

**Research at the Section of Craft Science and Textiles**  
**Teacher Education at the University of Helsinki**

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Front page: Fisherman's glove made of horsehair, the Collection of Textiles, Clothing and  
Craft Design, University of Helsinki

# 1 Craft science

## 1.1 The background of craft science

Research in the fields of craft and craft science dates back to the mid-seventies. The development of this field is thus relatively recent and several major lines of theory development cannot yet be distinguished.

The roots of craft science are in the education of teachers of textiles, clothing and craft design. Education in craft began in 1886, when the Helsinki Craft School (Helsingin käsityökoulu), which had been founded five years earlier, created a new department, that of teacher education. Textiles, clothing and craft design teachers received a college-level education until 1975, when the institute became incorporated into the Section of Textiles, Clothing and Craft Design at the University of Helsinki. The key turning points in craft science and textiles teacher education are annexed to this paper. (Annexe 1)

Upon integration of the teacher education program into the University of Helsinki, a professorship was founded in pedagogical research of textile crafts. In 1982, a further professorship was established in textiles, clothing and craft design, with its teaching field defined as being comprised of designing and making-up processes of textile products. When founding the professorship of textiles, clothing and craft design, there were discussions about other names for this scientific field, and most of all about the definition of the object of research for this new discipline. The possibility to concentrate, even in teacher education, on research questions arising from the subject content was particularly highlighted. The decision taken in Finland to establish a professorship in this field was internationally a precursor, since no comparable academic discipline or professorship exists elsewhere.

In 1989, Dr. Pirkko Anttila was nominated the first permanent professor in textiles, clothing and craft design. Professor Anttila has developed a theoretical basis for the field and a terminology that enables observation of the designing and making-up processes of craft products as well as their use. The main focus in her work is the formation of a theoretical model for the designing and making-up processes and the evolution of this model towards a basis for research methodology. In Anttila's model, of key significance are the physical and psychological resources and restrictions of human action—those of the product's creator(s).<sup>1</sup>

According to Pirkko Anttila, textiles, clothing and craft design has developed into a large and multidisciplinary research field whose central objective is the research of craft activities and their results. This is why the name proposed in 1990 for this field was **craft science**, which does not restrict the research object to a certain material or technique, rather refers to any materials and techniques that the optimal creation of products demand. In 1992, the change of the name to craft science was realized, although the definition of the teaching field of the professorship at the University of

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<sup>1</sup> Anttila, P. 1993. *Käsityön ja muotoilun teoreettiset perusteet* (The theoretical foundations of craft and design). Porvoo: WSOY.

Anttila, P. 1996. *Tutkimisen taito ja tiedonhankinta: Taito-, taide- ja muotoilualojen tutkimuksen työvälineet* (The art of research and acquisition of information: Research tools in the fields of skill, art and design). Helsinki: Akatiimi.

Helsinki remained unchanged. As a result of this change, craft science can be seen as an umbrella for the research community involved in the design, production and use of products in different fields.

Following Pirkko Anttila, Dr. Ulla Suojanen was nominated professor in craft science in 1996. Professor Suojanen's special interests are the environmental effects of textile products and the development of entrepreneurial activities as well as action research in the development of craft process.

The publication of doctoral theses is important for the progress of a discipline. The first to complete a thesis in craft science was Minna Uotila, whose 1994 thesis *Pukeutumisen kuva (Image of clothing)* was a step towards a theoretical analysis of the ideology and philosophy of product design both from the designer's and the user's point of view. Minna Uotila's thesis and her later works have enlarged craft science's theoretical basis towards phenomenology and media philosophy.

In 1995, Leena Kaukinen published her doctoral thesis *Elongation Behaviour of Elastic Stitch Types in Household Sewing Machine – Stretch-Stitches versus Serger Overlock Stitches*, which dealt with the development of household sergers and sewing technology to improve the quality of textile products.

