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**Industry-Driven Design Education: How Much Should Industry Dictate
Pedagogy?**

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Abstract

The value of design has grown far beyond its traditional role as merely a contributor to the well being of society and has recently been recognised as key to the global innovation process and a key to sustainable long term economic development (e.g. CiRAC, 2005, p. 5; Design Singapore Council, 2009; H.M. Treasury, 2005; Woodham, 2010). These developments are significant because designers and their education become a focus in newly introduced economic agendas and National Design Policies in many countries (e.g. Denmark, India, Singapore). This has led to a process of benchmarking design education in various countries to ensure that higher design education is preparing the designer needed for the 21st century. Throughout this process similar findings emerged and specific to digital media design education it was revealed that digital media design graduates are arguably not sufficiently prepared to bridge the gap between university and industry (60Sox, 2009, 2010; Design Council and Creative & Cultural Skills, 2007; ISIS, 2011). While universities are under increasing pressure to demonstrate that their graduates are ready to proactively navigate the world of work (Bridgstock, 2009), it is clear that there are ongoing issues that need to be addressed in order to enable digital media design students to add value to industry and business.

In response to the identified shortfalls of undergraduate digital media design education, an alternative learning and teaching model, the POOL Model framework (Fleischmann, 2010, 2011), was developed, implemented and tested over a period of two years across six subjects in the Bachelor of New Media Arts' digital media design major at the School of Creative Arts at James Cook University. While a broad

underpinning strategy of the POOL Model framework is to reflect industry practice through implementing workplace realities such as multidisciplinary teamwork with disciplinary constellations driven by the nature of a tasks, an equally important core strategy is to engage students with industry and community and making such engagement an integrated part of the undergraduate design curriculum.

While critical voices question how much should market/industry dictate pedagogy (Adams, 2006; Tunstall, 2006) stronger links to industry to better prepare students for the demands of the market are clearly identified by others (Ball, 2003; Design Council, 2005; Design Council and Creative & Cultural Skills, 2007; Livingston & Harvey, 2010). In context of these ambiguous views the question if integrating industry/community into the undergraduate digital media design learning environment result in better preparing digital media design students for industry practice was explored.

Keywords: industry-driven design education, POOL Model framework, industry and community engagement, multidisciplinary collaboration

Industry-Driven Design Education: How Much Should Industry Dictate Pedagogy?

The value of design has grown far beyond its traditional role as merely a contributor to the well-being of society, and has been recognised as vital to the global innovation process and a key to sustainable long-term economic development (e.g. CiRAC, 2005, p. 5; Design Singapore Council, 2009; H.M. Treasury, 2005; Woodham, 2010). For many organisations, design has increasingly become a strategic enhancement tool (Whyte & Bessant, 2007). These developments are significant because designers and their education become a focus in newly introduced economic agendas and National Design Policies in many countries (e.g., Denmark, India, Singapore). This has led to a process of benchmarking design education in various countries to ensure that higher education is preparing the designer needed for the 21st century. Throughout this process similar findings emerged; specific to digital media design education it was revealed that digital media design graduates may not be sufficiently prepared to bridge the gap between university and industry (60Sox, 2009, 2010; DCITA, 2006; Design Commission, 2011; Design Council and Creative & Cultural Skills, 2007; ISIS, 2011). While universities are under increasing pressure to demonstrate the readiness of their graduates to proactively navigate the workplace (Bridgstock, 2009), it is clear that there are ongoing issues that must be addressed in order to enable digital media design students to add value to industry and business. Some suggest close links to industry and strong connections with design practice are necessary (Churman, 2004; Design Council and Creative & Cultural Skills, 2007; State Government of Victoria, 2010; Steane, 2010) and key to resolve current shortfalls in design education (Clews & Mallinder, 2010; Design Council and

Creative & Cultural Skills, 2007). Benefits of such involvement are questioned by others (e.g. Eriksen, 2009; Smith, 2010 in regards to work placement; Vere, 2008). In context of these ambiguous views, further investigations are required.

Design Industry Perspectives: Employer Satisfaction

Major research into the employability of design graduates and designers has been conducted in the UK since 2003, with this nation arguably being the world leader in design graduate employability research. As part of a fact-finding mission, the Design Skills Advisory Panel (Design Council and Creative & Cultural Skills, 2007) identified skill gaps in a wide range of design disciplines including communication design, product and industrial design, interior and exhibition design, fashion and textile design, and digital and multimedia design. Of particular concern was the lack of professional skills in designers (defined in the report as deep discipline-specific skills), including business management and strategic skills. Further, there was a perceived lack of soft skills, including verbal communication of ideas and teamwork (Design Council and Creative & Cultural Skills, 2007). Results from a 2006 online questionnaire surveying 902 design professionals and educators) are presented in Figure 1, suggesting areas where professional skills of designers and design graduates need to be built.

