

INTERNATIONAL COLLABORATIVE DESIGN STUDIO PROJECT: PREPARING INDUSTRIAL DESIGN STUDENTS FOR THE GLOBAL EMERGING ECONOMY, PART 3

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ABSTRACT

This paper reports on recent developments on an international collaborative industrial design studio project entering its fourth year of existence between three universities in three different countries. Run from a third year design studio unit at University of Western Sydney (UWS), the project benchmarks Australian students with counterparts in Canada (Alberta University) and Chile (Metropolitan University of Technology). Thanks to using latest design, communication, prototyping and simulation technologies, it focuses on challenges to

- Education to achieve intended learning outcomes confronted with issues of globalisation, heterogeneous base and retention constraints,
- University as gatekeeper of professional standards while confronted with technological changes and new distributed professional, manufacturing and production developments,
- Research on teaching and learning, new methodologies and process relating to design, manufacturing, implementation and delivery of products and services
- Development of new dynamics of work and production through distributed means of communication and manufacturing (internationalisation and globalisation of design)

Keywords: action research, applied research, cognitive research, creative research, experimental research, ethnographic research, generative research, visual sociology, alienation and entrapment, globalisation, internationalisation, criterion referenced assessment, socio technical networks, learning by doing, evidence based learning, sustainability, education and industry sustainability.

1 INTRODUCTION

Current Australian tertiary education intake is formed by students with diverse experiences, skills, ethnicity, language proficiency and economic background. Accordingly, it is a challenge for design education to achieve intended learning outcomes while confronted with constraints of retention.

In a freer global market economy, design, product development and production are no longer framed by geographical boundaries. Increasingly, the creative process requires more specialized solutions coordinated by the work of multi and interdisciplinary project teams that no longer exercise their professions or trade in close by locations. In

addition, there is a raising trend towards shifting and segmenting projects between suppliers, teams, production and their components according to price, labour cost and speed of delivery. A number of areas and principles (i.e. business relationships, project management, quality control, even loyalty to a product and between employers and employees) need re-interpretation as more and more work is mediated by technology.

Both in education and professional practice, design workers and students need to understand and constantly update their expertise to take advantage of new opportunities across different professions, trades, cultures, languages and nations.

After a curricular transformation in Australia (2005) followed by its international expansion in 2006, the project evidence based and learning by doing philosophy is bringing about comparisons between the different teams' methods and practices. An evaluation process of data gathered is currently in progress according to students' perspectives, background and skills base, market and geography. On one side, findings point towards contravening traditional expectations on competencies between educations in developed over emerging economies. On the other, the project has already produced results where students decide to take the unit again despite having the chance to a pass mark. They believed they would like to move forward only after achieving their own expectations. Furthermore, other students have reported their work in the project has contributed greatly to obtain them jobs in the design and engineering industry. This project model has been peer reviewed by UWS independent assessors, nationally and internationally (ConnectED, ISSOTL), it is currently backed up by both UWS PVC Learning and Teaching and PVC Quality and Excellence, and is supported with a Learning and Teaching research fund (team leader, Mr. Mauricio Novoa).

We live in a rapid changing scenario where distance and local control are evolving onto distributed global collaboration in education, design and industry. This project contributes towards improvements in curricula and design research from present and future scenario perspectives now.

2 THE EDUCATION DILEMMA

Design has the significant role of acting as the link between creativity and innovation. Through different courses relating to design, management and manufacturing, tertiary education plays an important part for both the profession and industry by preparing students for their future working life in our local, national and global market.

Current tertiary education is challenged between the need to form market ready graduates and its role as specialist or generalist institution. There is awareness of a gap between design education and industry needs which is a common concern to many knowledge based economies either in industrialized or newly industrialized countries. Invariably, Australian universities have had to adapt to a range of federal, state and legislative changes, lack of sufficient plans and funds, with the purpose to meet Australia's skills demands. The student base in different courses seems to be determined to a degree by the need of maintaining economic survival. As statistics show, a quarter of undergraduates in Australian universities are overseas paying students, and up to a third of international students who received permanent residency after graduating from an Australian university do not have enough skill and English proficiency to be awarded a place in a tertiary institution here [1]. Many of them are unprepared for the rigors of university study and are in desperate need of language support [2].

