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The impact of social software in product design higher education

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The Impact of Social Software in Product Design Higher Education

Karl Hurn, Loughborough University

Abstract

It is difficult to ignore the impact that Web 2.0 and the subsequent social software revolution has had on society in general, and young people in particular. Information is exchanged and interpreted extremely quickly and in ways that were not imagined 10 years ago. Universities are struggling to keep up with this new technology, with outdated intranet systems and limited research into its application within the higher education sector.

The aim of this paper is to firstly develop a greater understanding of the use of social software by students in product design education and the impact of blogs, wiki's, Facebook groups, Flickr images, Myspace pages, RSS feeds, Tweets and YouTube video posts on their learning processes.

The research for the project involved a number of discrete methods over a four year period, initially involving a review of the technological platforms and the e-learning software available to product design academic staff and students and the effect this has had thus far on teaching practices. Product design academic staff were then asked to rank existing platforms against a number of criteria. This was followed by the examination of case studies of successful applications of social software within the writer's institution with a view to establishing if these technologies could be better integrated into higher education and current pedagogic practices in order to provide an enhanced learning experience for the student product designer. The first phase of the research culminated in a literature review to establish the state of play in the wider academic community and beyond.

This preliminary research fed into action research which consisted of the formulation and design of a blog and information website for the institutions product design programmes. Semi-structured interviews were then conducted to establish the views and opinions of the blog from key stakeholders including university marketing directors, academics and the student cohort. Questionnaires followed so that qualitative and quantitative data could be analysed.

The paper concludes with a description of the perceived validity and possible future developments for the blog and social software as a whole in the product design higher education sector.

Key words

product design, social software, education, design and technology, web 2.0, design blog

Introduction

Like the mobile phone before it, it could be said that social networking via social software has transformed how people, or at least the under 35s communicate. As far back as 2005 in the US around 85% of University students used Facebook, a figure closely matched here in the UK (Kirschner, 2010). Although these figures have fluctuated of late with recent month-on-month falls, the overall trend is still on an upward curve with the US still seeing a 23% overall growth in users between May 2010 and May 2011 to 155.2 million users. While the UK grew by 10% to 29.9 million in the same period (Arthur, 2011). The media famously called this revolution Web 2.0 (O'Reilly 2005), where due to technical advances in hardware and software, larger amounts of data, particularly images and video can be freely exchanged quickly and effectively over the internet.

Social software as a whole has already been well-documented, and depending on how you see it, is either all the rage or very 2008 (Underwood, 2009). Applications such as wiki's, blogs and social networking sites are increasingly being used in the education domain and have received widespread attention (Schroeder, 2010). Less well documented is the application of social software specifically in relation to product design higher education.

The research conducted in this paper seeks to acquire greater knowledge and understanding of the impact of social software in the higher education sector and its development and implementation by academics and students. More specifically the research focuses on the impact of social software on the learning processes of product design undergraduate students and how they are using these new technologies in their learning. Do product design academics and students see social software as a new teaching and learning experience that should be integrated into teaching practice? Or do they feel that social software is better suited to a more informal, extra-curricular supporting role?

The Impact of Social Software in Product Design Higher Education

Literature Review

It is widely acknowledged that the internet or world wide web was born out of the need for researchers, scientists, computer programmers and software developers to communicate quickly and effectively (Aboba, 1993). Some of the drivers for this also came from US military requirements in the early 1960s during the Cuban missile crisis which highlighted the need for fast communication for a response to a nuclear strike (Wheen, 2011). Email was the first domestic 'killer app' in the 1970s (Dyson, 2003) and during the 1990s America Online (AOL) established its dominance as an internet service provider (ISP) largely because of its emphasis on social interaction, principally via easy to use email and chat software (Darlin, 2012).

In 2002, the writer and consultant Clay Shirky, a leading authority on the social and economic effects of Internet technologies coined the phrase 'social software' to encompass "all uses of software that supported interacting groups, even if the interaction is offline." (Boyd, 2006). Shirkly felt that existing terms such as groupware, social computing and computer-mediated communication were a bad fit to address certain new technologies.

The term 'social software' describes patterns of use more than the technologies themselves (Shirky, 2008). Despite the fact that the web was a major enabler of social software technologies, the web actually dampened the development of social software as initially web pages were designed for one-way conversation between writers and readers of webpages (Shirky, 2008). Berners-Lee however, who is widely acknowledged as the inventor of the world wide web argues that his vision of the web was always as a collaborative medium and a place where people could all meet, read and write (Berners-Lee,2000).

The term Web 2.0 was first used in 1999 to describe an internet transformed by video and other dynamic media made possible by the speedy connection technologies that were coming (DiNucci, 1999). The web we knew then, which loaded into a browser window in essentially static screens, was only an embryo of the web to come (DiNucci, 1999). DiNucci wrote that the web would eventually be understood not as screens full of text and graphics but as a transport mechanism, the ether through which interactivity happens.

Whatever the viewpoint, there is evidence to suggest that Web 2.0 has facilitated the democratisation of social software (O'Reilly, 2005). This has led, as is the case with most new technologies, to the benefits and functions of social software broadening out and filtered down as it has developed. Allowing wider application of these new found resources as they are taken up by a more diverse range of people and disciplines (Cellan-Jones, 2011).

