

PocketSnips: Health Education, Technology, and Teamwork

*The PocketSnips Team**

Abstract

BACKGROUND: Short video clips are useful for learning clinical procedures, especially at the point of care and in distributed education. What key features should be included and how these are created has not been previously documented. A literature review confirmed key points relating to material brevity, adjunct materials, and some evidence of their impact on learning. **APPROACH:** Efficient and cost effective video production was highly reliant on effective team work. Collaborative participation by many groups and organizations has resulted in a highly functional and productive team. Key activities and personal contributions were enhanced by web-based collaborative software that maximizes team effectiveness. **FUTURE STEPS:** Further external collaboration with future partners around the world will be easier with new licensing and collaborative networking approaches.

Résumé

CONTEXTE: De courts vidéoclips sont utiles à l'apprentissage d'interventions cliniques, particulièrement au lieu de dispensation des soins et dans l'éducation répartie. Quelles caractéristiques clé doivent y être incluses et comment créer celles-ci n'a pas été documenté auparavant. Une revue de la littérature a confirmé des questions clé en rapport avec la brièveté du matériel, le matériel complémentaire et une certaine démonstration de leur impact sur l'apprentissage. **APPROCHE :** La production vidéo efficace et efficiente au niveau des coûts dépendait largement d'un travail d'équipe efficace. La participation collaborative de plusieurs groupes et organismes a eu pour résultat une équipe hautement fonctionnelle et productive. Les activités et contribution personnelles clé ont été rehaussées par des logiciels collaboratifs Web qui maximisent l'efficacité d'équipe. **ÉTAPES FUTURES :** Une collaboration étendue avec de futurs partenaires autour du globe sera facilitée avec des nouvelles approches d'octroi de licences et de mise en réseau collaborative.

Introduction

The PocketSnips project is an educational project that addresses the need for busy health professionals to have on-demand access to high-quality

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visual, audio, and print-based resources to refresh their understanding of procedures. The videos, complemented by print materials, can be viewed online (<http://www.pocketsnips.org>) or downloaded to a handheld device at the point of care. At the time of publication, the PocketSnips team has produced fifteen short videos and corresponding support materials. This article summarizes some of the lessons learned and techniques used in the creation of our library of videos.

Video-based applications are growing in popularity as a valuable resource for learners of many levels and in practice settings. Previewing a procedure through video can support a student in earlier active engagement with a procedure, thus avoiding the common experience of repeatedly “watching the first time” as a student moves through different rotations and preceptors. Videos also benefit practising health professionals who may be less experienced with certain maneuvers or who require a refresher before proceeding with a patient.

Literature Review

Video has been used as a learning tool for some time but we were concerned that the medium was not always used to its best advantage or created in the most effective manner. A literature review was conducted to examine how others had approached the use of video materials in the teaching of clinical procedures and how these videos were made available to learners. In particular, we focused on how short videos are made available to clinicians and others through the Internet and wireless handheld devices; thus, this literature search was limited to studies and reports published since 1995. The terms used in the search—singly and in combination—were video (video, micro-video, video clip(s), short video, digital video, audiovisual), education, remote/rural, medicine, nursing and medical education, and computer aided instruction. The databases reviewed were Medline, PsychInfo, IEEE, Proquest Nursing and Allied Health Source, Directory of Open Access Journals, and ERIC.

Articles selected for review were those that consider video and education, video and medicine, and video and health sciences education. The review was limited to these areas since this project uses video in a health sciences educational context. Eighty-seven articles met the relevant search criteria with some 35 articles directly applicable to the PocketSnips project. These articles included informed opinion articles, descriptive studies, and comparative studies with cross-sectional and pre-post-test designs, clinical trials, and systematic reviews.

Students generally regard videos to be valuable adjuncts to live lectures and training (McConville & Lane, 2006; McConville, 2006). In the domain of medical education, students routinely score the use of video in teaching and learning contexts highly. They comment on enjoying the

videos and suggest that it enhances their learning experiences (Burton, Diercks-O'Brien, & Ruddy, 2004; Burton, 2004). Videos that incorporate visual images and verbal instructions have been reported to increase recall and retention (Pinsky & Wipf, 2000; Pinsky, 2000).

The same types of experiences are reported by nursing students. For instance, self-efficacy in difficult situations has been reported to increase after the viewing of online video clips. Demonstrations of effective communication presented through video have also been reported to be helpful to clinicians facing challenging situations (McConville & Lane, 2006; McConville, 2006).

