

# Northumbria Research Link

Citation: Yee, Joyce (2007) Design education in the age of media convergence. In: Engineering and Product Design Education (EPDE07), 13-14 September 2007, School of Design, Northumbria University, Newcastle-upon-Tyne.

URL:

This version was downloaded from Northumbria Research Link:  
<https://nrl.northumbria.ac.uk/id/eprint/9155/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



**Northumbria  
University**  
NEWCASTLE



**UniversityLibrary**

# **DESIGN EDUCATION IN THE AGE OF MEDIA CONVERGENCE**

Joyce S R YEE<sup>1</sup>

<sup>1</sup> *Centre for Design Research, Northumbria University, Newcastle upon Tyne*

## **ABSTRACT**

The development of digital media has enabled the convergence of different technologies and forms of communication into a single distribution network, while also leading to the diversification of media forms. These convergent and divergent phenomena have affected the way in which products and services are created and delivered. This paper explores the implications of new communication technologies on design education, informed by teaching projects with graphic and multimedia design students. Drawing from a research project conducted as part of a doctoral program, this paper examines what new challenges might emerge for design educators due to the convergence and divergence of communication technologies. Observations made during the project were used as a basis for discussion around questions such as: How do design educators create relevant curricula that address the challenges posed by convergent media? How might educators address the growing gulf between traditional media-specific skills, and the skills required for new media? How might educators teach design skills that are applicable across a broad spectrum of media and disciplines, while still addressing the requirements of a specific medium? Several possible approaches will be offered in the conclusion of this paper and are used to inform further discussion on pedagogic approaches for convergent media.

*Keywords: Design education, convergent media, pedagogic approaches*

## **1 CONVERGENCE OF MEDIA**

Digital media have enabled the convergence of different technologies and forms of communication. Convergence can occur at the levels of production and distribution [1]. In terms of production, newspaper, television and radio may have very different production methods but can now all be created using a networked multimedia computer. Similarly, the distribution of these different forms of content can be converged into a single stream of delivery through an online network. However, convergence does not result in fewer forms of media; rather the opposite is true, with newer forms diverging and adding to the current forms [2]. This has led to the hybridization of media forms. For example, The Times newspaper has ventured into online news delivery [3] that is supplemented by audio and video media. Similarly the BBC, a television broadcaster, also delivers text-based news and articles through the Internet [4].

Convergent distribution networks and divergent media forms have presented designers with new challenges. For example, anecdotal evidence suggest that designers educated in the print medium have struggled to come to terms with this transition, especially in translating their static 2-dimensional knowledge into time-based screen applications. Additionally, there is limited vocabulary (methods, tools and techniques) in existing

frameworks to be used as a knowledge base for designing in new media environments. It is not surprising then that some designers are struggling to work in media where theories and technologies are constantly changing, and new applications of delivery and consumption are explored. As Stephen Boyd-Davis points out in his description of multimedia designers,

Designers must be able to give form to concept and content using an exceptionally wide range of disparate elements including graphics, music and sound, typography, text, animation and filmic imagery, all in an interactive context [5: p. 65].

## **2 BACKGROUND CONTEXT TO THE ACTION RESEARCH PROJECTS**

Three action research [6] projects were conducted with two groups of second-year multimedia design students and one group of graphic design students from Northumbria University. A pedagogic framework was developed during the author's PhD research which was aimed at improving the practise and understanding of typography in a cross-media environment. The action research projects enabled the proposed framework to be tested and evaluated with senior multimedia and graphic design students. As current theory and vocabulary used to describe typographic practice and scholarship are based on a historically print-derived framework, the projects were aimed at helping students bridge print-derived typographic principles with current development in multimedia technologies. This example in typography can be viewed as a micro illustration of how the proliferation of new communication technologies has enabled the designer to work across a broad spectrum of media. However, working across several media also requires designers to learn a new set of skills and knowledge that may not be provided for by existing design curricula.

