

Learners as producers: Using project based learning to enhance meaningful learning through digital video production

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This paper discusses an initiative that utilised a combination of “Project based Learning” and a “Learning with Technology” approach. Project based learning emphasises group work and knowledge construction whereas learning with technology emphasises using technology as a tool to promote thinking. A Digital Video (DV) Camp project was organised at the Hong Kong Institute of Education with twenty teacher education students to explore how technology could enhance meaningful learning in a project based learning environment. The objective of the project was to investigate how students could learn with Digital Video technology through collaborative project based learning activities. The paper discusses how students utilised DV technology in small groups to produce two DV outputs – a one minute introduction of their group members and a three minute DV on a specific topic. Student feedback and evaluation was positive in relation to the approach and feedback was used to reorganise another DV camp in the subsequent year. Implications for the approach are discussed.

Keywords: learners as producers, project based learning, digital video production, meaningful learning

Introduction

It has always been a goal of teacher educators to assist pre-service teachers and in-service teachers to teach more effectively and obtain feedback on their own teaching performance (Sherin, 2004). Sherin (2004) outlines how video has played a part in this process by providing a technology for assisting teacher educators and teacher education students to obtain feedback on their practice teaching, view classroom interactions, model expert teachers, examine the implications of cases and control the viewing of video in hypermedia and multimedia environments. “Watching oneself and other teachers on videotape became a common practice in teacher education and remains so at many institutions today” (Sherin, 2004, p. 2).

An early use of video in teacher education included micro-teaching which involved the teaching of a short lesson of 5-10 minutes on a specific teaching strategy to a small group of peers. Video feedback was immediate and the pre-service teacher also obtained feedback from other peers and the supervisor. The student would reteach the lesson until they had mastered the teaching strategy. Micro-teaching originated in the 1960s as portable video equipment became available and was popular for over two decades. In the 1970s interaction analysis or lesson analysis was introduced which involved using an observation instrument something like a checklist to analyse actual student and teacher interactions observed on recorded video. When a particular teaching behaviour was observed it was recorded on the checklist. Both micro-teaching and interaction analysis approaches were behaviourist in their orientation. As theoretical perspectives about teaching and learning changed to account for the internal processing of the teacher, cognitive approaches became more accepted. The interest moved from behaviour to teacher thinking. Cognitive approaches suggested that due to the complexity of teaching, expert teachers could assist by modelling good teaching which novice teachers observed. Novice teachers teaching the same lesson as an expert could then compare their performance. In the late 1980s case based pedagogy became popular and in the 1990s video cases provided issues which could be discussed by students and their supervisors. It was expected that these cases would foster reflection and problem solving skills. Improvements in technology also influenced the development of how video was used in teacher education. The development of hypermedia in the early 1990s meant that video could be integrated into laserdiscs and multimedia which allowed the user to journey to a specific point in the video as opposed to watching a purely linear recording. Digital video also allowed faster access to specific points in the video. Video recorded field observations of pre-service and in-service teachers have also been used by

supervisors to explain teaching points. In addition students have also produced videos as a portfolio of their teaching performance while on practicum (Sherin, 2004).

The use of video in teacher education has changed to reflect the dominant pedagogy or theoretical framework at the time and will continue to change as different pedagogical perspectives are adopted. Sherin (2004) suggested that the major factor affecting video usage has been the change in theoretical frameworks to explain teaching and learning. What has changed its usage in education and in particular teacher education have been the different theoretical frameworks of behaviourism, cognitivism, constructivism and social constructivism. In addition the roles of participants have changed from passive viewers of the video medium to active involvement by the users in the creation of their own video (Sherin, 2004). Improved technologies have also resulted in a shift from tape to digital formats and the availability of low cost digital video cameras is now ubiquitous. The digital age has extended the use of video into the production of VCD, CD ROM, DVD and streaming video on websites.

However the focus of this paper is not to provide a history of video as its usage mirrors the educational framework dominant at the time. Allowing users to create their own digital video projects is only possible due to inexpensive technology. Our focus in this paper is on project based learning, learning with technology and reflects a social constructivist approach where learners' produced video projects in a collaborative learning setting.

