

Loughborough University
Institutional Repository

*A creative journey
developing an integrated
high-fashion knitwear
development process using
computerised seamless V-bed
knitting systems*

This item was submitted to Loughborough University's Institutional Repository by the/an author.

Citation: YANG, S., 2013. A creative journey developing an integrated high-fashion knitwear development process using computerised seamless V-bed knitting systems. IN: Evans, M.A. (ed.). Case studies in the use of design practice by PhD researchers. [Online]. Loughborough: Loughborough University.

Additional Information:

- Design practice research case studies (fashion design).

Metadata Record: <https://dspace.lboro.ac.uk/2134/13661>

Version: Published

Publisher: Loughborough University

Please cite the published version.

CASE STUDIES IN THE USE OF DESIGN PRACTICE BY PHD RESEARCHERS

DPR
 case studies

A CREATIVE JOURNEY DEVELOPING AN INTEGRATED HIGH-FASHION KNITWEAR DEVELOPMENT PROCESS USING COMPUTERISED SEAMLESS V-BED KNITTING SYSTEMS
CREATIVE DISCIPLINE: Fashion design

RESEARCH METHODS:

- Literature review
- Socio-Technical systems analysis
- Action Research and Participatory Action Research (PAR)
- Data collection and analysis

NUMBER OF DESIGN CASE STUDIES UNDERTAKEN BY THE RESEARCHER: 8

LENGTH OF THESIS: 97000 words

EXAMINATION FORMAT: Thesis

DURATION OF STUDY: 3 years full-time

EXPERIENCE OF DESIGN PRACTICE BEFORE START OF PHD:

- Bachelor of Arts (Fashion and Textile Design major)
- Masters of Design
- Master of Apparel Design
- Associate in Applied Science (Fashion Design major)
- International experience as a creative fashion design practitioner and as a manager of fashion design manufacturing company (13 years)

PERSONAL MOTIVATION FOR UNDERTAKING PRACTICE DURING PHD:

In 1989, the researcher encountered the Japanese apparel industry environment at an apparel automation machinery exhibition in Japan. The production employees wore office-girl uniforms and were working on fully automated apparel machinery in an office environment. This approach to knitwear design and production contrasted with the most prestigious high-fashion knitwear companies where the work environment was similar to the smallest and poorest knitwear factories with untidy garment assembly room and noisy knitting machinery room. In 1994, the researcher saw similar office-like apparel industry workspaces on a trip with the Korea Textile Federation to Shima Seiki in Japan. These office-like environments facilitated the possibility to integrate the high-fashion garment design process with the direct use by designers of the computerized seamless V-bed knitwear technology. In conventional high-fashion knitwear, a significant amount of effort is spent ensuring that manufactured garments are identical to the design specifications of 1st samples as conceived and approved by the fashion designer. The researcher had many years ago conceived of this in terms of a one-person fashion designer garment production factory. The approach described in this research provides the practical basis for such an endeavor.

AIM OF THE RESEARCH:

To improve the design process for high-fashion knitwear design using computerized seamless V-bed knitwear design and manufacturing technology systems in a way that fashion designers are in control of the design process.

RESEARCH QUESTIONS:

- How much of the roles of the knitting machine technician and knitting machine operator can be undertaken by the knitwear designer to the point of 1st sample garment?
- What would be a more efficacious high-fashion knitwear design development process to the point of 1st sample with the knitwear designer undertaking more of the roles of the knitting machine technician and knitting machine operator?
- Can this new approach be taught?

OBJECTIVES:

- Use, test and redesign a variety of approaches across projects and knitwear outputs by using KnitPaint and other software to open up the functional envelope of the computerized seamless V-bed technology to give more creative opportunities to fashion designers for high-fashion design
- Map the design and manufacturing workflow processes for the different roles of fashion designer, knitting machine technician and knitting machine operator, and developing improved processes that facilitate the use of the computerized seamless V-bed knitwear technology by high-fashion designers
- Create a new effective and straightforward design process for fashion designers to design and manufacture high fashion garments directly using V-bed knitwear technology without dependence on knitting machine technicians or operators
- Self-review the researcher's own experiences in training at Shima Seiki in Japan and working in knitwear design and manufacturing in the East Asia, Europe and the USA
- Develop educational courses using the new design process for university fashion design students and knitwear design professionals



