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## THE INTERPROFESSIONAL VIRTUAL DESIGN STUDIO

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**Abstract.** With the advent of Web 2.0 technologies, the Virtual Design Studio (VDS) has been revived in many schools of architecture around the globe. The recently evolving online Social Networks (SN) Platforms, as instruments for learning, have provided a potentially fruitful operative base for VDS. Yet these platforms have not enabled the VDS to explore new frontiers. All participants come from the same professional field and learn elements directly related to their existing design curriculum. The development of the VDS for interprofessional learning moves design education beyond conventional boundaries. The Interprofessional VDS (IPVDS) is an innovative method of teaching students from two different professional faculties the skills required for successful consultancy and promotional communication in the public realm. The IPVDS enabled students to develop consultancy skills and evidence-based communication strategies appropriate for disparate target audiences. It employed a digital SN learning platform to engage remotely-located students in acquiring new skills, transferring knowledge and achieving learning outcomes that enrich their professional experience. The paper presents details of the IPVDS, its methodology, outcomes, and evaluation of the studio, and discusses how the IPVDS is effective in enabling architectural students to understand and use communication and consultancy skills for collaboration across professional disciplines for the purpose of community engagement.

**Keywords.** Virtual Design Studio; interprofessional; collaboration; consultancy; design skills.

## **1. Introduction**

The early nineties saw the emergence of one particular form of design studio, which investigated various possibilities that digital media and Virtual Environments (VE) can offer to the learning and the exploring of architectural design (Kvan, 2001). These Virtual Design Studios (VDS) established virtuality as acting while physically distant or as acting by employing digital tools (Maher et al., 2000). VE were established by the choice of design (Achten, 2001), way of communication (Schmitt, 1997) or digital tools (Kurmann, 1995). Later the VDS developed into real immersion within a VE, the medium for design interaction being the VE Design Studio (VeDS) (Schnabel, 2002). With the advent of Web 2.0 technologies, it became apparent that the next logical step to develop the VDS was collaboration within a social learning environment. Ease of communication, leadership opportunity, democratic interaction, teamwork, and the sense of community are some of the improved aspects that are offered by Social Networks (SN) (Owen et al., 2006). Mitchell (1995) also refers to the need for an ongoing evolution of the VDS towards a fully integrated studio where the borderlines between realms, professions, tools and mode of communications are dismantled. Subsequently the advancement of VDS moves design education beyond conventional boundaries and curricula, and engages participants socially from diverse professional fields. This leads to novel frontiers that enhance the deep learning within an interprofessional realm.

## **2. Consultancy and interprofessional collaboration**

Historically, with little exposure to communication and consultancy skills during training, architects have been expected on graduation to be able to promote design using professional communication and consultancy skills. Usually consultancy experience within the architecture curriculum comprises communication with colleagues who have a sophisticated understanding of the design process and ability to envisage design outcomes. However, in practice, architects are required to explain their designs to people who often have little or no architectural design sense or background, an experience very different from explaining a project to someone who is cognizant of the field (Nicol and Pilling, 2000). The opportunities for consultation with clients about design in an authentic context are limited (Woo et al., 2007); although a few schools provide opportunities to undertake design in live projects or other simulations of collaboration with clients, engineers or general public. Learning how to consult professionally with clients who undertake design for themselves but who have only limited understanding of it remains a major gap in professional

education, especially since, in architectural business practice, the satisfaction of the client is of prime concern (Adam et al., 2008).

### **3. Design communication**

Architects need to realise an aim to provide service to the broad community supporting their education. The service ideal has to be achieved without limiting the market for services because of inadequate attention to the necessity for good business practice (Freidson, 1986). The increasing marginalisation of architects in the workplace (Bennetts, 2008) suggests that professional ideals and professional work are poorly aligned. Unlike the health professions, architects are trained in design excellence, a key tenet in the espoused theory of architecture, without development of a concomitant understanding that design excellence must take into account the economic and social context of clients and project teams. Architecture students thus have a huge amount to learn following graduation about managing and sustaining relationships with diverse community and professional groups.