Marketta Luutonen's thesis *Kansanomainen tuote merkityksenkantajana – Tutkimus suomalaisesta villapaidasta (Rustic product as a conveyor of meaning – A study of Finnish pullovers)* came out in 1997. Her study developed a terminology permitting the analysis of craft products as a part and expression of culture.

In 1998, Ritva Koskennurmi-Sivonen completed her doctoral thesis. Her multimethodological thesis, *Creating a Unique Dress – A Study of Riitta Immonen's Creations in the Finnish Fashion House Tradition*, dealt with the career of a Finnish fashion artist and with the creation processes and products of a Finnish fashion house, both from the makers' and the users' points of view.

Now, at the end of the 1990s, there is a trend in craft science towards a new line of cognitive research connected with user-centered aspects of design. Other points of interest are products seen as expressions of contemporary culture and history, and the values of their designers and users. The objective is to create models and concepts in order to better describe and understand product designers' and users' activities. This provides information that can help the creation of the material environment to become more user-friendly.

## 1.2 Craft science's object of research

Research in craft science deals with the human being's relationship with his/her surroundings and with the modeling of the living environment.

Different aspects of investigation include:

- designing and making-up processes of craft products
- material and immaterial products
- relationship between processes, tools, products, human beings, and culture
- human being as producer and experiencer of the material world

Products have been created through designing and making-up processes and their production method has influenced the result. Material products are, in general, concrete, tangible objects; whereas immaterial products can be sensations, experiences or learning. Processes and products both reflect and create culture. The essence of craft science research is that the phenomena that constitute the objects of research are related to human beings'—designers', makers', users' or observers'—reality. Research in craft science can touch upon all of these dimensions, though it generally focuses on one of them.

