What do first year students think about learning graphics packages?

Joshua McCarthy
School of Architecture, Landscape Architecture and Urban Design
The University of Adelaide

This paper discusses the assessment of the change from Auto-des-sys's FormZ to @Last's Sketch Up as the primary CAD program in first semester, first year, delivered through a new compulsory course, *Human Environments: Design and Representation*, and the introduction of a graphic design based elective course, *Imaging Our World*, in the School of Architecture, Landscape Architecture and Urban Design at The University of Adelaide. The evaluation process involved pre and post semester questionnaires, weekly feedback from students and course SELTS. The aim is to accurately determine students' interests in digital media in design and to introduce new and relevant digital media components into the undergraduate degree to provide a suitable and structured lead-in to the Masters of Digital Media program.

Keywords: digital media in design, educational evaluation

Introduction

In 2005 a study was undertaken for The School of Architecture, Landscape Architecture and Urban Design at The University of Adelaide, in order to assess and assist in the restructure of the digital media components within the Bachelor of Design Studies degree, in accordance with the requirements and opportunities graduating students face when entering the workforce (McCarthy, 2006). There were two primary forms of information for this study. 1) A series of industry professionals and recent graduates, from relevant design fields were interviewed to gain a broad understanding of employers' expectations regarding potential employees and the nature of projects graduates experience as they enter the workforce. 2) Questionnaires were created to determine the current Design Studies students' interests regarding digital media. The interviews emphasised the growing importance of digital media within most fields of design. Strong digital skills are especially important for architecture graduates, as they will initially be employed for drafting and presentation purposes, two areas dominated by digital media, while they are trained in the design principles of the firm. The questionnaires highlighted the growing interest in digital media within our cohort, in all areas of design. The study assisted in two outcomes within Design Studies, specifically the change in 3D modelling software, in first year, from Form Z to Sketch Up, delivered in a new core course *Human Environments: Design and Representation*, and the introduction of a graphic design based elective subject, *Imaging Our World*, also in first year. In recent years there has been much discussion regarding suitable approaches to teaching software packages to students and incorporating these digital skills into design-based courses. Pietsch, (2005), raises the concern that too much emphasis is being placed on the "keystroke approach", where students spend excessive amounts of time learning the technical aspects of a program rather than using it as a design tool. Bromberek, (2005), adds to this by questioning whether specific software packages should be included in the curriculum at all, instead leaving this choice to students:

> The huge range of other 'essential' software means that vast commitment would be required from people new to all the worthy packages to master them. Then, it is more than likely that the package, mastered at great expense of time and effort, will not necessarily be the one that the employees or clients need. There is not enough time to train in any particular software package (Bromberek, 2005).

The importance of incorporating specific software packages into the curriculum becomes evident however, after discussions with architects; as Jason Schulz, Director of DASH Architects, emphatically states, "the first thing I look for in a prospective employee is which software packages they are familiar with." The focus here should be the selection of relevant software programs to include, and their delivery within an appropriate vehicle. There was a shared opinion throughout the academic staff in the school that FormZ had become inappropriate as an introduction to 3D modelling for first year Design Studies

students (Pietsch, Shannon, McCarthy, 2006). Sketch Up was examined as a possible replacement, over a six-week summer scholarship program involving the five academic staff members responsible for delivering the restructured first year course, and ten accomplished Design Studies students. The program included software training sessions, cross-platform file analysis to test the possible association between Sketch Up and other programs, evaluating existing digital tutorials and their capacity to integrate with Sketch Up, along with the design of *new* tutorial exercises, and was ultimately the catalyst behind the change. Sketch Up was delivered to students in the form of *Human Environments*, the restructured, core first year course in first semester. This course combines design and representation skills, introducing students to architecture and landscape architecture through small-scale designs; and to representing such designs through both CAD and hand drawn techniques. It was decided that *Imaging Our World* would take an urban design approach and incorporate Adobe Photoshop as a presentation tool for students.

