

# DESIGNING FOR USER EXPERIENCE IN NORDIC SKIING

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## **ABSTRACT**

Although the experience is the most important aspect of skiing, sports equipment manufacturers do not seem to take this into account in the development of skiing products. This paper examines how the sports industry can develop better products by focusing specifically on the user experience. Such a focus might lead to better experiences in winter sports. A user survey and a literature review were used as the main research methods. The results of the literature review were compared with the opinions and ideas of skiers. The findings revealed a disparity between the users' and producers' focus. Greater involvement of the user and the inclusion of the user experience in the design process could result in better ski equipment and better experiences. A set of design principles is proposed that can be used in the development of ski equipment.

*Keywords: Experience, user experience, user involvement, sports equipment, Nordic skiing.*

## 1 INTRODUCTION: BETTER EXPERIENCES THROUGH DESIGN

The focus of the sports industry is on performance, and the Olympic motto of *Citius - Altius - Fortius* [1], faster - higher - stronger, seems to direct the product development of many companies. Thus, the equipment they produce is developed with performance in mind rather than user experience. Although ski equipment appears to be designed only for high-performance skiing, people go skiing for other reasons. For many skiers, the experience is the main reason to go skiing, but equipment manufacturers appear to have overlooked this fact. There seems to be a discord between users' needs and the type of skiing equipment produced by manufacturers. This paper examines *how changes in the development of ski equipment can create better cross-country experiences*. The findings provide the foundation for a discussion on the themes of user involvement and cross-country experiences. Although the focus is on cross-country skiing, the findings may be relevant for the development of equipment for other sports and outdoor activities.

## 2 METHODS: LITERATURE REVIEW AND USER SURVEY

### **2.1 Literature: user involvement and experience**

The current literature on experiences and user involvement laid the theoretical foundation for this paper. As new themes emerged, the literature selection was revised to get a deeper understanding of the theory. The literature was assessed to develop a solid foundation for the development of the user survey and to gain a deeper understanding of the cross-country experience. The first step in the literature review was an analysis of key topics related to user involvement in the sport industry. The work of Bråtå et al. [2] provided an important source of information on users' roles in innovation processes in the sports equipment industry. An additional goal of the literature review was to shed light on the cross-country experience and to determine how one can design equipment for better experiences.

### **2.2 User survey: possible ski experiences**

A qualitative user survey [3] was conducted to understand what the skiing experience means for cross-country skiers. The aim was to acquire a deeper understanding of users' needs and wishes and not to find a universal truth that applies to all skiers (i.e. the goal was to answer what the ski experience *could be* rather than what the ski experience *is* at present). Surveys offer a broad but basic overview.

Although surveys can be used to determine the views of large numbers of respondents, they cannot provide the level of depth that is possible in interviews [3]. To determine the experiences sought by as many types of skiers as possible, the survey was distributed online both to active and recreational skiers. Page: 2

To gain insight into users' thoughts on skiing, the survey was made up of open questions. As it was sent out in advance of the ski season, the fact that most users had not been skiing for a while may have affected the answers.

### 2.3 Analysis: concept mapping

A qualitative analysis was conducted to identify similarities and differences between the literature and the results of the user survey. Concept mapping was used to compare and contrast the findings from the literature review and the survey. Concepts from the literature were used to categorise the respondents' experiences in a concept map [4]. The data collection and analysis were carried out in parallel through the research process.

## 3 USER INVOLVEMENT IN THE SPORTS INDUSTRY

According to researchers at the Nordic Innovation Centre, user involvement in the development of sports equipment is often limited to activities where they have little influence on the design process of the product, such as prototype testing and giving feedback on the finished product [2]. Their report notes that the focus of the industry is to develop better, faster, stronger and lighter equipment and not to create the ultimate ski experience. It also notes that the equipment is often developed in cooperation with both professional athletes and amateur users. Figure 1 shows the users' opportunities to influence the different phases of the design process. The possibilities to influence the design are greater early in the design process, but users might find it difficult to participate at this stage because of the complexity of the product.