#### **3.1. REQUIRED ABILITIES**

This raises the question of what architects in professional practice require of new graduates entering employment with them. A qualitative analysis of person and job specifications for Australian architects, derived from a qualitative analysis of job advertisements (Schnabel and Howe, 2009) revealed that the majority of job advertisements specified communication skills as a key performance criterion in the job specification. Communication skills were cited more frequently than managerial, business or presentation skills. However, client communication skills are not formally taught within most architecture schools. Design communication and public presentation skills are taught well and practiced in the social context of peers and colleagues, but this does not address the need for community engagement required in professional practice. Most architectural schools teach a component of practice management in their courses and the Board of Architects requires competency in knowledge about practice management before registration is granted but, from an educational point of view, these courses do not comprise vertically integrated training throughout the degree to facilitate student acquisition of these skills.

Architecture is also influenced by pressures from external forces. The final decision about design can be subject to input from corporations, builders and town planners, regulatory bodies and councils (Cuff, 1996). To be successful, the professional requires the participation of the client and the acceptance of professional expertise by the client. However, clients have pre-existing

concepts and beliefs about what products or services are acceptable. Architects feel the constraints of participatory communication because this must be cost effective to be acceptable to them. Additionally, the architect also must communicate with other members of the team whose position it is to actually construct the building (e.g., project managers, construction contractors, engineers). The opportunity to practice interpersonal skills with members of other professional communities offers architecture students a means of developing confidence and competence in professional engagement and teamwork.

### 3.2. PROFESSIONAL COMMUNITY ENGAGEMENT

Not only do architects have to develop interpersonal skills, they also need competence in community education. A significant factor informing professional relationships with clients in the health sector is the growing awareness of the importance of literacy in determining client understanding of health information (Nielsen-Bohlman et al., 2004). The prime reason for failure of the community to understand, accept or act upon health information is its low level of literacy, to understand health concepts (health literacy). Similarly, the community has a low level of *design literacy*, which impedes acceptance and pursuit of aesthetics and elegance of function in all forms of design, including architecture. This has been described by many authors, like Boyd (1963) and more recently Hollier (2008). In the same way that health professionals must take responsibility for the education of the community in hygiene and disease prevention, design professionals must take responsibility for education of the community in the basic elements and principles of good design. This means that teaching communication skills in undergraduate architecture programs must include action-based projects in consultancy and community engagement.

### 3.3. DESIGN LITERACY

Design literacy is critical for the production of functional and aesthetic environments. It is a crucial part of communication skills training for other professions wishing to avoid rejection in communication with their client communities. The situation where architecture students create designs from briefs manufactured by non-existent clients which are evaluated by like minded people, peers or colleagues, means that architects are trained to respond to challenges from peers but not from those of lay people who may be misguided, prejudiced or uninformed (Cuff, 1996). Similarly, in dentistry, patients arriving in an under-resourced, overcrowded public health system, have little power to accept or reject treatment, since most treatment is provided in emergency conditions.

Thus the student has only to satisfy the instructor with the quality of the work. Rejection is only experienced when the client has more pressing reasons to reject it. In architecture, students may also experience rejection by their colleagues. However, rejection of a good design is rare in this context. In the practice context, rejection of good designs by uneducated clients for inexplicable reasons comes as a surprise for which their education mostly has usually left them unprepared. It was for these reasons that we developed an authentic interprofessional design studio that utilised real clients, who were not asking for buildings, but instead, for design in community service promotion, one which required a clear understanding of principles in visual communication and engagement with the vagaries of disparate community groups.

#### **4. The interprofessional virtual design studio**

Based on the methodology of a conventional VDS and following Aristotle's concept of phronesis or practical wisdom (learning to judge when and where to put skill or knowledge into action) and drawing upon the arts to facilitate acquisition of knowledge (Dahlman, 2007), the 'Interprofessional Virtual Design Studio' (IPVDS) was set up to teach students the skills required for successful consultancy and interprofessional collaboration.

