O-14

An Investigation into The Role of Cad/Cam Technologies in Enhancing The Creative Process of Knitted Fabric Design.

Jane Scott
University of Leeds, UK

Within the global knitwear industry, design and manufacture is divided both geographically and through the distribution of skills (Hunter, 2004a). Recent studies (Eckert and Stacey, 1999b& 2001) identify a belief amongst some employers that comprehensive application of CAD/CAM technologies is detrimental to the creative process undertaken by knitwear designers. Instead, such employers prefer the realisation of design ideas to be achieved through the use of skilled technicians. It is argued that any attempts to unite technical competencies with design capabilities is perceived as damaging to a designer' s overall creative output (Eckert and Stacey, 1999).

This paper adopts the perspective that the design of a knitted fabric is intrinsically linked to technology (Black, 2002, p.9). The fabric structure is unique in its properties and construction; without technical understanding of how a fabric is formed and behaves, innovation in design is limited (Tellier-Loumagne, 2005pp.8-11).

This paper reports on a project developed at The University of Leeds aided by students specialising in knitted-fabric design. The aim was to identify their reactions to the introduction of new technologies, and to assess the ease with which they were able to adapt their design skills to a CAD/CAM system.

The paper presents a series of case studies, each focusing on a different student and their approach to using The Shima Seiki Super Micro System. The paper illustrates how these individuals have met the challenge of

interpreting their creative vision using the capabilities offered by CAD/CAM technology.

Each case study outlines a specific design problem, reports on the development process, and illustrates the approach adopted to solve the problem in the most creative and appropriate manner. Specific areas of study include:

◆ the impact of yarn selection on structural fabric development

◆ the use of knitted fabric as a source of inspiration for printed fabric applications

◆ the effect of a variety of stripe placements within complex drop stitch patterns

◆ the manipulation of knitted stitch structures to create a variety of textured effects.

This project provided the first opportunity for students to design fabrics using the Shima Seiki Super Micro System. The project ran over the course of one semester and students were required to submit final designoutcomes and design developments at the end of module.

All the students involved in the study had similar previous experience of CAD/CAM technologies which had been introduced to them through both lectures and demonstrations. However the case studies involve both level-two students and level-three students, and this paper identifies the impact of different levels of experience on the fabrics produced.

The study verifies the view that innovation and creative development in fabric design is inseparable from solid technical understanding,and that only through access to current and emerging technologies can knitted-fabric design evolve both structurally and creatively.

References

Aldrich, W. (1994). *CAD in Clothing and Textiles*, Blackwell Science, Oxford.

Black, S. (2002). *Knitwear in Fashion,* Thames and Hudson, London

Dutton, W.H. and Loader B.D (eds) (2002). *Digital Academe,*Routeledge, London.

Eckert, C.M. (2001). The Communication Bottleneck in Knitwear Design: Analysis and Computing Solutions, *Computer Supported Cooperative Work 10,* pp.29-74.

Gray, S. (1998). *CAD/CAM in Clothing and Textiles,* Gower Publishing, Aldershot, UK.

Hunter, B. (2003). Design Flair and Flexibility, *Knitting International,* vol.110 no.1306, pp.36-37.

Hunter, B. (2004a). Is Knitwear Software Too Rigid? *Knitting International*, vol.111, no. 1318, pp.19-20.

Hunter, B. (2004b). Technology Transfer, *Knitting International*, vol. 111, no.1311, pp.33-39.

Murphy, D. Walker, R. and Webb, G (eds) (2001). *Online Learning and Teaching with Technology Case Studies, Experience and Practice*. Koogan Page, London.

Norman, E. (1998). The Nature of Technology for Design, *International Journal of Technology and Design Education 8*, pp.67-87.

Stacey, M.K. and Eckert, C.M. (2000). Against Ambiguity. *COOP 2000 Workshop Proceedings: The Role of Objects in Design Collaboration: Communicating through Physical and Virtual Objects,* Sophia Antipolis, France, pp.69-86.

Stacey, M.K. and Eckert, C.M. (1999a). CAD System Bias in Engineering Design, *Proceedings of 12th International Conference on Engineering Design (ICED99),* Munich, Germany, 3, pp.1413-1418.

Stacey, M.K. and Eckert, C.M. (1999b). Expertise and Designer Burnout, *Proceedings of 12th International Conference on Engineering Design (ICED99),* Munich, Germany, 1, pp.195-200.

Taylor, P. (1990). *Computers in the Fashion Industry*, Heinemann Professional Publishing, Oxford.

Tellier-Loumagne, F. (2005). *The Art of Knitting,* Thames and Hudson, London.