

**VICARIOUS EXPERIENTIAL LEARNING OF CHALLENGING
TECHNICAL TOPICS MEDIATED BY THE PROCESSES OF VIDEO
PRODUCTION: A CASE STUDY OF SECOND YEAR
UNDERGRADUATE ENGINEERING STUDENTS**

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Abstract

This case study investigated how a small group of engineering undergraduate students, working in pairs, generated digital learning objects to illustrate challenging topics within their courses. It shows that the students particularly valued the ability of video to convey narrative effectively, and all chose video as their learning object format. It argues that the video production processes they employed provided effective mediation for vicarious experiential learning. It also argues that the composition of the pairings was important, with pairs composed of students from more differing backgrounds exhibiting more curiosity for their topic and more confidence in their status within their community of practice, than pairs with similar experiences.

Introduction

For some time, university students in the UK have had experience of, and access to a range of media production tools (Bowker, 1991). The technology is freely available, with mobile phones and stills cameras capable of recording audio and video, and simple editing systems coming as part of most computer operating system software. Indeed, by May 2006, some 15% of children aged 12-15 had made a short film using a digital camcorder or mobile phone, and a further 36% said they were interested in doing so (Ofcom, 2006, p56). It is reasonable to assume the figures for young people entering higher education will be considerably higher as they access more technology in post-16 education.

A number of vocational degree subjects, such as Marketing, Journalism and Media Studies, usually contain some form of media production as a core taught element. At this level, the media production process is often viewed as a specific taught skill separate from other elements of study (see, for example, Buckingham, 2003). It develops the technical understanding of specific production tools and the aesthetic understanding of visual literacy, and students regularly produce media packages as part of their studies. However, it is seldom, if ever viewed as a vehicle for learning the complex topics that a media package is able to portray. Whilst it is widely acknowledged that user-produced video plays an important role in learning through technologies such as YouTube (Juhasz, 2011), few, if any studies discuss the attributes of student-developed video, or acknowledge that students may well be better equipped for media production than their tutors.

The Entertainment Technology Field Group at Southampton Solent University runs a number of BSc degree courses aimed at preparing engineers for work in the media industries. Some of these courses specialise in sound technologies and others vision, but all students undertake a mix of media production and electronic engineering activities.

Working with a small group of these students, this case study explored the processes they applied to the production of media packages on specific technical topics. It aimed to investigate how those processes impacted upon their learning of the topics. The students had already completed modules on audio and video production. They were, therefore, quite experienced in managing the operational and aesthetic requirements of producing a media package. They also had a good understanding of the technical principles underpinning their assigned topics.

The investigation centred upon the students' production of digital *learning objects*, a "grouping of materials that is structured in a meaningful way and is tied to an educational objective" (Smith, 2004, p1). Students were able to choose the materials and format (audio, video, smartphone application, etc.) for their learning object, but they had to pick a topic from a list appropriate to their degree title. The study investigated the choices the students made about the format and structure of their learning objects, and how their learning could be considered to be largely experiential and cyclic. It also considered the interactions between the students themselves and between them and their tutors, and how this impacted on their learning processes.

Video in Undergraduate Teaching and Learning

Although the use of video for teaching in schools and Further Education is well established, this is mostly limited to the use of broadcast television for the primary delivery of new concepts. Its role in Higher Education teaching strategies is less well documented (Barford and Weston, 1997).

Few studies specifically consider the video production process as an aid to learning. However, Norman (1999) notes that it is important not to see what he defines as the specific 'affordances' of the video production process as properties of that process, but rather the varied ways the students have experienced these properties and adopted them for their own ends, and Beetham (2007) identifies the importance of encouraging students to use tools like video, stating that:

Tools for creating representations in different media...are all too often regarded as the prerogative of the learning designer, but there is no reason why they should not be used by learners to create their own representations of subject matter. (p. 35)

Finally, Lou et al. (2006) identify that video is unique in that it:

Can present information in a dynamic and stimulating manner and therefore may be more appropriate for teaching concepts and skills...where students may benefit most from vicarious experience. (p. 141)

Experiential Learning

This study focuses on both the personal and the environmental experiences of the student, and the processes and outcomes of those experiences. Hence, experiential learning was viewed as the most appropriate model for analysis. Experiential learning can be defined as new insights emerging from the reflection upon experience. Most models of experiential learning are cyclical, usually beginning "...with the experience followed by reflection, discussion, analysis and evaluation of the experience... From these processes come the insights, the discoveries and understanding" (Wight, 1970, p. 236).

