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Designing Digital Video to Support Learner Outcomes:
A Study in an Online Learning Resource for Healthcare Professionals and Students

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Designing Digital Video to Support Learner Outcomes:

A Study in an Online Learning Resource for Healthcare Professionals and Students

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Abstract

Instructors are incorporating video into their blended and web-based courses at an ever increasing rate. Thus the need for research in this area is required to understand how to design, utilize, and incorporate video most effectively as a pedagogical tool. This study explored how the design and implementation of digital video resources in an online educational environment affected learning outcomes. Forty-five health professionals and students evaluated the digital videos incorporated into ePhysicianHealth.com. Three types of digital video genre were examined in this study: modeling/demonstrations, personal stories/commentaries, and content expert narratives. The findings suggested that the majority of the participants found that the digital videos to be a valuable addition to ePhysicianHealth.com, as they made the learning environment more authentic, memorable, realistic, varied, and accommodating to different learning styles.

Key Words:

eLearning; online learning; video; healthcare education; physician wellness; disruptive behaviour; emerging technologies

Introduction

The increased demand for eLearning courses has led educators to examine more interactive and creative ways to motivate learners and make the online experience more realistic and effective (Monahan, McArdle, & Bertolotto, 2008). It has long been acknowledged that using videos can increase learners' willingness to learn, enhance learners' engagement with academic material, and stimulate a wide variety of learning intelligences (Kumar, 2010; Cherrett, Wills, Price, Maynard & Dror, 2009; Miller, 1994). The incorporation of digital videos into online resources can create a common classroom experience (Seyforth & Golde, 2001), present real-world problems and scenarios (Furman, Dorfman, Hasson, Davachi, & Dudai, 2007), and add variety to the learning environment (Watts, 2007).

Variety of pedagogical approaches is an important element to consider when designing online resources (Watts, 2007). Kirschner (2005) reminded us that despite the availability of a plethora of multimedia tools, many distance education courses have "student activities that are limited to reading from the screen, filling out boxes and, at best, chatting with peer students about the content" (p. 547). Poorly designed text-based learning can be monotonous, which can result in poor learner comprehension of the material (Zhang, Zhao, Zhou, & Nunamaker, 2004). Learner engagement when learning online can be dramatically increased when multimedia resources, such as digital video, are used to present course material (Monahan, McArdle, & Bertolotto, 2008). Digital videos have been proven to present a more authentic learning environment than text-based online resources (Bliss & Reynolds, 2004). Moreover, multimedia learning resources motivate online learners and engage them emotionally (Hung, Keppell, & Jong, 2004).

A wealth of research has been conducted on the design, delivery, and implementation of online learning (Gustafson & Branch, 2002; MacDonald & Thompson, 2005; Ryder, 2007; Thompson & MacDonald, 2005). However, there have been few empirical evaluations of the use of video for learning and the literature has even fewer publications that provide practical guidelines for designing digital videos to achieve desired learning outcomes (Schwartz & Hartmann, 2007; Cheng & Chau, 2009). In online classrooms "forms of learning that stress the active engagement of learners in rich learning tasks and the acquisition of skills are rare" (Kirschner, 2005, p. 548). With more and more web-based courses incorporating videos, the need for research in this area is required to understand how to design, utilize, and incorporate video most effectively as a pedagogical tool.

This study explored how the design and implementation of digital video resources in an online educational environment affected learning outcomes. Forty-five health professionals and students evaluated the digital videos incorporated into ePhysicianHealth.com, the world's first comprehensive online resource on health and wellness for physicians and physicians-in-training. ePhysicianHealth.com includes nine interactive, self-paced modules on mental and physical health issues—such as substance use disorders; weight, nutrition, and fitness; depression, burnout, and suicide; and primary care—as well as five modules on disruptive workplace behaviour. Content is provided through video, interactive activities, self-assessments, animations, graphics, and text. The content of the digital videos in ePhysicianHealth.com includes specific scenarios, testimonials, and presentations based on the real-world personal and professional experiences of health professionals. Three types of digital video genre were examined in this study: modeling/demonstrations, personal stories/commentaries, and content

expert narratives. The effectiveness of the videos in producing specific learning outcomes associated with the genre was examined.