The author took on the role as a secondary tutor, tasked with delivering lectures as well as providing subject support to the students. Projects 1 and 2 were conducted with two sets of multimedia students while Project 3 was conducted with a group of graphic design students. Briefs for Projects 1 and 2 required the students to develop an integrated typographic solution for four different book covers and an online promotional counterpart that came in the form of an interactive 'teaser'. Project 3 required graphic design students to produce a teaser trailer, interactive website and DVD-ROM packaging relating to the release of a fictional film. While the particulars of the briefs were different, they required students to work across different media and apply their medium-specific specialist knowledge in a new medium. Multimedia students were required to design a print element, while the graphic design students were asked to design a screen element. During the course of the action research projects the author was able to observe how students responded to the brief, and developed different approaches to help them cope with difficulties that emerged. These observations and strategies will be discussed in the subsequent sections.

## **3 KEY OBSERVATIONS OF THE PROJECT**

### **3.1 Observation One: Domain-specific Knowledge**

While both sets of students (multimedia and graphic design) were required to design outside their primary medium, it was the graphic design students who encountered more difficulty translating their conceptual knowledge (knowledge of categories and their relationships) and procedural knowledge (knowledge of difference technical processes) into screen-based medium. In terms of conceptual knowledge, their narrative and motion-based skills were basic and often based on print's spatial and temporal model.

Although the multimedia students' design solutions were lacking in sophistication (due to their inexperience of the medium), they were able to translate their knowledge into print without too much difficulty. There could be several reasons for these differences; firstly print is an established medium, with familiar technological and representational characteristics. Additionally, print is a two-dimensional medium without the additional complexity of time and space elements. Although concepts applied on screen have traditionally been derived from print (for example, scale and contrast principles), screen-based characteristics such as movement, timing and sound are derived from other disciplines such as film. As a result, graphic design students unfamiliar with these characteristics found it difficult to apply them in their design.

Graphic design students were also unfamiliar with screen-based software, which tend to be more specialised and specific to the medium. As a result, the students lacked the technical knowledge required to use the software proficiently. In comparison, the multimedia students had less difficulty using print-based software, as they were already familiar with popular desktop publishing programmes (such as Adobe Photoshop, Illustrator and InDesign) through other projects.

### **3.2 Observation Two: Medium-specific Concept Generations**

The requirement for cross-media concept generation revealed gaps in the students' design process, particularly amongst the multimedia design students. They were required to present three integrated concepts and had to develop design solutions that were conceptually linked and stylistically similar. However, most of the presented concepts were dependent on the medium of transmission and failed to provide an integrated solution for both components. Concepts for print and screen were often considered and presented separately. The students' failure to apply concepts across media revealed their inability to abstract or identify characteristics common to other medium-specific ideas. It demonstrated a weakness in their *interpreting* cognitive process [7], which refers to the ability to change from one form of representation to another. For example, one student presented a series of print finishes for the book jackets as a concept. However, this 'concept' would be difficult to translate into the screen medium without further interpretation.

### **3.3 Observation Three: Design Jumps**

Students were often operating on only two levels of abstraction, moving straight from their first idea (functional) into a material solution in the form of a product within a specific medium (structural). This activity, described by Newstetter and McCracken [8] as 'design jumps', meant that students often made mis-informed assumptions about an idea without having gone through the required stages of problem formulation and solution generation. They were often unaware of the implications, leading them to incomplete design solutions. These design jumps occurred in both multimedia and graphic design students, and are commonly linked with novice behaviour [8]. Additionally, an over-reliance on digital tools was observed as a factor that helped perpetuate this behaviour. Compared with the graphic design students, the multimedia design students were more reliant on digital tools to create design elements and were often reluctant to spend time experimenting with traditional visualization tools like drawing and sketching. This approach immediately constrained the creative possibilities to the limits of the tool and forced the actualization of a design before the concept was fully developed.

## **4 EDUCATING FOR A CONVERGENT MEDIA**

Based on the observations made from the first project, several strategies were devised during the second and third action research projects as possible ways to address the identified problem areas. Space prevents in-depth discussions of each strategy, but the following offers a starting point for further discussion.

### **4.1 Focus on Transferable Knowledge**

Students in the action research projects were observed to be heavily dependent on domain-specific technical knowledge such as sketching, image manipulation, animation and web-based programming. As a result, in the second and third action research projects, the tutors placed more emphasis on transferable skills in the area of conceptual techniques and heuristic tools (for example analysing problems, generalising principles, proposing and arguing solutions) in order to help students understand the complexity of different media requirements. It enabled students to begin to recognise the similarities and differences between media and helped them apply appropriate models to them.