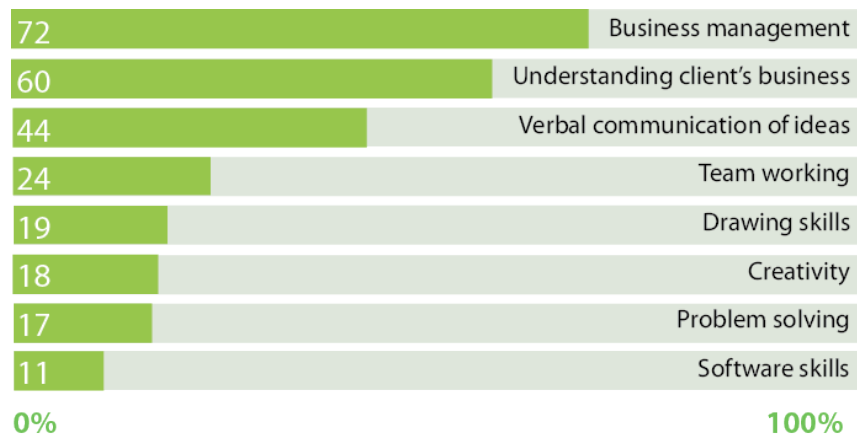


Figure 1. Which skills do designers lack the most? (Design Council and Creative & Cultural Skills, 2007, p. 27).

No doubt, these and other recent reports (e.g. Design Commission, 2011; Whyte & Bessant, 2007), though UK-specific, are indicative of global problems faced by design education. Indeed recent findings relevant to employers' satisfaction in the digital content industry in Australia (60Sox, 2009, 2010) revealed similar facts. The 60Sox Report Volumes 1 (2009) and 2 (2010) comprise two surveys that provide highly valuable, but also alarming evidence specific to the employability of digital media design graduates in Australia. According to 60Sox (2009) this was "the largest survey of its kind ever undertaken in Australia" (p.5) with 507 aspiring creatives, defined as recent graduates and/or people with fewer than two years' industry experience, and 50 employers of Australia's creative digital industries surveyed. Similar to the findings in the UK, employers "found it 'difficult' to recruit aspiring creatives with the 'right' skills and attributes" (60Sox, 2010, p.12). It is indeed concerning that three of the highest-ranked skills and attributes by employers in Australia are also identified as the largest capability gaps in aspiring creatives, as displayed in Table 1 below.

Table 1

Digital Content Industry: Employers' expectations versus workplace realities (based on 60Sox, 2010)

Expectations of employers	Workplace realities / view of employers
Most important skills and attributes	Largest capability gaps
teamwork communication skills problem-solving skills motivation adaptability	teamwork communication skills problem-solving skills initiative and enterprise skills self-management skills

These findings are concerning and suggest that aspiring creatives in Australia, including digital media design graduates, are not sufficiently prepared to bridge the gap between university and industry (60Sox, 2009).

Exploring Existing Links Between Higher Education and Industry

Links between the creative industries and higher design programs often exist, through integrated work placement modules (Triggs, 2004) or internships, where students can gain valuable industry experience prior to their employment (Sernack, Quee & Thomas, 2010). However, not all design programs offer integrated work placements, as it has become “increasingly difficult for institutions to place students within professional design practices” (Sernack, Quee & Thomas, 2010, p. 2), whether because companies are less willing to take students (Design Council, 2005, 2010; Sernack, Quee & Thomas, 2010) or because a three-year undergraduate education does not leave room for such experience.

This is problematic, especially when seen in context of existing research that identified that linking industry and design education is important. For example, a study conducted by the Design Council (2005) in association with the Design Business Association (DBA) in the UK revealed that *direct input* from the creative industry into the academic environment is considered very beneficial. A significant number of telephone interviews (2,433) were conducted with design consultancies, in-house teams and freelance designers in the UK to explore the notion of creative industry involvement in design education. Eighty-eight per cent (88%) of the design professionals thought that design education could be improved through increasing the number of practicing designers working in education, and 85% would require full-time lecturers to spend time working in the industry (Design Council, 2005).

These findings are also reflected in one of the Design Council and Creative & Cultural Skills Panel's (2007) recommendations, which endorsed a "network of visiting design professors [practising designers and design managers] to better connect ...higher education with professional practice" (p. 42) in order for universities to be more responsive to what employers seek. Building on this recommendation, Steane (2010) recently suggested setting up a "learning hub" in which "[p]racticing design professionals would encourage Universities to establish more informal settings for sharing knowledge, research and informing practice. From this humble start, mutual research and business opportunities may arise" (p. 5).

In general, digital media design education provides many opportunities to connect with industry and with the local community due to its nature of "being a creative discipline and a servant of clients" (Price, 2005, p. 1). Community engagement opportunities and the development of relationships with small- or

medium-sized enterprises (SMEs), for example, are commonly created through community organizations or SMEs (both referred to as "industry" in this study) seeking support from their local university due to the lack of resources to finance professional design solutions. These client-service relationships are mutually beneficial, as students gain valuable experiences through being engaged in a real-world project with a real brief, developing commercial understanding as well as social responsibility (Smith, 2010), and the industry or community partner benefits by accessing expertise pro bono or, for example, by conducting a student competition with a small financial reward for the winning entry (Eriksen, 2009).

Should Design Education Become More Involved with Industry?