Background

Online resources are a valuable tool for all forms of adult learning and are becoming more important and relevant in the health professions. This is particularly true of physicians. A recent survey conducted by Manhattan Research found that 25% of physicians utilize the Internet during patient consultations (Egan, 2007). Further, physicians' use of Internet resources between patient consultations had increased by 11% from the previous year, their use of online conferences had increased 13% between 2005 and 2007, and their consultation of online journals also increased by 25% during the same period (Egan). Holzer and Kokemueller (2007) proposed that these statistics indicate "the tipping point and suggest that physicians are prepared to make major shifts in using the Internet to impact health care" (p. 1275).

Studies on continuing medical education (CME) have found that much of physicians' self-directed learning occurs through interpersonal interactions (Sargeant, Curran, Allen, Jarvis-Selinger, & Ho, 2006). Further, these interactions are critical to effective interventions and learning (Mazmanian & Davis, 2002). Sargeant et al. (2006) found that physicians' professional learning occurred in three distinct stages: preparing for change, making change, and solidifying change. Others have also identified three stages of learning when physicians learn: deciding whether to take on a learning task, learning the skill to resolve the problem, and gaining experience with the knowledge in different settings (Fox & Bennet, 1998; Fox, Rankin, & Costie, 1997; MacKeracher, 2004). While the authors used different terms, the themes of the three stages are the same: preparation, change, and application. Fox, Mazmanian, and Putnam (1989) found that all three stages of learning involve interaction and the exchange of ideas with

colleagues but interaction is particularly critical to the second stage: making change. Physicians respond favorably to input from and interaction with colleagues to gain the motivation to undertake new learning experiences.

Indeed, one of the best methods of effectively conveying information in online courses is the use of streaming video. Green et al. (2003) found that "significant numbers of students used, enjoyed, and had confidence that they learned from resources that embedded streaming video" (p. 260). In fact, video has been found to be extremely valuable in aiding narrative visualization, modeling techniques and behaviour, and simulating workplace activities (Craig, Chi & VanLehn, 2009; Davis, 1991). This is especially true when using real-life scenarios, as written accounts are often over-simplified: "video may lead to a better description by the teacher and enhanced visualization, recognition and identification by students" (Green et al., p. 260). When video resources are synchronized with the written learning materials, learning is improved as this leads to a greater understanding of the instructional information (Yang & Liu, 2004). It appears it is the integration of digital video into online written content that leads to increased comprehension and improved learning among eLearning participants.

When an author determines the features and content of the video before it is created, Schwartz and Hartman (2007) termed this "designed video". They developed a "framework for matching different genres of video with different types of learning outcomes" (p. 336). Three of these learning outcomes are: saying, engaging, and doing.

"Saying" outcomes involve the ability to assimilate and internalize verbal or factual knowledge. In other words, this means the ability to take a topic and make it subjective or personally relevant to the viewer. Video is particularly effective at developing these skills as learners can easily construct their own version of the events or facts that are presented in the

video (Bruce, 2003; Wei & Hung, 2000). "Saying" outcomes can best be achieved using video genres that share personal stories, experiences, and commentaries (Schwartz & Hartman, 2007). It has been found that digital video is an excellent online tool for professionals to encourage self-reflection (Leijen, Wildschut, Simons, & Admiraal, 2009). Videos have also been shown to be important instructional techniques that can make material more memorable and personalized for learners (Cherney, 2008; Reisetter & Borris, 2004). Digital videos of personal stories and dramatizations can nurture feelings of appreciation and association and foster a change in attitude in the learner (Koumi, 2006).