### **4.2 Breadth-First rather than Depth-First**

The current model of discipline (and knowledge) separation should be integrated to reflect the convergence of delivery streams, and at the same time address the divergent forms of media by introducing relevant medium-specific content. This requires a macro to micro approach, where global concepts are emphasized first (giving students a contextual understanding) before introducing more specific specialist skills where practical knowledge will develop as the concepts are applied to different media. This approach may be counter to the current model of design knowledge acquisition (see for example, Cross [9, 10], Cross et al [11], Dorst and Cross [12], Dorst [13], Atman et al [14], Ericsson and Smith [15], Lawson [16] and Popovic [17]) where domain-specific knowledge has to be acquired before strategic knowledge can develop. This paper proposes that while this model is ideal for design activity that is domain-specific, the convergence of media and disciplines requires more emphasis on the drawing of connections between different areas of knowledge rather than domain-specific skills, and this requires conceptual dexterity rather than content manipulation skills. This approach helped to reduce the focus on medium-specific concept generation during the second and third action research projects. For example, the concept of storytelling was discussed with students using examples from different media, demonstrating that principles of narrative could be applied whether it is through a book, film or an interactive product.

### **4.3 Improving Learning Through Metacognitive Knowledge**

Metacognitive knowledge refers to a person's ability to understand and to make sense of their experience, as well as their knowledge about cognition in general. An important component of metacognitive knowledge is self-knowledge, which includes knowledge of one's strengths and weaknesses in relation to cognition and learning [18]. Current theory and research in learning suggests that making students aware of their own learning, and getting them to act upon this awareness, will help them learn more effectively [19]. In an environment where technologies and media are mutable, the ability to adapt quickly will be crucial. During the second and third action research projects, it was observed that students who were made aware of their cognitive shortcomings were more likely to make an effort to improve on them. It is important for educators to not only facilitate this awareness through methods like Reflective Practice

[20], but also to help students make accurate assessments of their own self-knowledge to avoid over-inflating their academic self-esteem.

#### **4.4 Developing New Reference Frames Through Remediation**

It has been suggested by Bolter and Gruisin [21] that we understand new media through a process of 'remediation', whereby new media borrows and appropriates concepts, terminologies and definitions from previous media in order to make sense of itself. In relation to the three action research projects, the lecture materials drew their source from established domain knowledge derived from typography and graphic design, as well as from non-domain knowledge derived from external disciplines such as games design, film, theatre and interactive art. This approach was helpful for both sets of students in different ways; the multimedia design students became better informed on basic typographic principles, while the graphic design students were introduced to the characteristics of screen-based medium.

### **5 SUMMARY AND IMPLICATIONS**

This paper has argued that in order to understand the requirements of a convergent media, design education requires new critical frameworks to contextualise existing knowledge as well as to include new specialist knowledge derived from technological and social changes in communication technologies. It proposes a knowledge-model, rather than domain-model, with emphasis on delivering global concepts first before focusing on the specifics of different media requirements. Specialist skills should be used to highlight the differences between media, and to encourage students to apply their knowledge appropriately in accordance with the characteristics of their medium. Improving learning through a focus on metacognitive knowledge will equip students with the strategies, cognitive tasks and self-awareness required for quick adaptation to changes.

This paper has used examples from multimedia and graphic design projects to illustrate the challenges posed by a convergent media. Parallels can be drawn with other design disciplines such as in product design, where the focus is no longer on just a physical object but also on its interface, interaction and services that it exists in. For example, in the development of a mobile phone, product designers have to design a product that encompasses a 3-D form, a virtual and physical interface and its service functionality. Global concepts applied might be the understanding of personal communication and usability principles, while specialist skills might include computer and physical modelling, and authoring software knowledge for interface prototyping.

Design educators are advised to review the suitability of the current design curricula in response to changes brought about by converging media. It is hoped that the approaches described here will contribute to these on-going discussions.

