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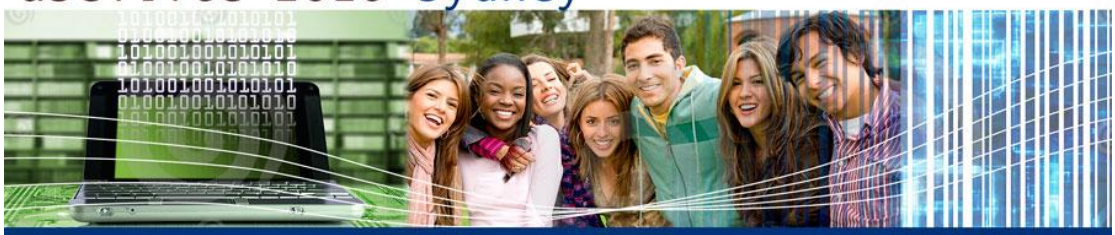

Teaching developmental psychology using online video

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This paper examines the use of an interactive online **E**ducational **V**ideo platform with collaborative temporal **A**nnotation (**EVA**), with the aim to develop undergraduate psychology students' competence in assessing and understanding cognitive development. Two videos were developed, showing children being assessed on cognitive tests. One video was shown in a tutorial and actively guided by a teacher. The other was available online via the EVA platform with peer feedback as a voluntary supplement to the tutorial; the aim is to facilitate collaborative peer supported learning, scaffolded by pre-set prompts from teachers. Low level online users were compared with active users. Overall, students gave positive evaluations of the peer supported online learning especially among the active users. However, students in general preferred the classroom tutorial experience largely because of the presence of active teacher guidance and facilitation. Given that the online learning activities were voluntary and delivered in a competitive learning environment with minimal guidance, we believe that collaborative peer supported online learning has demonstrated educational potential in a range of contexts. We discuss factors that may facilitate greater student participation, elicit better learning outcomes, and promote learning satisfaction in an online peer learning environment.

Keywords: skill based learning, collaborative peer supported learning, video annotation

Background

In Psychology, as well as other disciplines, there are a range of content areas in which students can benefit from observation of real children. The senior Developmental Psychology unit of study at the University of Sydney involves a strong emphasis on observation of child behaviour, both in vivo and on film, and writing up observations in a formal report. A key goal is to develop students' skills in objective assessment of children, critical evaluation of test procedures, and application of observations to theory. While contact with children is essential, video exposure provides a valuable means of extending students' experience and supplementing more formal skill acquisition. Observation of real children provides a unique opportunity to observe and discuss the varied reactions of children to testing contexts, and to generate solutions to the challenges that emerge.

From a theoretical standpoint, it is clear that passive viewing of video material is unlikely to be as effective as a teaching tool unless students can exchange ideas and actively comment on the material. Traditionally this has been accomplished in a classroom setting, but there is increasing evidence that online delivery can be effective. The challenge however, is to provide opportunities for interactive engagement as students watch the video. This paper reports on the use of a web based Educational Video with collaborative Annotation (EVA) framework (Wong & Reimann, 2009) to provide the interactive online video based learning experience. EVA is a web based interactive video-based educational platform with integrated video streaming, capacity for real-time collaborative temporal

annotations, synchronized video and annotation delivery, auto-indexation of the video bookmarks and associated lists of annotations for easy searching and navigation. The EVA pedagogical model represents a synthesis of established pedagogical theories and methodologies in social constructivism, activity theory, scaffolding, situated learning, and SER (Seeding, Evolutionary growth, and Re-seeding) model of collaborative life long learning (Fischer & Ostwald, 2002). A further advantage of the online medium is that it can allow for different learning styles, providing an alternative forum for expressing and exchanging ideas for students whose communication or learning style might not fit the pace and the very public nature of tutorial discussions. Our aim in this exploratory study was to evaluate the efficacy of video material in the two delivery modes, and in particular to determine whether providing online video material as a supplement to conventional classroom material would open productive learning opportunities for the students.