Traditionally, part of the working practices of a designer was scouring through books and journals for research information. Now they use interactive resources such as the internet to find information (Simmons & Badni, 2007). Increasingly designers from around the world are using the internet, and specifically social software as a portal to make themselves known, to share ideas and to do business. Wiki's, Groupware, Blogs, Internet Forums and social networks make it possible to become known world-wide for individual projects and to develop relationships with other professionals. Proficiency in on-line publishing, especially blogs, video and photo sharing websites is becoming necessary for any designer to exist in the modern world (Bonanni, 2008). Further to this, the information requirements of designers will increase as the designer's role widens. It is inevitable that the internet will play an increasing role in helping to meet designer's information requirements (Norman, 2006).

The education domain has a long tradition of using information and communication technology and universities should be actively involved in the updating and development of the learning process to keep pace with society and current thinking. As early as the 1970s, institutions had started to embrace electronic media such as audio tapes or radio broadcasting as alternative channels for the distribution of learning materials (Schroeder, 2010).

Academics see social software as a new and important tool for communicating, supporting and encouraging students' interest in their chosen area of study. However, professional bodies such as the Joint Information Systems Committee in the UK (JISC), whose main purpose is to inspire UK colleges and universities in the innovative use of digital technologies stated that despite the hype, there is significant debate over the advantages and

disadvantages of incorporating social software into mainstream education (JISC, 2007). This, together with further studies showing that Facebook use can lower a student's grades by 20 percent (Kirschner, 2010) academics and university governing bodies remain cautious about adopting social software as a mainstream tool.

From a students' perspective, social software is a logical addition to the student learning toolbox. 18-21 year old undergraduates fit the profile of the heaviest users of social software and can arguably draw on and bridge the gap between the teen socialising experiences of bebo through to the corporate connections networking website LinkedIn and beyond (Minocha, 2009a). 'Generation Y', the group of individuals born between 1980 and 1994 (McCrindle, 2006) are characterised by their familiarity with and reliance on information and communication technologies (Tzeng, 2011). Therefore the affordances of social software, when integrated into education, could facilitate a "participatory culture" amongst students and provide "low barriers to artistic expression and civic engagement" (Minocha, 2009a).

Successful integration of social software into teaching and learning in HE requires a focussed and considered approach (Carmichael, 2010). It is necessary to develop a clear understanding of the complexity of existing academic practices, including current patterns of technology use before it is implemented if it is not to be written off as yet another example of the dumbing down of university education. The problems and responsibilities must be closely considered and monitored to make sure it is exploited in a positive way to potentially provide the basis for enhancing teaching and learning in virtually any discipline (Cochrane, 2006) and not merely used as a marketing tool to attract young people.

The underlying pedagogy of social software tools can support a social constructivist approach to e-learning by providing students with personal tools and engaging them in social networks. Thus allowing learners to direct their own problem-solving process (Dalsgaard, 2006) and further studies have outlined improvements in students' socialisation, collaborative learning, team working and overall engagement through exposure to social software (Minocha, 2009b).

Despite the advantages of social software in higher education, it is argued that higher education is built on legitimised forms of knowledge and that there are limitations in social software for including marginalised learners (Hughes, 2009). The danger with social software is to assume that changing the 'delivery' challenges the 'essence' of learning. It is the complex interplay between pedagogies and technologies that have the potential to enhance the learning process (Hughes, 2009).

When we look specifically at Industrial/Product Design undergraduate teaching, most industrial design schools continue to embrace Bauhaus style studio courses centred on individual, hands-on product development (Tzeng, 2011). As design and manufacturing technologies advance it could be claimed that traditional workshop skills are less relevant (Thorsteinsson, 2004). Many design academics struggling with teaching current 'Net Generation' students due to their reliance on digital technology for learning. Since design education can never be accomplished solely by using digital technology for learning, design educators are facing a major transformational change as technology alters how design learning is enabled (Tzeng, 2011).

Social software can encourage novel ethnographical methods to inform the design of physical products, and that the globalisation of industrial production isolates consumers from designers and manufacturers. The term 'Open Design' was coined in 2008 and describes a new movement in the on-line community for open source design that will have a big impact on the designers of the future enabling designers to target custom-designed products to communities and individuals (Bonanni, 2008).

However, trends in lifelong learning and widening access in modern industrial design education may yet have the most profound impact on the application of social software in higher education as the demand for web-based learning environments designed for student-centred education and support mechanisms will become more prominent (Gill, 2000).

Background to the research

The notion of using social software to further the understanding of product design amongst undergraduates is something that the author has been researching

since beginning his academic career at the University of Derby in 2002. Before this, as an Industrial Designer working for a large multi-national company with a strong computer aided design background, the concept of sharing information via networks and working with people remotely was already second nature. But it was the discovery of the portfolio forum site Coroflot.com in 1998 that struck a chord with the author and highlighted the broader possibilities of the technology for the design community.

The communication element which was designed to allow students and staff to create and use module forums, Wiki's and web pages was too rigid, confusing and locked down by the university to make it an effective platform for product design students to express and exchange creative ideas. Blogs however, could provide students with a way of reflecting on their own experiences while connecting with other students facing similar opportunities and challenges (Bryant, 2006).