On the clinical skills front, researchers have observed a variety of positive outcomes. When a study examined a hospital disaster drill training program that incorporated video, an 82% increase in the pass rate of participants was noted (Bartley, Fisher, & Stella, 2007; Bartley, 2007). Video instruction in CPR has been likewise associated with superior overall performance (Todd et al., 1998; Todd, 1998). Significant improvement in performance of procedures and procedural knowledge related to lumbar puncture has been linked to an Internet-based educational tool incorporating video demonstrations (Moorthy et al., 2003; Moorthy, 2003). In their training, medical students demonstrated improved procedural skills after viewing videos (Sookpotarom, Siriarchawatana, Jariya, & Vejchapipat, 2007; Sookpotarom, 2007). Similarly, higher scores on tests have been reported among residents who spent only one hour engaged in video-based computer applications dealing with physical examination and basic treatments in contrast with the scores generated by their peers (Thomas & Allen, 2003; Thomas, 2003).

While videotaped vignettes have been broadly recognized for their usefulness in learning about communication, they are less recognized for instruction about clinical examinations. At the same time, in situations where live patient contact is limited, the potential of multimedia technology in medical education has been recognized (Lim, Ong, & Seet, 2006; Lim, 2006). Computer based video instruction (CBVI) has been recognized as an effective means of providing expert feedback on technical skills. Thoughtfully incorporated into curricula, CBVI can facilitate efficiency in the use of faculty time and serve as a valuable pedagogic adjunct for basic skills training (Xeroulis et al., 2007; Xeroulis, 2007).

When video is available on the Internet, further benefits emerge. Students can study via video from home or the office; those in rural and remote communities can study within the social and clinical confines of their communities. Video available in a web-based setting can equalize educational opportunities and has been connected with an increase in the probability that the practitioner may remain in rural practice (Neame, Murphy, Stitt, & Rake, 1999; Neame, 1999).

Educational videos vary in length. Shorter clips, two minutes or less, are thought to be especially helpful because this time window represents the typical attention span for most video viewers (Pinsky & Wipf, 2000; Pinsky, 2000). While videos including complex information can negatively affect the learning experience, shorter videos that break down complex information may enhance understanding (Dubrowski & Xeroulis, 2005; Dubrowski, 2005).

Asked when they tend to use video, students reported using streaming digital video for review before examinations but not to replace classroom attendance (Dev, Rindfleisch, Kush, & Stringer, 2000; Dev, 2000). Visualization provides students and educators with alternate methods of teaching and learning and the possibility of increased retention of information (Kresic, 1999; Kresic, 1999). When videos of standardized patients were reviewed individually or in small groups, all participants reported positive learning experiences. However, individual review was reported to be significantly more effective (Parish et al., 2006; Parish, 2006).

Future studies of computer-assisted instruction that include comparisons and cost assessments may better define the precise role of this educational tool (Letterie, 2003; Letterie, 2003). Evaluation of video clips as they support learning of basic and more advanced procedures is also required (Sookpotarom et al., 2007; Sookpotarom, 2007). Current evaluation strategies tend to be too simplistic to reflect real differences attributable to video use. Follow-up studies are necessary to validate the current self-report, opinion surveys, and questionnaire-based data.

History of PocketSnips

The PocketSnips project started in 2005 with a health education organization in northern Ontario called the Northeastern Ontario Medical Corporation (NOMECC) located in Sudbury. Through this project, a small group of emergency medicine physicians at the Sudbury Regional Hospital collaborated with the faculty development unit at NOMECC to develop clinical skills videos for health professional learners. Funding for this work was provided by the Northern Ontario Heritage Fund Corporation (NOHFC).

In parallel, similar projects underway at Dalhousie University and the University of Calgary have enhanced collaboration and production processes from the earliest days of PocketSnips. Following the initial work of NOMECC, the Northern Ontario School of Medicine (NOSM) has continued the development of a repository of procedurally-focused learning objects as part of its e-learning agenda. The project was also supported through funding made available through Pfizer and the Inukshuk Fund.

NOSM invited participation across the health education community of Northern Ontario—the PocketSnips team presently includes representation from Cambrian College, Laurentian University School of Nursing, Laurentian University Instructional Media Centre, and the emergency medicine department of the Sudbury Regional Hospital. The different skill areas brought to the table include subject matter expertise, educational expertise, web-based technological skills, and videography. Except for the videographer from Laurentian University, the project manager, and the video producer, team members were not paid. The PocketSnips team was driven by values of innovation, educational excellence, transparency, collaboration, and a sense of joint ownership in all aspects of the project.

Collaborative Teamwork

Like other educational projects that involve technology and a widely dispersed team, progress would not be feasible without the expertise of a skilled project manager. The project manager has been particularly effective in team building, scheduling of meetings, and budgeting. She is an impressively skilled and tactful “task master.” While this title is offered in a slightly tongue-in-cheek manner, it should not be underestimated how powerful this approach is: it is a rare individual who can ensure the productivity of team members in a subtly persistent yet engaging manner, when they are distracted by other aspects of busy professional lives.

The topic list of videos to be created arose from a Delphi approach with iterative circulation of lists of potential topics, gathered from internal and external groups (including other similar video projects), focused discussion and peer review of the topics, their relevance and the practicalities of video production. As the project proceeded, the topic list was reviewed continuously, with comparisons made as to what topics were already available elsewhere from other sources.