"Engaging" outcomes involve creating learner interest in the subject being presented, as well as developing a desire for future learning and exploration of the topic (Schwartz & Hartman, 2007). This type of outcome can be achieved using video genres such as narratives from content matter experts and anchors/hosts who provide introductions to new topics. Video is an excellent tool for engaging the attention and imagination of learners, which is a prerequisite for motivation to learn (O'Connell, McCarthy, & Hall, 2004). Digital video technology allows learners to interact with a wide variety of new topics, narrators, and subject matter experts, which "may enhance learner engagement, and so improve learning effectiveness" (Wieling & Hofman, 2010, p. 992). Koumi (2006) described effective digital video presenters and hosts as having "the ability to nurture and stimulate an appetite to learn by revealing the fascination of the subject [and] provok[ing] viewers to get up and do things" (p. 4). Hosack (2010) highlighted the need for greater interaction and learner motivation in online video use, especially when presenting content to learners.

The third category of learning outcome, "Doing", can be achieved using video genres such as demonstrations or step-by-step case studies where a skill is modeled for the learner. The

learners can then transfer and apply these new skills to their personal lives or performance in the workplace (Schwartz & Hartman, 2007). The use of video in health education is particularly useful to facilitate dynamic modeling and real-life behaviours, which lead to greater recognition and identification by learners (Green et al., 2003). Cherrett et al. (2009) suggested that digital videos can

> be used to teach both 'hard skills' (e.g., site emergency evacuation procedures) and 'soft skills' involving human interaction (e.g., decision-making under time pressure, communication, motivation and leadership), and help promote a deeper learning approach by linking multiple ideas and concepts together within a personally engaging environment. (p. 1132)

Modeling and the demonstration of skills by an expert in digital videos are both considered to be distinctive ways of assisting skill development and application by the learner (Koumi, 2006).

The purpose of this study is to analyze the three groups of video genre in ePhysicianHealth.com and determine how effective they are at producing their associated learning outcomes (see Table 1).

Table 1. *Video Genres and their Associated Learning Outcomes* ***(adapted from Schwartz & Hartman [2007] and Koumi [2006])***

Video Genre	Learning Outcome
Modeling/Demonstration	Development of New Skills
Personal Stories/Dramatizations	Self-Reflection/Internalize Content
Content Expert Narratives/Hosts	Nurturing Motivated Learning

Methodology

Research Questions

The following research question and sub-questions guided the evaluation of the digital videos in ePhysicianHealth.com:

- How do digital videos impact the learning experiences of health professionals and students in an online learning environment?
- The three sub-questions consider the design (genre) of digital videos and how they contribute to the specific learning outcomes of health professionals and students in an online learning environment:
    1. How do digital videos involving modeling and demonstrations contribute to the development of new skills in an online learning environment?
    2. How do digital videos of personal stories and dramatizations influence self-reflection in an online learning environment?
    3. How do digital videos of content expert or host narratives nurture the motivation to learn in an online learning environment?

Participants

Forty-five healthcare professionals and students (31 female and 14 male) from six different professions agreed to participate in this study. Thirty-six percent of the participants were medical students, 29% were residents, 25% were practising physicians, 4% were nurses, 4% were physiotherapists, and 2% were educators. Participants were comfortable using the Internet to find information for personal and professional needs, and identified Facebook, threaded discussions and real-time chat as their most common online experiences (see Table 2.1).

Table 2.1. *Learners' Personal and Professional Computer Usage (N=45)*

	Min[a]	Max	Mode	Mean	SD
How often do you use the Internet to find information for personal interest and/or essential needs? Examples could be Internet browsing, playing online games, shopping, finding medical information, finding help with hobbies etc.	3	5	5	4.44	0.622
How often do you use the Internet to find information related to your profession?	3	5	4	4.16	0.521
What types of online experiences have you had?					
Participated in threaded discussions	1	5	2	2.59	1.261
Real-time chat	1	5	3	2.80	1.234
Listened to podcasts	1	5	2	2.51	0.922
Co-created wikis	1	4	1	1.18	0.584
Videoconferencing	1	5	3	2.45	1.170
Audioconferencing	1	5	2	2.20	1.272
Simulations	1	4	1	1.79	0.913
Webcasts	1	5	2	2.34	0.991
3D virtual learning environments	1	3	1	1.50	0.703
Facebook	1	5	4	3.34	1.422
Twitter	1	3	1	1.07	0.332

[a]Response options: 1 = none; 2 = not often; 3 = sometimes; 4 = often; 5 = always

For 60% of the participants, this was their first online learning program or course that they had done. However, overall they indicated that the online experiences they had had (e.g., podcasts, wikis, videoconferencing, real-time chat) were positive: 78% indicated that their past online experiences had been positive whereas the remaining 22% reported having neutral experiences. Participants came into the study with a very positive attitude towards online videos, with 84% identifying that videos enhance the online learning experience (see Table 2.2).