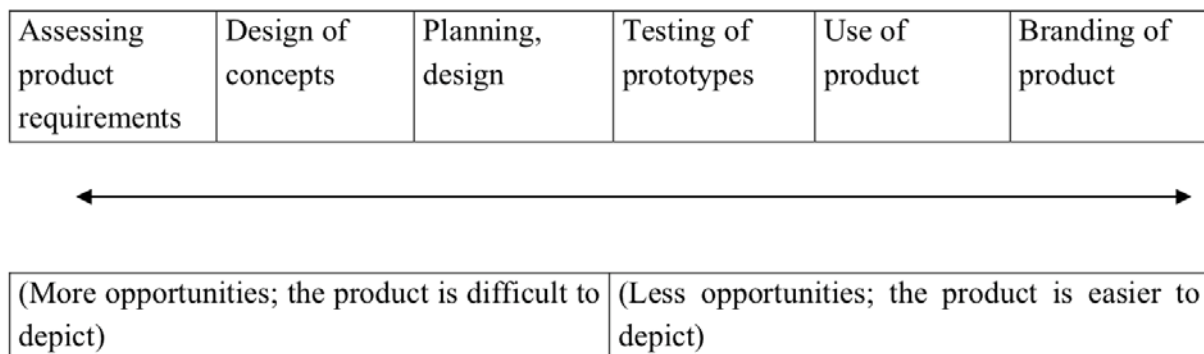


Figure 1. Users' opportunities to affect the innovation process [2]

## 4 EXPERIENCE

The literature on experiences and products often focuses on the experience *of* products [5, 6]. In this study, the experience *with* the products was studied. When skiing, the experience of nature and the experience of skiing are important, not the experience of the skis themselves. The experience consists of several elements, which may overlap. An introduction to some of these elements is presented below.

### 4.1 Flow

The state of *flow* can occur in several activities [7, 8]. When in flow, a person is so immersed in an activity that nothing else matters. In this state, the person does not think about anything else (i.e. not about the time or place or food), and the activity takes over. Flow occurs when the person has found a balance between skills and challenges and results in a strong sense of achievement. Flow occurs in the phenomenon known as the *runner's high* when an athlete has surpassed himself/herself in physical or technical feats [9]. The concept of flow is particularly applicable to cross-country skiers. In Nordic skiing, flow can occur when the skier goes faster or performs better technically than before and when the skier manages not to fall during a difficult descent. To achieve flow, several conditions must be

met. The main conditions are a balance between skills and challenges, concentration and the absence of distractions [7].

## 4.2 Nature experience

In a study of competitive cross-country skiers, Engeset [10] pointed out that flow was an important part of the experience, especially during hard training and competition. The same study found that the experience of nature was also important for the skiers, with several of the skiers who were interviewed describing the feeling of enjoying nature as the major reason why they skied. Mangen [11] looked in more detail at what the nature experience consisted of in a study of nature as a health-promoting arena, noting that it can be seen as a counterweight to the everyday experience. Mangen [11] highlighted the silence, being alone and the feeling of escape from everyday life as reasons why we seek nature experiences.

## 4.3 Designing experiences

Most of the literature on creating experiences focuses on interaction and web design, but many of the principles can be transferred to product design. Forlizzi [12] examined the structure of experiences, noting that a rich experience can be built up by several smaller events or activities. Walter [13] discussed the use of *priming* to create rich experiences. Priming refers to small activities that prepare the user for the main experience. Gulden and Moestue [14] discussed how the experience of products can ensure a product's longevity. Chapman [5] and Norman [6] examined the experience *of* products but said little about experiences *with* products. Another study looked at how the tourism industry used design to provide nature experiences and a form of priming to put users into the right state of mind before a nature experience [15]. However, it may be difficult to transfer methods used by the tourism industry to product design.

# 5 RESULTS OF THE USER SURVEY

The survey provided an understanding of what the ski experience can be for users, and the findings reflected those in the literature. Although the results revealed many recurring themes, the view of the ski experience differed between the respondents.

## 5.1 The skiing experience

Although the desired experience differed between users, some elements recurred in the survey. Concepts from the literature, such as flow and nature experience, were apparent in different ways in the users' replies. Flow and nature experience are presented as separate concepts in the literature. However, among users, they seemed to overlap. The most active skiers seemed to experience the feeling of flow more frequently than less active skiers. The survey also showed that flow can easily be disrupted, for example, by poor weather proving insurmountable (in terms of skills) and small distractions having an adverse effect on concentration. Several users described their skiing as a sort of escape from everyday life. As noted elsewhere, the feeling of leaving the city can be seen as part of the nature experience [11].

# 6 DISCUSSION: USER INVOLVEMENT IN DESIGNING SKI EXPERIENCES

As Figure 1 shows, users can be involved in different stages of the design process. In the traditional design process, which focuses on performance, user involvement is often limited to testing existing products and prototypes. In a more experience-based design process, the user is involved at several stages, both to find out what to produce and how the product should work. User involvement earlier in the design process can lead to better skiing experiences, but early user involvement also requires more structure. Figure 2 shows a concept map [4] of two possible design processes in a sports equipment company where the goal at the top of the figure is designing for performance and at the bottom for experience. The upper part of the figure is based on current trends in the sports industry [2]. The lower part of Figure 2 is based on the results of the survey and concept mapping [4]. It shows a hypothetical design process aimed at creating a better user experience. Users are involved in multiple stages of the design process, and only the company alone does the most technically demanding parts of the process. User involvement early in the design process can provide a greater focus on the users' actual needs but requires that they be included and monitored in the design process. The responses to the survey

indicate that many users are not aware how their ski equipment can affect their skiing. Therefore, it may be difficult for users to envisage what they really want to achieve in the design process.