Online video based teaching and learning framework

Figure 1 shows an example of EVA's main interface. Users can bookmark a series of time-points (cue-points) or time-segments (cue-segments) of a video to stimulate and share discussions via real-time collaborative temporal annotations using a web HTML editor. Learners can search information from the content of cue-points and annotations against the time-point. The EVA framework is unique in that that it not only allows learners to view online video material as many times as, and wherever they wish, but also to collaborate, comment and discuss each segment of the video, with annotations and comments that are context-sensitive and context-rich, providing opportunities for collaborative peer-supported learning and collaborative problem solving. The aim is to foster social commitments among learners, enabling them to engage in peer learning and to gain new knowledge and understanding via interactions and negotiations (Topping et al., 1998). Hu et al. (2010) argue that, in a range of educational settings, such a framework can foster effective collaborative learning, reflection and social enquiry.

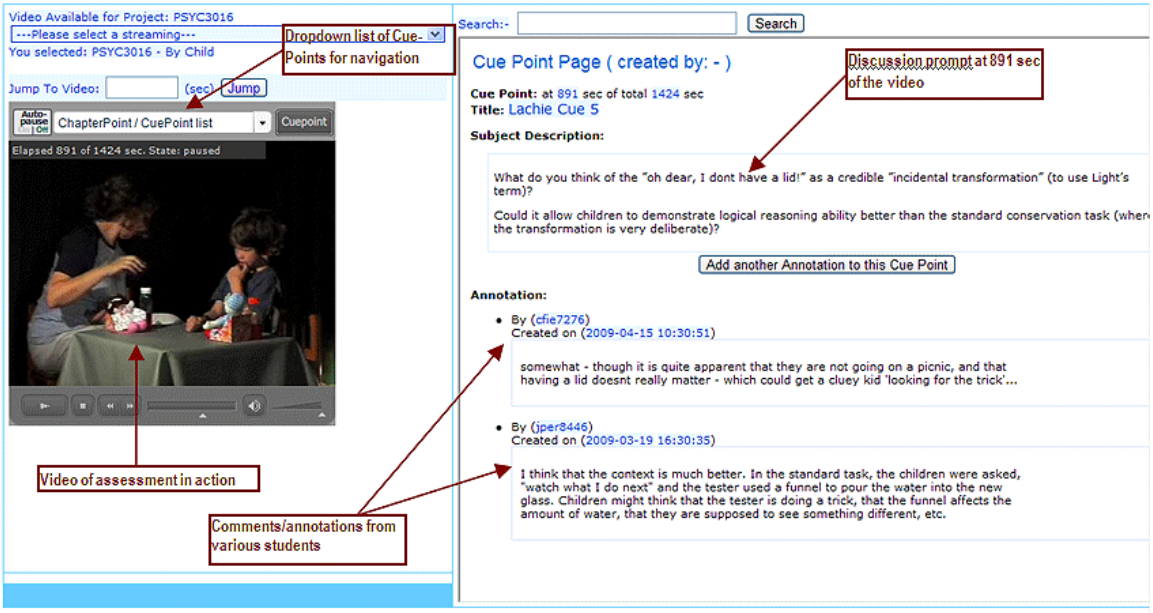

Figure 1: Main interface of the interactive EVA online video teaching and learning platform

Setting: Participants, material, procedure, and evaluation

Participants were 113 of 180 students enrolled in a senior unit of study in developmental psychology. The material used extensive video footage showing cognitive assessment of children based on Piaget's theory of cognitive development. The videos were originally developed for conventional classroom tutorial teaching, with tutors stimulating discussion. Two videos were developed, each showing administration of the same tests to a different group of children. The material was directly relevant to the Child Study Report which was the major assessment for the unit of study, and which required students to use the demonstrated tests to evaluate a child individually. One video was shown during a regular weekly tutorial while the other was offered via EVA as a voluntary and not compulsory

supplement to the classroom material, with the aim of extending the students' experience and prompting them to exchange ideas. In the standard tutorial setting, the tutor paused the video when it was felt appropriate and guided discussion, inviting students to comment on the testing procedure, factors affecting the child's responses, and theoretical interpretations. In contrast, the online video included pre-set prompts and scaffolding inserted by a tutor at key points, which raised similar issues to those raised by the tutors.