The students' learning and interactions were conducted in a blended (real and virtual) learning environment that was aided by a freely available Web 2.0 Social Network platform provided by 'Ning' (<http://ning.com>). This virtual Learning Management System (LMS) allows participants to interact in multi-channels, varied media forms, with rich text or media content, which enable their peers, experts, facilitators and invited guests to share social communication and generate knowledge (Owen et al., 2006). Our findings are similar to those of Harrison and Donn (2006), who explain how online SN allow the students to preserve and share their own thoughts and conversation about design, decisions and related issues to create a network of intelligence as the designs evolve.

Proceeding to their log-in to the LMS all students completed the *VIA Signature Strengths Questionnaire* (Peterson and Seligman, 2002) to identify key strengths to be featured in their online presence of the SN. This allowed members, who did not know each other prior to the IPVDS, to learn about strengths of their peers and group-members. Then one student of the School of Architecture at the Chinese University of Hong Kong (N=11) was assigned as the consultant to a group of four students of the Faculty of Dentistry, the University of Sydney (N=55). Within the IPVDS they collaborated in developing a dental health promotion project for a community audience.

In order to develop skill in health promotion, the dentistry students require an understanding of communication in visual media and how design can alter the efficacy of message transmission (Evans, et al., 2008; Katz et al., 2006). The quality of materials produced for use in public health education clearly shows failure to grasp basic graphic design skills. Dental students require assistance from genuine design consultants to develop an understanding of how to communicate these vital messages to the public, applying trained standards of design aesthetics and elegance to facilitate professional engagement with the community. Architecture students require genuine clients, who can consult with them, bring preconceived ideas to the table, question and challenge them as real clients do. To provide an exposure to an authentic client–expert relationship for each architecture student was a dilemma that was resolved by collaboration with dentistry students. Hence all students learned together about the challenges of persuasive communication and community engagement.

The objective was to develop an oral health promotion program for caries prevention around the message: “*Tooth decay can be stopped, reversed and prevented*”. The students were provided with in-class and live video-lectures as well as electronic resources before being assigned to their work-group, each group working with a different target audience (e.g., infants, school children, teenagers, older adults, ethnic or indigenous communities). They reviewed literature about caries prevention, target audience characteristics and design concepts, then collaborated via the LMS to develop a booklet for health educators working with the target group containing the evidence base, a promotional product (poster, brochure, web-site, DVD, T-shirt, etc.), and an audio-visual presentation for peers. The products were assessed for research quality by the Faculty of Dentistry and quality of design communication by the School of Architecture and presented at the *National Australian Oral Health Week*.

The student groups presented their work with each target audience in peer-teaching virtual (design) crits that were broadcast to the other university’s location via a live video-stream using *Skype* software. Students at both faculties evaluated the IPVDS as a learning experience using the Web Attributes Flow and Performance Questionnaire (Huang, 2003) and provided qualitative feedback in focus group interviews. They finally provided evaluative feedback to each other about consultancy and teamwork skills using a protocol derived from Lurie et al. (2007).

## 5. Results

All student teams developed products meeting the requirements for each project program. Student groups successfully developed within the IPVDS framework eleven research-based, well designed oral health promotion pro-

grams of a quality suitable for publication or use in public campaigns as evaluated by the two teaching faculties and presented at oral healthcare campaigns as well as at their online SN platform (<http://dentarch.ning.com>).

#### 5.1. STUDENT EVALUATION OF THE LEARNING EXPERIENCE

Overall evaluation of the project was positive. The issue most impacting student satisfaction was the delivery of information and resources in the virtual studio format. They enjoyed its multidimensionality and scope for interaction, reporting that the LMS allowed them to participate naturally and collaborate within their accustomed pace and style. Their experience with other social networking sites enabled them to use the project site easily, although the architecture students were more impressed with the utilitarian performance of the site than were the dentistry students. The multiple channels for communication were enjoyed by most students, although a small number found them distracting from the main academic task.