While critics question how much industry should dictate pedagogy (Adams, 2006; Agre-Kippenhan & Kippenhan, 2005; Tunstall, 2006), stronger links to industry better preparing students for the demands of the market are clearly identified by others (Ball, 2003; Design Council, 2005; Design Council and Creative & Cultural Skills, 2007; Livingston & Harvey, 2010). Research on "how to do it", what it encompasses and the role of industry in design education is limited. Some literature exists highlighting the benefits of linking industry and community with the learning environment, through real-world projects as one possible strategy. Choi (2009), for example, sees many benefits in industry clients providing real-world projects for students, enabling them to experience practical design constraints and have the benefit of sponsors' "formal and informal mentorship to the students." Sernack, Quee and Thomas (2010) agree that exposing students to real clients and real briefs is very important. According to Rothstein (2002), the partnership between the university and industry is largely responsible for the success of projects: "real-world assignments

and interaction with individuals from practice clearly motivate and broaden students' education" (Rothstein, 2002). Ghory-Goodman (2010) also sees the benefits of engaging students in real-world projects, however also points out that "teachers have to balance the value of real-world problems with the necessity of choosing assignments that are meaningful and appropriate within the sequence of the curriculum". Innes (2006) sees a challenge in that occasionally "these projects serve the learning needs of the students, rather than serving the request of the industry" (Innes, 2006, p. 191). Choi adds "the drawback is the potential of lack of academic pedagogy if the sponsor is too inclined to get the outcome." Dubberly (2001) sees the same risk when teaching with real-world projects and argues that in some cases the "outcome or product can overshadow the process. Time spent working on the product can crowd out understanding principles."

Despite challenges, engaging industry 'clients' in the learning environment is one possible strategy to introduce students to industry practice and current work processes during the course of study. Evidently, though only a short overview is presented in this paper, the engagement in real-world projects with 'clients' demanding solutions applicable to industry standards can result in situations where "students learn the ins and outs of a project from discovery to completion. The addition of this [type] of industry engagement to a degree program can lead to many opportunities as students are aided in a successful transition from classroom to workplace" (Foroudastan & Hardyman, 2003). Challenges exist, but appear to be manageable by balancing real-world requirements and learning goals through thoughtful selection of appropriate projects (Vere, 2008).

Another strategy for engagement with the industry is the model of the teacher-practitioner with design schools or departments employing creative industry

professionals to deliver content in lectures or tutorials to students (ADM-HEA Subject Centre & NESTA, 2007; Clews, 2009; Vaughan et al., 2008). These “[t]eacher-practitioners are recruited presumably because they bring the ‘difference’ of industry perspective from outside HE [Higher Education]” (Clews, 2009, p. 73). While it appears to be common practice (ADM-HEA Subject Centre & NESTA, Clew, 2009; Shreeve, Sims & Trowler, 2010), their role and contribution to the education of design graduates is yet to be investigated in depth and with a variety of research evidence. Especially in context of contradicting views for example the ADM-HEA Subject Centre and NESTA (2007) stating that teacher-practitioners “appear to behave like academics rather than industry professionals” with “little evidence that they have an impact on curriculum content or delivery” (p. 91) and others suggesting that their professional industry experience brings benefits to the teaching and learning community by adding up-to-date and industry-relevant knowledge (Clew, 2009; Welch & Russo, 2005). These diverging views may exist through the variety of roles creative industry professionals can take within the teaching environment (e.g. tutor, visiting critique or visiting guest lecturer). Each role may result in outcomes more or less effective in regards to what was overall intended. Clew (2009) confirms that “the practitioner role or model within arts education remains poorly articulated” (p. 71) and points out that more research is needed to explore the complex relationships between teaching and practice. An alternative approach to learning and teaching design therefore may include the previously described and ‘tested’ strategies and also involves design and creative industry professionals into the learning and teaching environment of design degree programs.

In summary, because “employers often complain that design graduates do not acquire ‘real-world’ knowledge and experience whilst gaining their qualifications”

(Sernack, Quee & Thomas, 2010), some design degree programs, in addition to offering internships to students, involve industry (community organisations or industries such as automotive, leisure, transport) as clients, providing real-world projects. The latter replicates the client-service relationships in which design graduates will most likely engage after graduation. The effectiveness of creative industry professionals being engaged in various roles in the learning and teaching environment needs further exploration in particular because closer links specifically to design industry and their practitioners were recommended as one approach to close skill gaps and ensure that “students are developing current, industry-relevant skills” needed to effectively contribute to future development of the design industry (Design Council and Creative & Cultural Skills, 2007, p. 6).

A Framework that Reflects Industry Practice and Sets on Integrating Links to Industry

In response to the current identified shortfalls of undergraduate digital media design education, an alternative learning and teaching model, the POOL Model framework (Fleischmann, 2010, 2011), was developed, implemented and tested over a period of two years across six subjects in the Bachelor of New Media Arts’ digital media design major at the School of Creative Arts at James Cook University. While a broad underpinning strategy of the POOL Model framework is to reflect industry practice through implementing workplace realities, such as multidisciplinary teamwork with disciplinary constellations driven by the nature of a tasks, an equally important core strategy is to engage students with industry and make such engagement an integrated part of the undergraduate design curriculum.

The core concept of the learning and teaching approach is based on a ‘pool’ idea (a group of resources or people to be ‘used’ when needed), a concept widely used to manage resources (e.g., a car pool). The pooling of people or expertise (students, educators, industry and community partners) occurs via teaching and learning pools. In each pool, multidisciplinary groups work together to either define a problem and guide the problem-solving process (teaching pool), or solve a problem (learning pool). People outside the university, such as industry professionals and community partners (arguably a pool in itself), are part of the teaching pool in the following roles:

(1) Professionals from the digital media design and other creative industry sectors are involved as:

- (a) tutors to deliver up-to-date and industry-relevant knowledge;
- (b) guest lecturers to share up-to-date knowledge and industry experience;
- (c) advisors and assessors to guide and link learning outcomes to workplace realities.

