TEACHING CREATIVE CONTENT ONLINE: COMPARING AND CONTRASTING ONLINE TECHNIQUES WITH FACE-TO-FACE APPROACHES

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Abstract
This research looks at the application of online teaching techniques and resources in the field of creative design education. Teaching creative design principles and delivering content around this topic is often viewed as being more suited to a hands-on, face-to-face style of delivery. Yet online techniques can be extremely effective in these creative fields. This paper describes the findings of a five year study, involving more than five hundred participants from various age groups, cultures and locations, and compares face-to-face teaching methods with online delivery of creative course materials. The study highlights the strengths and weaknesses of each technique. Results from each method, including learning outcomes, student satisfaction and engagement clearly demonstrate that online techniques are highly effective in transferring knowledge and providing students with the skills needed for developing effective creative outcomes. Yet there are other more subtle advantages that are often overlooked, including the fact that participants in online groups had a tendency to be more daring in their work. The relative anonymity provided by online methods led to students taking greater risks with their creative works and overall achieving better creative outcomes. Risk taking and experimentation is an important element of creative learning and online methods show potential to improve this area. Although knowledge transfer and outcomes were more effective with online approaches, the level of student engagement and satisfaction was lower. Clearly the nature of face-to-face personal interaction was a preferable form of engagement for student participants. An interesting exception to this was for students who are normally more excluded in face-to-face interaction scenarios. These participants, often distanced due to language, culture or physical issues such as disabilities, performed significantly better in online groups and also reported higher levels of engagement and satisfaction.

This project also developed and compared several different types of online resources and delivery. The use of more personalized online resources proved to be much more effective in terms of student engagement. With large group recorded lectures showing much lower engagement than the same information being presented in a personal discussion form. With online delivery of teaching materials becoming more widespread, the application of online teaching in creative fields is an important area for future development, this research has demonstrated the potential for online delivery in creative courses as well as defining some key principles in targeting these resources and developing effective content and delivery.

Keywords: Innovation, technology, education, creative, online, teaching.

1 INTRODUCTION
The interconnected network that represents the current state of the educational environment offers many areas of both potential and risk. Online learning and teaching has become far more common and the benefits and weaknesses of online delivery continue to be identified [1]. From the simple use of pre-recorded video of in-class experiences, primarily used in reviewing content or to showcase scenarios that were unavailable in the classroom [2], through to highly interactive live online engagement, students actively use online teaching and resources in greater and greater numbers. Studies by the US Department of Education estimated that in 2004/2005 more than 37% of school districts had technology supported education courses. By 2005/2006 estimates rose to more than 700,000 students engaged in online learning, two years later in 2007/2008 this number had risen to over one million [3]. This represented a 43% increase and demonstrates the rapid growth of technology driven online education [1].
With this rapid growth there is a need for better understanding of the strengths and weaknesses of online delivery and how it compares to other approaches, in particular comparing and contrasting online approaches with the more common face-to-face style of delivery. Existing studies indicate that there is little rigorous research making such comparisons. ‘A systematic search of the research literature from 1994 through 2006 found no experimental or controlled quasi-experimental studies comparing the learning effects of online versus face-to-face instruction’ [1]. ‘A subsequent search that expanded the timeframe through July 2008 identified just five published studies’ [1].

As a field of education, creative education has a very hands-on, practical approach. As such the bulk of teaching in this field has been carried out in a classical interactive face-to-face manner. With the limited number of studies across the entire educational spectrum, the amount of research into online delivery in creative fields has been very limited. Given the practical nature of many creative courses it may appear that effectively applying online teaching approaches would be challenging. This research looked at the development of appropriate online resources and the application of online delivery approaches to creative course materials. These online resources and delivery methods were directly compared to the more common face-to-face teaching methods.

2 TEACHING RESOURCES

The development of appropriate teaching resources is a key element in the success of any educational program. This project looked at developing new resource materials for the purpose of creative education at a tertiary level in the fields of image creation and manipulation, design principles, film and visual effects, three dimensional computer animation, games design and development. These resources were delivered using lecture style presentation for theoretical concepts in conjunction with practical hands on tutorial activities. Participants came from differing levels of educational experience, with some undergraduate first year first semester students and others in the final year of their three year degree studies or working at a postgraduate level. The online course resources were designed to make use of available technology and incorporated both online video and interactive web interactions (through interactive activities and forums/chat). Earlier research in this project looked at developing and presenting complex information in simple interactive web based visual forms and computer interfaces, these principles were applied in the interface design for the online teaching resources [4][5]. To enable comparison between styles of content delivery the course resources were developed in three key styles, each of which is outlined below.

