

Users as Producers: students using video to develop learner autonomy

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Abstract

This paper will report on a project that is being conducted within one of the UK Centres for Excellence in Teaching and Learning (CETLs): 'The Centre for Promoting Learner Autonomy'. The paper will discuss the learning, teaching and assessment methods used on first year and final year engineering undergraduate modules in order to promote student learner autonomy.

The first year module, 'Materials, Manufacturing and Environmental Engineering', has traditionally been taught through a series of keynote lectures, followed by seminars, laboratory classes and case studies. Semester 2 case study work has been replaced by student groups either undertaking investigations into 'engineering disaster management', or 'materials and manufacturing processes', incorporating video into their presentations. The result was an end of module 'student conference', where each group presented a technical paper. The final year module, 'Polymers and Composites', also replaces case study work with student production of a DVD video for assessment, which is also a potential future teaching resource.

This paper will discuss development of the learning scenarios and the introduction of video and media to stimulate, present and assess the learning. Data from a questionnaire and student interviews will be discussed and will show how the students have developed within the modules.

Introduction

The Centre for Promoting Learner Autonomy (CPLA) at Sheffield Hallam University has funded numerous developmental projects across the university to develop student learner autonomy. In engineering at Hallam it was decided to undertake development work with groups of staff on specific modules to incorporate autonomy through the use of media/ technology within group working utilising an enquiry-based learning approach. Our simple definition of autonomy is that "students take responsibility for managing and constructing their own learning". The characteristics of an autonomous learner are:

- Critical reflection
- Self-awareness
- Taking responsibility for their own learning
- Working creatively with complex situations

Students today have an expectation of communication technologies. "These students, many of whom have never known a world without personal access to information technologies, often take them for granted and integrate them seamlessly

into their daily lives. These technologies also represent an opportunity for making changes in higher education instruction. How can higher education fully embrace the possibilities they present?" (Caruso JB & Salaway G, 2007)

Easy creation, distribution and instantaneous uploading and downloading of digital media is the norm. 'MySpace' and 'YouTube' are just two examples of free user-generated on-line video sharing.

Such resources are bringing about new opportunities and a potential revolution in the way teaching and learning can be managed. Students in mainstream education are becoming increasingly knowledgeable and proficient in creating and up-loading media. Based on their experience in this area (As evidenced by recent studies conducted by JISC (2007) and ECAR (2007)) those who do enter Higher education tend to have higher expectations, and are much more skilled compared with their predecessors.

Consequently some academics are taking up this opportunity to better address the needs of these media literate students.

Learner Autonomy in Engineering

One of the projects in engineering is concerned with working with first year (level 4) undergraduate engineering students taking the module, 'Materials, Manufacturing and Environmental Engineering'. Two student groups take this module, BSc Automotive Technology and BSc Engineering Design and Innovation. It has been traditionally taught over 2 semesters, with keynote lectures and laboratories/ tutorials in semester 1, followed by case studies in semester 2. However, learner autonomy is not explicitly developed within these case studies and so a new learning and teaching methodology has been used under the CPLA development work.

The main objectives of the project were:

- To develop learner autonomy in engineering first year students.
- To link individual critical review of knowledge and skill development of the students and relate this to their Personal Development Planning (progress files) through the use of project and enquiry based learning.
- For students to work effectively in teams and independently to develop communication, presentation, enterprising, creative and problem solving skills.

It was decided to use group working to develop learner autonomy in these first year students, using experiential learning and social interaction enhanced by the use of technology.

Students therefore undertook two new types of project work in mixed multidisciplinary groups. The students were split into two sections. Both sections were asked to produce short video clips (less than 2 minutes) A current university Learning and Teaching Institute (LTI) initiative, 'Users as Producers', was introduced providing an opportunity for the students to learn and develop skills in video and media production. The students were introduced to camera skills, the grammar of television of television, interview techniques and editing skills. Each group produced their own video asset which was either embedded within a PowerPoint presentation, or placed into the Blackboard Virtual Learning Environment. As well as developing skills in media production there was also an opportunity for students to develop key skills

such as presentation techniques, project management skills and conflict resolution (whilst working together in groups).