### **REFERENCES**

- [1] Lister, M., Dovey, J., Giddings, S., Iain, G. and Kieran, K. *New media: a critical introduction*. (Routledge, London, 2003).
- [2] Rogers, E. *Communication Technology: the new media in society*. (Free Press, New York, 1986).
- [3] Times. *The Times Online Website*, Available: <http://www.timesonline.co.uk> [Accessed on 7 February], (2006).
- [4] BBC. *BBC News*, Available: <http://news.bbc.co.uk> [Accessed on 7 February], (2007).
- [5] Boyd-Davis, S. Educating the Multimedia Designers. In Dudley, E. and Mealing, S., eds. *Becoming Designers: Education and Influence*, pp. 63-80 (Intellect, Exeter, UK, 2000).

- [6] Lewin, K. Action research and minority problems. *Journal of Social Issues*, 1946, 2, 34-46.
- [7] Anderson, L.W., Krathwohl, D.R. and Airasian, P.W., eds. *A taxonomy for learning, teaching and assessing: a revision of Bloom's taxonomy of educational objectives*. (Addison Wesley Longman, New York, 2001).
- [8] Newstetter, W. and McCracken, W.M. Novice conceptions of design: Implications for the design of learning environments. In Eastman, C., McCracken, W.M. and Newstetter, W., eds. *Design knowing and learning: cognition in design education*, pp. 63-78 (Elsevier, Oxford, 2001).
- [9] Cross, N. The Expertise of Exceptional Designers. In Cross, N. and Edmonds, E., eds. *Expertise in Design: Design Thinking Research Symposium 6* (University of Technology, Sydney, Australia, 2003).
- [10] Cross, N. Expertise in design: an overview. *Design Studies*, 2004, 25(5), 427-441.
- [11] Cross, N., Christiaans, H. and Dorst, K. Design Expertise Amongst Student Designers. *Journal of Art and Design Education*, 1994, 13, 39-56.
- [12] Dorst, K. and Cross, N. Creativity in the Design Process: co-evolution of problem-solution. *Design Studies*, 2001, 22, 425-437.
- [13] Dorst, K. Investigating the Nature of Design Thinking. In Redmond, J., Durling, D. and De Bono, A., eds. *Futureground: Design Research Society Conference*, pp. 72-81 (Monash University, Faculty of Art & Design, Melbourne, Australia, 2004).
- [14] Atman, C.J., Chimka, J., Bursic, K.M. and Nachtman, H.M. A Comparison of Freshman and Senior Engineering Design Processes. *Design Studies*, 1999, 20, 131-152.
- [15] Ericsson, K.A. and Smith, J., eds. *Toward a general theory of expertise: Prospects and limits*. (Cambridge University Press, Cambridge, 1991).
- [16] Lawson, B. Schemata, gambits and precedent: some factors in design expertise. *Design Studies*, 2004, 25(5), 443-457.
- [17] Popovic, V. General Strategic Knowledge Models Connections and Expertise Development in Product Design. In Cross, N. and Edmonds, E., eds. *Expertise in Design: Design Thinking Research Symposium 6* (University of Technology, Sydney, Australia, 2003).
- [18] Flavell, J.H. Metacognition and cognitive monitoring: a new area of cognitive-development inquiry. *American Psychologist*, 1979, 34, 901-911.
- [19] Bransford, J., Brown, A. and Cocking, R., eds. *How people learn: Brain, mind, experience, and school*. (National Academy Press, Washington, DC, 1999).
- [20] Schön, D.A. *Educating the reflective practitioner: toward a new design for teaching and learning in the professions*. (Jossey-Bass, San Francisco ; London, 1987).
- [21] Bolter, J.D. and Grusin, R. *Remediation: Understanding New Media*. (MIT Press, Cambridge, Massachusetts, 1999).

#### Acknowledgements

The author gratefully acknowledges the participation of the Multimedia and Graphic Design students and their tutors who took part in this research.

#### Corresponding Author Contact Information

<sup>1</sup>Dr. Joyce S R YEE  
 Centre for Design Research,  
 Northumbria University  
 Squires Building, Newcastle upon Tyne,  
 NE18ST, United Kingdom  
 joyce.yee@northumbria.ac.uk  
 + 44 191 243 7856