Figure 1. The rather uninspiring face of a university Intranet system in 2007 versus core77.com

The initial scope of the project in 2007 was to create an online forum specifically for the university's product design students. The aim was to broaden their knowledge of what was happening primarily with different year groups within the product design programmes as well as the design community at large. This very quickly snowballed into a blog site with a large proportion of the site requiring, as is the nature of product design, the use of different types of visual media. A key problem that this highlighted was the rigid nature of the university's intranet system UDo (University of Derby online).

Although the 'University of Derby Online' (UDo) system has been very effective at providing access to file sharing, course materials, timetables, library resources and professional legislative resources such as British Standards and Mintel market research information for a number of years. The basic principle dates back as far as the 1960s and Licklider's thoughts on using networked computing to connect people in order to boost their knowledge as well as their ability to learn (Alexander, 2006).

Research by Lofthouse in 2003 established links with designers' strong responses to visual stimuli (Lofthouse, 2003). With this in mind a pilot study was conducted to benchmark four existing websites that were sources of product design information for academic staff and students. The four members of the product design academic staff were asked individually to rate out of ten the four leading websites in regards to five different criteria, namely appearance, navigation, clarity, content and speed of access. These criteria were adapted from the empirically researched criteria used by Lofthouse in her study of effective website design for industrial designers. The overall collated findings of this are represented in figure 2.

The results for this pilot research showed a correlation between the overall visual appearance of the websites and the perceived validity of the content as well as the overall performance in the eyes of the design led staff.

Once a blog site could be established, the aim was to use this initial data and build on the knowledge gained to

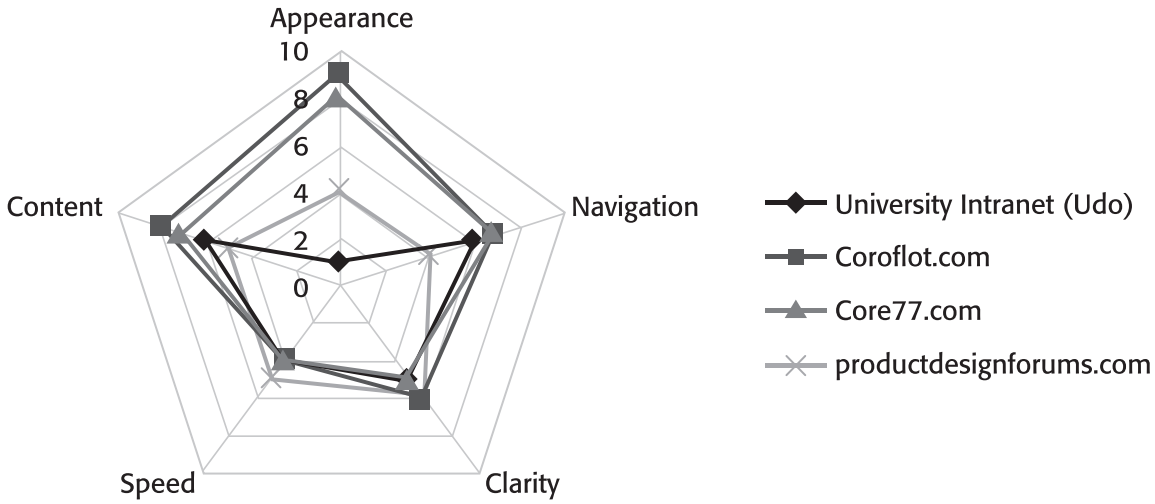


Figure 2. Pilot study into academic staff opinions regarding product design web sources of information

establish a set of guidelines for the further development of the use of social software by product design academics and students to establish whether or not social software would be incorporated into regular teaching practices or remain as an additional aid to learning outside of the academics main remit.

Research methodology

The research for this paper was conducted in several phases using a number of discrete methods over a four year period.

Firstly as mentioned in the background to the research section a quantitative preliminary investigation where key features of leading product design sites were rated was conducted by the product design programmes academic staff and the author into existing product design specific social software sites in order to establish key elements that could be incorporated into the trial blog site.

Concurrent to this in phase one, in order to gain a more general understanding of social software application within the university, projects at the University of Derby were investigated with the assistance of key members of staff from different specialism's, departments and faculties. This was facilitated by semi-structured interviews. The data that was obtained during this part of the research was analysed using a coding and clustering approach, common in qualitative research.

Further qualitative research conducted enabled an overview to be gained of opinions generally regarding social software in higher education. This second phase consisted of semi-structured interviews carried out with staff individually. Open style questions were used to start the feedback process, allowing the staff to express their issues and concerns rather than any preconceptions that the interviewer may have had. Key to this was the mixture of staff that had different goals and expectations for the use of social software due to their teaching, marketing and university widening participation backgrounds and focus. The responses were recorded and analysed by mapping each interviewee's perceptions on top of each other around corresponding issues relating to both the design of a blog site and design interaction principles generally.

The data collected from phase one and two was then used in phase 3 of the research to formulate the design of a product design blog site that would allow the author to use action research (Norman, 1999) to gain further, more focussed qualitative data from students regarding the blog itself. This in turn would provide a balanced overarching perspective of social software in product design higher education.