Method

The evaluation of the two new courses involved four key steps: a pre-semester questionnaire, weekly feedback from students, course SELTS (Student evaluations of learning and teaching), and a post-semester questionnaire. The pre-semester questionnaire was issued to the students in the digital workshops in week one in *Human Environments*. The students were broken down into two categories – those who chose *Imaging Our World* as their elective course (IOW students), and those who did not (non-IOW students). The questionnaire was designed to determine a) students' initial interests in the following digital media topics: web and graphic design, architectural and landscape visualization through animation and image composition, character animation and visual effects; and b) their intended study paths. Throughout the semester students were given the opportunity to provide feedback regarding the two courses through a series of weekly digital workshops, where they were introduced to new digital skills through small, assessable design exercises. The exercises often required students to research topics and complete work outside of course contact hours, while the assessment criteria covered three key areas – technical ability, design quality and reflection. Firstly, it was important that students learnt and retained the technical skills introduced during the workshops. The tasks were presented in front of the class, of approximately 40 students, on a projector by the lead tutor. This *'instruction'* period would last for around 25 minutes and was followed by one-on-one help in a studio environment. Secondly students were required to demonstrate a strong design quality in their work. This was assessed through the students' responses to specific design problems within the exercise, such as spatial relationships in a small dwelling. Finally, reflection was assessed through a 200-word statement supplied by the student, which included feedback on the exercise and any difficulties they faced. This weekly feedback allowed an ongoing assessment of the two courses throughout the semester, making it possible to immediately address any serious concerns. The course SELTS were held during week 11. A *special survey* was used for *Human Environments*, which included additional questions regarding Sketch Up, such as the students' confidence regarding their newfound communication skills, the ease of learning Sketch Up, and their confidence in tackling new software packages as a result of learning Sketch Up. Lastly the post-semester questionnaire was distributed to students during the digital workshops in week 12. Key questions featured in the previous questionnaire were retained to determine if there were any substantial changes in a) the students' interests in specific areas of digital media, and b) the students' intended study paths. Questions concerning the students' experiences with digital media during the semester were also included.

Results

The pre-semester questionnaire, featuring a response rate of 74%, provided some substantial results. 65% of this year's first year students are school leavers, and the majority have had minimal experience with digital media in design. The students' reactions to learning specific areas of digital media were generally positive despite this lack of experience. When asked whether they would like to see the inclusion of such digital media components within the Design Studies degree the responses were as follows: there was a positive response of 75% to digital graphic design, architectural and landscape visualization through animation, and image composition, and 71% to visual effects. Only web design and character animation generated a comparatively low positive response of 55% and 52% respectively. These statistics were compiled using a Likert scale with responses ranging from 1 (strongly disagree) to 4 (undecided) to 7 (strongly agree). The questionnaire also indicated that the majority of students, 64%, entered Design Studies with the intention of going on to the architecture degree. 9% indicated they would go on to the architecture / landscape double degree, 11% to landscape architecture, 5% to Masters of Digital Media,

while 11% suggested that completing Design Studies was their only intention. Generally the weekly feedback from the students was positive, particularly from two students who failed the corresponding course last year, when Form Z was in use. Both students commented on the ease in which they were able to communicate their design ideas in Sketch Up as opposed to Form Z, as one noted, "the way in which we create objects is so much easier." The most compelling results however, came from the post-semester questionnaire. Here there was one sizeable difference between the IOW students and the non-IOW students. When asked which areas of digital media they would like to see included in Design Studies, the IOW students' mean responses were substantially higher towards graphic design, architectural animation and image composition, the three topics they had experienced during the semester, indicating that students responded positively towards the digital media components within both *Human Environments* and *Imaging Our World*. Further supporting this claim were the results from the non-IOW students. Again there was a substantial rise in interest within architectural animation and image composition. There was, however, only a minimal rise in interest in graphic design (+0.1, 5.5 to 5.6), suggesting that *Imaging Our World* was responsible for increasing students' interest in digital graphic design, as shown in Figure 1.
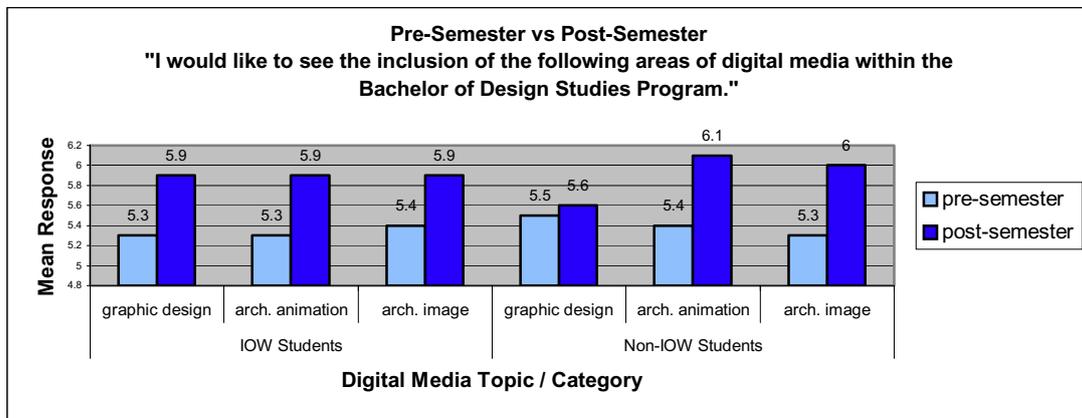