(2) Professionals from other industries (e.g., food, automotive, hospitality) are involved as:

- (a) sponsors and/or clients providing projects/problems for students to work on;
- (b) advisors in relation to the project they have provided or sponsored.

(3) The community is involved as:

- (a) clients providing projects/problems for students to work on.

The following sections report on the implementation of the POOL Model framework in an undergraduate digital media design learning environment, and research investigating the following question: Does integrating professionals from the

design/creative industry into the learning environment contribute to better preparing digital media design students for industry practice?

Implementing the POOL Model Framework in an Academic Environment:

Subject Design

The researcher teaches at a regional Australian University of medium size, where the media design major is part of a three-year undergraduate degree program titled 'Bachelor of New Media Arts'. Four other majors are offered within the same degree program: digital imaging, digital visual arts, digital sound and performance. *Creative Exchange Project* is a capstone subject in the Bachelor of New Media Arts degree, facilitating the collaboration of these five creative arts disciplines in the final semester of study. This already inbuilt multidisciplinary collaboration model for digital media design students was extended to include non-creative arts disciplines such as Information Technology (IT), Business and Education in the learning pool. Furthermore, students were encouraged to form alliances with other students across university (not enrolled in the subject) in order to access additional expertise, if required for the project and approved by participating educators.

The aim of the subject *Creative Exchange Project* (Fleischmann & Hutchison, 2012) is to engage students in a collaborative multidisciplinary team-based learning environment to directly experience the planning and production of a large-scale project during a thirteen-week semester. Each project may require diverse expertise. Accordingly, students form teams choosing members from the learning pool with the discipline-specific skillsets necessary to produce the project. Projects may be either 'real-world', provided by industry or community partners, or created to resemble a typical industry project.

In order for students to also engage with design and other creative industry professionals, thereby gaining insight into current work practices, a '*Creative Exchange Meets Industry Day*' is an integrated part of the subject. Student teams engage with an industry panel consisting of national and/or international design and other creative industry professionals. These professionals share their experience and give expert advice through panel discussions or guest lectures and provide direct feedback to students on their project early in the development process. Student teams are further encouraged to establish additional contacts with professionals from the design and other creative industries.

The application of the POOL Model framework was tested in Creative Exchange in two iterations (Trial A in 2009 and Trial B in 2010) involving 111 students (46 digital media design major, 50 other creative arts disciplines, 15 non-creative arts discipline), 19 educators (15 creative arts, four non-creative arts disciplines), nine industry professionals (eight creative arts industry, one IT industry) and four community clients. Details for one of the trials (Trial A) are shown below.

Trial A: Figure 2 illustrates the application of the POOL Model framework for *Creative Exchange Project* in Trial A, showing the team constellation and expertise input/exchange for two exemplar projects, and also shows participants of the learning and teaching pools in the key on the right side of the graphic.

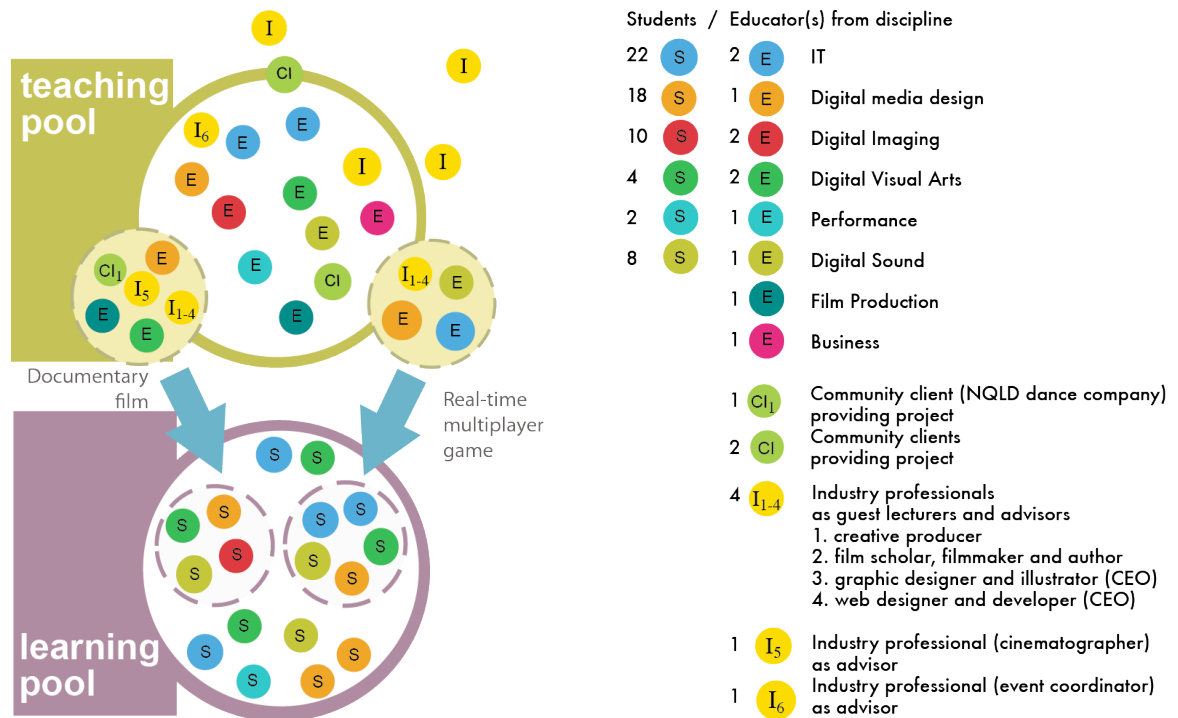


Figure 2. POOL Model framework for Creative Exchange Project including two exemplar projects: Trial A.