Because the focus of the online learning was on collaborative peer learning and the purpose was to supplement the classroom tutorials, tutors did not provide feedback in the online video learning platform. Online participation did not contribute to the grade for the unit of study. Students were encouraged to participate, initially by emphasizing the value to their report, but latterly by incentive prizes. A paper and pencil evaluation of the two experiences was conducted in a tutorial at the end of the semester. The survey sought students' opinion anonymously regarding whether each learning experience achieved a range of goals. Students rated agreement with 10 pairs of parallel survey statements, one of each pair describing the classroom experience and the other the online experience, on a 5 point scale ranging from 1 (strongly disagree) to 5 (strongly agree). They were also asked open ended questions about the best and worst aspects of the two experiences.

Results

Data was misplaced for 10 students, so the final sample consisted of 103 students. Of these, 18 (17.5%) did not access the online material at all, 10 citing technical difficulties (due to low quality home broadband network bandwidth and some initial software problems), 19 (18.4%) accessed it once, with 4 reporting technical difficulties, and 61 (59.2%) accessed the online material on multiple occasions, with a range of 2 – 8. Only 20 students (19.4%) contributed comments, most once or twice, with a small number contributing multiple comments. Students were classified as non-users (N=22) if they did not access the online material, or accessed it once and reported technical difficulties, as it was considered that these students had not had genuine access. Students who accessed the material at least once, without encountering technical difficulties, but without making any online contributions, were classified as low active users (N=61), and students who made at least one contribution were classed as active users (N=20). Table 1 shows the means and standard deviations of ratings for key evaluation statements, for the relevant user categories. For each of the 8 statements for which ratings of both tutorial and online activities were sought, a 2 (level of online use: low versus active) x 2 (delivery mode: tutorial versus online) ANOVA was conducted to determine whether the high and low online users differed in their preferred mode of delivery.

Table 1: Means and standard deviations (in parentheses) of ratings for tutorial and online experience

Categories of users / Selected Survey statements	Low active online users (N=61)		Active online users (N=20)	
	Tutorial	Online	Tutorial	Online
Helped me to understand the kinds of tasks to be used for the report	4.34 (.69)	3.81 (.84)	4.17 (.86)	3.85 (1.09)
Gave me a good feel for how real children would perform on and respond to the tasks	4.12 (.72)	3.71 (.89)	3.95 (.97)	4.00 (.92)
Helped to clarify issues relevant to the report	4.02 (.78)	3.34 (.98)	4.16 (.90)	3.15 (.88)
Informative	4.27 (.63)	3.60 (1.08)	4.21 (.71)	3.50 (1.15)
It is useful to hear other students' point of view	3.49 (1.24)		4.12 (.86)	

For 7 of the 8 comparison survey statements, the tutorials were rated more highly than the online materials. There was one interesting exception to this pattern. For the item "Gave me a good feel for how real children would perform on and react to Piaget's tasks", there were no main effects of delivery mode or level of use, but there was a borderline significant interaction, $F(1,74)=3.36$, $p=.071$. That is, the low users tended to rate the tutorial more highly (Mean=4.12, SD=.72), than the online experience (Man=3.71, SD=.89), but the high users gave equally high ratings to the online (Mean=4.00, SD= 92) and tutorial experiences (Mean=3.95, SD=.97). There were other interesting trends that did not reach significance but which suggest potential differences between the two groups of users. For the statement

"Helped me to understand the kinds of tasks to be used for the report", both low and active users showed substantial agreement in relation to the online activity (Means 3.85.and 3.81 for low and active users respectively), but the low users tended to favour the tutorial more strongly than the active online users (Means 4.34 and 4.17 respectively), $F(1,73)= 1.16$, $p > .05$. There was also a borderline significant difference between the two user groups on the statement: "It is useful to hear other students' point of view". The active users agreed with this statement more strongly (Mean 4.12, SD .86) than the low users (Mean=3.49, SD=1.27), $t (72) = -1.94$, $p=.056$. Examples of comments made in response to the open ended questions about best and worst things about the online exercise were:

> Now that the system is working… it looks good, it gives me a good idea of the different things that can happen in an exercise like this, and what to be careful of in terms of how I word things. The comments from others were helpful, where they confirmed my thinking they helped me feel more confident, where they differed they got me thinking about other possibilities.
>
> It would be good to know that a lecturer or seasoned tutor was watching the responses, so if anyone says anything outlandish that it gets picked up and corrected - otherwise we could all just confirm each others errors ...eeek! lol
>
> I did not know if the [online] comments made by other were correct or not which led me to either discount or ignore their [online] comments – if the professor would quality check the comments, it would help a lot
>
> Best things: it made me think about issues I hadn't considered - it showed us how to set up & conduct the tasks. Worst thing: I don't want to give my good ideas away – its intellectual property

Discussion

The aim of this project was to pilot a peer-supported interactive online video based learning in an undergraduate teaching context, and to compare it with conventional tutorial delivery. The ratings of both tutorials and online materials were generally positive. Although overall students rated the classroom experience more positively, largely due to the availability of active feedback, facilitation, and guidance in the classroom from a tutor, the ratings for the online experience were encouraging, particularly given the initial technical difficulties, the voluntary nature of the activity, and the fact that the online experience provided only peer feedback but no tutor feedback other than the provision of basic discussion prompts.

Several factors may have contributed to students' general preference for the tutorial experiences. Firstly, some advantages of the online experience may have been reduced because of limited home access to good quality broadband for some students and initial software problems. Secondly, the online materials were pitted against a traditionally effective component of the unit of study, as indicated by the high ratings of the tutorials. The tutorial provided a good deal of formal information about general content and report requirements, as well teacher feedback facilitation and guidance regarding the video content. Importantly also, teacher feedback was absent in the online experience in this exploratory study. The lack of authoritative validation of the online peer comments may have been particularly important given the close relevance of the video material to a major assessable report. The fact that, compared with the online activity, the tutorials were rated as more informative and more helpful in clarifying report issues, is consistent with this conclusion, as were several spontaneous comments offered by students in the open-ended section of the survey. Perhaps this reflects a predictable but concerning tendency for students to seek the "correct" answer from "authorities" rather than thinking through problems or constructing knowledge themselves. However, it also suggests that, in developing online delivery of this sort, efforts should be made to combine active teacher feedback and guidance with strong encouragement of peer-to-peer and self-evaluation.

The open ended comments about intellectual property suggest that direct relevance to a major assessment is not ideal content for an online experience of this sort. Tutorials clearly provided the desirable social experience of a face-to-face group setting. It may be that the students who contributed online were particularly self-motivated. The fact that the active users agreed particularly strongly with the statement that "it is useful to hear other students' point of view" suggests that their decision to

contribute might reflect an attitude or learning style that favours peer exchange. Those online comments that students did make were of very high quality, but as noted, the number of active contributors was not large, in spite of encouragement from tutors. A surprising number of students reported reluctance to give away ideas that they could use in their report. The competitive nature of university study appeared to have undermined the benefits of collaborative learning unless the effort from collaborative peer feedback is recognized and rewarded via some form of assessment criteria. We did offer a prize incentive when we noted the low participation, but this appeared at a late stage and did not noticeably increase student online contribution.

Conclusion

Our result, especially from the active users, suggests that interactive online video learning resources have the potential to enhance student learning in undergraduate teaching settings. This is in line with extensive documentation in the literature of the advantages of asynchronous interactive online learning in relaxing time/space restrictions, competition, or interruptions (Harasim, 1990; Althaus, 1997). EVA platform has since been enhanced in order to refine usability and to ensure robustness and quality user experience. However, our findings also support arguments from Kreijns et al. (2003) and Kirschner et al. (2007) that minimally guided, minimally facilitated, and minimally rewarded online collaborating peer supported learning environment will not produce the optimum learning outcomes. Future implementation of the peer supported online experience will enlist teachers to provide quality control, monitoring, and validation of the dynamics and content of the students' online contributions while at the same time encouraging, facilitating and stimulating autonomous peer contributions and collaboration. Reward structure will be implemented for peer contributions and collaboration. For example, students will be rewarded with bonus grade points for online contributions based on positive feedback criteria (Gielen et al., 2010; Topping, 2008). Modification of the pedagogy may be considered to produce a more effective blended strategy.

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