2.1 Face-to-Face Delivery

The resources described as ‘face-to-face’ involved lecture slides and tutorial steps provided online to all students. Classes were scheduled and ran in appropriate spaces with a member of the teaching staff in attendance delivering the content. That lecturer walked through the materials with the students in a face-to-face interactive scenario. This was very much a standard tertiary classroom scenario. Although online lecture notes and tutorial resources were provided this method was referred to as ‘face-to-face’ for the purpose of clarification.

2.2 Fully Online Delivery

The fully online materials were designed to function such that any participant could complete the full course without ever needing to attend any physical face-to-face classes. These resources involved all course content being provided online with lectures delivered in the form of online videos and interactive chat sessions, tutorials as interactive online web pages and/or online video and chat times/rooms available on a weekly basis for discussion. Assessment in the form of examinations and project work was carried out online using video conferencing for presentations.

2.3 Mixed Delivery

Mixed (Online and limited Face-to-Face) delivery was added to the research trial one year into the project, following the initial discovery that online methods had lower student satisfaction levels. These resources/methods involved all of the resources listed in the online scenario but with more personalized lectures (ie. lectures not simply a recording of a lecture to a large room of students but in the form of a one on one discussion) and a small number of face-to-face meetings (three per semester) for discussion of materials and projects.
3 COMPARITIVE TESTING

The purpose of this project was to compare and measure the strengths and weaknesses of differing styles of delivery for creative course materials. Testing each method took place over a five year period from January 2005 through to January 2010. To ensure consistency in testing all comparisons were made between participants engaged in learning the same course content over the same time period with consistent assessment and feedback applied to each group. The only difference between each group was the method of delivery (ie. some face-to-face others online). The materials being covered were tertiary level undergraduate creative courses. Each course was delivered to class groups ranging in size from twenty participants up to a maximum of thirty five participants. The course materials were delivered in the English language (note that this was the first language for most students but not all).

The full experimental trial included five hundred and nineteen participants. These participants ranged in age from seventeen years up to fifty six years of age (with an average age of twenty two years). They came from varied cultural backgrounds including participants from all major continents and more than fifteen countries. For the online groups, participants undertook the course from both nearby locations as well as significant distances (majority from south east Queensland (<100kms) but many from other areas of Australia and several overseas including Thailand, Norway, London and Kuala Lumpur).

For each group of participants they were allocated a style of delivery (either online or face-to-face). They then undertook the fourteen week course using that method of delivery, submitting appropriate assessment items as required. During the fourteen weeks they were also surveyed to gain insight into their feedback on how satisfied and engaged they were with the course and its delivery method. The final data element that was collected looked at how the students engaged with the online resources by recording the methods and times at which they accessed the resources, providing information on which resources were more or less effective and how important the assessment items were in driving use of the resources.

At the conclusion of the course an assessment was made of the students work in the form of examinations and project based work outcomes. These assessments were used to measure the effectiveness of the teaching method in terms of learning outcomes. The student feedback was also collected as a means to measure student satisfaction and engagement. From this data comparisons between the methods of delivery were developed.

4 RESULTS

Results from the automatic recording of resource interaction (ie. when participants viewed and accessed the online materials/classes) demonstrated some interesting outcomes. For those students attending face-to-face classes the early weeks showed high levels of attendance (>90%) at face-to-face classes (these numbers dropped through the 14 weeks) and high use of online tutorial resources during the in-class timeslots. Outside of those timeslots the resources were rarely used. The one exception to this was in the three day period before the examination when the online lecture notes and tutorials received 70% of their use. For the online groups the patterns of accessing the course materials were much more random (in fact the highest access rate for online lectures was at 11pm in the evening). Interestingly much like the face-to-face group it was in the days prior to the examination and assessment that the resources were heavily used. Online students accessed the resources in patterned ways. Regularly returning at the same times each week, different times for almost all students but a consistent pattern on a student by student basis.

In terms of learning outcomes, the results from the trial demonstrated that online delivery was as effective as face-to-face in terms of direct knowledge transfer as measured by examination and project outcomes (see Fig. 1). Interestingly online delivery achieved a slightly higher average outcome with the mean of online group results coming in at 71.4% as compared to face-to-face groups achieving an average of 64.7%. Although subtle this result matches similar findings from other online studies [1][6][7]. The sub elements of these overall results, the examination and project, were both relatively close in value. The examination results proved to be extremely close for both groups (72.5 % and 74%) it was the project work that made the bulk of the difference. These results in essence reflected the nature of the project based work created by the online students. Observation of these project outcomes demonstrated the fact that participants in the online groups tended to take more risks with their projects (and the variety of outcomes from these groups was broader). The online participants had been more willing to use higher end tools and approaches than their face-to-face colleagues.
As Fig. 1 shows the online group has achieved a larger number of students at the very high outcome level (>80%). Indicating that the high achieving students did better in the online groups than they did in the face-to-face groups. Overall the two methods are not significantly different in terms of outcomes, indicating that both methods were effective means of transferring creative knowledge.