Project based learning

Project-based learning is defined as "an instructional technique in which meaningful tasks, often in the form of problems, serve as the context and stimulus for knowledge building and critical thinking" (Howard, 2002, p. 348). Project based learning focuses on meaningful activity in which realistic, intriguing, relevant learning occurs through participation in a challenging and motivating project. It also emphasises situated learning and apprenticeship learning which deals with real world issues. Open ended generative tasks are advocated in which there is not a prescribed approach or solution and that the learners generate their own questions, plans and goals. Collaborative decision making and problem solving is necessary as teams work on projects in which they discuss, consult, collaborate and problem solve to create a product. Project based learning also changes the role of the teacher to a cognitive coach who models, coaches, guides and encourages independence in goal setting and decision making and promotes reflection (Howard, 2002).

Of particular relevance to the digital video camp are the concepts of meaningful activity, situated learning, open ended generative tasks, collaborative decision making and/or problem solving and the changed role of the teacher (Howard, 2002). Engaging students in meaningful activity should encourage students to be more motivated and engaged in an activity that is meaningful and relevant to them. If an activity is more relevant to students' lives, they will devote more time and effort into the activity which may lead the student to a deeper understanding of the learning task. In addition students learn knowledge and skills which are contextualised in the learning task as opposed to learning knowledge as a foundation for application at a later stage. Situated learning focuses on tasks that professionals in the real world would encounter. For instance video producers need to work with clients who are unaware of the need to write a script for their video production. Students engaged in the production of a video soon learn the necessity of scripts for assisting video production and assuring a quality production. Unless students experience this first hand they often question the necessity of using scripts. The digital video camp emphasised the stages of video production but placed it into a real context where the student was the producer. Open ended generative tasks focus on determining a suitable approach to a project among many options rather than providing one solution. Students in small teams need to negotiate with each other and determine an approach that is based on their own plan, questions and goals that they set. The digital video camp asked students to develop a one minute video to introduce their group which provided students with the opportunity to construct knowledge using a generative process.

Small group activities were also used to focus the student team on collaborative decision making and problem solving. Sometimes it is very easy to develop an individual plan for a project. However within a team the group need to agree on the plan and negotiation and decision making needs to occur to determine the best solution for the project. This is sometimes difficult to put into practice. However the learning of collaboration is a real world skill that is highly prized in professional settings. In project based

learning the teacher acts as coach/mentor/guide throughout the process. Within the digital video camp several expert videographers coached and guided students and encouraged the students to ask questions. In this setting the “teacher must provide an environment within which students can act on, generate and receive feedback on descriptions appropriate to the topic goal” (Laurillard, 1993, p. 94). In other words the dialogue and the conversations throughout the process will largely determine the quality of the project. The students also develop the ability to plan, to monitor their own thinking, to evaluate progress and to adjust learning accordingly. It may then be possible to apply these skills to other situations (Howard, 2002). Deep understanding may provide an environment conducive to transfer to other real world situations. With this activity, the participants may gain deep learning and be able to transfer these generic skills to other settings (Howard, 2002). It is suggested that knowledge gained in school should be able to be applied to new problems in school and in real life situations (Howard, 2002). If the students have difficulty transferring knowledge to real life situations in society we may need to rethink about whether we are teaching students to master classroom work or we are teaching them to be able to deal with real world situations and problems. Meaningful collaborative learning among students through the combination of “learning with technology” and “project based learning” (PBL) offers some promise in developing learners as producers of knowledge as opposed to passive learners. In this application of project based learning “learning with technology” a concept coined by Jonassen, Howland, Moore & Marra, 2003 also needs to be considered.

Learning with technology

It probably comes as no surprise that technology within educational settings is often utilised in a way that learners are expected to learn *from* technology as if it were a teacher that has some inherent ability to convey meaning. Video in this sense is used by teachers as a media to support teaching. However technology should be a *partner* in the teaching and learning process and engage and support thinking (Jonassen, Howland, Moore & Marra, 2003). Five important characteristics are highlighted by Jonassen, Howland, Moore & Marra (2003) as important meaningful learning principles which we have considered in learning *with* technology. Meaningful learning is *active*. In other words when learners are engaged in real world tasks they manipulate, change, experiment and then observe the results of these manipulations. The students in the DV camp actively changed parameters and observed the results in the digital video production. Meaningful learning is *constructive*. By articulating and reflecting on new experiences and relating these insights to prior knowledge, learners begin to create their own simple mental models to explain the world. Within the context of the DV camp students have preconceptions about digital video production and will change these conceptions through the process of learning. As their views become more sophisticated their mental models change to accommodate this new learning. Meaningful learning is *intentional*. When learners have clear goals to achieve they are acting in a goal directed manner. Learners who are able to set their own goals and reflect on their progress are usually able to understand their learning and may be better able to apply this learning to new situations in the future. Meaningful learning is *authentic*. Ill-structured and complex problems do not simplify real world issues. In terms of the DV camp the task involved placing the learner in the role of a producer. In their groups they needed to make decisions and wrestle with the real issues of video production on a real project. Meaningful learning is *cooperative*. Within the context of the DV camp the learners worked in groups to socially negotiate a group project. This is no small task as each member of the group needs to come to a common understanding of the task and agree on the stages and the methods they will use to achieve the goal of the project (Jonassen, Howland, Moore & Marra, 2003).