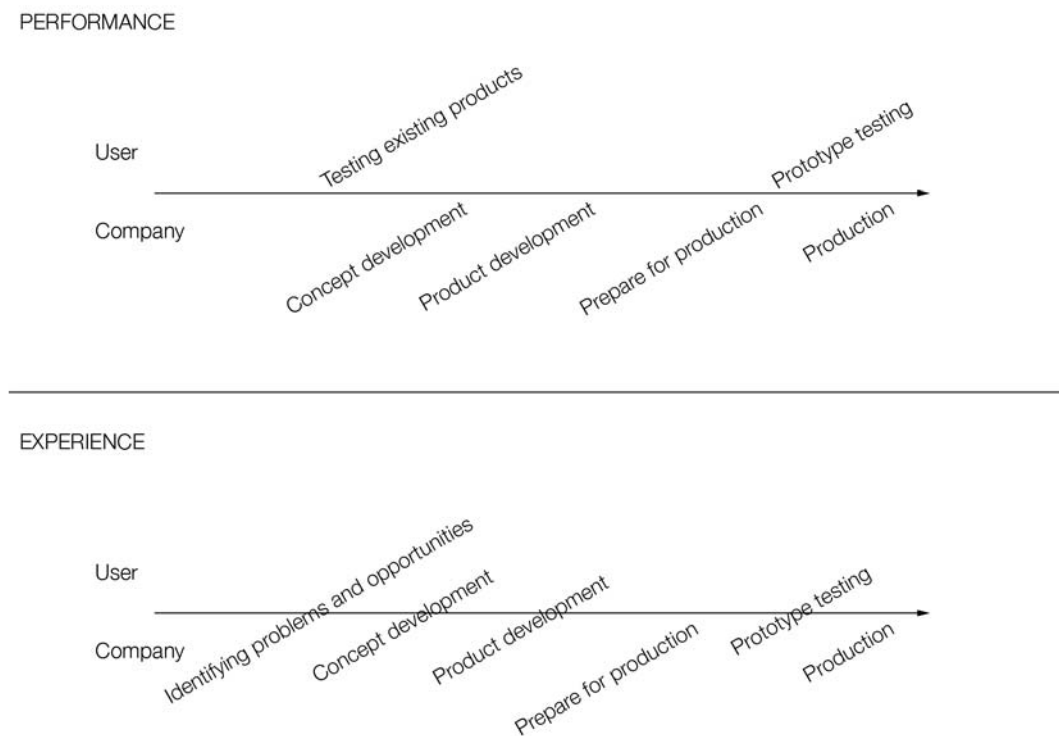


Figure 2. Simplified example of user involvement in two alternative design processes

From the survey, it may seem that the most active skiers are more concerned with finding the feeling of flow and less concerned with the nature experience. The survey was too small for the findings to be statistically significant. However, they suggested that those who primarily use cross-country skiing as a form of training primarily value flow, whereas those who rarely go skiing focus more on the nature experience. However, in a study of cross-country skiers, Engeset [10] reported that the nature experience was important for competitive skiers. Aakre [16] also found that the desire to experience nature explained why some competitive athletes (in this case, professional road cyclists) engaged in sports. Therefore, focusing on the experience of nature may be useful when designing equipment that will be used primarily by competitive skiers.

## 6.1 Factors affecting the skiing experience

Many factors influence the skiing experience, and not all are under the control of the skier or the designer. In the survey, some of the respondents highlighted factors that cannot be influenced, such as the weather, skiing conditions and environment. Although these factors cannot be controlled, skiers can always adapt to the conditions. A good jacket cannot decrease the wind, but it prevents the wearer from becoming cold while skiing. Similarly, under sub-optimal conditions, the right ski waxes can improve the skiing experience. In sum, we cannot control the weather and snow conditions, but we can ameliorate their effects with appropriate equipment and clothes. Developing better clothes, skis and ski waxes means that we can have good skiing under conditions that previously would have led to poor experiences. Although it may sometimes be difficult to provide good ski experiences, improving the individual elements involved in the experience can help to aid flow among skiers.