Although in direct comparison online delivery showed slightly better success in recalled knowledge and learning outcomes, the students did report lower levels of engagement and satisfaction with the online resources (see Fig. 2).
Given that the student feedback was for the same course material and assessment with the same member of teaching staff. This highlights the fact that students in the online groups found the online course less engaging and as a result were less satisfied than their face-to-face counterparts. These early findings led to the project adding the 'mixed' style of delivery to the trial. This mixed style added in a limited number of optional face-to-face sessions (in addition to all of the resources offered in the online version). Over the three years these optional sessions were attended by on average 62% of students and led to improvements in feedback (although improved, feedback still had online much lower than face-to-face).

The level of experience at a tertiary level also had an influence on the results with students in their first semester of tertiary studies showing different levels of success to those later in their studies (ie. second or third year of tertiary studies).

**Comparing Online for First Semester Students vs More Experienced Students**

![Figure 3: Comparing Online for First semester Students vs More Experienced.](image)

As Fig. 3 shows the first year student results demonstrate a clear group of students (16% of first years) who achieved very low outcomes (<20%) when in the online group. The bulk of the first year groups outcomes are similar to those of the second and third years but it is clear that an element of that group found the online version difficult. The addition of an online skills section at the start of course materials was beneficial in assisting this group, but overall first year outcomes for online groups continued to feature this pool of low achieving students. Interestingly the first year students also reported lower satisfaction levels than their more experienced counterparts. The highest satisfaction ratings were from mature age students with the lowest coming from first year first semester students.

The other notable result involved students who are normally more excluded in face-to-face teaching environments. Those being students for whom the class is in their second language and those students with cultural or physical issues that limit their ability to engage in a face-to-face scenario. Although these participants (who are referred to as disadvantaged students below) represented only a small portion of the overall group (23 out of 519), their results demonstrated that online methods are more effective for particular groups (see Fig. 4).

In this particular trial there were a total of five students with physical disabilities that limited their ability to engage in the classical face-to-face scenario. There were also eighteen international students for whom English was not their first language (and who had previously had significant difficulties in their studies). Over the five year period this trial placed these students in both face-to-face and online classes to measure whether online methods could assist their learning challenges.
Interestingly as is shown in Fig. 4 students in this category achieved much better outcomes when in an online group as compared to a face-to-face group. Those students with physical disabilities improved from an average face-to-face result of 61% up to 74.5% when in online classes. Students with language/culture issues also showed improvement going from 39% in face-to-face classes up to 61% in online classes. This improved ability to engage and transfer knowledge to these particular groups through the use of online methods was unexpected and offers potential. With both international and disabled students playing such a large role in tertiary education these results were an important finding from this study.

5 CONCLUSIONS

Overall this project has demonstrated that tertiary level creative education courses can be successfully delivered in an online form. The results show that online methods offer slight advantages for broader student learning and creative outcomes. This matches the findings of online studies in other fields of education [1] [8] and is most likely due to the students ability to go back and review or repeat materials at their own pace and in their own time. Online teaching methods offer the potential for the student to take control of their own learning style and pace and this empowers the student. This ability also plays a role for the students who have difficulty with language, culture or physical disabilities. These students, who under normal circumstances fall behind in face-to-face classes can control the pace of the material in online delivery and, as this study has shown, this ability leads to improvements in learning outcomes for these particular groups.

Despite these positive outcomes online methods do have many challenges, in particular in addressing the student engagement and satisfaction issues. Online groups achieved better learning outcomes, yet they found their courses less engaging and reported lower levels of satisfaction. Providing more personalization of online teaching resources helped to improve engagement (eg. personal one-on-one lecture rather than lecture to a large theatre) but online methods were still a less desired form of learning, engagement and community experience. For creative courses where the practical element is a significant one, bringing that engagement into online resources is critical. In reality the assessment tasks were the key factor in driving students to engage (in both face-to-face and online) and these need careful consideration in developing future online resources.

The surprising finding from this project was that online teaching methods led to students being more willing to take risks with their creative projects. Feedback indicated that the sense of anonymity in the online class played a role in this. Students reported that the level of anonymity provided in online
learning allowed them to put forward concepts that would be held back in face-to-face classes. In a creative sense this is an important finding as it may allow for the future development of online methods to encourage more risk taking through this 'virtual anonymity'. In addition the lack of 'community engagement' led to each student developing their own work rather than being influenced by others, thus leading to greater diversity of creative outcomes. On the whole this combination led to a broader range of more creative possibilities.

Overall this demonstrates the potential for online delivery in creative education, there are clearly still many steps needed to refine this area but there is also significant potential. Clearly online methods can be effective in transferring knowledge they can also help assist those who are struggling to engage in face-to-face scenarios. The challenges in online engagement are significant and a key issue for the successful development of future versions of creative online educational resources.

REFERENCES