All students were unanimous in their appreciation of the virtual design crit as a rich learning experience. This was reported to be the highlight of the program, enabling students to describe their experiences to their professional peers and to discover how differently the project brief was interpreted for each new target audience. The IPVDS succeeded in providing the students an environment that allowed them to bridge interprofessional boundaries, social and cultural differences and international time zones.

#### 5.2. ORGANISATION

Because flexible time in the curricula of two professional faculties is limited, students had to develop efficient ways of communicating with each other, holding team meetings and delegating individual responsibilities. The setup of the IPVDS with its SN platform allowed students to work synchronously, asynchronously and remotely. Resources had been provided to assist understanding of meeting procedures and students documented their application of strategies for team organisation, role delegation, meeting minutes and individual research contributions.

All students reported that, despite their recognition of the requirement for self-directed learning, they had experienced some difficulty in negotiating the time difference between their two countries and needed more allocated time within the curriculum for their online interactions. Discussion involved the usefulness of a Ning application that would permit the group members to video-conference on the site during the design phase of the project.

In order to meet the perceived expectations of their peers in the other faculty, students reported working very hard in research of the evidence base and mastery of core skills. Dentistry students completed extensive research into the project topic whilst architecture students, recognising the requirement to educate their dental clients in design principles and publishing software, ensured their own proficiency in these things. The dentistry students reported that they valued the gain in design knowledge that would assist them in their practice promotion tasks in the future. The architecture students found the experience of working with clients with poor design skills but clear ideas about project outcomes to be interesting but challenging at times.

### 5.3. TEAMWORK AND SOCIAL ENGAGEMENT

The publication of personal strengths was found to be useful in facilitating development of communication between the dentistry group members and their architecture consultants. An analysis of the personal strengths of each group found that while both dentistry (36%) and architecture students (80%) identified curiosity as signature strength, in the architecture group this appeared to be a defining characteristic. The other signature strengths of architecture students were fairness and spirituality (each 50%), social intelligence, integrity and appreciation of beauty (all 40%). Somewhat in contradistinction to prevalent stereotypes but not surprising in a health profession, dentistry students cited their other strengths as loving and being loved (48%), gratitude (48%), kindness (43%) and fairness and citizenship (each 41%).

A common shortcoming of student group-projects is the inequitable division of labour, where some students coast as 'passengers' on the effort of other team members. All aspects of communication and social engagement of the IPVDS, with the exception of 'instant chat,' were visible to supervisory staff on the SN site, generating an incentive for every student to take part in the whole studio at all times. At any point of the IPVDS the contribution of each team member was openly commented upon by all other participants of the studio. This open evaluation was rigorous, honest, diplomatic, constructive, and informed, this last quality being one often not open to academic staff assessing students' work.

In all but one group, working relationships were found to enhance productivity and enjoyment, although some groups reported difficulty in managing the large amount of background material generated by diligent research of the topic area. They suggested that the opportunity for a supervised group discussion during the early part of the project would assist them with this problem.

#### 5.4 COMMUNICATION WITH OTHER PROFESSIONS

The requirement that students understand each other's professional background needs and skills resulted in their high appreciation and recognition of the value of interprofessional collaboration. Dental students developed a better grasp of why they needed to understand principles of design in order to develop effective health promotion materials. Architecture students were surprised by the difficulties encountered in dealing with clients, often with limited experience of design but strong opinions about what they wanted. The IPVDS also allowed participants to reflect on their own professional understanding, jargon, dealings, assumptions and shortcomings.

#### 6. Conclusion

The IPVDS moved both faculties from sequestered autonomy into an enriching, deep learning experience in communication for both cohorts of students. Subsequently the IPVDS has enabled development of a strong link, not only between two professional disciplines, but also between two faculties usually perceived as having little in common. The project engages both students and academic staff in learning about professionalism, communication, collaboration, consultation, blended environments and community engagement.

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