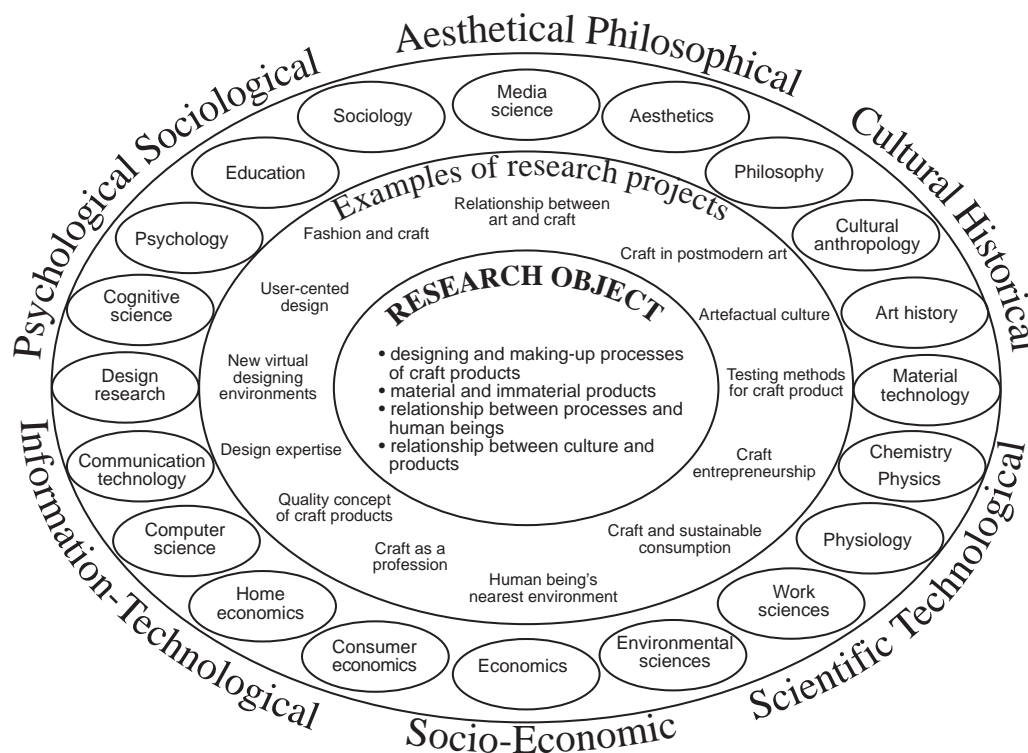


Figure 1. Craft science's research objects, projects and related disciplines

### 1.3 The paradigm of craft science

Craft science is an independent scientific field in the Department of Home Economics and Craft Science, where pedagogical research of crafts, home economics and pedagogy of home economics are also represented. The Section of Craft Science and Textiles Teacher Education in Helsinki is the largest in our country, representing a great variety of expertise in craft science and related knowledge from other disciplines. Postgraduate degrees are also available. In this paper, craft science and

the pedagogical research of craft are treated separately, as they are independent fields of research.

To define the craft science paradigm, one has to pass to an upper conceptual level in scientific theorization; to constitute the basic terminology and derive structures and laws on the basis of the findings of completed studies. Alongside theorization, it is necessary for a researcher to have craft skills in order to master substance and to maintain hands-on contact with the object of research. In addition, craft science needs the results of other sciences to support its theoretical and methodical development. Yet the support of other sciences is not sufficient for explaining the craft phenomenon, the entity formed by the creation and use of artifacts. The development of concepts and theories specific to this area is needed.

Craft is seen as an interaction between an acting human being and the object of the action, the visual-aesthetic environment. The research object of craft science covers all different fields and forms of craft: the research can focus on the craftsman, the designing and making-up processes of products, or the products themselves from a psychological, social, cultural, economic or technological point of view. Craft can be a form of self-expression of its author and its result can be the expression of an artistic intention. Craft science's paradigm is situated in the intersection of science, art and technology.

#### **1.4 The multidisciplinary character of craft research**

The strength of research in craft science is in its multidisciplinary character. Research belonging to the field of craft science combines, for example, art history, philosophy, aesthetics, semiotics, cognitive sciences, psychology, technology and economics with the craft phenomenon, and in addition to this, craft science also has a link to craft skills. The objective is to create large projects in basic research and to develop research programs.

The multidisciplinary approach targets the theoretical and methodological development of craft science. The variety of studies in craft science need support from other sciences. The starting point is often situated in human sciences: the psychological, social, cultural-historical and socio-economic dimensions to human action. Some studies of craft science approach natural sciences and technology. A multidisciplinary theory may be based on the following disciplines: psychology, cognitive science, socio-psychology, aesthetics, philosophy, design research, communications research, media sciences (information and communication technologies), art history, ethnology, cultural anthropology, feminist research, sociology, economics, consumer economics, environmental sciences, work sciences, physiology, home technology, chemistry, physics, information technology and computer science.

Craft science, as an inter- and multidisciplinary field, takes as one of its starting points the importance of scientific borderlines being continually reduced, as research becomes more and more problem-oriented. This orientation has been described in international discussion, for example, by Gibbons in his work *The New Production of*

*Knowledge*.<sup>2</sup> The Finnish Academy's Committee for Cultural and Social Research, in a parallel direction, puts forth in its report evaluating the state of Finnish research *State and level of Finnish science: cultural and social research* that this development is not only necessary but also desirable.

## 2 Principles of the development of research in craft science

### 2.1 Theoretical and methodological development of craft science

The central instrument for the development of theory and methodology is the theoretical model of designing and making-up processes of craft products, created in Pirkko Anttila's research. The process model describes craft process and its different stages.<sup>3</sup> Empirical applications of the model in describing and analyzing different designing and making-up processes have revealed its usefulness in defining the essential features of designing and production. An important challenge for the theoretical development of craft design is the further development of the theoretical model. In recent discussion, an important focus has been the need to describe the use of products and to find conceptual instruments for translating user experiences into design language and new designs.

A second central area is research of the expertise related to design and production. The cognitive processes involved in designing have been analyzed in craft science. By analyzing the essence of expertise, it is also possible to create pedagogical methods for teaching the required skills to beginners.