Kolb's experiential learning model (Kolb & Kolb, 2006) employs two distinct but related methods of gaining experience – Concrete Experience (CE) and Abstract Conceptualisation (AC), and two distinct but related methods of transforming that experience – Reflective Observation (RO) and Active Experimentation (AE). Experiential learning will take place when there is a *creative tension* among the four methods in a particular context. He portrays the process as an idealised learning cycle where the learner undertakes all the activities – experiencing, reflecting, planning and acting:

Immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications can be drawn. These implications can be actively tested and serve as guides in creating new experiences. (Kolb & Kolb, 2006, p. 7)

Without the desire or willingness of a student to move through the cycle, experiential learning as Kolb describes it will not take place. Loewenstein (1994) posits that curiosity is key to engagement with educational tasks and proposes a model of curiosity based largely on our need to understand our environment. His model suggests that we are motivated to discover something once we realise that there is a gap between our current knowledge and a desired new knowledge state. However, he points out that "to stimulate curiosity, it is necessary to make students aware of manageable gaps in their knowledge" (Loewenstein, 1994, p. 94). The gaps must be manageable: gaps that are too great actually demotivate, as students will be deterred from attempting to gain a new learning level if they perceive that new level to be unattainable. Students will then exhibit helplessness rather than curiosity. Similarly, if the gap is too small, students exhibit little enthusiasm for the task, as their curiosity isn't sufficiently stimulated. So, curiosity about a subject relies on a pre-existing knowledge base in that area.

Vicarious Learning

Not all experience is direct. Over the last decade, a number of authors have highlighted the possibility of vicarious experiential learning enabled by the dialogue generated by tutors and other learners (for example, Lee, 2010). By vicarious learning they usually mean that which happens by a student viewing and/or listening to another student discussing a topic with their tutor. Lee et al. (1998) further suggest that vicarious learning through re-representation, or multiple representations, of taught material has positive

benefits in understanding “perhaps because the transition from one representation to another may make available interpretations which are emergent with respect to the first and more explicit in the second” (p. 3). Iacucci et al. (2002) extend this specifically to student-constructed video material based upon pre-existing clips of tutorial dialogues and additional teaching materials. In this study, students construct ‘documentary’-style presentations based on their reflections upon the original material, in essence providing this re-representation. They suggest that the video production process successfully provides mediational means for shared representation of the learnt material, making it measurably more accessible to third parties. The above suggests that the production of the learning objects could provide the mediational means for the students’ vicarious experiential learning of the topics covered. However, it also suggests that the effectiveness of this learning depends on the students’ initial knowledge base.

Methodology

The students in this qualitative intrinsic case study were in the second year of BSc (Hons) degree courses, specialising in sound and vision technologies. They were undertaking a unit titled *Post-Production Techniques* in which they were expected to develop the technical and operational skills associated with the composition of audio, video and graphical material for delivery on a number of different platforms. A colleague, an Associate Lecturer who was an active professional in this field, taught this unit. Part of the assessment for this unit required the students to develop completed packages in a number of different genres. For this study, working in pairs, the students were set the task of developing a learning object that could be consumed on a mobile platform. In this case, a learning object was to be a digital media package that could aid solo mobile learning. They were instructed that the target “audience” was to be students similar to themselves. The students were given free reign over the format of material produced, partly so that they could specialise in the techniques they found interesting and partly so that I could investigate what formats they thought most appropriate. The students were free to choose from a range of technical topics that had been suggested by teaching colleagues, who were also then engaged as ‘expert consultants’ to the students. These topics were specifically identified as traditionally being challenging to most students.

In total, eighteen students undertook the unit and, initially, twelve students volunteered to take part in the study. Two pairs later decided to opt out for personal reasons. Of the eight remaining students, six were in the 19-22-age range with one in the range 23-26 and one 26-30. Two of the students were female, working together in a pair, which was representative of the gender mix of students studying the unit.

Data was collected from the students in three distinct stages using two different methods: an initial semi-structured interview; a student-written log of activities; and a second semi-structured interview. Semi-structured interviews were chosen as the primary data collection method as they enable the participants to discuss and express situations from their own viewpoint, and allow expression of thoughts and emotions.

Analysis and Discussion

Learning Objects Produced by the Students

Despite having the opportunity to choose from a range of different media for their learning objects, all of the students produced rather 'traditional' videos following the standard television documentary structure, though there was some variety in their style. In the interviews, all of the students expressed that they found the idea of producing a video both least intimidating and most interesting. Though these are both rather task-based concepts, they often then suggested that they were more curious about what they could achieve using video as a medium. However, when pressed about the appropriateness of use of video for their target audience, the emphasis switched to their own experiences of learning from other electronic media, such as games, for example:

Student P: "Most things like [games, apps] seem okay at first, but they get boring really quickly and you don't really remember much."