Table 2.2. *Learners' Attitudes Towards Online Learning and Online Videos (N=45)*

	Min[a]	Max	Mode	Mean	SD
Would you consider your past online learning experiences to be positive?	3	5	4	3.96	0.643
Please indicate your agreement with the following statement. Videos enhance the online learning experience.	3	5	4	4.11	0.646

[a]Response options: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

Participants indicated that they were familiar and comfortable with online video resources; 93% indicated that they had watched online videos, such as YouTube, for enjoyment several times before or often. The vast majority of participants also indicated they were comfortable using online videos for educational purposes, with 83% indicating they had used them often or several times before (see Table 2.3).

Table 2.3. *Learners' Experience with Online Videos (N=45)*

	Min[a]	Max	Mode	Mean	SD
Have you ever watched videos online before for enjoyment (e.g., YouTube)?	1	4	3	3.27	0.648
Have you ever watched videos online before as a means of learning?	1	4	3	2.93	0.692

[a]Response options: 1 = never; 2 = once before; 3 = several times before; 4 = often

Procedures

Quantitative and qualitative data that allowed the research questions to be answered were collected from two sources: surveys and interviews.

Participants completed two online surveys that were adapted from existing survey tools developed for use with *W(e)Learn* (MacDonald et al., 2009). The *W(e)Learn* framework was designed to guide the design, delivery, and evaluation of interprofessional education and has five components: Content, Structure, Media, Service, and Outcomes.

The W(e)Learn Framework. The W(e)Learn framework advocates that the foundation of a learning resource begins with its structure (Appendix B). This includes learner assessment, facilitation strategies and interactivity. It also involves creating a learning environment that utilizes pedagogical strategies that take into account learner and context analysis. These fundamental elements of the structure guide the creation of online resources that present relevant content. "This involves aesthetically pleasing presentation and technology that is innovative and interactive" (MacDonald et al., 2001, p. 23). The ideal online resource should be an interactive

support system, with tools and resources that support the specific learning environment (Kirkley & Duffy, 1997). Built upon superior course structure is consumer demand: content, media and service. Content should not only be comprehensive and well researched, but also should be authentic and reflect the real-world problems and scenarios that can be found in the workplace (Savery & Duffy, 1996; Uhlenbeck, 2002). This notion of real-world content fits in perfectly with two important concepts discussed earlier in the literature review: establishing an authentic learning environment and motivating physicians to make a change and undertake a new learning exercise.

The W(e) Learn framework also guide the effective use of media ensures excellent usability and interactivity, and utilizes tools that allow a variety of learners to interpret and obtain meaning from course content. A variety of media and communication tools are important as they can be used to accommodate different learning styles (MacDonald, Stodel, Thompson & Casimiro, 2009). This echoes the research of Shank (2004), who urges facilitators to consider "affordances that various technologies, tools, and strategies have, that can enhance teaching and learning" (p. 4). Efficient course service includes not only the accessibility and responsiveness of staff, instructor and technical support, but also access to a variety of resources that offer authentic learning opportunities from multiple perspectives. In the end, solid course structure and the satisfaction of consumer demands lead to superior learner outcomes such as the motivation to learn, learner satisfaction, and the acquisition of new skills that can be applied to authentic, real-world contexts. Mann (2004) advocates a constructivist learning approach for teaching physicians, since they need to observe multiple perspectives and create personal meaning from their educational experiences in order to develop real-world problem solving skills. This framework, therefore, is ideally suited for the development of eLearning resources for

physicians. For a more detailed explanation of the framework: http://www.ennovativesolution.com/WeLearn/.