Digital video camp

The above principles of the shifting role of video in education, project based learning, learning with technology and meaningful learning were integrated into the planning and conceptualisation of the digital video (DV) camp. In addition, with reference to the Schools Council Project on Communication and Social Skills (Moss, 1984) four unique characteristics of video projects for learning were framed:

1. Collaborative nature - the video production process implies social roles and relationships that may not emerge in a conventional classroom.
2. Comprehensiveness approach – video production integrates illustrations, diagrams, dramatic reconstructions, scenes recorded on site, sounds, music and even writing.

3. Public artefact – a video outcome will become a relatively public statement on completion and possibly be exposed to large groups of students or teachers.
4. Social relevance nature - video is a social relevance media to children (Moss, 1984).

The main focus of the DV Camp was to engage students in a meaningful authentic project within a supportive environment where they could actively and collaboratively construct DV production knowledge and represent the learned knowledge with technology. The students were requested to produce video collaboratively, to show a comprehensiveness approach which integrated graphics, sound, drama and reconstruction. The project based learning outcome of the video production was treated as a public artefact, which will be presented to the others and will be uploaded to websites for sharing. Two DV Camps have been organised in the summer of 2003 and 2004 and the remaining part of the paper will discuss the design of the projects in the DV Camp, the outcome of the project and the students' feedback on meaningful learning.

Learner as producer

Is there a way to harness the passions of youth so that they can engage in projects that have clear educational benefits and that are also engaging to them? (Baecker and Posner, 1999)

The design of the DV Camp at the Hong Kong Institute of Education (HKIEd) was inspired by the summer camp project developed by Baecker and Posner (1999). Baecker and Posner organised a one week summer camp in which children learned about computers and filmmaking through digital video production. Adopting many features from this approach, the DV Camp project utilised a two day camp to encourage HKIEd students to learn the knowledge of digital video production for teaching and learning activities. According to Jonassen, Howland, Moore & Marra (2003), when students become producers of video, they are learning with DV technology and naturally assume more active, constructive, intentional, authentic and cooperative roles. In particular video production is an example of a design problem solving activity. deSouza, Fardon & Phillips (2002) conducted a similar project based learning approach for students producing their own interactive multimedia materials and the objective was to offer language students an alternative way to learn language skills. The project also used a combination of project based learning and learning with technology. In this case the production of the multimedia materials was the focus as opposed to digital video production. The design of the DV camp focussed on exploring the concept of students as producers by combining the principles of project based learning, learning with technology and meaningful learning.

In 2003, a teaching development grant project titled "Constructing knowledge of DV production through a networked learning environment" was organised and involved twenty students from HKIEd in DV production knowledge through a two day Camp. The project consisted of two main activities. Firstly, a two day DV Camp was organised while a project based approach was used by students to complete three DV production tasks. Secondly after the camp, students joined an online discussion forum to share their problems encountered during the DV production, and posted feedback to each other in order to build up a learning community for DV production and its application in a teaching and learning context.

Design of DV Camp

Learning environment

The Campsite of the DV Camp was selected in Cheung Chau, a small island 60 minutes by ferry from Hong Kong Island, the main island most people associate with Hong Kong. Cheung Chau is famous as an old traditional market with beautiful beaches. Li Lai-shan beach is famous in Cheung Chau as the beach where Hong Kong's first Olympic gold medallist, learned to windsurf. It is an ideal setting for allowing groups of creative producers to be inspired by the surroundings. The campsite was located at the top of a small hill within 15 minutes walking distance from the market and beaches. Task briefings and discussion were undertaken in the campsite in the early part of the day. A production house type approach was utilised in order to replicate real world approaches to the video production activities. The tasks were constructed as in a production house where teams would submit a production proposal for approval before undertaking the video production in the latter part of the day. Under this authentic environment, students were actively engaged in discussion and collaboration with an intention to complete the meaningful tasks relevant to their interests and learning objective (Lebow & Wager, 1994).