Craft as a hobby and the people engaged in it form an important research area. From this point of view, the importance of action, skills and products is emphasized in the construction of identity and as a tool for self-expression. Craft may also be a form of therapy in the process of re-establishing contact with the social community and activity. Craft science research aims to develop models for analyzing experiences and sensations related to these processes.

In craft science, research material often consists of concrete material objects and products. The interpretation and understanding of the characteristics and meanings of these craft products have required the creation of new methods of analysis. In many craft science studies, the Peirce model of three ontological categories<sup>4</sup> has been applied to the observation of product characteristics and meanings. This model enables the analysis of the relationship between human being and object, based upon the level of consciousness and the experience of the observer. The Peirce model enables the combination of human experience and the human being's relationship with the product to form part of the analysis, according to the basic objectives of

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<sup>2</sup> Gibbons, M. 1994. *The new production of knowledge: the dynamics of science and research in contemporary societies*. London: Sage.

<sup>3</sup> Anttila, P. 1993. *Käsityön ja muotoilun teoreettiset perusteet* (The theoretical foundations of craft and design. Porvoo: WSOY.

<sup>4</sup> Peirce, C. S. 1931. *Collected papers of Charles Sanders Peirce. Vol. 1-2. Principles of philosophy*. (Eds. Hartshorne, C. and Weiss, P.) Cambridge, MA: Harvard University Press.

craft science. Methodological development is still needed in analyzing the visual and tactile characteristics of products.

Craft products' material and non-material characteristics are closely related. Their inseparability is reflected, for instance, in the concept of aesthetics. Aesthetic qualities depend on material form, structure and the method of production as well as on the cultural perception of these material characteristics. For research purposes, however, products' characteristics are often limited and their observation is conducted by different methods. Material characteristics of products are more easily described by measuring methods, whereas non-material characteristics are most often investigated by interpretative methods. Product research may also focus on the maker's or user's point of view, or both. Figure 2 represents a situation where the maker is a different person from the user, but where the maker and the user have a connection, as is usually the case with commissioned work. On the other hand, the maker and the user can be the same person, as is often the case in craft as a hobby; or the maker and the user may have no direct connection, as when marketing ready-made products.

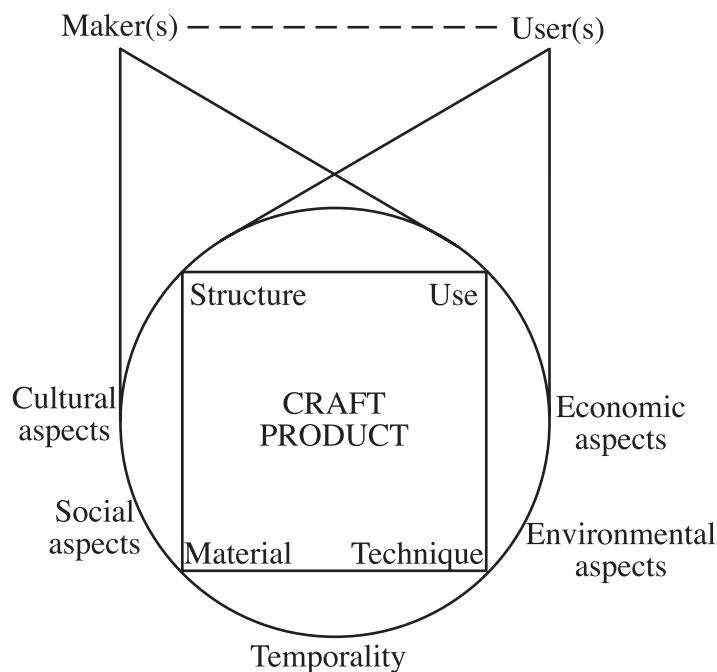


Figure 2. A craft product from the maker's and user's point of view.