Surveys. A demographic survey was administered before participants were given access to the learning modules in ePhysicianHealth.com and a post-module survey was administered after the participants completed a module. Participants were asked to complete two modules and therefore two post-module surveys. The demographic survey collected background information on the participants, as well as information on the learners' experiences with online resources, Internet tools, and online digital videos. The post-module survey obtained feedback on the digital videos in the modules based on the five *W(e)Learn* constructs (e.g., participants were asked to indicate their agreement with the following statements: The videos in the module encourage reflection [outcomes]; The videos in the module present strong links between theory and practice [content]. The tool includes both closed and open-ended questions.

Interviews. Semi-structured individual and focus-group interviews were conducted with eitghteen participants once they completed the modules. Participants were offered the option to be interviewed face-to-face or via telephone. The format of the interviews depended on participant availability. In total, seven focus-group interviews and two individual interviews were conducted. The nine interviews lasted between 25 and 35 minutes. The interview participants included 4 fourth year medical students and 14 residents (seven in pediatrics, one in internal medicine, one in entomology, two in family medicine, and three undeclared).

Data Analysis

Qualitative data analysis involved examining the interview transcripts and information from the open-ended questions in the post-module survey for information that answered the research questions. QSR Nvivo 8 was utilized to manage the data. Numerous themes emerged as

the data were analyzed utilizing the constant comparative method. Once the themes were identified, created, and organized, the data were assigned to the various themes. The qualitative findings are presented using direct quotations in order to preserve the voice of the participants.

The data from the demographic survey and the closed questions in the post-module surveys were analyzed by calculating the minimum and maximum scores, mean, and standard deviation for each of the survey questions.

Findings

The answers to the primary research question are organized according to three of the constructs of *W(e)Learn* (content, structure, and media), and the answers to the three sub-questions are organized according to the W(e)Learn construct of outcomes.

How Do Digital Videos Impact the Learning Experiences of Health Professionals and Students in an Online Learning Environment?

Content.

Responses on the *W(e)Learn* post-module survey revealed that 86% of responses indicated that participants either agreed or strongly agreed that the videos presented ideas and information that are useful for dealing with problems they face in their personal or professional lives. Over 84% of responses indicated that participants felt the videos presented strong links between theory and practice. The interview data further supported that the participants felt the digital video content was both relevant and useful. Several participants identified the videos as being important learning tools in order to present content in an authentic manner. Medical Student 2 suggested, "For some, having real-life examples and other students or physicians in the videos talk about their experiences defiantly added a more relevant touch to demonstrate that these issues are relevant and important". Another participant added that the information in the

digital videos is relevant for all the members of the healthcare team, "[The videos] highlight issues that are relevant to health staff and the people training. It could be relevant to medical students, health staff, or other allied health workers" (Resident 2). Resident 12 agreed, "The videos brought the practice setting to the theory of the module".

Several participants indicated that the videos added variety to the learning environment and appealed to their different learning styles. Medical Student 5 wrote, "[The videos] enabled me to view the information in many different ways—auditory, visual". Others agreed: "I am an audio-visual learner. When I hear information, it sticks in my head better" (Resident 5) and "I feel like the information in the videos 'stuck' with me much more than the bullet points" (Resident 4). Finally, Resident 10 put it simply: "The [videos] fit best with my learning style."

Over 81% of the responses in the post-module surveys indicated that participants felt the videos promoted a meaningful learning experience. Participants repeatedly identified the videos as adding realism and meaning to the content because they presented the information in a new and different fashion. For instance, Resident 5 stated, "It is nice when they have new stories or examples in the videos as opposed to just telling you the information". Participants agreed the videos were a valuable tool for adding realism to educational information: "Overall, the videos … are fantastic. They make it easy to follow and really illustrate what is going on. Especially the disruptive behaviour [videos]. It really demonstrates what is going on" (Resident 2). Comments on the open-ended survey questions supported the idea that the videos enhanced meaning. Medical Student 4 noted, "The videos helped me to focus on the information presented". Another agreed, "There was a lot to pick up on. One could say they were 'dripping with examples'" (Resident 3). Finally, Resident 2 added, "They held my attention and I think set the tone for assimilation of the other content."