## 6.2 Design principles

This research on user involvement in the design process and skiing experiences identified potential design principles for use during the development of sports equipment. The proposed design principles are outlined below:

- Move the focus from performance to experience,
- Include the user throughout the design process,
- Design for the *whole* skiing experience,

- Use the steps leading to the main experience as priming,
- Remove distractions,
- Make the equipment as simple and functional as possible,
- Allow users to adapt the equipment to their needs.

The proposed set of principles is intended as an addition to existing corporate design principles. The use of the design principles can lead to better user experiences, which, in turn, can lead to extended product longevity and help tie consumers to a specific manufacturer [14].

### 6.3 Potential solutions and applications

The design principles invert the traditional design process in the sports industry by encouraging manufacturers to develop equipment with a focus on the experience. Gulden and Moestue [14] described how natural conditions can ruin a cross-country experience and how design can ameliorate the effect of these conditions: Some users avoid skiing when conditions require klister (liquid ski wax for wet conditions) because the wax is sticky and difficult to handle. With a new concept for klister packaging, the user avoids contact with the sticky paste and can go out skiing even in difficult waxing conditions [14]. One does not need to redesign the actual ski equipment to make the skiing experience better. Designing for the activities before the ski trip can affect the user experience. The skiing experience can be greatly improved by priming [13]. Priming activities can include ski waxing, transportation to the ski piste and the attachment of skis and poles. From the aforementioned, it is clear that design for better cross-country adventures need not revolve only around creating better cross-country equipment.

## 7 CONCLUSION: DESIGNING FOR EXPERIENCE AND PERFORMANCE

Manufacturers already involve users in the design process, but they could create better cross-country experiences by involving users in several stages of development. It can be difficult to involve users in the early stages of the process, before product development is underway. However, including users early in the process may result in the creation of products that are better suited to users' needs. Experiences with products are difficult to create because the experience is user specific. Although determining the components of a good experience may be challenging, the design principles described herein can help to facilitate better experiences in winter sports. The industry should concentrate more on the user experience but not at the expense of performance. High-performance equipment can improve all users' skiing. Equipment manufacturers design what users want, but perhaps not what users need.

## REFERENCES

- [1] Olympic Charter: In Force as from 9 September 2013. Lausanne: International Olympic Committee; 2013.
- [2] Bråtå H. O., Hagen S. E., Hauge A., Kotro T., Orrenmaa M., Power D., et al. *Users' role in innovation processes in the sports equipment industry: experiences and lessons*. Oslo: Nordic Innovation Centre; 2009.
- [3] Lazar J., Feng J. H. and Hochheiser H., *Research methods in human-computer interaction*. Chichester: John Wiley; 2010.
- [4] Maxwell J. A., *Qualitative research design: an interactive approach*. 2nd ed. Thousand Oaks: Sage Publications; 2005.
- [5] Chapman J., *Emotionally durable design: objects, experiences and empathy*. London: Earthscan; 2005.
- [6] Norman D. A., *Emotional design: why we love (or hate) everyday things*. New York: Basic Books; 2004.
- [7] Csikszentmihalyi M., *Flow: the psychology of optimal experience*. New York: HarperPerennial; 1990.
- [8] Jackson S. and Csikszentmihalyi M., *Flow in Sports: The keys to optimal experiences and performances*. Champaign: Human Kinetics; 1999.
- [9] Charbonneau R., *Chasing the Runner's High: My Sixty Million-Step Program*. Scotts Valley: CreateSpace Publishing; 2010.

- [10] Engeset B., *Hvordan er det å være langrennsløper?: en fenomenologisk undersøkelse av langrennsopplevelser [How is it to be a cross country skier?: A phenomenological study of skiing experiences]*. Bø: Høgskolen i Telemark; 2013.
- [11] Mangen H. A., *Naturen kaller: Marka som helsefremmende arena [Nature calls; Nature as a health promoting arena]* Universitetet i Oslo; 2014.
- [12] Forlizzi J. L., *Designing for Experience: An Approach to Human Centered Design*: Carnegie Mellon University; 1997.
- [13] Walter A., *Designing for Emotion*. New York: A Book Apart; 2011.
- [14] Gulden T. and Mostue C., *Contexts of Experience - a psychology-based design tool, towards sustainable consumption through extending the product lifetime*. 2011.
- [15] Christoffersen G. H., *Opplevelsesdesign og verdiskaping: med fokus på kundens perspektiv [Experience design and value creation: focusing on the customer's perspective]*. Bodø: Universitetet i Nordland; 2013.
- [16] Aakre A., *Sykkelrytteren [The cyclist]*: Harvest; 2013 [cited 2014]. Available from: <http://www.harvest.as/artikkel/sykkelrytteren>.