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Student produced media and the use of web based sites for the assessment of technical and communication skills in engineering students

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Abstract: This paper describes the development of new assessment approaches for engineering students through the use of video production and on-line blogging. The course team in Materials Engineering have developed an approach enabling students to explore ideas and publish work by creating a short film focussing on technical areas. This technical work was previously assessed by a written report and PowerPoint presentations. However, the team wanted to make the reporting more creative and fun for the students and so decided to incorporate a more visual approach introducing video production skills into modules taught on the programme. Discrete modules at all levels of the course were developed in this respect and the outputs of this work have been previously reported. For example, students were given the task of researching a topic in polymers or composites and the end production was a digital video case study handed in on a CD or DVD for assessment. This assessment task replaced a traditional 6 week case study that would have covered the same technical areas, but would have resulted in a group report and PowerPoint presentation. The students were supported with an initial seminar on video production skills, followed by weekly drop-in sessions for technical support on filming and editing. During the last two years students have been asked to produce a website in the form of a technical blog to report their work, both individually and in groups. The result has been an end of module presentation of the sites for summative assessment. The paper will describe the advantages and issues realised with this type of activity, utilising student feedback as part of the evaluation.

Keywords: *Assessment, Use of Media, Blogs*

1. INTRODUCTION

Engineering students are traditionally taught through lectures, tutorials and laboratory practical exercises. Assessment is usually by closed book examination and coursework. The coursework element is generally made up of either a write up of the practical laboratories, a technical essay or a presentation by individuals or in groups, or a combination of these. For final year projects we may ask them to produce a poster of their work. Students studying a 3 or 4 year undergraduate engineering degree get multiple opportunities to be assessed in these ways, but do we really need to carry on in this way with our assessments or should we be allowing students to be more creative and utilise technology and even perhaps have fun when doing their work?

The course team in Engineering at Sheffield Hallam University have been trying different forms of assessment with our students for a number of years. We started with first year students a number of years ago by getting them to work in groups and explore 'Engineering Disasters' [1]. In later years we asked them to make short technical videos, and more recently we have asked them to produce technical blogs by developing websites. We shall report on these initiatives in the next sections.

2. FIRST YEAR PROJECT ON ENGINEERING DISASTERS

First year students worked in small groups and each group investigated an engineering disaster, looking at why it happened and how it could have been prevented. This was part of an engineering Materials and Manufacturing module. Several groups researched famous disasters, such as the Challenger Space Shuttle and numerous bridge failures. Students learnt through enquiry, as we were trying to develop their learner autonomy [2]. Students presented the results of their finding at an end of year one day conference, Figure 1.



Figure 1 - Students presenting at the end of year Student Conference

The conference had a national health and safety expert who presented a keynote on a famous disaster, which was followed by the students presenting their work. The coursework assessment for the module came from a mark for their group presentation at the conference. Previously on this module students had undertaken a case study and handed in a group report. The results of this new approach led to greater student engagement and increase in first time pass rate from 80% to 95%. Students enjoyed the day and commented [3]:

“Communication in the actual presentations.....I felt we learnt from it.....and communication between us in the group we also benefited from....the experience of doing something like this [student conference] ...it’s the first time I’ve done something like this....”

“...by doing this it has boosted my confidence...don’t mind doing it again and again....”

3. FINAL YEAR STUDENTS MAKING VIDEOS FOR ASSESSMENT

The team further developed their assessment methods by getting final year students to produce videos for assessment [4], Figures 2, 3 and 4.



Figure 2 - Engineering students making videos



Figure 3 - Student editing of their videos



Figure 4 - Student Video in the laboratory

Again this approach was to encourage and promote enquiry based learning, research informed teaching and the development of skills in learner autonomy. Students worked in groups to develop these key skills, and were able to be creative and inspirational in their outputs. One example which we will describe was within a module of 'polymers & Composites'. Students were asked to work in groups of 4 and explore a topic of their interest in depth. Their output would be a short video of their research, which was initially handed in on a DVD, but later replaced by them uploading their work to an online repository. Student feedback on this type of assessment was positive:

" through editing the video, which took many hours, we learnt the material really well, it sort of sunk in and it sort of disguised our learning..."

"... it improved our team working and communication skills"

Overall the student feedback informed us that they were able to be creative, that their learning was disguised by the activity of producing and editing the short videos. They gained deeper learning through the process of storyboarding and editing, which took a large amount of time. They improved their team working and communication skills, and hence their employability skills through undertaking this project work for assessment.