The first student section related to materials, manufacturing or environmental processes.

The second student section based themselves on the theme of 'Engineering Disaster Management'. Initially (within 2 weeks) the students were required to develop a half page 'brief' related to an engineering disaster that has happened anywhere in the world. This brief detailed:

- Background to the disaster and where it fits in within the context of materials and/or manufacturing and/or environmental engineering
- Define the project/ problem, give details, outcomes, solutions (future prevention)
- Work programme/ Project Plan of how they are going to undertake the project, e.g. find information, the type of information, who is responsible for the different aspects – team roles etc.

During semester 2 they carried out the project and reported back at certain milestone points on progress. The project work required that both staff and students were trained and supported in the use of new teaching methodologies, particularly the use and production of media material.

Students were prepared for their project work in a number of ways. A series of seminars on video and media production were given during semester 1 and reinforced in semester 2 with 'drop-in' sessions available. Also, students were introduced to the Belbin model (2003) of team roles to help them get the most from their group working. Students undertook a self-perception review in class, which highlighted their perceived team role. This can then be reflected upon both during, and at the end of the project.

Ultimately, both groups of students presented their project at the end of module 'Student Conference'. The presentations were PowerPoint based, containing embedded media, either from existing sources or produced by the students themselves. The conference was a simulated technical conference with a keynote speaker from industry.

A second project was working with final year students on a Polymers and Composites module. 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 in a similar way to the first year students, with an initial seminar on video production, followed by weekly drop-in sessions for technical support on filming and editing.

Assessment of first year module

The first year module is currently assessed by coursework only, with one of the elements of assessment being an in-class time constrained multi-choice test. The end of module 'student conference' was held during the latter part of semester 2, but early enough to be able to have the in-class test a few weeks afterwards, so that questions based on the knowledge disseminated at the conference was included.

This meant that the students had to engage with all the student presentations, as staff used the conference to produce more multi-choice questions from the day's event. In addition an external speaker was invited to give a keynote presentation at the conference on 'Engineering disasters'. This gave more realism to the conference and allowed students to get the feel of a 'real-world' conference event.

The assessment of the students was on their presentations, with a panel of staff and external industrialists marking them. Copies of the presentations were obtained from the students prior to the conference day in order to formulate the conference programme. The staff only marked the presentations with no group reports, which reduced the staff assessment burden and allowed for a fast turn around of feedback to the students.

Overall, the first time pass rate for the module increased from the previous 3 years of 77% 75% and 80% to 95%. The only referrals were those students that failed to attend the conference. This improvement in pass rate is believed to be due to the increased attendance and motivation of the students by using this type of project work.

These project assignments gave students the opportunity to reflect on their participation, within their Personal Development Planning (PDP) progress files. Students could include their Belbin analysis and critically reflect upon how the assignment went, the role they played and what they have learnt about their strengths and areas for future development.

Assessment of final year module

After the DVDs were handed in the short films were given a 'public showing' which showcased their work. Staff marked the work after the event a few days later, using criteria similar to a final powerpoint presentation, with marks for communication value and technical content, evidence of research, evidence of preparation. It was soon realised during the marking that staff were uncomfortable using the existing criteria. Future work will look at this area to find a better way of assessing them.

Evaluation of first year students

At the beginning of semester 2, a questionnaire was given out that found out from the first year students what they perceived as learner autonomy; also seeking to evidence their current learning styles and expectations, as well as their views on vocational skills. 28 questionnaire responses were received from the 40 students that took part. A follow-up at the end of the module with some focus group discussions was used to further evaluate the student view of the assignments in order to identify the benefits of this type of learning and teaching methodology. Fuller details of this survey have been reported elsewhere. (Bramhall and Radley 2007).

