

Teaching the 'YouTube' Generation:

Exploring the benefits of an interactive Teaching approach in Sustainable Product Design

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Abstract

This paper presents findings from a doctoral study, which investigated effective methods for teaching social sustainability within product design courses in British and Irish universities. Specifically exploring, how to foster a holistic understanding of the social aspects of sustainable product design amongst undergraduate and postgraduate students, through design thinking.

Perceived relevance is considered as a fundamental aspect in enabling students to engage deeply with sustainability [1]. Authors [2;3;4] note that 'Net Generation' learners have specific learning preferences that can be targeted in order to improve the students learning experience. Through the careful design of materials which build upon the students tendency towards visual learning and seeking increase relevance and motivation, by offering opportunities for collaborative learning and learning through discovery.

Three 'Rethinking Design' workshops were designed and developed as part of a doctoral study to introduce students to the wider social aspects of sustainability and these were conducted in five universities in Britain and Ireland. The workshops featured visually rich audio visual introductions followed by collaborative group based mind mapping activities, which were successful in fostering deep learning by facilitating learning through discovery, critical reflection, peer learning and creativity leading to an exploration of design thinking solutions.

1 Introduction

This paper presents findings from a doctoral study, which explored effective methods for the teaching of the social aspects of sustainability in sustainable product design (SPD). Specifically this paper considers how the learning preferences of the 'Net Generation' learners were fostered through the careful design of learning materials in the 'Rethinking Design' workshops, which were conducted at 5 universities within the UK and Ireland.

The paper begins with a literature review, which considers the 'Net Generation' and their specific learning preferences, which informed the design of the 'Rethinking Design' workshops. The design and content of these workshops are then described and the findings relating to the relevance of the 'Rethinking Design' workshops and the ability to foster collaboration, reflection and design thinking are outlined and conclusions are drawn.

2 Net Generation Learners

In order to increase the relevance of the workshops the students learning styles, both as designers and 'Net-Generation' learners was considered.

Authors use multiple terms to describe the current generation of students, including the Net-Generation. Oblinger and Oblinger [5] define the 'Net Generation' as individuals born from 1982 onwards [6;3]. This generation would have all typically been using computers before they were 16

to 18 years old [3]. However Oblinger and Oblinger [3] note that the differentiating factor for the 'Net Generation' may be their technological experience rather than just their age. Whilst Tapscott [7] defines the 'Net Generation' as those born after 1977, the generation born after 1982 are also referred to in the literature as the 'Millennials' [6;8] and 'Digital Natives' [9]. The Net Generation would typically apply to the vast majority if not all of the students involved in undergraduate and postgraduate study in the UK during the period of the study (2010-2011) and all those students subject to this research study. Allowing for mature students, as an individual born in 1982 would be 28 years old at the start of the main study trials, whilst traditional undergraduate students were be aged between 18 and 22 years.

The Net Generation have differing learning styles and preferences to the generation that preceded them [2]. This is partly due to the influence of computer technology, the internet and the social media upon their lives and also partly subject to the social climate [4] in which they are raised and their response to the attitudes of the previous generations [6].

2.1 Autonomous

'Net Generation' learners in Higher Education prefer to be autonomous learners with a preference for experiential [2], learning by doing [10]. Such students place a greater emphasis on exploratory learning by discovery, whether individually or collaboratively with their peers, to the traditional lecture format where information is given to them [3;4]. Tapscott [7] notes that this exploratory learning style improves students' retention of information, allowing for more creative and meaningful use of knowledge [7].

Oblinger and Oblinger [5] note that the Net generation are very achievement oriented and have a preference for structure, seeking parameters, rules, priorities, and procedures; they are keen to know what it will take to achieve a particular goal.

2.2 Socially Orientated

Net generation students are attracted to activities that promote and reinforce social interaction including interactive learning [2;4], peer to peer learning [3] and teamwork activities [6;3;2;4]. This social nature of the Net generation means that they typically dislike online learning environments or distance learning, [10] despite the technological focus because distance learning lacks the social interaction that a traditional learning environment offers. Tapscott [4] notes benefits of this social approach describing how students start to internalise their learning when they start to discuss it amongst themselves [4]. Oblinger and Oblinger [5] note that a peer-to-peer approach, where students help each other is seen by Net generation students as more credible than a teacher led approach.