In developing methodological instruments, a central question is what research methodology is needed for investigating the maker's and the user's tacit knowledge. The maker's tacit knowledge has been accessed when the researcher has participated in a collaborative process with her research object. Craft science has also applied a thinking-aloud method and qualitative contents analysis to take into consideration the special characteristics of craft design. Design analysis and problem solving are central areas of craft science.

## Relationship between research and teaching, and the development of expertise

A central target of university education and research is to create an academic community characterized by a discussing, argumentative, explicative and interactive culture of skills and knowledge. Scientific reflection and research results are transmitted to the surrounding society through teaching. Craft science is closely related to teacher education but can also serve society on a large scale. Craft research is beginning to develop new points of view in the designing and making-up processes of products. It is oriented towards the cognitive processes of designing, conditions of user-centered design, craft technology, and support to expertise by means of information and communication technologies. Craft research is interested in the relationships between art, craft and design, and craft as a profession and an economic activity.

Teaching and learning in craft science and teacher education is problem-based; it activates reflection and questioning of different phenomena. An important is the interactive relationship between construction of knowledge related to practical processes and scientific reflection. Teaching is based on research, which is in close contact with doing. One can speak about the dialectics and trinity of doing, researching and teaching.



Figure 3. Progressive inquiry and distributed expertise (Hakkarainen 1999)<sup>5</sup>

<sup>5</sup> Hakkarainen, K., Lonka, K. & Lipponen, L. (1999 in press). *Tutkiva oppiminen. Älyttään tiedon rajat ja niiden ylittäminen*. (Progressive Inquiry: The Limits of Intelligent Action and Beyond Them) Helsinki: WSOY.



Teaching craft science should be based on research from the basic courses onwards. According to the idea of apprenticeship, the student is from the very beginning taken into an expert culture. The contents are approached in a problem-based way. The students solve minor research problems by looking for theoretical approaches to describe the research object. Problem solving is supported by new generation learning environments based on collaboration, which enable the follow-up of the process development of problem solving and the realization of interaction between members of the learning community. In an interactive learning environment, there is no single authority or source of intellectual input, instead everybody participates in the construction of knowledge.

In both craft science and educational science, the study programs are constructed in such a way that a research approach is present throughout the studies. In craft science, the entities for basic and intermediate subject studies are divided according to the contents of 1) the basics of craft science, 2) studies on designing and making-up of craft products and 3) the basics of craft research. In advanced studies, the above-mentioned content areas are completed with project studies and a Master's thesis. In educational science, the basic, intermediate and advanced studies are divided according to their content into 1) the basics of education and learning, 2) the practice of education and learning and 3) the research of education and learning. Craft science and pedagogical studies go hand in hand throughout the studies. This supports the progression towards becoming a teacher.<sup>6</sup>

In the constitution of craft science's profile in the field of education, it has been important to clarify the relationship between the university and polytechnic education in craft and design. The experimental programme realized in 1990-1998 in craft science has shown that education and research collaboration between university and polytechnic could work. So far there are about 60 students who have graduated with a Master's degree in this programme, two of whom have gone on to complete a Licentiate degree. According to student feedback, craft science builds a scientific foundation and an analytic approach applicable to the whole field of craft and industrial arts; as well-suited for professional needs as for teaching.<sup>7</sup>

## 2.2 Publishing fora in craft science

Although Finnish and international publishing channels for craft science studies do exist, they are rather limited with regard to specialization or related sciences. At the moment, there is no guarantee that all research in craft science will have a suitable

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<sup>6</sup> The two above paragraphs are written by Helena Laurila and they are included in the memorandum *Käsityönopettajien koulutus Helsingin yliopistossa* (Craft science and Textiles Teachers Education at the University of Helsinki), 30.4.1999.