In addition to the two visualised teams in Figure 2 above, 11 more teams (a total of 13 project teams) were formed in Trial A. Projects were generally self-selected, provided by community clients or proposed by a team of educators. The team configurations were diverse in size and range of expertise and are overviewed in detail in Table 2, showing which project students engaged in, team size, disciplinary constellation of teams, what additional expertise was sought and if community and/or industry was involved.

Table 2

Student teams and their engagement with community clients and industry professionals in Creative Exchange Project in Trial A

Team and project in Trial A	No of students	Disciplines Involved*	Engagement with industry panel	Other optional expertise sought (university/industry/community)	Community client
Team 1: Book and DVD design for Festival of Contemporary Art	3	DI (2), DS	✓	Not pursued	NQLD Art Gallery
Team 2: Documentary film	4	DMD, DI, DVA, DS	✓	Lighting professional, camera man, professional dancer, designer	NQLD Dance Company
Team 3: Music & Culture of the Cook Islands - DVD	4	DMD, DI, DVA, DS	✓	Cook Islands Dance group	Multicultural Support Group
Team 4: Performance production	4	DMD, DVA, P(2)	✓	Actors	
Team 5: Tower defence game	6	DMD, DS, IT(4)	✓	3-D modeller, online designer	
Team 6: APP development for mobile device	3	DMD(2), DI	✓	IT professional	
Team 7: Italian recipe book and DVD	3	DMD(3)	✓	Actors and storyboard artist, Italian chef	
Team 8: Fashion magazine	2	DMD, DI	✓	Business (1) and journalism students (3)	
Team 9: Music video and DVD production	3	DMD, DI, DS	✓	Not pursued	
Team 10: Multimedia exhibition	4	DMD(2), DI, DS	✓	Not pursued	
Team 11: Real-time multiplayer game	4	DMD, DS, IT(2)	✓	Not pursued	
Team 12: Interactive online movie	4	DMD(2), DVA, DS	✓	Actors	
Team 13: Final year exhibition	4	DMD(2), DI(2)	✓	Event coordinator	
Total number of students	48				

* DMD – Digital Media Design, DI – Digital Imaging, DVA – Digital Visual Arts, DS – Digital Sound, P – Performance, IT – Information Technology

The activities in which student teams were engaged with the industry panel and participants of the panel are shown in Table 3 below.

Table 3

Integrated engagement of design and other creative industry professionals in the learning and teaching environment in Trial A

Trial A Creative industry panel involved as guest lecturers and advisors	
Activity	Creative industry panel consisted of
<ul style="list-style-type: none"> • Panel discussion: “Collaboration and creative exchange: Challenges and opportunities for the contemporary artist” • Creative Exchange student teams presented their prototype to industry panel • Student teams consulted with industry panel 	<ul style="list-style-type: none"> • Creative producer (Australian metropolitan area) • Film scholar, filmmaker and author (Germany) • Graphic designer and illustrator (CEO) (Australian regional area) • Web designer and developer (CEO) (Australian regional area)

In the subsequent trial (Trial B), the application of the POOL Model framework for *Creative Exchange Project* was repeated. Minor changes occurred - the learning pool was enlarged by two disciplines (Business and Education), and the teaching pool by one discipline (Anthropology), as a particular project required expertise in these areas. As occurred the year before, the team configurations (11 teams) were diverse in size and range of expertise and had various industry connections: two teams had a community organisation providing a real-world project, seven of the 11 teams sought expertise from the creative industry or other industries (e.g., IT, Marketing) and all teams engaged with the creative industry panel on ‘*Creative Exchange Meets Industry Day*’. Table 4 details the activities students engaged in on the industry day and members of the creative industry panel in Trial B.

Table 4

Integrated engagement of design and other creative industry professionals in the learning and teaching environment in Trial B

Trial B Creative industry panel involved as guest lecturers and advisors	
Activity	Creative industry panel consisted of
<ul style="list-style-type: none"> • Guest lecture: “Collaborative Practice is Every Day’s Business” • Creative Exchange student teams presented their concept idea and first prototype to industry panel • Student teams consulted with industry panel 	<ul style="list-style-type: none"> • Producer, film maker (Australian metropolitan area) • Interior designer (Australian regional area) • Graphic designer (CEO) (Australian regional area) • Photographer (Australian regional area)

Methodology and Research Design

The application of the POOL Model framework is complex and touches on a variety of broader pedagogical topics in higher design education, such as teamwork and group learning, peer assessment, authentic learning environments and scenario-based learning. While the overarching research on the development and implementation of the POOL Model framework explores how digital media design students can be better prepared for professional practice in the creative industries, this particular part of the study focuses on whether integrating design/creative industry professionals into the undergraduate digital media design learning environment contributes to such better preparedness. This small-scale study is part of the author’s larger doctoral research project. Despite “limits of small scale educational experiments” this study attempts “to generate new and useful ...knowledge” (Mardsen, 2007, p. 565) that informs educational practice in some way.