The intake of local students seems to also bring up obstacles for the pursuing of excellence and competency, nationally and internationally, by the way of uncertain and uneven degree of English language proficiency, mathematical and literacy skills.

Current discussion in favour and against a unified curriculum for the Australian school system intends to formulate strategies to overcome the apparent “dumbing down” syndrome referred to education in high schools and increasingly to university as well [3]. Furthermore, the interest to improve standards appears to succumb to political confrontation concerning issues of federal and state control of education and budget. Universities seem to be slow in recognizing the impact of changes in demography, background, experience, skills and industry demands in recent times. These concerns seem to be contributing factors to problems of attrition of students and retention in tertiary education [4].

Schools of design at university level are also affected by those circumstances. Design is a discipline tightly linked with the rapid advances in areas of creativity, science, innovation, technology, knowledge culture and its management. The industry expects modern education to fulfil its needs. As Laurillard stated “the knowledge society, fuelled by the expanding higher education sector, is in turn generating more knowledge industries, producing additional, competitive pressures for traditional institutions of higher education. Those involved in university teaching in this digital age must cope with the fact that the knowledge industries are creating the means by which individuals can acquire the immediate skills and knowledge those industries need. As a result, many individuals are questioning the true benefit of a university education, given its cost” [5]. Design education should fit nicely with that demand. Nonetheless, it still needs to overcome the paradox of preparing “world-class subject-matter experts who too often lack commercial aptitude.” ‘School leavers and graduates often have little or no idea of how a company works, and how they could fit in. The cost: too many great technological ideas are squandered as their creators have little to no idea how to express their inventions” [6].

Design schools deliver acceptable standard of basic design principles still with contemporary relevance [7]. However, their shortcoming rest on the very essence of modern knowledge culture. Most schools continue to function in a fine arts environment where the ability to make the *object* is the rigueur. Many only have remedial programs that do not offer alternative solutions to establish updated conceptualisation and knowledge base [8, 9 10]. Their de-contextualised teaching and learning objectives and outcomes is dependant on either, a baby boom generation legacy, lack of coherence and access or the dumbing down of educational system [3]. Within these circumstances, the *object* focus of design education becomes burdensome for a heterogeneous student base with diverse backgrounds, experiences and lack of understanding concerning their place and role in this era. Objects many times have no innovation input as their contextual meaning is missing. Therefore, contributing further to a socially and environmentally unsustainable product based sense of well-being with life choices determined by freedom to interchange, buy or sell among finite and disposable marketable goods [11]. Since they lack real lasting value, function and place; objects soon lose their attractiveness and do not reach stage of significance and transcendence for students. Consequently, many times students are rendered unable to internalise education as experience and progressively construct their own knowledge wares.

3 COLLABORATIVE DESIGN STUDIO PROJECT DESCRIPTION

The reformulation of the unit Industrial Design Studio 4 (IDS4) onto an international project at UWS intends to comprehensively attend to the contentious issues mentioned above, while working in a proactive and generative manner with a heterogeneous and uneven student, knowledge and skill base.

IDS4 runs as a design agency/studio and production environment with standard constraints and processes concerning time, cost, negotiation, pitching, tendering, quoting, development, testing, manufacturing and implementation. Students are given a feel of professional life with access to industrial experts, academic and political authorities on both continents, use of state of the art rapid prototyping and modelling facilities, videoconferencing, Skype, WebCT, blogs, etc. Given a brief targeting children toys in the bracket 0 – 6 of markets in opposite sides of the Pacific, the creation of a 'sociotechnical virtual collaboration' brought about the concepts of 'working together apart', 'role playing', 'authorship', 'ownership' and 'intellectual capital' based on group and self evaluation. Mediated 'knowledge sharing' generated a process of action, cognitive, empirical, applied and creative research, 'virtual learning teams' and 'social identity' for the project while students worked on their specific designs. Students work was tailor made to fit each group own brief interpretation by applying a criterion referenced approach with moderation, assessment and feedback by peer, blind, group, lecturers, international, interaction and marking by experts and industry. The ultimate goal pursued is for students to take full responsibility and ownership, develop and test their critical judgment, assess and mark themselves according to industry parameters.