Summary of first year questionnaire findings

Students' perceptions of learner autonomy: Half of the students did not understand what the term 'autonomous learning' meant. The remainder thought it meant 'to take control of one's own learning' (7 responses), 'independent or self learning' (4 responses) and 'planning my own studies' (3 responses).

In educational settings, autonomy is most commonly defined as a capacity to take charge or control of one's learning (Holec 1981). Candy (1991) places the development of autonomy on a continuum with teacher-control at one end and

learner-control at the other. Learners achieve different points at the learner-control end of the continuum depending upon context.

A further series of questions attempted to find out more about their perceptions on autonomy, types of learning and tutor guidance. Students were asked various statements for which they had to rank on a five point scale from 'strongly agree' to 'strongly disagree'.

Most students thought that they had excellent skills as an autonomous learner, and that group working helped them develop this further. However, most students thought that the best way to develop learner autonomy was through independent study.

Results also showed that students were very strongly assessment driven, only researching and gathering information when undertaking an assignment, figure 1:

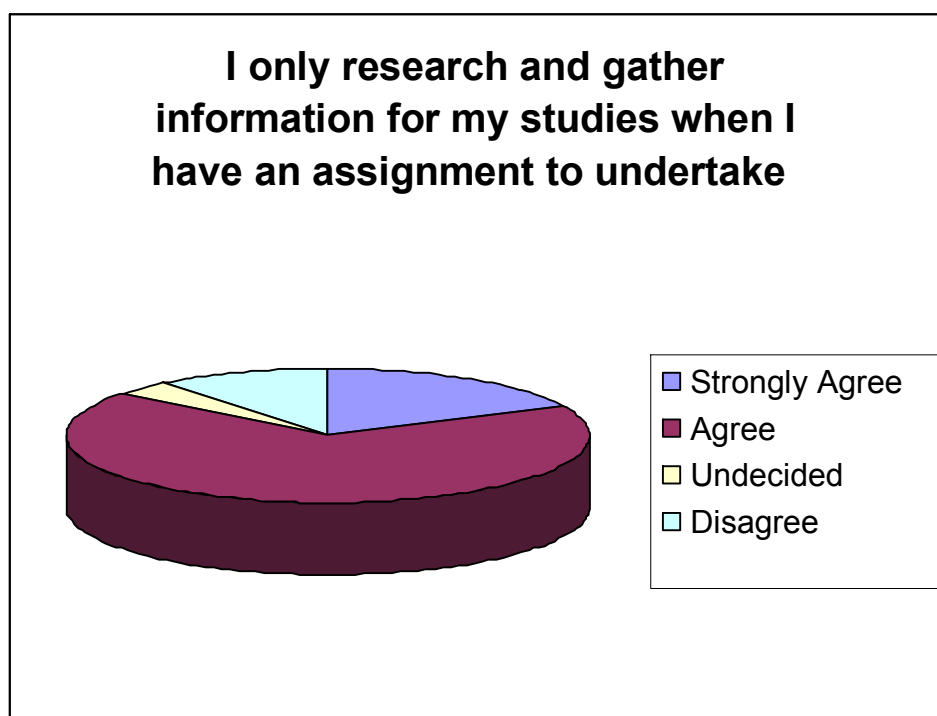


Figure 1 – Student views on researching and gathering information

Most students expected strong guidance from their tutors/ lecturers. Students were then asked a series of questions on the importance of various vocational skills and values that were important for a qualified engineer to able to perform his/her duties. A score of 0 was of 'no importance' with a score of 10 being 'very important'. An opinion of the level of these skills actually exhibited in their fellow students followed each question on a scale of 0 to 10, with 10 being very high.

The following data shows the mean results:

Communication skills	Importance	Perception of fellow students ability
Present and defend points of view and outcomes of their own work in writing to colleagues, clients and superiors	6.8	4.1
Present and defend points of view and outcomes of their own work verbally to colleagues, clients and superiors	7.1	4.8
Critically read written works, making judgements on their relevance and value	7.1	4.9
Use visual aids in presentations	7.2	5.8

This data shows that the students perceive the need to develop their writing and presentation skills, rating these highly important, but with a low perception of fellow student's abilities in these areas.