A pragmatic approach (Punch, 2009), which enabled the researcher to choose methods that suit the real-world practice nature of the situation, was applied to this

research study. Within this pragmatic framework a mixed-method research approach (Johnson & Christensen, 2008; Punch, 2009; Teddlie & Tashakkori, 2009) seemed most relevant and was applied. Setting out to triangulate data sources in order to obtain more information from varying perspectives, data was collected from three stakeholder groups: students, educators and industry professionals/community clients (see Appendix, Table 1A for details). In gathering data from students, triangulation was also applied to the method of data collection obtaining quantitative data from questionnaires and qualitative data from questionnaires and interviews in a parallel mixed design (Teddlie & Tashakkori, 2009).

The data gathered in both Trials A and B were rich, providing a variety of avenues for exploration. Data analysis for this part of the study was driven, according to the research question, by exploring the outcomes of involving industry and community into an undergraduate learning and teaching environment; it therefore focused on “benefits” and “challenges” experienced by stakeholder groups. Qualitative data obtained from responses to open-ended question in questionnaires and interviews was coded using the research analysis software NVivo. The application of a conversion method to enable qualitative data to be converted to quantitative data (e.g., counting students' references to a certain issue during an interview) was also considered as appropriate for this study. Quantitative data obtained from the questionnaires was analysed using descriptive statistics provided by the SurveyMonkey platform or by using Microsoft Excel.

Exploring Student Perspectives

Digital media design students were asked to provide feedback via questionnaire on the experiences they had in their engagement with the creative industry panel. Table 5 presents the findings from both subject trials.

Table 5

Digital media design students' perspectives on involving creative industry professionals as expert advisors

Question	Yes		No		Total Participants	
	Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
We had four creative industry professionals invited to meet with you. Was this day a good experience for you?	94.4% (17)	92.6% (25)	5.6% (1)	7.4.0% (2)	18	27
Did you find the feedback from the industry professionals helpful?	94.4% (17)	81.5% (22)	5.6% (1)	18.5% (5)	18	27

Table 5 shows that the majority of digital media design students viewed their engagement with creative industry professionals as beneficial, and valued the industry's direct feedback on project work. The average ratings across both iterations of the subject (Trial A and Trial B) are very high, with 93.5% of students stating that engaging with the creative industry panel was a positive experience, and 87.9% finding the panel's feedback helpful. In order to explore the nature of these benefits, focus group interviews conducted with all student teams were explored in regards to experienced benefits and challenges. Table 6 synthesises all feedback in terms of key benefits that emerged.

Table 6

Students' perspectives on integrating industry into the learning and teaching environment

Key benefits identified	No of student teams		Total no. of references made	Examples of typical comments from 98 students (Trial A/Trial B)
	11	13		
	focus group interviews			
	Trial A	Trial B		
Gain insight into industry and understand professional practice	22	9	31	<p>We had learned the theory behind these projects before but never carried them out. One thing I have learned is that everything needs to be finished and tested before it goes out to the client. So it was a steep learning curve. (Trial A)</p> <p>We got to see work of the designer and hear her opinion, and she explained how she would structure the project and work on the designs for the different media. Her advice was really good so we understood how they do things in the industry and we just did it the same way. (Trial B)</p>
Prepares us for real life	10	10	20	<p>I understood all the little things you learn about in class, but don't actually see the finer details until you are doing it. I feel much better prepared now to work in industry. (Trial A)</p> <p>It probably makes coming out of university a bit easier because you've been a student, and then you're going into the industry; this subject gives us a mix in between that. It helps us with the transitions into the world of work. (Trial B)</p>
Learn to communicate with industry professionals/ make industry contacts and build networks	12	8	20	<p>I've gained confidence out of it, in speaking to people and people-skills. I've had a lot of face-to-face meetings. I feel like I'm a new student, but I'm not anymore. It's a weird transition. (Trial A)</p> <p>You build your own networks, your own connections, and I like the referrals to other people as well. (Trial B)</p>
Total			76	

Table 6 shows that students viewed their engagement with the creative industry as valuable. The engagement creates a series of beneficial real-life experiences for students, in that they feel they gain insight into industry practice and feel that they better understand industry and workplace realities.

It is notable that references made to ‘gain insight into industry’ are higher in Trial A than in Trial B. This outcome directly relates to the different methods industry professionals employed to share their experience. In Trial A students attended a panel discussion, which involved all four industry professionals presenting their views on “Collaboration and creative exchange: challenges and opportunities for the contemporary artist”, and in Trial B students attended a guest lecture by one industry professional who presented a singular view. This would therefore explain the difference in the volume of references to this aspect.

It was important to also explore whether students experienced any challenges when engaging with industry. Table 7 presents findings of key challenges, the number of times these were referenced in each trial, and exemplar quotes that reflect each challenge.