<sup>7</sup> Kaipainen, M. (ed.) 1999. *Käsityöalan kokeilukoulutusohjelman raportti. Käsi- ja taideteollisuusalan yhteistoimintakokeilu 1990-1998*. (Report on the experimental programme in the craft field. Collaborative experiment between craft design and industrial arts 1990-1998.) University of Helsinki, Department of Home Economics and Craft Science. Report # 1.

periodical or publication series based on referee practice. An immediate target in research policy is to actively pursue the foundation of such a series of publications having an international referee practice that would be common to the faculty of education. The series should be open to all research conducted in the department, regardless of what specialization scientific publishers and organizations represent.

### **3 Research projects at the Section of Craft Science and Textile Teacher Education**

Research in craft science centers around the development of a theoretical foundation or concrete processes and products. The object of research can be craft as a hobby or as a profession, as a part of the economy, or as a part of human life in general. Most often research is focused on one of the dimensions of craft science's research object, while simultaneously touching upon other dimensions. Current projects in craft science research are based on the themes of completed Master's, Licentiate and Doctoral theses. Some of these theses are related to the projects of researchers and teaching personnel. Current research projects can be divided into groups as follows: 1. the development of a theoretical basis for craft science and the pedagogical research of craft, 2. the development of designing and learning environments and 3. craft as a profession and craft in the media:

#### **1. The development of a theoretical basis for craft science and the pedagogical research of craft**

Theoretical development of craft science (Marketta Luutonen)

Multidisciplinarity and hermeneutics (Jussi T. Koski)

The Department of Home Economics and Craft Science as an expert community (Jussi T. Koski)

The quality concept for textile products from the point of view of the consumer (Marja Anttila)

#### **2. The development of designing and learning environments**

Design, cognition and new information technology (Pirita Seitamaa-Hakkarainen)

Cognitive process of design (Pirita Seitamaa-Hakkarainen)

Development of a learning environment for pattern drafting and design (Kirsti Salo-Mattila)

Experiential clothing design (Pirkko Ahoniemi)

#### **3. Craft as a profession and craft in the media**

Craft as a profession (Marketta Luutonen)

Fashion and craft in Finland (Ritva Koskennurmi-Sivonen)

Relationship between art and craft (Kirsti Salo-Mattila)

Dress advice and consultation given by the press (Päivi Aikasalo)

## **4 The pedagogical research of craft**

Pedagogical research conducted at the Section of Craft Science and Textiles Teacher Education reflects the general scientific structure of educational science. The following fields of research can be highlighted:

- educational philosophy
- history of education
- research methodology
- individual and group learning processes
- functioning of educational organizations
- teaching plans and curricula
- teaching skills
- modern learning environments

Current projects in pedagogical craft research are oriented specially towards the following research themes:

- craft teacher's pedagogical reflection
- craft and creativity
- hermeneutic method in craft research

Pedagogical research in craft will also be developed as part of the training of teachers and in co-operation with students, schools and teachers participating in this training.

## **5 Measures to be taken**

The following measures must be undertaken: 1. theoretical and methodological development of craft science, 2. pedagogical arrangements and 3. research communication.

1. The central needs of theoretical and methodological development are related to the development of existing scientific instruments so that the description of designing and making-up processes can be enlarged to analyzing product use and designer activity. The objective is to produce theoretical analysis and methodological instruments that enable the description of the life of a product from its initial design idea through to its creation and use up to the point of its replacement by a new design concept.
2. For the pedagogical arrangements, one of the central needs is to support the multidisciplinary characteristic of craft science inside study modules and by forming multidisciplinary study modules. It is important to ensure that the teaching remain problem-related and to support the interaction between doing, researching and teaching.
3. In research communication, it is of key importance to write down research results in a form which enables their use as a support material for craft professionals and in pedagogical applications. It is essential to explore different possibilities in communicating research results and development projects. Also necessary is the creation and maintenance of high-quality scientific publications.

