

Title	DPXの学際的服装設計教育方策について - スマートクロージングの設計を例に -
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Citation	
Issue Date	2018-06
Type	Thesis or Dissertation
Text version	ETD
URL	<a href="http://hdl.handle.net/10119/15425">http://hdl.handle.net/10119/15425</a>
Rights	
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学位の種類	博士(知識科学)		
学位記番号	博知第 226 号		
学位授与年月日	平成 30 年 6 月 22 日		
論文題目	Design Plus X: An Interdisciplinary Approach to Education Strategy in Fashion Design with Specific Focus on Smart Clothing		
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### 論文の内容の要旨

The cultivation of interdisciplinary human talent in the field of fashion design is an urgent issue for technological innovation and development and socioeconomic development, while also conforming to the principle of growth of innovative human talent, and becoming a global trend towards reform in design education. However, the study of design thinking approach in fashion design field is still at developing stage. The research of design and new technology has made uncoordinated contributions. The study is lack of an integrated thinking approach to optimize efforts from the different areas.

Combining the knowledge of knowledge Science (KS) and Fashion Design (FD), The thesis aims to establish a new strategy for interdisciplinary practical education called "Design Plus X" (DPX), as an integrated new design thinking approach based on multidiscipline crossover. "X" corresponds to knowledge from various crossover departments and fields (e.g. sociology, management science, electronic engineering, information science, etc.). The purpose of the new practical system research called Art Design DPX is, with the whole process of design development as a carrier, to incorporate the knowledge from various crossover departments and fields represented by X into design, utilize the broadening and deepening of knowledge related to design development, to comprehensively crossover multidisciplinary fields such as Design Plus Humanities and Sociology, Design Plus Management and Design Plus Technology, and to develop an integrated, innovative practical education.

The design process of DPX involves a series of four workshops and group presentation:

1. Market: Identification of market and business drivers.

- 2.Product: Generation of product feature concepts.
- 3.Technology: Identification of technology solution option.
- 4.Prototype: Refining or co-refining embodied solutions.

This is an iterative feedback loop that takes place until the desired outcome is achieved.

DPX: humanities-oriented research, conception of commercial strategies and plans for technological realization will be incorporated into practical education, and practical training about integrated solutions related to product design and services will be conducted. This thesis contains two case studies. One project is " Designing Comfortable Smart Clothing: for Infants' Health". The other one is "Fashionable Experience for Blind Children—Design Research of Intelligent Glove Featuring Perception of Chromatic Color". The thesis has made many practical researches in the experimental stage and explained the two case studies with the DPX thinking approach. By applying DPX approach, designers have made some innovative products. They have achieved good results on design works. The main contributions of the work can be briefly summarized as follows:

1. The “Design Plus X” strategical thinking approach facilities new strategy for interdisciplinary practical fashion education, it offered an integrated new design thinking approach based on multidiscipline crossover.
- 2."DPX" with the whole process of design research development as a carrier, multidisciplinary fields will crossover comprehensively, and by enforcing the consistency of Design Plus X, a new integrated concept for design practice within practical education, overemphasis on formal reorganization in design education can be resolved, and a core capacity for innovation that centers on reform of method and function will be cultivated.
3. Based on DPX thinking approach, it brings a fresh set of attitudes, aspirations, and capacities. It provides the expertise, sets new standards that others will rise to, and contributes to the development of capable and creative designers. It is encourage designer from different way to thinking problem, mix knowledge break discipline bound to solve issues of fashion design field. The integration of multiple domains is encouraged in order to respond to the need for societal wellbeing.
- 4.Based on “DPX” thinking approach, we design the experiment of Fashion Project. In the action research, we provide the new methods to solve the problem of design. This not only constitutes a significant achievement but also encourages further study of the proposed strategy for interdisciplinary practical fashion education.

5. We apply the KS to support smart clothing design research work from designer perspective, promote research and education in the field of Knowledge Science based on Fashion Design and Smart Clothing Design. The research works will contribution to develop KS into design for Human Life.

**Key Words:** *Design Plus X, Interdisciplinary Practical in Fashion Education, Design Thinking Approach, Smart Clothing*

### 論文審査の結果の要旨

本博士論文は、知識科学を基盤とした学際的なアプローチによるデザイン教育の手法（DPX）を考案し、未来に向けた新しいカリキュラムの方向性（教育戦略）とモデルを提案するとともに、ファッション・デザイン分野での事例を通じ、新しい可能性を探索する実践的研究である。これからの社会において発展が見込まれる衣料技術分野のマーケットを想定し、センサー技術と知識処理技術を統合した“Smart Clothing”のデザイン開発のデザインプロセスを報告している。デザイン開発のプロジェクトとして、2つの事例を取り上げ、それぞれの“Smart Clothing”デザインについて、プロトタイプとテストを経て、成果物に至るまでのプロセスをワークショップ構成で検討している。また、成果物については、子どもを被験者とした実験により性能をテストし、有効性を示している。第1の事例では、乳児を対象とした Smart 衣類のデザイン開発を目的とし、体温測定による健康管理の機能を主とする提案を示した。成果物のテストでは被験者数は少ないが有用な結果が得られている。第2の事例では、視覚障害のある児童が色彩を感知できる仕組みとして手袋とその練習用絵本教材をデザイン開発している。評価実験では教育現場の制約もあり被験者数が少ないという問題があったが、研究方法とその結果には学術的意義が認められる。また、開発されたデザインには技術的な有用性が認められた。さらに、本論文では、教育実践の中で新しい思考モデルを構築しようという目標に向けての試行錯誤の蓄積が示されており、プロジェクト型実践研究としての意義が認められる。従来のファッション・デザイン教育を改革する試みであり、デザイン思考やユーザエクスペリエンスデザインを進展させる新たなデザイン思考の教育モデルとして有用な提案であるとともに、知識科学としての学術的貢献も十分である。

以上、本論文は、デザイン教育の手法について分野融合的な手法を開拓したものであり有用であるとともに、学術的に貢献するところが大きい。よって博士（知識科学）の学位論文として十分価値あるものと認めた。