Table 7

Student perspectives on challenges when engaging with industry

Key challenges identified	No. of student teams		Total no. of references made	Examples of typical comments from 98 students (Trial A/Trial B)
	13	11		
	Focus group interviews			
	Trial A	Trial B		
Difficult to maintain communication/unreliable	6	16	28	I think that our main problem was communication. Having to chase them constantly. (Trial A) I think it was just communication and trying to get what we needed from them by a certain deadline... It was always like here it is an hour beforehand. (Trial B)
Do not take students seriously	1	4	5	They would probably be more professional if we were paying them. (Trial A) There are people who let you feel that “you aren’t good enough to work with me.” (Trial B)
Total			33	

Table 7 shows that students experienced challenges. There is agreement across the two subject trials that it is difficult to maintain communication with creative industry professionals, and some students, though a low number (5), describe them as unreliable. It is not surprising that students referenced this challenge; it is a reflection of industry realities, particularly in the creative industries, where professionals have busy schedules and work on tight deadlines. While they might generally be willing to help, market pressure may prevent it. In addition, given that students are also pressed for time with an academic submission deadline looming, this can certainly present a challenging situation for a student.

In summary, from the 109 comments that related to industry engagement, 33 (30.3%) refer to challenges. The 76 identified benefits (69.7%) evidently outweigh the challenges, although some issues were acknowledged that would require ongoing attention and management. In conjunction with findings from quantitative data, the POOL Model framework appears to create, from the students' perspective, mostly positive results in the understanding of workplace realities and preparing digital media design student for industry practice in these two iterations of Creative Exchange.

Exploring Educator Perspectives

Insight into educator perspectives on the outcomes of integrating creative industry professionals into the undergraduate learning environment was gained from qualitative feedback via face-to-face interviews conducted after each subject trial. Table 8 synthesises the interviews with fifteen educators in terms of key benefits revealed, with the subject trial in which they occurred indicated through a tick (✓). If

more than one educator referenced a benefit, a number is shown in brackets and exemplar quotes are shown in the last column.

Table 8

Educators' perspectives on the benefits of integrating industry into the learning and teaching environment

Key benefit identified	No. of educators			Trial A: 7	Trial B: 8
	Stated as an outcome (no. of educators if more than one)			Examples of typical comments (Trial A/Trial B)	
	Trial A	Trial B	Total no. of references made		
Students get different and "real" perspectives	✓ (5)	✓ (4)	9	<p>Having an industry group come in from outside is so important for the students because they see us [their lecturers] for three years. They need someone from industry to tell them that they are on the right track, because they stop listening, I think, to the people they've had for three years. (Trial A)</p> <p>I think the students got a lot out of it. Some of them realized how inadequate their planning had been to that stage, or how short-sighted some of their goals were. A lot of criticism [from the creative industry panel] was spot on, ... I think the fact that the industry panel was coming up meant that the criticisms that I was making about some of the groups, they probably came to the decision to make some changes that they probably would not have otherwise made. (Trial B)</p>	
Students gain real-world experience, insight into industry and prepares them for professional practice	✓ (7)	✓ (6)	13	<p>... the difference between a student doing Creative Exchange, and a student not doing it, is fifty percent. I think they are able to walk into a job knowing what sort of things will be a problem, what sort of things to expect, having a degree of confidence because they have experience working with an outside stakeholder. (Trial A)</p> <p>They are all obviously forced to take their projects out into the world. Some of them did that to a better effect than others. It was intimidating for them even just to talk to people that ran venues or to negotiate higher fees, then to get the word out there to the right people. So the advertising was new to a lot of them. However, once it was in motion there were people at those events, cards exchanged and jobs offered. There are examples of people directly getting work out of that, which is more than we could have hoped for. (Trial B)</p>	
Mutually beneficial relationship/ industry-university feedback circle	✓ (5)	✓ (5)	10	<p>...it is very important for students, and for industry, for many reasons. They need to know what students are doing these days; they need to keep in touch with higher education and the latest in learning. The students need to know what is going on in industry, who the players are, etc. (Trial A)</p> <p>Having students engage with industry and community in Creative Exchange is absolutely critical for many reasons; first of all we have no accreditation bodies so it becomes a benchmarking tool; it becomes a testing tool to see if what's happening is relevant and valid and real with industry and community. Students graduating from our creative disciplines are always working with clients, community, industry groups, whether it's school students, community outsourcing organizations, individual clients, getting a job done, so they need to get prepared for that, and also, higher education should be about contributing to not only the development of the individual student, but contributing to the broader goals of a society, so we need to make that contribution when there's mutual benefit. (Trial B)</p>	

The feedback presented in Table 8 is largely positive. Educators highlight creative industry's engagement in the learning environment as beneficial, in that students gain real-world experience and insight into the industry, which ultimately prepares them for professional practice. It was particularly encouraging that educators see the engagement with the creative industry as mutually beneficial, and that some educators pointed out the importance of the industry-university feedback circle. Overall, educators were in agreement that involving creative industry professionals is essential to advancement of design and creative arts education. Upon further exploration of educator views no challenges were identified. One educator saw the potential for involving creative industry professionals in the assessment process, however he also stated that it is a "double-edged sword," perhaps leading the industry professional to have inappropriate expectations of a student at a particular level of study. Overall, educators were in agreement that involving creative industry is essential to advancement.