Student A: "Yeah, I would much rather watch a video because, if I don't remember something, I can watch it again. It's usually easier to understand too."

This view was reinforced by the later interviews and many of the video reviews where a number of the subjects identified a preference for learning from video. Of these, most identified mainstream broadcast media as their preferred model, with television documentaries dominating. Throughout the study, all of the subjects returned to the theme of the importance of narrative in their learning objects. Most of the subjects suggested that non-linear activities, such as interactive games, lacked perceived narrative structure and that, rather than encourage the expected learner-centred, exploratory learning, this actually limited comprehension (a view supported by Laurillard, 1998).

They saw the lack of structure imposed on interactive media as a disadvantage if they needed to discern this structure for a message to be understood. Similarly, throughout the study, all of the students stressed the importance of the role of *storyteller* in their learning object and suggested that this was most effectively supported by the 'traditional' media (print, audio and video) where narrative is more easily conveyed. This was also reflected in the choices they made about the structure of the videos.

Structure of the Videos

Whilst all the students employed presenters to provide clear narrative, the composition of the videos varied. Of the four considered for this study, students wholly presented two, a member of the teaching team wholly presented one, and one used a mixture of student presentation and tutor interviews. The students' discussion of structure and style showed very different approaches to their target audiences.

When considering their target audience, only one clear common theme emerged: all of the students cited a positive prior experience with their chosen style and structure. I thought this was interesting as they were working in pairs and had, therefore, different prior experiences. I therefore introduced

questions into the second research interviews to explore this. Two pairs of students suggested that, within each pair, they had very similar positive prior experiences and that they only needed limited discussion to reach a conclusion about their approach. Their videos were of a very traditional instructional style. However, the other two pairs of students suggested that they had initially very different ideas within each pair and went on to describe rigorous negotiations to determine their final approaches. This resulted in much more complex representations of the material. Whilst it is perhaps not surprising, this points to a conclusion that the richness of prior experience determined the richness of the negotiation and that, in turn, determined the complexity of style and structure of the final video.

Whilst some students discussed it more than others, this collaborative approach to deciding on the style, structure and content of the video was a clear theme in all the research interviews. The initial negotiation that this required seemed to set the foundation for how they would collaborate in the project and, in turn, how they would negotiate the meaning of individual elements.

Initial Levels of Understanding

One key theme that emerged from both the literature review and the interviews was the importance of negotiation of meaning.

In the second research interview, all of the students were asked to describe how they represented a concept that they originally hadn't understood. In every case, the students pointed to a negotiation of a model to represent the concept. In some cases this was between the students and their tutor, though the negotiation then was limited as the students tended to accept what they were told. It was more noticeable when the students' initial perceptions differed. For example:

Student N: I didn't understand the whole component video thing, so L. drew me some drawings of the waveforms to show me how it worked. Then I thought 'what would that look like on a real picture?' because... that is what is important. So we took a picture and broke it up in Photoshop to show the individual components.

Interviewer (to L): Do you think that was better than your explanation?

Student L: Oh yes, much better. It actually helped link the technical stuff to what you can see, which I hadn't seen before.

In this case, the shared perspectives of the problem produced a negotiated representation that both students declared beneficial. These students gave a number of similar examples. Iacucci et al. (2002) call this property *intersubjectivity*, where the overlaps between the understandings each participant have of the collaborative task provide the common understanding required. The negotiation was constrained by the task, in that there are only a limited number of possible ways and to represent the concept, or tools available to produce the video. However, there was sufficient space for intersubjectivity as the two participants initially had quite different perspectives.

In a different pairing, the students indicated that they had a similar level of understanding but had consciously negotiated the appropriateness of each element of their video in order to achieve what they believed would be the most effective result. Their video contained a rich variety of images, carefully selected through negotiation to support their topic.

It appeared that intersubjectivity impacted upon the style of video produced. Where both students were very confident with the topic, had mostly shared understandings of the material to be covered and demonstrated very little negotiation of the representation, the result was a very traditional, and arguably rather 'dry', training video. In all the interviews they indicated little discussion of individual elements and when specifically asked if they could identify a point of disagreement they found none.

Similarly, where the students initially showed a shared low level of understanding of the topic, they were inclined to only use the representation presented by the teacher, as they didn't have the confidence to negotiate a new representation. In both interviews and final review both students repeatedly cited their tutor whenever technical detail was discussed. Again, this produced a very traditional result.