Participants felt that the subject matter experts in the videos were qualified and experienced in the industry, with 98% of responses indicating participants either agreed or strongly agreed. One participant (Resident 7) said she thought the subject matter experts' credentials were impeccable, while Resident 6 said that he liked the diversity of the narrators and how this was introduced in the videos:

> I enjoyed the fact that the experts came from a variety of backgrounds. I remember in the resilience section a family medicine practitioner in Western Ontario talking about her job as a mentor and a program director in helping her colleagues and trainees. Then you had another expert who has a psychiatry background.

Structure.

Eighty-three percent of the survey responses indicated that participants either agreed or strongly agreed that the structure of the videos made the information engaging. Resident 9 echoed a theme identified by several participants, "The videos added dynamism as well as a sense of interaction with the health professionals". Medical Student 3 agreed: "The videos were good because they provided patient stories and interaction." Participants' responses to the open-ended questions were equally enthusiastic: "I found [the digital videos] the most compelling medium" wrote Nurse 2. Resident 6 agreed: "Very effective in engaging me, as I could understand what the interviewees had experienced." Finally, Medical Student 11 wrote: "[The videos present a better way to get the information across".

Media.

Over 70% of the responses indicated participants agreed or strongly agreed that the videos included information that stimulates imagination and curiosity. Occupational Therapist 1 wrote that the videos were excellent at "increasing my level of interest and giving me ideas".

Medical Student 5 agreed, "They added personal anecdotes and reflections and made the principles come to life". Findings from the interviews support the quantitative data. For example, Resident 2 said the videos in the disruptive behaviour module opened her eyes and allowed her to see new perspectives: "It was eye opening, it did teach me a few things that I didn't recognize or realize. It gave individual perspectives on that same scenario. They were fantastic". Several participants said they found the personal testimonial videos added meaning and presented the issues with a more realistic perspective: "Anything which has information with a personal touch and seeing someone talk about it, you get the idea a little better than just reading about something" (Medical Student 6). Another participant (Resident 11) reiterated this point and said the videos reinforced the text and also gave her another dimension from which to learn.

A number of participants mentioned that the videos were too lengthy. Resident 5 stated the videos in the Relationships module were too long and seemed to repeat and explore the same information as the written text. Another participant agreed many of the videos were too long and a better job could be done to edit them to a more appropriate length: "The videos with people just talking...far too many of them. I understand they are authoritative experts on the topics but I would listen for 30 seconds and then stop and get bored" (Resident 4). Medical Student 3 felt the introductory videos to the modules made the modules unnecessarily long.

In terms of usability, some participants were frustrated that multiple links led to the same video. Resident 4 noted, "Sometimes I felt like I got back to the beginning video more than once. I got annoyed that I had to restart at the intro video when I had already seen it". Resident 3 agreed, "I stopped clicking on the videos once I realized they were the same videos over and over again.

Participants also mentioned that the video links were difficult to access. They reported they were very small and recommended making them larger and including writing below each video link. Resident (4) also suggested, "...it would be nice if the whole picture of the person could be a link as well, click on the image and the video would load".

Outcomes.

How do digital videos involving modeling and demonstrations lead to the development of new skills in an online learning environment?

There were seven videos that involved modeling and demonstrations that will be the focus for this research questions (see Table 3).

Table 3. *Modeling and Demonstration Videos*

Video Title	Module
How to Select a Running Shoe	Weight, Nutrition and Fitness
How to Read a Food Label	Weight, Nutrition and Fitness
Disruptive Behaviour Case Study	Disruptive Behaviour: Physician Leaders
Disruptive Behaviour Case Study	Disruptive Behaviour: Medical Students
Disruptive Behaviour Case Study	Disruptive Behaviour: Healthcare Teams
Disruptive Behaviour Case Study	Disruptive Behaviour: Residents
Disruptive Behaviour Case Study	Disruptive Behaviour: Practising Physicians

Participants indicated that the two videos in the weight, nutrition and exercise module presented skills and information that they will utilize in their personal lives. Resident 12 stated:

> I found specifically one video that comes to mind, the video on how to read a food label in the weight module. It is something that I had learnt a long time ago and didn't actually put it into practice but to actually go through it step by step and having someone doing it rather than it being in written form was great.