Exploring Creative Industry Professionals' Perspectives

A group of eight regional, national and international creative industry professionals were interviewed regarding their engagement in these subject trials and their views on the conception of the POOL Model framework. As a result the following could be established:

All creative industry professionals agreed that involving creative industry in an undergraduate curriculum is important. The following comments offer insights into their views:

- [Creative Exchange Meets Industry day] “makes students understand that clocks are ticking differently outside university.” (Filmmaker and author; Trial A)
- ...“academia is not an ivory tower, not a world of its own. Ultimately the students have to make a living outside and this is where the outside world comes in. I think it is a very good approach, a very valid approach and not taken too often unfortunately until this day.” (Graphic designer; Trial B)
- “I think it is important to talk to students so they are more prepared for when they leave University. ... it is important to have that engagement with their target industry. The more preparation the better, less shock.” (Producer, filmmaker, Trial B)
- “The industry people know about all the changes. Whereas I guess when you are not doing it all the time [referring to educators], it is hard to know what is going on in the industry. So bringing those other people in who deal with it every day really helps. It gives the students a bit more up-to-date knowledge.” (Web designer and developer; Trial A)

In general, all agreed that introducing creative industry professionals as guest lecturers or guests who share expertise, and/or provide direct feedback on student work is an excellent and important step to better prepare students for workplace realities.

Conclusion

The application of the POOL Model framework intends to provide digital media design students with a more authentic learning environment through reflecting work practices, for example the multidisciplinary collaborative work environment, but

equally important by making design and other creative industries professionals an integrated part of the digital media design learning and teaching environment.

Although a small sample and study, findings suggest that integrating design and other creative industry professionals into the undergraduate digital media design learning environment is vital. In general, students, educators and creative industry professionals felt that engagement with the design and creative industry was beneficial for students in that the direct engagement resulted in students developing an understanding of real-world requirements and workplace realities.

It is therefore possible that design and other creative industry professionals should be involved in the shaping of the digital media design curriculum in order to ensure that dynamic industry practice is constantly reflected in undergraduate design education, especially with the majority of graduates entering the workforce after completion of their studies. Both creative industry professionals and educators were positive about the mutual relationship and highlighted that interaction between industry and the learning and teaching environment creates a dynamic feedback circle that supports keeping digital media design education relevant and up-to-date. Changing trends in methodology, work practice and technology could be recognised through such a practice-informed approach.

In terms of challenges, some students experienced their interaction with creative industry professional in regards to communication as not responsive and/or timely enough. Adding workshops that prepares students for communication at a professional level or, as recently suggested, helps them to develop social network capabilities (Bridgstock, Dawson & Hearn, 2011) may help avoid these types of challenges. Although educators did not identify challenges directly related to the integration of creative industry professionals into the learning and teaching

environment, it is clear that the POOL Model framework is ambitious and requires significant effort (e.g., time, organization, managing collaborations) to be implemented successfully. This challenge has been embraced by those involved and has led to evidence-based benefits. In part based on evidence provided by this study, the application of the POOL Model framework in the Creative Exchange subject is ongoing and future developments anticipate the implementation of the framework across the whole Faculty of Law, Business and Creative Arts by 2013.

Appendix

Table A1

Questionnaires and interviews relevant to this study conducted in Creative Exchange in Trial A and Trial B

Trial A					
Participants		Profile	Feedback mechanism		
			Online questionnaire		
			Feedback participants	Response Rate (%)	Week
Students (13 teams)	18	3 rd year digital media design	18	100	13
	24	3 rd year Bachelor of New Media Arts students: digital imaging (10), digital visual arts (4), digital sound (8), performance (2)			
	6*	3rd year IT			
	48	Total number	Focus group interviews after project presentation: all students		
Educators	10	Digital Imaging (2), Film Production, Digital Visual Arts (2), Digital Sound, Performance, Business, IT (2)	7	Interview (face-to-face) after assessment was completed	
Industry Professionals	5	Creative producer, Film scholar, Graphic designer, Web designer and developer, IT industry professional	4	Interview (telephone) after the event	
Community Clients	2	Public Programs coordinator, NQLD Art Gallery Film producer/ director	2	Interview (face-to-face) after final presentation	
Trial B					
Participants		Profile	Feedback mechanism		
			Online questionnaire		
			Feedback participants	Response Rate (%)	Week
Students (11 teams)	28	3 rd year digital media design	27	96.4	7
	26	3 rd year digital imaging (13), digital visual arts (8), digital sound (4), performance (1)			
	4	3rd year education			
	2	3rd year business			
	3	3rd year IT			
	63	Total number	Focus group interviews after project presentation: all students		
Educators	10	Digital Imaging, Digital Visual Arts (2), Digital Sound, Performance, Business, Digital Media Design (2), Film production, Anthropology	8	Interview (face-to-face) after assessment was completed	
Industry Professionals	4	Photographer, Interior designer, Producer/film maker, Graphic designer,	4	Interview (telephone) after the event	
Community Clients	2	Anthropology expert Coordinator of performance programs in High School	2	Interview (face-to-face) after final presentation	

*The pool concept, "using" resources or people when needed, was utilized to its full potential. That is, not all IT students participate in Creative Exchange Projects. Rather, where IT expertise was required for a project the IT students were invited or recruited to join a team for the production of a larger scale project.

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