Participants

The Hong Kong Institute of Education (HKIED) is a dedicated teacher education university in Hong Kong. It has approximately 8000 students, 325 academics and 700 non-academic staff. Although the DV camp is not a core module or required module the DV camp was an initiative of the media production team of the Centre for Integrating Technology in Education. The purpose of the initiative was to promote constructivist and social constructivist approaches in using video. The DV camp provides a powerful exemplar that can be used by the team to illustrate to both staff and students of the Institute how video can be used for teaching and learning. Students voluntarily enrolled for the DV Camp project in 2003 and needed to complete an application form with a 100 word description expressing his/her opinion on the relationships between digital video and teaching and learning activities. Twenty full time students were selected which included thirteen Bachelor of Education year one students, two Bachelor of Education year two students and two Bachelor of Education year three students. The remaining students were from Certificate courses. The students major subjects were diverse and included General Studies, Chinese, Art, Music, Mathematics and Home Economics.

Meaningful activities utilised in the DV camp

Twenty full time students (Table I) volunteered to participate in a DV Camp in the summer of 2003. Within the camp setting they were divided into four groups with five students in each group. The students were asked to complete three tasks over the length of the camp. The details of the tasks and relevant learning objectives are outlined in Table 1.

Table 1: Tasks undertaken within DV Camp and their corresponding learning objective

Tasks	Learning objective
Task 1: Each group had to produce a one minute video. Within one minute they needed to introduce the name of their group, the members of the group and they also needed to create a slogan for their group. The challenge for the group was that the one minute video had to be filmed in 'one take' without video editing. The one minute video was presented and the most innovative video was selected as the winner.	This was a warm up activity for the Camp. The objective was to let the participants familiarise themselves with the operational procedure of the camcorder; present themselves in front of the camcorder, and coordinate the different roles and responsibilities of the group which included: producer, presenters and cameraperson.
Task 2: A list of topics was developed before the Camp and groups selected one of the topics to produce a 3 minute video including the following stages and outcomes: <ul style="list-style-type: none"> objective (started the discussion while taking the ferry to Cheung Chau) story outline simple storyboard shooting, with OK takes marked with the marked OK takes, our technical staff would capture the OK takes into the computer and completed the simple video editing Final outcome was presented to all participants and the most meaningful story was selected. 	Learning Objective of the task: <ul style="list-style-type: none"> learn how to conceptualise an objective for video production learn how to draft a story outline based on the objective learn how to draw simple storyboard learn how to shoot according to the story board learn to mark down the OK takes while shooting learn how to produce a paper edit based on the marked OK takes, and instruct our technical staff to edit a rough cut according to the paper edit
Five recommended topics <ul style="list-style-type: none"> Delicious food in Cheung Chau How can we spend the hot summer time? Why is the DV Camp so interesting? What should the coolest people bring? Latest Hi-Tech products, such as Mobile phone, Digital Cam Others topics: approved with discussion 	

<p>Task 2: Evaluation Journalistic approach in TV magazine programme was presented after viewing the outcome of task two.</p>	<p>In general, the participants did not have adequate knowledge in video presentation and programme structure. Their common errors were putting too much information in the video and not developing an angle of focus. A Journalistic approach would help them to understand basic TV programme structure.</p>
<p>Task 3: Groups were allowed to re-do task 2 in Journalistic approach. Shooting was not necessary, but a one minute script was the outcome.</p>	<ul style="list-style-type: none"> • learn how to find out the angle of focus from their task 2 outcome • learn how to present information based on information collected and rewrite the materials in news structure

In the first part of the paper the major characteristics of project based learning as well as the major characteristics of meaningful learning were outlined. This section examines how these principles were integrated into the design of the DV camp.