RESEARCHER: Dr Sooyung Yang
INSTITUTION: Curtin University, Australia
DATE OF AWARD: 2011
SUPERVISOR(S): Dr Terence Love
EXAMINER(S): Professor Vesna Popovic
 Dr John Shackleton



Unexpected WholeGarment® dress. Source: CURTIN, 2008 (1)



The performing dancers in their white tube outfits. Source: DAFWA, 2008 (2)

SUMMARY:

This PhD addressed the problem of gaining the benefits of computerized seamless V-bed knitting technology for high-fashion knitwear design as distinct from retail mass-market clothing design. It developed a new design and manufacturing process that enables high fashion knitwear designers to design and manufacture garments directly without support or involvement of knitting machine technicians and operators. The research also contributed directly to the field of socio-technical complex systems research.

This participatory action research PhD also resolved problems in high-fashion knitwear design involving computerized seamless V-bed knitting technology due to the conflicts between workflow and processes of three main professions; the knitwear designer, knitting machine technician and knitting machine operator. It demonstrated that knitwear designers can manage all aspects of the technology to the completion of 1st sample. Outcomes included a new integrated high-fashion knitwear design process and workflow; a redefinition of the roles and tasks of the knitwear designer, knitting machine technician and knitting machine operator; the development of new design methods; a new role of 'designer-interpreter'; confirmation of feasibility of a 'post-industrial craft-based one-person knitwear design and manufacture workshop'; and the development and evaluation of new fashion design courses and teaching curricula.

RATIONALE FOR THE INCLUSION OF DESIGN PRACTICE UNDERTAKEN BY THE RESEARCHER:

The problem addressed by this research (failed benefits of computerized V-bed knitting technology) required the researcher to undertake more roles than is usual in participatory action research. The research project involved technical processes, information processes, human processes, and content and professional skills in multiple professional domains including high-fashion knitwear, business management, craft and art. As a result, this research required a more complex approach than the simpler and more common structures of Participatory Action Research. In Participatory Action Research, the most common scenario is where the researcher acts in a single role as a participant in the situation being researched. For example, in education of research, the researcher might participate as a teacher. The participatory action research undertaken for this PhD was unusual in that the researcher participated separately and sometimes simultaneously in the following roles: high-fashion knitwear designer; knitting machine technician; knitting machine operator; new integrated high-fashion knitwear designer, programmer, knitting machine operator (defined by the researcher as 'designer-interpreter'); and fashion design lecturer. The identification of the details of the systems involved required active participation in the design and manufacturing processes.

HOW THE PHD DESIGN PRACTICE DIFFERED FROM THAT OF COMMERCIAL PRACTICE:

The creative practice used in the research differed from typical creative practice because it resulted in contributions to knowledge in the field of high-fashion knitwear design and manufacture. It also provided insights for improving both high-fashion knitwear design practices and design education for high-fashion knitwear designers relating to the use of computerized seamless V-bed knitting technology.

THESIS AVAILABLE AT:

http://espace.library.curtin.edu.au:80/R?func=dbin-jump-full&local_base=gen01-era02&object_id=152435

CONTACT DETAILS: Fashion Design & Research HUB, Curtin University, Australia (Soojung.Yang@curtin.edu.ac / daubee@empal.com)

ACKNOWLEDGEMENTS:

(1) Garment shape designers: Daniella Caputi & Kate Townsend
Photographer: Penny Lane

(2) Garment shape designers : Curtin 2nd year Tube project students
Photographer: Sam Landels

(3) Garment embellishment: Aranee Poolsawat
Photographer: Penny Lane



Tubes with post-embellishment. Source: Curtin & DAFWA, 2008 (3)