Figure 1: Pre-semester versus post-semester, non-IOW Students and IOW Students

Changes within both groups of students were also noted when it came to their intended study paths. The percentage of students intending to go onto to architecture decreased dramatically: 70% to 42% among IOW students, as shown in Figure 2. The most notable increases were Design Studies, 3% to 12%, Architecture / Landscape Architecture double degree, 10% to 24%, and the Masters of Digital Media Program, 3% to 12%. This last figure indicates there is a growing interest among Design Studies students in the Masters program, from the initial stages of the undergraduate course.
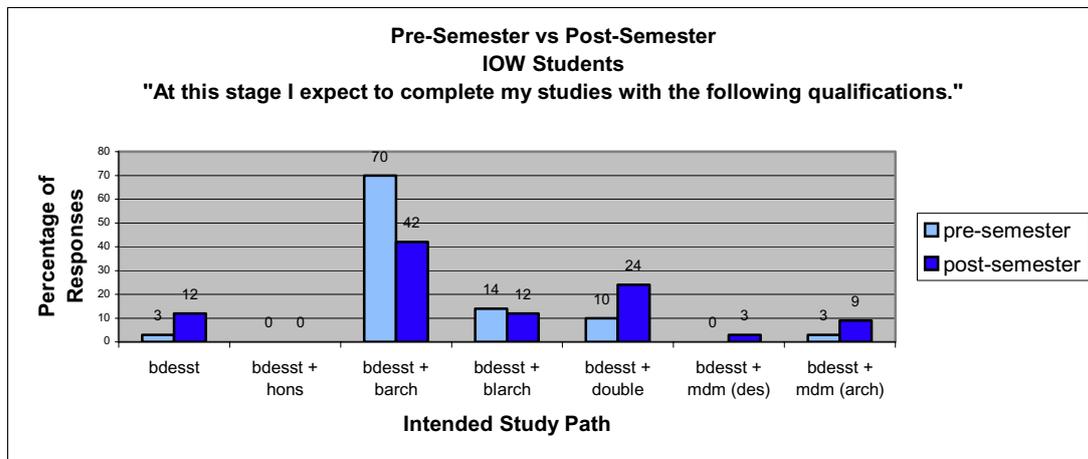

Figure 2: Post-semester versus pre-semester, IOW Students

The changes amongst non-IOW students were far less substantial. Again architecture dropped off, from 60% to 52%, the 8% distributed among the various alternatives, most notably the Architecture / Landscape Architecture double degree, from 9% to 14%, and the Masters of Digital Media program, from 6% to 10%. The general response to the digital media components within both courses was positive. When asked whether they had enjoyed the digital media components within *Human Environments*, 100% of IOW students responded positively, a mean response of 6.1, while 87% of non-IOW students responded positively to the same question, a mean response of 5.5. When asked whether they had found the digital media components in *Human Environments* relevant to their studies, 97% of IOW students responded positively, a mean response of 6.4, while the positive response rate among non-IOW students rose, also to 97%, a mean response of 6.2. Finally, when IOW students were asked the same questions regarding *Imaging Our World*, the response rates were again pleasingly high, 97% enjoying the digital media components, a mean response of 6.2, and 100% finding them relevant to their studies, a mean response of 6.6.

Conclusion

The students' growing interests in digital media, made evident by the comparative analysis of pre and post-semester questionnaires, underline the importance of digital media within the program, and suggest the restructuring of first year has been prosperous. The course SELTS results for both *Imaging Our World* and *Human Environments* support this, and confirm their successful integration into the program. All of the questions in the SELTS concerning the courses or digital media received a mean response of 5.0 or higher. The results suggest that despite a lack of experience regarding digital media in design, first year students are excited by the prospect of learning new digital skills. Furthermore the positive responses to both Sketch Up and Photoshop, supported by the increase in interest in the Masters of Digital Media program, indicate a *growing* migration towards digital media. Over semester two 2006, the study of digital media within Design Studies will continue with the analysis of second and third year students and their experiences with the two elective courses, Digital Media II and Digital Media Studio III.

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Author contact details

Mr Joshua McCarthy, Lecturer, School of Architecture, Landscape Architecture and Urban Design, The University of Adelaide, Adelaide 5005, Australia. Email: joshua.mccarthy@adelaide.edu.au