Outcomes of the DV Camp

After the DV Camp, a website was produced to organise all the materials produced in the DV Camp. The materials include all the written materials and videos produced during the digital video camp. The written materials included the students' project proposals, story outline and storyboard. Examples of these artefacts can be viewed at the website of DV Camp (2003). (An English version of all aspects of the DV Camp is currently being developed).

In addition a number of video interviews were conducted with some of the students about their experiences during the camp. The coordinator of the DV camp was particularly interested in what they had learned during the process of developing the projects. These videos have also been uploaded to the website. Examples of these artefacts can be viewed at the website DV Camp (2003).

At the same time, a resource bank for video production and an on-line discussion forum were developed with the intent of providing additional resources for the students and for encouraging the students to dialogue about questions and issues related to digital video production. This online discussion forum can be viewed at the website of DV Camp (2003).

Evaluation

Throughout the Camp, a DV camcorder was used by the staff to capture important processes throughout the camp in order to document the DV Camp. Students were creative in developing a video outcome that embodied a number of the key principles outlined above. The video interviews with a number of the students demonstrated their capacity to reflect on their experiences during the digital video camp. Students were also interviewed during the project based learning activities. The students' interview video clips can be viewed at the website of DV Camp (2003). In translating and reviewing students' feedback, it was found that the students valued their learning experience and were highly positive of the DV technology and project based activities. They achieved their own personal learning goals, actively engaged in the collaborative learning activities and produced a number of excellent projects. In reflecting on their experience one student (Producer A) suggested:

I had produced a short DV assignment before and I found a lot of difficulties during production. I really want to learn the skill and technique from the DV Camp. This time I improve a lot because from the last production assignment, everything was so loosely organised. For example, I had no knowledge in production skills, procedure and shots marking. Last time just after the shooting, I had captured all the segments into the computer and spent the whole week for editing but some how, the editing still could not be completed. However, this time we have learned how to mark down OK takes during shooting. After coming back to the Campsite, we can quickly finish the editing according to the marked OK takes (Producer A, DV Camp, 2003).

Table 2: Characteristics of project based learning and meaningful learning integrated into the design of the DV Camp

Project based learning characteristics	Integration of design principle
Meaningful activity	Students examined a number of relevant topics for their three minute video. These included: <ul style="list-style-type: none"> • Delicious food in Cheung Chau • How can we spend the hot summer time? • Why is the DV Camp so interesting? • What should the coolest people bring? • Latest Hi-Tech products, such as Mobile phone, Digital Cam • Others topics: approved with discussion
Situated learning	Students needed to produce a short video in 'one take' (without video editing) which challenged their skills and ability to perform the short segment correctly for the one minute. <ul style="list-style-type: none"> • Within one minute they needed to introduce the name of their group, the members of the group and they also needed to create a slogan for their group. The challenge for the group was that the one minute video had to be filmed in 'one take' without video editing.
Open ended generative tasks	<ul style="list-style-type: none"> • The one minute introductory video had broad goals. How the students developed the concept and completed the video production needed to be decided by the team. • The three minute video involved the selection of a broad topic. How the team completed the project was decided within the collaborative group setting.
Collaborative decision making and problem solving	<ul style="list-style-type: none"> • Groups of five students worked in teams on the two tasks. During this time they negotiated and collaborated with each other to determine the best solution for the tasks.
Changed role of teacher	<ul style="list-style-type: none"> • During the camp the role of the teacher/tutor changed to a role in which they coached or mentored the students to complete the digital video tasks. • The technical staff provided expert guidance to students during briefing, production, presentation and evaluation.
Meaningful learning characteristics	
Active	<ul style="list-style-type: none"> • Students became the producers, cameraperson, presenters, and photographers for the tasks. To learn DV production the students needed to be actively engaged in the tasks.
Intentional learners	<ul style="list-style-type: none"> • The DV Camp was a voluntary non-credit bearing activity. Students applied to join the DV Camp as part of their professional development. They were highly motivated learners who demonstrated a great deal of enthusiasm for the tasks.
Constructive	<ul style="list-style-type: none"> • Students manipulated and changed parameters, reflected on these changes and began relating new knowledge to prior knowledge about digital video production.
Authentic	<ul style="list-style-type: none"> • The authentic digital video production tasks allowed the students to grapple with real world issues in the development and production of the digital video. A production house treatment was utilised throughout the DV Camp.
Cooperative	<ul style="list-style-type: none"> • Students had to socially negotiate the group project.