Developing Social Software Tool

Drawing on the findings of phase one and two, the project moved into the action research phase to enable feedback to be gained from specific first hand social software tools developed in the context of the product design programmes. This research method was chosen as the formulation of a design led blog lent itself well to what Norman describes as a designerly mode of enquiry (Norman, 1999). For designing the blog appeared to

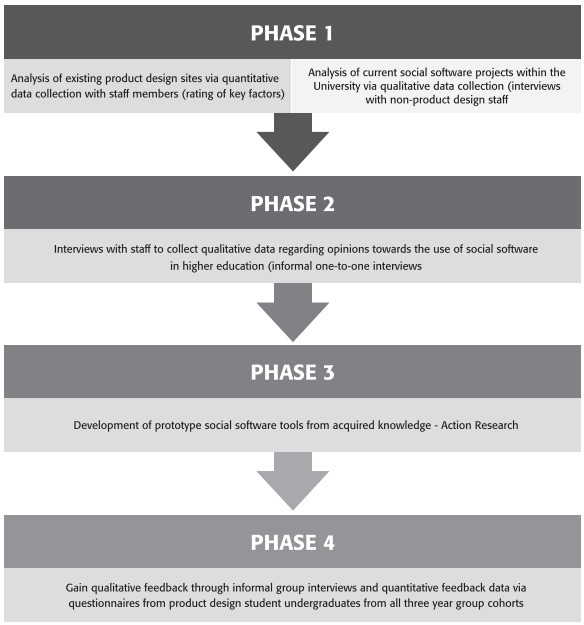


Figure 3 – The overall phases of the research project

have some of the characteristics of a 'wicked problem' as identified by Rittel and Weber such as "solutions to wicked problems are not true or false, but good or bad" (Rittel & Webber, 1974) and because action research generates the immediately applicable new knowledge (Simmons, 2008) that was required at this phase to move the project forward.

The Blog Site

From these preliminary investigations a blog site was formulated in 2007 outside of the university UDo intranet system using the edublogs network. This provided the freedom to include the product design content required as well as allowing the students to create and comment on some of the blogs content. This was not uncommon, as educators frequently choose dedicated applications or even web-based applications in the public domain as platforms for launching their social software initiatives (Schroeder, 2010) due to the rigidity of university intranet systems as previously mentioned.

The blog structure was designed to incorporate as many elements as possible required by the key stakeholders of staff and students but also maintain a level of simplicity and visual clarity. This information came directly from the interviews with staff at phase one and two of the research.

The structure, seen in figure 5 was prioritised according to the responses at the interview stages, where staff were asked to consider what were the most important elements required within the blog from a staff and students point of view.

Early in the blog's development, the potential of the blog to be used as marketing tool to positively promote the product design programmes was highlighted; therefore the blog's structure included pages for programme information. The site was also accepted by the university marketing department as a valid and useful marketing tool and was given a link from the main website. This provided the opportunity to monitor the 'click-through' traffic and therefore gauge the blog sites marketing potential.

A quantitative questionnaire session with the students followed at an informal session conducted over the course of an hour. This was to ascertain student opinion specifically of the blog site format and content as well as their thoughts on the development of social software within design education. Forty six students from the first and second year cohort which constitutes all of the members of the two year groups of the product design programmes were asked to complete the questionnaire. With the questions taking the form of closed multiple choice questions, closed 'yes/no' questions and scaled questions. Following the session the students were asked as a group some qualitative open questions so that the students could reflect on their experiences and share their own thoughts and opinions with the group.