Several team members provided content expertise. Three emergency physicians led the team but many others have contributed numerous hours to storyboarding, script writing, and filming activities. Notably, all storyboarding work was supported by a video planner with expertise in video production for health audiences. All videos include voice-over narration; as much as possible, on-screen talking heads are avoided. This decision was taken to facilitate alignment between the audio and visual components of the clips and easy repurposing of the videos. This strategy further increases the likelihood that the videos will be reproduced in different languages.

All aspects of the film production work are the responsibility of the videographer. At appointed times and on demand, the videographer has been available to film clinicians performing procedures on patients who

have consented to participate or who are willing volunteers when patients are unavailable. Time spent on planning the storyboards and key learning objectives for each video paid off handsomely in reduced post-production costs.

Preparation of the video clips is only one component of the project. Other tasks include preparation of adjunct support materials called breadbaskets, creation of the web site, beta testing, and promotion and dissemination of the PocketSnips videos. Table 1 outlines the steps of producing one video clip.

An approach that has worked very well in supporting the collaborative work of the PocketSnips team is the use of web-based collaborative software. The team has made extensive use of a Microsoft SharePoint™ Team Site for communication and coordination of activities. Two features of SharePoint that have been particularly helpful have been the wiki and the shared documents library.

The wiki has been an intuitive and effective means of collaborative editing of storyboards, scripts, and other documents that support the production process. Members of the team quickly adopted the wiki approach and are very comfortable with a shared authorship method. The advantage of immediately seeing the most current version and changes, without having to keep track of “who had which copy” has been appreciated by all. The shared documents folder assists in the sharing of large files and multimedia elements. Most email systems cannot handle very large attachments. Some project participants live in isolated rural locations with only dial-up Internet access: large email attachments pose problems for these users. Placing large files on the team site, however, gives participants the option of when to download or view such files. The team site has a sophisticated version control mechanism which prevents project members from unintentionally overwriting each other’s valuable contributions. Site contents are protected by secure access. Such privacy encouraged team members to be open with each other, commenting on works in progress, without drafts and early iterations being open to the web world at large.

Collaboration was not a result of software alone. A key feature of the collaborative nature of the project team has been mutual appreciation of the skills and expertise of all team members and the practice areas they represent. External users of PocketSnips videos comment on the superior production values evident in the clips. Involvement of professionals from video media and the corporate communications world has raised the level of video and audio quality enormously. This emphasis on quality is immediately evident when comparing PocketSnips materials with other self-created videos of clinical procedures found on other video sites. In some of these sites, the “Blair Witch” effect that is all too commonly seen, is enormously distracting and prevents efficient file compression.

Table 1. Production stages.

Task/Step	Time Required
Stage 1: Storyboarding	
Clinical lead scripts storyboard	1 hour (lead clinician)
Team peer review and feedback	10 min per clinician
Project lead approves storyboard	10-15 min
Stage 2: Pre-production Activity	
Film producer reviews storyboard prior to filming	1 hour
Producer and project manager coordinate logistics	1-2 hours
Stage 3: Production	
Team films procedure	1-2 hours
Producer prepares DVD of shoot	1-2 hours
Stage 4: Post-production Activity	
Producer creates narrative with clinical leads	1-3 hours
Narrator creates script with clinical leads	1-2 hours
Narrator reads script with producer	4-6 hours
Further editing	4-10 hours
Stage 5: Video Review	
Producer presents video for team review	30 min
Further editing if necessary	1-2 hours
Cycle repeated if needed	-----
Webmaster posts final cut	1 hour
Stage 6: Breadbasket Creation	
Clinical lead writes adjunct material	1-4 hours
Team peer review of breadbasket	1-2 hours
Webmaster posts approved breadbasket	1 hour
Webmaster applies closed captions if needed	1 hour
Stage 7: Dissemination	
Video broadly peer reviewed and pilot tested	

A collaborative spirit was highly evident at face-to-face team meetings which were well attended and characterized by general good will. Levity and creativity were appreciated, and all comments were welcome. The regular face-to-face interaction of these meetings strongly buttressed the online components of collaboration and contributed to strong cohesiveness among the team.

The Future of PocketSnips

The PocketSnips team sees the future as including two distinct directions. Firstly, the team is actively seeking new partners around the world with whom to collaboratively develop more videos, share lessons learned, and refine production techniques. Ultimately, it is hoped that such collaborating teams will feel comfortable with others refining their existing work under a Creative Commons share-alike license. The second step is to document, through research, the impact that PocketSnips videos have on learning. A further area of research is the PocketSnips process itself. In a spirit of sharing and responsiveness to an educational need, the PocketSnips team is an example of a cooperative that excels because of group and individual commitment to a common goal. Understanding why the PocketSnips project has worked so well when other similar collaborative projects have not, is worth further study from an organisational psychology perspective.

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