Of particular interest to sustainability, it is noted that the Net generation are keen to engage in community activities, preferring to work on things that matter, such as addressing an environmental concern or a community problem [3]. Howe and Strauss [6] similarly note that there is more emphasis on academic programs that serve public rather than individual interests [6].

2.3 Visual Learners

Net generation students are visual learners [8], with enhanced visuo-spatial skills [3;4], who are more comfortable in image-rich environments than with text [3;11;4]. Net generation students retain on average 30% of what they see but only 10% of what they read and prefer to have graphics before text rather than graphics following text [3]. Oblinger and Oblinger [5] note that Net generation learners have a highly developed visual literacy, with the ability to read images and instinctively communicate through visual methods. They are also capable of combining images, text and sound seamlessly [3] and this is demonstrated by the prevalence of amateur You Tube content.

2.4 Multitasking learners

Net generation learners seek and handle information differently to previous generations. They multitask [8;2], quickly shifting their attention from one task to another and can work on two tasks si-

multaneously [3] and deal with information in nonlinear ways [3]. Net generation learners respond more quickly than previous generations and expect rapid responses in return [3]. However it is suggested that this rapid pace may be detrimental to the student's ability to reflect and adopt critical thinking skills, which is cited as a weakness of the Net generation [8;3].

3 Design of workshop Activities

Three 'Rethinking Design' workshops were developed to introduce students to a range of social aspects of SPD, these workshops were conducted at 5 universities 4 in the UK and an Irish university and were conducted with approximately 150 students in total. Each workshop consisted of two elements, a 3-5 minute audio visual (AV) introduction and a 45 minute group based workshop session in response to the AV introduction.

The choice of these particular elements was supported by the literature, which suggested that the audio visual and group based approach taken with the workshop should be beneficial to the students' learning in a number of ways, such as:

- Increased relevance through the visual methods used [3;11;4] and team work [6;3;2;4].
- Encouraging students to personalise aspects of sustainability through indirect experiences [12] by using carefully selected photographs.
- Group work that builds opportunities for discussion, debate and critical reflection as well as engagement [13;14].

The A/V presentations were designed to be contemporary in style using photographs and music to capture the students' attention, deliberately mimicking internet based media content such as YouTube, where images or silent video are overlaid by a piece of popular music. This style was adopted so that the A/V material was more readily relevant to the 'Net Generation' audience, who are able to weave text, images and sound in a natural way [3].

The photographs used were intentionally selected to portray a number of different aspects echoing the well-known Chinese proverb, "one picture is worth ten thousand words", so that each A/V introduction could introduce a much larger range of social issues than a traditional lecture format could accommodate, if only at superficial level. The use of photographs was also chosen as the literature findings suggest that the use of images can elicit an indirect experience that can foster personalisation of sustainability [12]. Furthermore, Griffith [15] cites the use of introductory audio visual presentations as a means of promoting interest in responsible design amongst students, as well as supporting lecture content and stimulating discussion and activities in tutorials.

The group based aspect of the workshops was developed to further adopt approaches that intended to meet the learning preferences of the students. Including:

- Contextually relevant content in each of the workshops to suit the modules being undertaken at each university.
- Opportunities for collaborative group work to enhance peer learning and critical reflection.
- The use of questioning to elicit reflection amongst learners.
- Fostering deep learning through critical reflection.
- Enabling learning by discovery a learning preference of students.
- Fostering a holistic approach to enable systems thinking.

4 Methodology

The 'Rethinking Design' workshops were conducted at 4 universities in the UK and an Irish University amongst undergraduate and postgraduate product design students. The total sample size was approximately 150 students and the workshops were conducted within modules which considered sustainable design. Data was collected via a mixture of methods including two student questionnaires which were completed prior to students commencing the workshops and immediately

after completion to measure differences in individual students understanding and attitudes. Audio recordings and photography was used to record the students interactions during the workshops and the audio recordings were transcribed and analysed alongside the images using coding and clustering techniques. Student reflective diaries were additionally evaluated from the in-depth case study institution and were also analysed using coding and clustering techniques. Coding and clustering was used to analyse the qualitative data because this approach enables data to be reviewed and dissected in a meaningful way whilst still keeping the relationships between the data intact [16].

5 Workshop Findings

The students enjoyed 'Rethinking Design' workshops particularly noting preferences for the A/V and group based nature, which enabled students to demonstrate collaboration, critical reflection and design thinking techniques and each of these is discussed in further detail below.