Ability to work in groups	Importance	Perception of fellow students ability
Work with others in teams adopting a relevant role	7.9	6.4
Organise and delegate tasks	7.6	6.0
Assume leadership positions when necessary	7.4	5.7

This shows that the students understand the relevance and importance of working in teams, and that their fellow students have reasonable abilities in this area.

Problem solving skills	Importance	Perception of fellow students ability
Identify and solve unstructured problems	7.6	5.6
Find creative solutions	7.3	6.1
Integrate multidisciplinary knowledge to solve problems	6.9	5.0
Perform critical analysis	7.3	5.6
Work independently	7.8	6.7

Students recognise the importance of problem solving skills and the need to therefore develop these skills, especially in a multidisciplinary environment.

Stress management skills	Importance	Perception of fellow students ability
Organise the workloads to meet conflicting demands and unexpected requirements	7.5	6.1
Organise the workloads to recognise and meet tight, strict and coinciding deadlines	7.9	6.3
Organise the workloads to select and assign priorities within time constraints	7.8	6.2

Students were consistent in ranking this area of high importance, especially the need to organise workloads to meet deadlines, rating this 7.9. This ranking was equal highest of all questions together with 'working in groups', which was also 7.9.

Information technology skills	Importance	Perception of fellow students ability
Use relevant software, e.g. databases, spreadsheets, word processors	7.7	7.2
Use electronic information sources	7.2	7.1

Not surprisingly, as shown above, the students rated IT skills important, but recognising that they already have these skills.

Focus group discussions

Below are some of the first year student comments taken from focus group meetings:

"...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...."

"...going away and looking for the information for ourselves was quite good, rather than being spoon fed..."

"...I've found out much more about manufacturing and materials and how engineering disasters are investigated.....my presentation skills have definitely improved as well...."

"...presenting information and ideas to an audience helps with employers..."

"...working as a group is the best option as you get to know who they are and how other people work, what is their strengths plus their weaknesses..."

"...the analysis skills, the communication, the teamworking works.....gave me skills to apply in any situation in the future...."

Discussion and Conclusions

Overall, the questionnaire's results raises the importance of developing the student's communication, teamwork and leadership skills and to critically solve problems in multidisciplinary environments.

The new case study work, as described earlier, using group work, video and engineering disaster management should fulfil these needs. This was borne out in interviews with students following the case studies, as detailed above.

These comments show that this type of project work benefits the students, adds realism, aids communication and analysis skills and hence helps with their employability. From the questionnaire results it is clear that the areas that needed development were addressed to a great extent. The student motivation and hence

achievement was improved, as demonstrated by the improved pass rate for the module.

Student views from the final year module were also sought through video interviews both during and after the end of the module. In summary the following positive outcomes were found:

- The students were motivated by this methodology in the use of video for assessment.
- Students developed skills that increased their employability
- Students developed new technical skills (media/IT) that some thought would be of use in the future.
- Students developed a deeper understanding of the technical content of the module.
- Learner autonomy was developed as students managed their learning and assessment.
- Students produced future learning media resources.
- The overall approach is not staff labour intensive.

Most recent research agrees that autonomy is a developmental process which cannot be taught or learnt (Benson 2001). However, the Sheffield Hallam CPLA model is based on constant interactions between pedagogic learning environments, learner autonomy characteristics and policy impacts, achieving 'pedagogic resonance' for students (Trigwell and Shale 2004)- creating a space for new learning partnerships. CPLA draws upon different traditions e.g. constructivist theories of learning, particularly experiential learning (Barnes, 1976; Kolb, 1984, Kohonen, 1992) and also the central idea of a learner-led curriculum (Peters 2004) that is increasingly made possible through the appropriate use of technology. Constructivism is based on the premise that knowledge is constructed by each learner through processes of social interaction. So these engineering group projects are an ideal format for students to construct their own learning and develop autonomy skills.

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