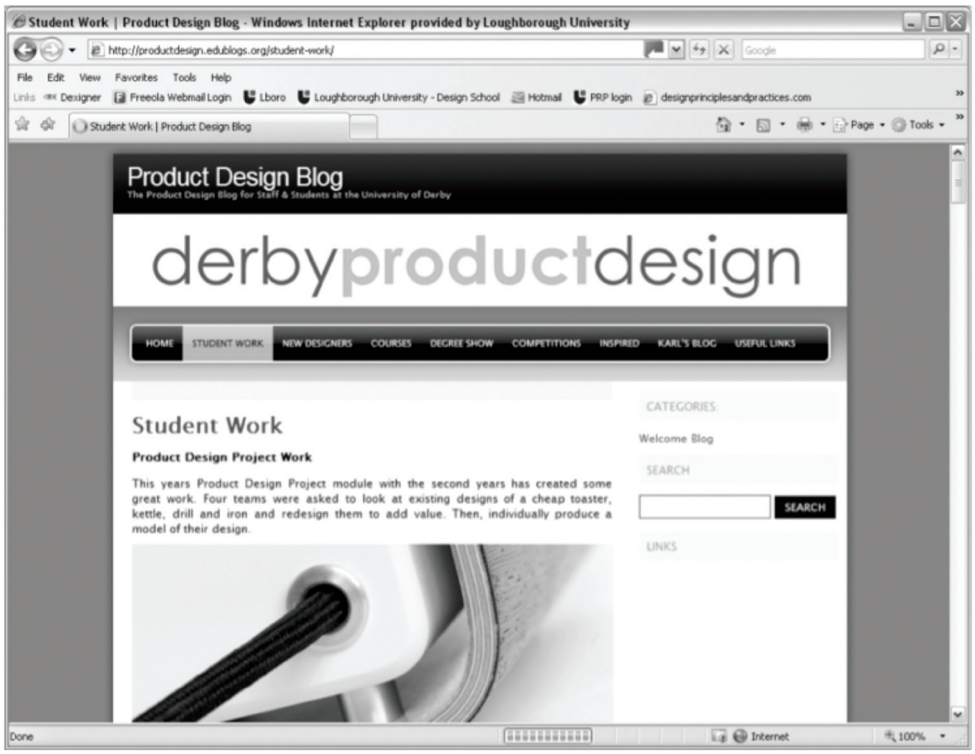


Figure 4. The initial Derby product design blog site was created in 2007 to facilitate the gathering of student opinions & experiences

The YouTube Channel

In 2008 a YouTube channel was created by the author initially to facilitate video content for the blog site. This created a shift in the type of videos that were being used and created on the channel for the blog. Whereas initially videos were of exhibitions such as the national graduate exhibition 'New Designers' where the programmes exhibited yearly, and student videos of individual projects had been the focus. Now videos that showed the range, quality and scope of the work created at Derby were showcased as well as videos that showed the student experience such as the 1st year 'egg drop challenge' induction project. The traffic, hits and comments of these videos were then monitored in order to gain a clear understanding of where the future scope of social software deployment might lead.

Facebook Groups

With the blog site developing organically through student input, the research branched out further with the creation of product design groups on Coroflot.com and Facebook. These groups and others that were created as offshoots were then monitored to determine if they provided greater scope, freedom and a platform for the creation of ideas rather than simply reporting on work already produced which had been the focus of the project thus far. The Facebook groups in particular provided an opportunity to see if there was any difference in the students' use of a platform where they had complete ownership of the group. This was as opposed to the blog site which they may have seen as an official element of the university as it had been introduced to them by their programme leader.

Results

The initial research into social software for the project in 2007 found that there was already a wealth of blogs, groups and media available to help stimulate and connect product design students. This has snowballed tremendously in the past few years. However, students found the amount of information daunting, questioned the validity of the information and found it increasingly difficult to separate the wheat from the chaff. The author realised that a key benefit of a programme specific blog would allow information to be collated by a recognised and local source and thus channelling and validating the information for students. As well as this, it is clear that a blog site, if

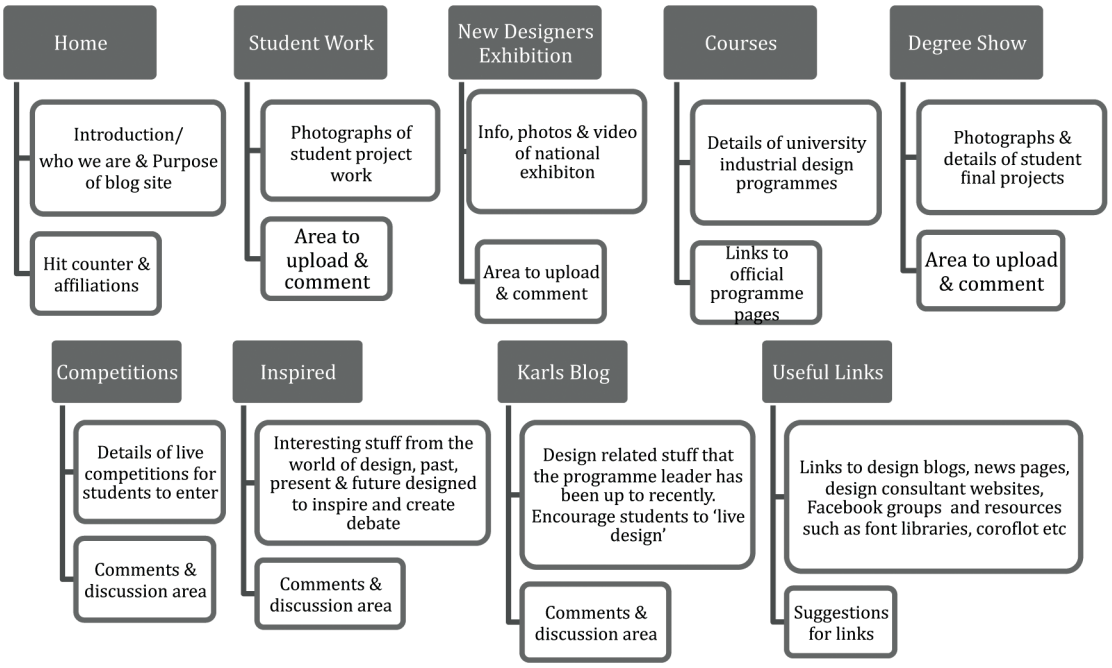


Figure 5. The structure of the blog site evolved to allow student interaction & as its wider marketing potential was realised

presented in the right manner, could be extremely useful from a promotion and marketing point of view for the product design courses. Further to this, a blog site could be used to demonstrate the passion of the staff and the students which would in turn facilitate communication with the wider design community.