IDS4 has been successful filling the gap between education and industry. Its thriving force is founded on the premise that in the current rapid changing global scenario, design education should not only teach what is known but, it needs to go beyond into teaching how to come to know new methods, processes and applications for design. The project has turned its international heterogeneous student base into a positive whirlpool of generative knowledge by the way of students and lecturers work and arguments validation based on rules of evidence. Confronted with insufficient comprehension of social, historical, anthropological and technological parameters, they have been assisted to develop intellectual tools to search, find, discriminate and set new referents.

The project has resulted in benchmarking through transformational change of curricula, objective and learning outcomes, teaching delivery, generation of knowledge, negotiation dynamics, student satisfaction and retention. It has shown commonalities and differences in approach, parameters, conceptualisation, planning, strategies and implementation, nationally and internationally. The findings also commenced a process of questioning about learning objectives, assessment and desired graduate attributes, manual skills and knowledge base to prepare students for the new collaborative and distributed circumstances of future professional life and their competency in comparison with those in newly industrialised countries. More broadly, design agency as interpreter and creative contributor to cultural analysis, descriptor of culture and cultures within cultures, relation artefact-history-context, and information transmission model.

Cultural values and dimensions analysis brought to light the need for sociological analysis on topics relating to centre vs periphery, inclusion vs isolation and entrapment, etc. Comparative cultural patterns are shaping up that question hegemony and homogeneity of groups and individuals according to geography or region's development. Point in case is UWS that is located in the periphery from Sydney's design hubs. However, the school is in the middle of the largest national industrial cluster generating more than 70 billion dollars of national revenue per year. Proximity does not guarantee access, participation and competitiveness in the current knowledge era. Notably a number of projects from South America were of high standard.

4 REDEFINING DESIGN FOR DEVELOPMENT IN THE ERA OF ORGANIC NETWORKS

As the world seeks economic balance in a post Cold War era, new power play forces are bringing about political and economic contenders intending to gain hegemony. The race for dominance is not longer over exploitation and control of hardware resources and capital only. Subsequently, current first world nations conceive their long term competitive advantage depends on immediate investment and development of creative industries with a short window of opportunities of “perhaps five to ten years” before emerging “economies develop the kinds of creative skills necessary to compete across the board” [3]. Historically until now, the concept of development has been associated to discussions on generation and distribution of capital, wealth and access to commodities with a top down approach. In addition, a number of trends have commanded research and analysis on economic and cultural development by producing findings based on market parameters, averages and simplification. While such models have proven certain success when applied to general population in the past, recent social and technological changes are questioning those findings agency as averages applied to countries do not relate to individuals in those nations. Not all individuals or even regions with subcultures fit into the mould and data becomes difficult to maintain up to date and accurate when social identity moves in flux [12].

Increasing technological revolution in speed and magnitude is making more difficult for researchers and analysts to keep pace and give operative explanations relating to change. Furthermore, escalating growth of population, migration and stress on resources makes imperative to take responsibility on any future directions that may have a negative impact on sustainability, as it should be considered as ecological, economic, social and cultural [13]. Since we passed the 50% divide between rural and urban population recently, humankind future scenario will be marked by increasing migration, most demographic agglomeration in urban centres before reaching critical mass and two thirds of humankind struggling to procure basic commodities as water, fuel, etc [14].