Producer A always wanted to be a video producer. She was actively engaged in the project and had high expectations of herself and an incentive to learn how to be a DV producer. In particular she learned about the strategies for video editing. The meaningful project and expert guidance facilitated her learning in this area.

Another student (Producer B) also had some background experience in DV production. He was creative in both scriptwriting and acting. He actively drafted the script and presented the story in front of the camcorder.

I have learned basic operation of the DV camcorder and the shot composition etc. I think the DV Camp is better than any other DV production camp, workshops or courses that I had enrolled before. Just as other participants mentioned, we have our choice to choose the topic, an authentic environment for shooting and implementation of our video proposal ... and the most important is the implementation process. It is better than attending a workshop, or reading a textbook. (Producer B, DV Camp, 2003)

Producer B has articulated the main objective for the DV Camp which is pleasing to the facilitator of the DV Camp. It appears that he enjoyed the project based learning activities and the learning with technology approach of the DV Camp. The camp was not considered to be theoretical and although lectures, workshops and textbooks are necessary to supplement the objectives of the camp the active engagement and authentic tasks were motivating for the students.

Education is an art, DV production is also one of the art media. In the DV Camp, I can implement my learned skill and story telling methods. For example, the theme of the story should be defined clearly first, and with story board, division of labour and collaboration, we could then construct a story in video.... I do not know how to act in front of the video. I choose to be a director and so I can test my decision making ability and learn how to communicate with others members. I really show improvement in these aspects (Producer C, DV Camp, 2003).

During the digital video camp Producer C preferred to take on the role of producer or cameraperson as she was not as comfortable with being a presenter. With her active involvement, she learned division of labour for a video production task and how different skills, abilities and personal characteristics need to be blended via collaboration throughout the project. As mentioned by this student, decision making and communication are important competencies learned in this authentic project. It also appears that she should be able to transfer these newly acquired skills to other projects in the future.

Maybe I like to interview people... I learn from the process of production that a lot of debate would arise, such as the selection of topics, the shooting sequence etc. I learn to compromise with others, and how to make up decision from different viewpoints. Our group members are new to each other so it is quite difficult for us to have compromised (Producer D, DV Camp 2003).

Producer D was a people person who enjoyed being in front of the camera interviewing and speaking to people. She was interested in completing a topic which emphasised her skills in interviewing. She had completed research and found that a Japanese professor lived in Cheung Chau, owned a coffee shop and was selling a famous food in Cheung Chau - the Red Bean Cake. This student had talents in the area of interviewing and had aspirations of being a Journalist some day. Although she was creative in developing a feature story she had difficulty in convincing the other members of her group that they should complete their group project on the area. She also was good at brainstorming possibilities for the story but had difficulty in focussing on one specific angle to develop the story about the Professor. As imagined this student learned a great deal about herself from the project based learning approach. She learned to compromise and cooperate with members to produce the final outcome.

Conclusion

Overall the students were positive about the DV Camp experience which is reflected in their creative projects and enthusiasm for the meaningful activities. The coordinator of the DV Camp also felt that the combination of project based learning principles, meaningful learning and learning with technology influenced the success of the DV Camp. Although students sometimes felt uncomfortable with being active as opposed to listening about an area, the DV camp has demonstrated that given the right learning environment, approach and emphasising knowledge construction and creativity students become motivated learners. In addition it was very pleasing to take on the role of mentor as opposed to teaching with a transmission model. Mentoring and coaching students is highly effective in developing the skills and talents of students in the project based learning environment. Having conversations with student's means that the teacher can also continue to obtain feedback about their own teaching and learning. The

student project is not a final point in the process as subsequent conversations will enhance and develop learners as producers.

Acknowledgements

Hong Kong Institute of Education: Teaching Development Grant (2002-03). Vincent HK Hung
Constructing knowledge of DV production through a networked learning environment.

The authors also wish to acknowledge the generous support of the students involved in the DV Camps and the media production team.

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Please cite as: Hung, V.H.K., Keppell, M. & Jong, M.S.Y. (2004). Learners as producers: Using project based learning to enhance meaningful learning through digital video production. In R. Atkinson, C. McBeath, D. Jonas-Dwyer & R. Phillips (Eds), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 428-436). Perth, 5-8 December. <http://www.ascilite.org.au/conferences/perth04/procs/hung.html>

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