Very quickly it became clear that this could be used as a vehicle to gain exposure for the programmes on a wider scale than the blog while at the same time directing traffic towards the blog site itself. The University's stance on the blog swung from initial attempts to hijack the project to exploit its marketing potential to resistance to the idea of a blog site outside of the control of the University server. Because of this the blog had to remain under the control of the author and student access rights had to be limited to purely viewing the site, which limited the scope of the blog itself.

University Projects & Academic Staff Views

Social software projects at the University of Derby outside of the product design department gave an indication of how broad the application of social software was becoming in higher education. Not only was it being used to simply communicate ideas and information to students, but also to facilitate a student's personal development planning (PDP), gain feedback from students on work placements via blogs, and as a marketing platform to promote the university to new students and keep in touch with the old ones via the Alumni.

The Director of the Textiles department at the University of Derby headed up a project that concerned students making use of weblogs for personal marketing. This was conducted as part of the nationwide keynote personal development planning project which is designed to help students think about how their learning fits into their life and future goals. The Director stated that "I was thinking, what could I do to make PDP more palatable and useful to ADT (Art, Design & Technology) students? Using multimedia weblogs as a vehicle for the projection of ideas, personal reflection and promotion seemed a compelling prospect".

The Director cited a number of key advantages of using blogs as personal promotion tools, including positive feedback from employers who can have instant access to likely candidates' portfolios for employment opportunities

as well as advantages for dyslexic and deaf students. The Senior Lecturer in Imaging in the Radiography subject area has been using blogs with her students for a number of years. The academic created her own blog and used it as a method of keeping in touch with her students while they were out on placement. "I created the initial blog and then gave my students access to modify the site and add their own pages, that way they could see what I was doing while they were off working at their placements. I just used to talk about what I had been doing, social stuff really, but it was quite useful I think because somehow it makes the students feel part of what's going on and gets them fired up about the subject because they see that you're really into it."

The Senior Lecturer found that it was the students who then took it on and developed the concept, creating their own pages linked to the blog and feeding back information from their placements to the other students. "Because they were on placements, they were reflecting on their experiences, so other students gained a lot from seeing what the others were doing, so it helped in a way I suppose to create the group feel even though the students were scatter all over".

The marketing department at the university were quick to capitalise on the use of social software which influenced the redesign of the university website. Many of the individual programme pages have had multimedia elements from around 2009, with YouTube videos and galleries of students work. The Marketing Manager for the Faculty of Arts, Design and Technology said in an interview conducted by the author that "96% look at the web first for information about courses before looking anywhere else, so our website is really important…we put a lot of effort into social network sites like facebook, Bebo, Myspace etc."

The marketing department also make use of Google technology with a pay per click campaign. Not only allowing monitoring of hits, but using this technology to build profiles of prospective students movements within social software and other sites on the web to allow them to focus the university's marketing more effectively, the Marketing Manager added "This monitoring of social software and Google has been getting us some real results so we are increasing the spend on this going forward." From these findings, it is clear that social software has, more often than not, been picked up by proactive members of staff and used for innovation in areas outside of their core teaching responsibilities. Therefore it is clear that educators are instrumental in a social software initiative within higher education (Minocha, 2010). Little evidence was found of social software (other than the university's own intranet system) being used to organise, deliver or respond to the core teaching practices (lectures, workshops, tutorials) at the university. This is echoed by wider studies that have shown that although many people consider the idea of, for example, delivering lectures remotely as part of the future of mainstream e-Learning, the reality is that this remains unlikely to happen in the foreseeable future (Kieslinger, 2008).

Students Views

When questioned at the beginning of the project in 2007, surprisingly only half of the product design students at the University of Derby used Facebook on a regular basis. With coroflot.com being regularly used by 100% of the second year undergraduate students, possibly due to its promotion by the author during lectures. When questioned specifically about the blog site, 85% of students questioned had used the blog, with all of the students questioned seeing the blog as a positive promotional tool for the programmes they were studying. 70% believing that the blog would have had a positive influence on their choice of university. Further to this, all students questioned saw the blog as the best way to maintain contact with the university after they graduate.

A rating scale of the content showed that the most popular sections of the blog site were the more visual pages with images of ex-student work, exhibitions and examples of inspiring design. This was closely followed by the 'links' page and 'Karl's blog'. It could be deduced from this that students were using the blog as inspiration to feedback into their own work as well as benchmarking themselves against other students. This also correlates with the data from students that showed 85% of the students questioned cited inspiration as the main reason for using the blog. Elements that scored less favourably were those more directly connected with assessment with only 20% of students seeing discussion of assessment as