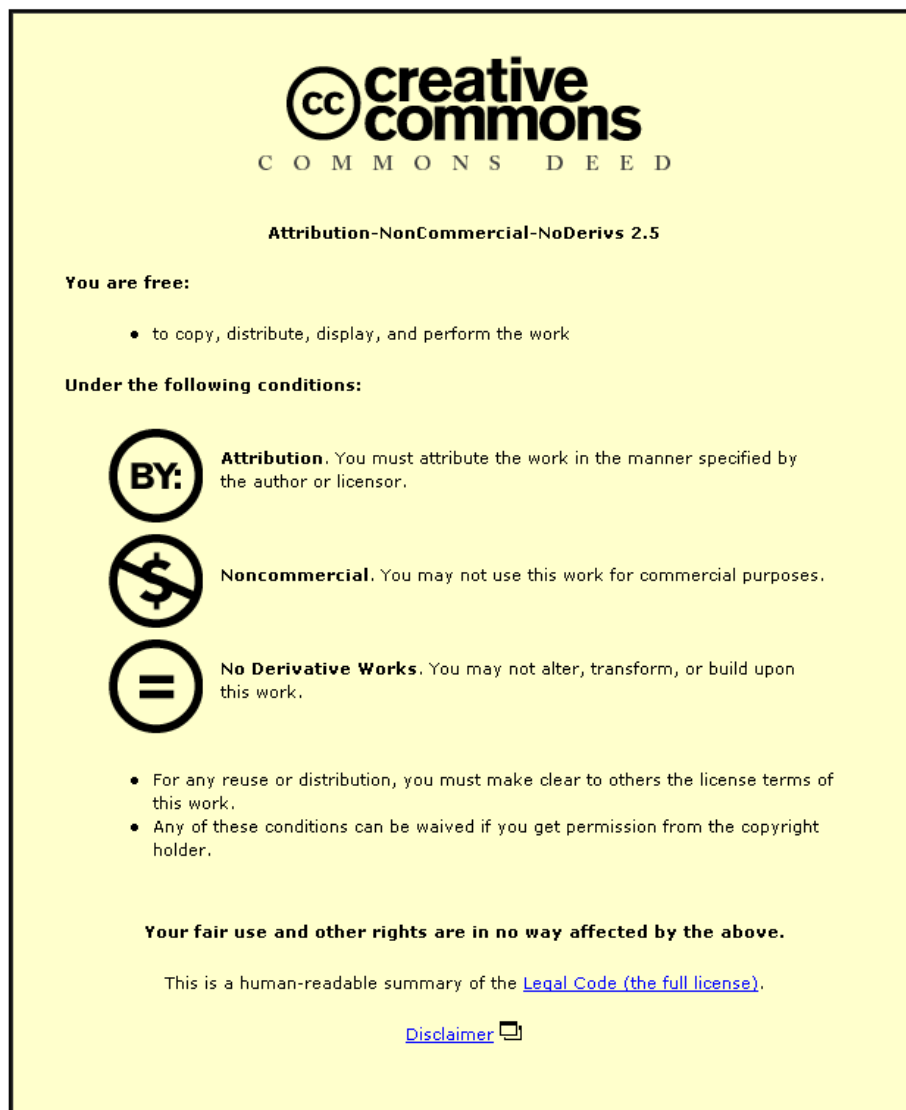
Garment created for the AltaRomAltaModa fashion show in Milan 2008.
Source: Courtesy of Bianca Gervagio



Garment created for the AltaRomAltaModa fashion show in Milan 2008.
Source: Courtesy of Bianca Gervagio

Design Practice Research Case Studies have been compiled by the Design Practice Research Group at Loughborough Design School. If you would like to work with us or contribute a case study, please contact the Design Practice Research Group Leader, Dr Mark Evans (M.A.Evans@lboro.ac.uk).

This item was submitted to Loughborough's Institutional Repository (<https://dspace.lboro.ac.uk/>) by the editor and is made available under the following Creative Commons Licence conditions.



cc creative commons
COMMONS DEED

Attribution-NonCommercial-NoDerivs 2.5

You are free:

- to copy, distribute, display, and perform the work

Under the following conditions:

BY: **Attribution.** You must attribute the work in the manner specified by the author or licensor.


Noncommercial. You may not use this work for commercial purposes.

No Derivative Works. You may not alter, transform, or build upon this work.

- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

Your fair use and other rights are in no way affected by the above.

This is a human-readable summary of the [Legal Code \(the full license\)](#).

[Disclaimer](#) 

For the full text of this licence, please go to:
<http://creativecommons.org/licenses/by-nc-nd/2.5/>