspiration. In the exercise we saw a main focus on behaviour typical aspects of the footwear. The connection with the ground and the way people walk in different environments inspired the students the most.

There is an urgent need to establish a more structured code of practice before we can finalize this frame as useful and adoptable in footwear design education. The authors will refine the framework by testing if combining ethnographic input with the 'i-ideation' model stresses the behaviour typical aspects of design. More research is also necessary to check if the frame can benefit design practitioners in other fields.

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