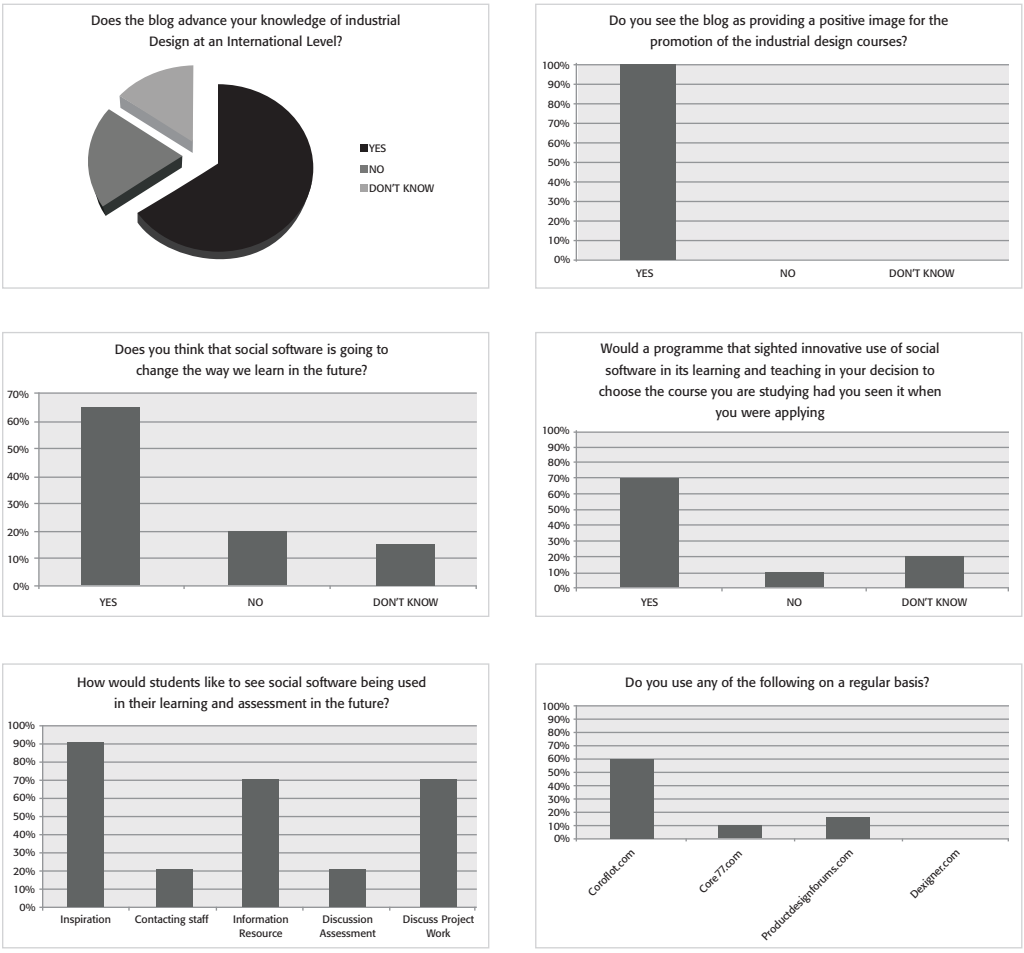


Figure 6. Data collected from product design students

a reason for using the blog. However 70% saw the blog as a good place to have discussion relating to group projects.

Students were upbeat about the content stating that it "can help to inspire new and current students". Interestingly, students also thought that they were more likely to comment on other students work via the blog than they would do face to face, which could provide an interesting opportunity for group assessment in the future. More generally, 65% of students believed that social software will change the way we learn in the future, however students were divided when it came to the question of developing social software into areas of assessment.

Growth & Divergence

The subsequent YouTube channel in 2008 showed that YouTube usage for product design students internationally still mainly centred on the social side of undergraduate life. Perhaps fuelled by the desire this created to see undergraduate product design project work, the videos created for the research received over 17,000 hits in the first year. Whereas this highlighted the greater possibilities for video content for promotional purposes, it did not provide any data with regards to the possible use of YouTube and other video media sites for teaching and learning.

Moving into 2010, the use of Facebook groups in connection with their studies has grown rapidly amongst product design students both at the University of Derby and the author's current institution, Loughborough University. Students cited the reasons for this being the greater flexibility now offered by social software sites such as Facebook and Twitter for rapid communication and exchange of ideas due to their migration to mobile based platforms. A clear example of this was the use