The group based discussion and workshop exercise demonstrated detailed consideration of the material with students exploring the A/V introductions at a deeper level. Students engaged with the content of the A/V introductions at both a personal level and corporate level.

5.1 Visual nature

The use of photographic images and the visual nature of the audio visual introductions were widely noted amongst the students in their reflections, who described the '*striking*' nature of the photographs and composition and '*the wonderful selection of photos that made them stop and think*'. Students also described how the video nature of the presentations helped them think and remember aspects more easily, with many students noting specific images that were used in presentations. Students also described how they related to particular aspects portrayed in certain images or found specific images inspirational. Whilst specific photographic images were widely noted, a number of students also cited text based quotes from the A/V introductions that were memorable suggesting that headline like quotes were also culturally appropriate, however discussion and reflection was not evident in respect to the text based quotes, whilst the subjective nature of the photographic images prompted discussion, debate and critical reflection.

5.2 Audio nature

Students commented positively in respect to the inclusion of music within the workshops and made links between the music and the visual content. Students made comments relating to the emotional nature of the music and discussed the nature of the lyrics in relation to their enhanced learning and understanding in one workshop in particular 'Step into my World' with a song of the same title. The song lyrics were effective in triggering discussion and thinking that led to a variety of user centred empathic research approaches being suggested including ethnography and co design. With student taking the lyrics literally and considering what it would be like to step in the world of the individuals portrayed in the photographs which accompanied the music. "Lyrics of the song – take a step in my world, this suggests living in one of these peoples shoes for a day". However across the inclusion of music was noted and discussed less than the photographic visual elements.

5.3 Effectiveness of the workshop style and format

Students discussed the effectiveness of the audio visual introductions in particular students responded positively to the style of the A/V introductions, citing the short length and simplicity of the A/V introductions, the thought provoking nature and ability to evoke discussion. The A/V introductions also provoked an emotional response amongst students who commented on how they found them '*powerful*' and noted the emotive nature of the music. "*You look a bit affected by that yeah, it was an emotional video, it was yeah I was a bit upset.*"

Students cited the workshops as enjoyable and beneficial, whilst describing how the workshops had helped them broadened their thinking and outlook in respect to their design solutions. "Overall

I thought the workshop was very beneficial as it opened my mind to looking beyond the obvious problem and look deeper into the situation to come up with a good solution.”

Students also cited the group work and group discussion aspect of the workshops, recognising the benefits such as the consideration of different opinions and viewpoints. “We then broke off into groups and discussed what we thought of the videos. We had to group with people we don’t normally group with which was quite good because we saw different opinions”

One student noted that the group work element of the workshop was particularly beneficial to his learning, echoing the literature, which suggests that the current generation of students find a peer-peer learning approach more credible than a teacher learning experience. “I felt that the group discussion was an excellent approach to the learning outcomes. It is in my opinion that students learn more from each other if they carry out projects in groups.”

Students also reflected the conflicting views that arose within the group discussion, recognised that there are often two viewpoints or arguments to a particular issue, grasping an important characteristic of the complexity of sustainability and demonstrating critical reflection.

6 Conclusions

The audio visual method used within the workshops was described as relevant, effective and enjoyable by the students. The students reflected on how the workshops enabled them to engage collaboratively and explore multiple perspectives through consideration of the opinions of their peers, addressing a key element in the understanding of the complexity of sustainability. The workshops also fostered autonomous learning through discovery enabling the students to explore the implications of the content explored within the A/V introductions through peer discussion and debate.

The style of workshops was therefore effective in addressing the learning preferences of the ‘Net Generation’ and were perceived as relevant and engaging by the students additionally encouraging peer learning and critical reflection. The visual element of the A/V introductions was clearly the most memorable to the students, however the effectiveness of the music was more difficult to measure and appeared to differ dependant on the workshop in question. However it was the combination of both the audio, visual and group based mind mapping aspects together that fostered the learning preferences of the ‘Net Generation’ and so consideration of the relative effectiveness of individual elements of these is not an easily demonstrable or measurable factor.

The workshops represent a container for the key elements needed to create a learning atmosphere where students can creatively explore the social aspects of SPD holistically through reflection, personalisation and collaboration. Rather than representing a one size fits all approach to the fostering of a holistic understanding of the social aspects of SPD.

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