## Annexe 1

## KEY DATES IN THE EDUCATION OF TEACHERS OF TEXTILES, CLOTHING AND CRAFT DESIGN

- 1881 foundation of the Helsingin käsityökoulu (Helsinki Craft School)
- 1886 foundation of the Department of teacher education in the Helsinki Craft School
- 1933 name-change to Helsingin käsityöopisto (Helsinki Craft Institute)
- 1949 name-change to Helsingin käsityönopeettajaopisto (Helsinki Institute for Craft Teacher Education)
- 1959 completion of the present building for the institute
- 1975 foundation of the craft teacher study programme at the University of Helsinki
- 1975 foundation of an assistant professorship in pedagogical research of craft
- 1979 a degree programme leading to a Master's degree in education became available
- 1982 foundation of a professorship in textiles, clothing and craft design
- 1983 first students graduated with a Master's degrees in education
- 1984 first Licentiate thesis in textiles, clothing and craft design was published
- 1992 field name-change from Textiles, Clothing and Craft Design to Craft Science
- 1994 first doctoral thesis in craft science was published
- 1998 foundation of the Department of Home Economics and Craft Science

## EDUCATION OF TEACHERS OF TEXTILES, CLOTHING AND CRAFT DESIGN

- education of teachers of textiles, clothing and craft design: approximately 30 new students each year
- post-graduate education: approximately 20 students at different stages
- students who complete their college degrees: approximately 10 new students each year
- minor subject students from other sections, faculties and universities:
  - 15 + 5 + 5 students in basic, intermediate and advanced studies
  - + 3 from the University of Art and Design Helsinki
- education projects  
for a total of approximately 250 undergraduate students

A brief update in March 2002 to the paper entitled

**Research at the Section of Craft Science and Textiles Teacher Education at the University of Helsinki**

2001 Dr. Leena Kaukinen was nominated the professor in craft science.

2000 Pirita Seitamaa-Hakkarainen published her doctoral thesis *Weaving Design Process as a Dual-Space Search*.

2002 Riikka Räisänen's doctoral thesis Anthraquinones from the Fungus *Dermocybe sanguinea* as Textile Dyes is in the examination process.

**Research projects and doctoral studies of staff members and financed doctoral students in 2002**

Skill in textile crafting (Leena K. Kaukinen)

Networked craft university KVV: Development of learning models for virtual lecturing and design and making processes (Leena K. Kaukinen, Anu Kaukola)

Approaches to creativity: individual and organizational perspective (Jussi T. Koski)

Development of a learning environment for pattern drafting and design (Kirsti Salo-Mattila)

Women's craft as a historical and cultural phenomenon (Kirsti Salo-Mattila)

Fashion and craft in Finland (Ritva Koskennurmi-Sivonen)

Art experiences, identities and clothing: Art educational approach to clothing design in the context of craft (Pirkko Ahoniemi, doctoral study)

The quality concept for textile products from the point of view of the consumer (Marja Anttila, doctoral study)

Clothing, the human being and the environment (Anna-Mari Raunio, doctoral study)

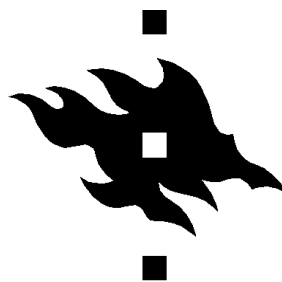
Craft teacher' pedagogical thinking (Erja Syrjäläinen, doctoral study)

Anthraquinones from the fungus *dermocybe sanguinea* as textile dyes (Riikka Räisänen, doctoral study)

The development of designing and learning environments (doctoral study Henna Lahti) as a part of the project Design, cognition and new information technology (Pirita Seitamaa-Hakkarainen)

Cultural representations of craft and craftsmanship (Jaana Kärnä, doctoral study)

The publication series *Department of Home Economics and Craft Science Research Reports* established in 1999 has offered the staff members of the department and joint projects a new possibility for publishing. In 1999–2001, nine volumes were published including conference proceedings, doctorat theses, monographs and a book of readings.



UNIVERSITY OF HELSINKI

FACULTY OF EDUCATION

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SECTION OF CRAFT SCIENCE AND TEXTILES TEACHER EDUCATION