The negotiation process appeared important. All the students suggested that initial disagreement led to a richer discussion about best representation of individual concepts, and that this was particularly important in video production. Some pairs were more effective at this than others, but all suggested that it was the video production process that stimulated this negotiation.

I would also argue that the 'richness' of this negotiation was dependent upon the difference between their initial levels of understanding of the topics covered. If the students initially had very similar understandings, then the negotiation was limited, whereas a significant difference in understanding stimulated more meaningful discussion.

Motivation and Engagement

Whilst the students were not directly questioned about their motivations for working on the task, I used their discussions about topic choice and engagement as indicators of motivation to undertake the task.

One pair of students showed a high level of interest in the topic, albeit for different reasons. As a student concentrating on sound, student N. had a knowledge gap about video that might appear intimidating on its own. However, the fact he had support from his peer seemed to allow him to overcome this. Student L. seemed to relish the opportunity to discuss his understanding with his colleague, using it to reinforce his own understanding. This combination of students with different backgrounds (doing similar, but different courses) was unusual. Most students chose to work with colleagues from the same course and, interestingly, most applied a much more strategic approach.

In a typical case, the students had specifically chosen their topic as the one that required, from their perspective, the least initial work, so that they could concentrate on the elements they with which they were confident. When pushed on why this was important, they revealed that they believed that concentrating on the production, rather than the content of the learning object would gain them higher marks. They appeared less inclined to discuss their relative abilities with each other, assuming a knowledge base that was the same, even though it probably wasn't. When pushed on this point, students with very similar backgrounds seemed reluctant to divide up responsibility for learning material, saying 'we...' much more often than 'I...'

All of the students were actually of very similar ability and had performed equally well in individual and group tasks previously. However, the students with differing backgrounds consistently talked more enthusiastically about their individual curiosity about the different elements of their topic, whereas those with similar backgrounds generally approached finding out new things as a group task. It seems that, when they assumed a similar base level of knowledge, they appeared less willing to discover new information alone.

When asked about their experience, all of the students responded favourably, with the simple question, "Did you enjoy the task?" universally gaining positive responses. Three of the groups commented that they had spent more time on the task than it was probably worth considering the marks they gained, though none appeared to begrudge this. All of the students said they remained interested in the topic throughout the task.

The learning objects were produced as an assignment for a module that contained a number of similar activities. The leader of that module reported that, when he marked it, the work submitted for this activity demonstrated a higher level of commitment and skill than that produced for any other. Whilst this may be because the students knew they were taking part in a study, it also supports their reported satisfaction and engagement with this activity.

Conclusion

All of the students in this study chose video as the preferred format for the production of their learning objects. The reasons for this were based both on positive prior experiences of video as an effective aid to learning and a perception that the video production process would be more interesting. All of the students reported satisfaction with the task and an increased understanding of the topics covered. Increased engagement with the task certainly resulted in more time being spent on the topic than would have been the case with other teaching methods. However, the interaction between the students within each pair, and between each pair and their tutor, appeared important for student understanding, and this collaborative production process provided effective mediation for the negotiation of meaning within the topics.

Sample size was a key weakness of the project as it would have been useful to have additional perspectives on the processes undergone by the students. However, the students that did take part were very open and honest with their answers, leading to a rich, reliable data set with some clear conclusions. In

answer to the process-based research question, I have shown that all of the students' approaches could be mapped onto Kolb's Experiential Learning cycle, and that, in each case, individual students have benefited from the vicarious experience of others.

More interesting, perhaps, was the significance of prior experience within the pairings of the students to the outcome-based research question. Students with different backgrounds appeared to undertake much more negotiation throughout the project and this seemed to have a number of impacts. The initial negotiation appeared to inspire curiosity in the students, by allowing the students within the pairs to identify and (importantly) manage their learning gaps and to negotiate their learning goals. These students valued explanation in their videos and were more active in their independent research. However, students with similar backgrounds appeared less curious about their chosen topics and more reliant on factual, descriptive materials to present their videos. They were also more likely to rely on their own knowledge or accept that of their tutor.

This last point is also important, as it seemed to impact on the power relationship with the tutor. The pairs with differing backgrounds managed the relationship with their tutor quite effectively, deciding in advance what they needed from them and how to get it. The students with similar backgrounds were more subservient in their approach, relying on the tutors much more for information and/or validation.

Therefore, I conclude that, whilst all of the students in this study benefited from the video production process to aid their understanding of challenging topics, the student pairs with differing backgrounds benefited more than pairings with similar prior experiences. I make no claim that this result can be extended to all students working in pairs on similar projects. However, it will be used as the focus for further research when the unit is repeated in the next academic year, with specific attention paid to prior experiences and a larger student sample.

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