4. STUDENT BLOGS

In the last two years we have developed our assessment practice even further working with our final year engineering students to produce and publish work on line as a technical blog, both individually and in small groups. The module involved was 'Degradation and Surface Engineering. WordPress was the selected as the platform to host the work. The individual student project involved a series of weekly homework questions that students were asked to undertake and write up on their sites. These would then be marked at the end of the semester counting towards the module mark, which was assessed by only coursework. The tutors had the opportunity to look at the blogs each week and add comments on how well they had done each week. In this way students were encouraged to continuously work and receive ongoing feedback. The second part of the module assessment was a group blog in teams of up to 5 students. A series of topics were taken from the syllabus and students were asked to pick one of them as their group project. Students then executed their research through enquiry and eventually they presented their blogs at the end of the module for assessment, Figure 5. Students were supported through their blog development by a WordPress specialist, and groups were asked to show the team their progress on the blogs throughout the semester. They were also encouraged to utilise existing or to produce short video clips to include on their sites.

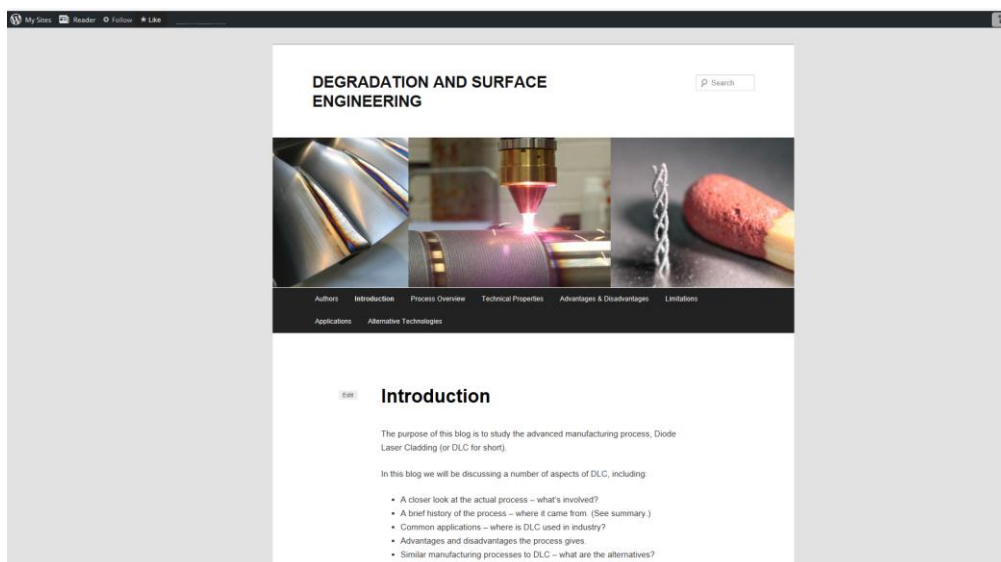


Figure 5 - Student group blog

Student feedback was mixed. The part time students found it difficult to work in groups when they only saw each other once per week in class. However, they ended up producing the best sites and getting the highest marks for their work. Overall the students welcomed **working creatively**, doing something different for assessment and enjoyed the use of a technology that

added to their skill sets. The staff involved learnt several lessons from this work to inform future development of this type of assessment:

- The naming of sites was problematic, as most called them 'Degradation and Surface Engineering', the module title, hence difficult initially to distinguish one site from another when looking at the list.
- Roles within the group - all students had to contribute to the blog, but it was sometimes difficult to assess who had done what, and so marking individuals was problematic, and group marks were awarded. However, some students could 'freeload' on others work.
- Advice on structure and content - students were supported during their blog development, but some initially produced superficial sites, with not enough technical depth. It was therefore important that students regularly reported where they were at and not leave it all until the last minute and produce a sub-standard site.
- Students tended not to generate their own media and simply lifted video content from other sites.
- Referencing was an issue in some cases, so it became clear that students needed further support in ensuring they produced their own critical analysis of their topic and referenced any cited work and video clips in the correct way.
- Some blogs did not have clear links between the individual work of each student and this led to a lack of flow or consistency in their blogs. Blog design is therefore very important.
- Marking the blogs took a long time for the staff, who sat in a room for a whole day to look through them all, and to check for plagiarism.

5. SUMMARY & CONCLUSIONS

Overall the students in each of these projects adapted well to the use of technologies such as video production and the use of WordPress. Students become more motivated and were able to be creative. They developed a more autonomous approach by learning through enquiry, and using the latest research to inform their critical analysis. In this way their learning experience was significantly enhanced. Their employability skills are developed, and they have good sources of evidence for interviews. The media produced by can be used for future students to learn from. Although the main staff time is in setting up the module assessments and support each week, the week by week resource needed is not extensive. However, the marking of the blogs can be quite time intensive, although enjoyable!

6. REFERENCES

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