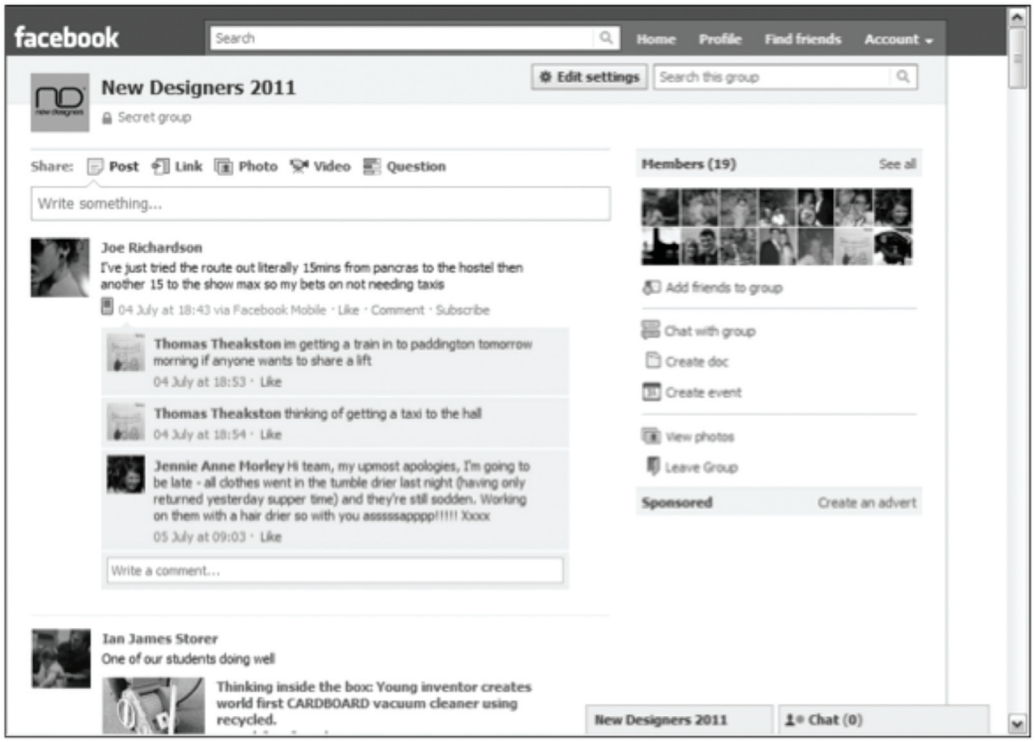


Figure 7. A Facebook group used by students & academic staff to remotely design, develop & coordinate the 2011 New Designers Exhibition

of a Facebook group for the creative development, management and coordination of the exhibition stand for the New Designers exhibition in London in July 2011. Students and Academic staff were able to exchange and develop creative ideas for the stand itself, organise reviews of the work to be displayed and even communicate with students on-site or on route to the venue. This was achieved with a fluid mix of text, photographs and video on the fly in a manner that was not possible with the blog site of a few years previous.

Discussion

Use of social software has developed in this manner contrary to academics initial resistance to students expressing a wish in the blog development questionnaire to be able to contact academic staff outside of normal working hours. In fact staff and students now seem to be able to tap into what Clay Shirky describes as their cognitive surplus and enrich the learning process with every waking, product design related thought. It is this potential to bridge pedagogically designed learning contexts, facilitate learner generated contexts and content (both personal and collaborative), while providing personalisation and ubiquitous social connectedness, that sets this new 'mobile learning' apart from more traditional learning environments (Cochrane, 2008).

Limitations

The limitations of the research conducted for this paper are that the blog site did have to be restricted so that students were unable to create their own content. This meant that the scope to expand the project stalled. Further to this, most of the data collected was predominantly based on the blog site so a more rounded view could be gained by extending the scope of the research further. This has been compounded by the rapid divergence of student use of social software from the original research blog to Facebook and the like on to mobile devices which the blog site could not be adapted to. As well as this a larger data collection sample, perhaps including a range of UK universities could have yielded greater insight into teaching and learning integration.

Conclusions

The Impact of Social Software in Product Design Higher Education

In response to the original research questions posed at the beginning of the project that asked if social software is being integrated into the teaching and learning practices of product design undergraduate programmes the answer is unclear. Yes there is perhaps greater integration of the existing university information systems. But there is still resistance to the use of such software for anything other than peripheral/satellite activities such as exhibition organisation and Skype interviews. There is strong evidence however that academic staff and students alike believe that elements of social software will shape and eventually even define the future of how we learn.

It is clear that these new technologies still have a lot to offer higher education if applied to the correct aspects of the teaching and learning experience, and indeed the marketing and self-promotion of both students and universities.

Social software can enhance the student's experience and has already made the shift from communication to creativity. There will always be a need for the more traditional legitimised forms of learning. Whether or not these will be further enhanced by the integration of social software will depend on how these traditional and modern technologically driven pedagogic approaches are specifically blended to meet the learning needs of 21st century students.

Future Research Possibilities

The limitations of social software are, it could be argued, yet to be discovered, and with developments such as Google + we could even see yet another paradigm shift, such is the nature of this rapidly developing phenomenon. In the time frame that this research has been conducted between 2007 to 2011, there has been a mobilisation of the technology that has rapidly altered and speeded up the social exchange of ideas and information between product design students and academic staff. These developments have been largely outside of core teaching and learning activity. Yes there have been e-learning developments with, for example, video casts and pod casts of traditionally delivered lectures and platforms such as iTunes U, but the real leaps forward are taking place outside of this.

Technologies and developments on the horizon might change the 'outsider' position of social software in higher education and bring it into core teaching with a jolt, initially in the area of computer aided design teaching. As large CAD software suppliers such as PTC and SolidWorks integrate social network inspired modules into their software for model sharing and cloud computing becomes more prevalent, perhaps the integration of social software into mainstream teaching practice will seem more fluid.

Product design higher education must always have an eye on what is cutting edge in the industry. With notable design firms such as IDEO and product manufacturers Sony experimenting with idea sharing sites such as OpenIDEO.com and Openplanetideas.com that have been inspired by the 'open source' or 'free' software community (Bonanni, 2008), the adoption and adaption of social software by the industry could and should lead to it becoming a core skill of a graduate product designer. Technologies such as augmented reality have huge potential to hook into this new type of anywhere anytime learning, particularly for a largely visual discipline like product design.

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