With such demand overcharge, it is understandable; nations may assess growth as economic potential and apply series of traditional design development measures. As in the past, economy of scale would dictate to apply rationalized solutions from the main centres with the hope that benefits eventually flow down to the less privileged stratum, nations and regions. However, such institutional implementation would fail to grasp current changes are rendering those one sided actions inadequate even now. Already a number of main cities in developed and in development nations are experiencing infrastructure and distribution failures.

Additionally, in a world more diverse and distributed, the definition and limit between centre and periphery becomes blurry. Local design and industries are affected by the loss of demand and contracts, while capital moves to less expensive labour, manufacturing and production locations seeking a larger return on investment [15, 16, 17]. In parallel, there is need to redefine previous design conceptualisation according to rigid divisions between first and third world, or class structure where “human beings” are treated “as mere instances in the process of objectivisation (*Verdinglichung*) and commodification” while pursuing industrialization as the solution [18, 19]. Even the concept of “product based sense of well-being” [11], may need repositioning as artefacts are becoming tools towards skills and intellectual competition from the periphery, either rural or marginal. Here is where design, research and education can be catalysts for bringing about recognition, validation, equity and empowerment. There is a lot of accumulated knowledge in the periphery that can contribute to balance up future

demands to the centre. Further design and research into, through and for design will garner, create new knowledge and integrate fringe and centre into an organic network sharing collective thinking through a node system. It is evident to forecast, the top cannot longer exist in disregard and at the cost of needs and capacity of those at the bottom of the pyramid or displaced.

REFERENCES

- [1] Birrell, Bob., *International Students Data*. Centre for Population and Urban Research, 2007, Monash University
- [2] Barthel, Alex, Are tertiary students competent in English? English Language Study Skills Assistance Centre University of Technology, Sydney *Lingua Franca*. ABC 2007
- [3] Donnelly, Kevin. *Dumbing Down*. Harie Grant Trade Books. Australia, 2006
- [4] Long, M, Ferrier, F and Heagney, M., *Stay, play or give it away? Students continuing, changing or leaving university in first year*. Centre for the Economics of Education and Training, 2006, Monash University, ACER
- [5] Laurillard, D. 2002. Rethinking Teaching for the Knowledge Society. *EDUCAUSE Review*, Vol. 37, No. 1, January/February, 2002, pp. 16–25.
- [6] Cox, G. 2005. Review of Creativity in Business: Building on the UK's Strengths. *British Design Council*. December 2005
- [7] Boucharenc, C., Research on Basic Design Education: An International Survey. *International Journal of Technology and Design Education*, 2006, 16:1–30.
- [8] Giard, J. 1990. Design Education in Crisis: The Transition from Skills to Knowledge. *Design Issues*, Vol. 7, No. 1, Educating the Designer. (Autumn, 1990), pp. 23-28
- [9] Brody, N. 1993. The way to survive is to get real with technology and think about language. *XYZ: Design and Technology* (August 1993).
- [10] Gornick, N. 2005. Convergence: New Management Imperatives and Their Effect on Design Activity, *Design Management Review*.
- [11] Manzini, E. 2004. Context-based wellbeing and the concept of regenerative solution. A conceptual framework for scenario building and sustainable solutions development. *The Journal of Sustainable Product Design 2*: 141–148.
- [12] Hofstede, Geert. (1991). *Cultures & organizations: Software of the mind: Intercultural cooperation and its importance for survival*. New York: McGraw-Hill.
- [13] United Nations World Population Prospects 2003 - 2050.
- [14] Food and Agriculture Organization Statistical Databases (FAOSTAT) Population Growth Prospect 1997 – 2025 ABL.
- [15] 2005. Manufacturing and Industry report. *Australian Business Limited 2005*
- [16] ABS. 2005. Innovation on Manufacturing, *Australian Bureau of Statistics*.
- [17] AIG. 2006. Manufacturing Futures, Achieving Global Fitness. Australian Industry Group.
- [18] Bonsiepe, G (1991) Developing countries: awareness of design and the peripheral condition, history of industrial design: 1919-1990 the dominion of design, Electa, Milan
- [19] Bonsiepe, G (2005) *Design and democracy*, Design Issues.

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