Resident 11 agreed that this video enhanced the learning environment, "Some skills are best learned by viewing rather than by a description of them." Resident 12 felt that this video "Really brought the message home." Medical Student 10 agreed: "Videos used for demonstration of

skills are most useful." Three participants listed the food label video as the most valuable part of the module. Medical Student 1 felt the same way about the running shoe video: "Videos were probably the most valuable part, especially the ones with direct demonstration (such as the podiatrist explaining what to look for in a running shoe)," Resident 10 agreed, "If every video was like the sneaker video I would download every video. They feel like they are clinically or personally applicable."

The majority of the participants in the disruptive behaviour modules said the case study videos provided skills they will transfer to the workplace. "Content wise, definitely for the medical student [disruptive behaviour] module it gave me better skills into dealing with people in a politically correct manner and me mediating that conflict that would be arising with the disruptive physician or resident" (Medical Student 2). Resident 9 agreed (for the resident module), "It was eye opening, it did teach me a few things that I didn't recognize or realize. It gave individual perspectives on that same scenario. They were fantastic". Medical Student 7 said the case study video was practical because it illustrated the viewpoints of each person involved in the conflict. She added that, "Sometimes we forget those as we progress or fail to recognize them." Medical Student 4 agreed, "It demonstrated very effectively the potential for a gap when working with others; the assumptions we make of others' motives and intentions."

Conversely, one learner identified that while the demonstration videos did present useful information, they were based too much on theory. "I remember being bored with a couple of them. Even the one where it is describing food labels, it might be interesting to take you through a food label. I think it was almost too much theory" (Resident 9). Resident 7 assimilated the information in the videos, but questioned if it would give him the skills to apply in a real situation:

> Like the case staff physician [in the disruptive behaviour: resident module] who was leading the residents around, certainly I could identify with that. Other than recognition that it's inappropriate, it would make me recognize it more readily but I don't think it would change my threshold to act on anything.

How do digital videos of personal stories and dramatizations lead to self-refection in an online learning environment?

Eighty six percent of the responses from participants indicated that in general the videos encouraged reflection, and 90% of responses indicated that the videos promoted self-awareness. Participants indicated that this was particularly true of the personal stories and commentaries, which were found in three of the modules (see Table 4).

Table 4. *Videos of Personal Stories and Dramatizations*

Video Title	Module
Personal Story: Dealing with Alcohol and Drug Addiction	Substance Use Disorders
Personal Story: Healthy Lifestyle Changes	Weight, Nutrition and Fitness
Dramatization: Anxiety in the Workplace (Ana and Pedro)	Anxiety
Dramatization: Dr. Baxter, Dr. Katz, Melonie	Depression, Burnout and Suicide

Many participants cited how the videos helped put the content into a personal context. Resident 4 wrote that the personal stories in the Weight, Nutrition and Fitness module "...allowed me to think about what aspects of their situation was similar to my own, and encouraged learning to facilitate similar changes (Resident 4). Resident 10 agreed, "I think the value comes from seeing faces and hearing someone express [himself or herself]. It has a different impact to see someone speak of their own experience and makes the experience a lot more personal". Several other participants wrote that the personal touch in the videos made the

content more relevant for them: "Honest, real-life experiences made the topic seem more real (Resident 8)". Resident 5 claimed that because the people are real "it's very sobering and adds a lot of credibility and improves acceptance of the material".

Medical Student 3 said that personal stories in the Substance Use Disroders module help make the content seem more realistic and easier to assimilate. "For the substance use one with the gentleman talking about his problem normalized it, which I think is important for people that are actually approaching these modules looking for help. That will make it easier to take for them" Medical Student 2 agreed, "You do get a first hand story from a gentleman who did have to go through a problem with substances and he was a physician and prominent guy. I guess it normalized it for somebody who could potentially be having problems and they might be more willing to come forward."

In the interviews, participants said the videos involving dramatizations in the Depression, Burnout and Suicide module allowed them to better identify with the module information. These videos were scripted stories read by actors. Resident 8 said the videos helped her identify with potential problems in the workplace: "The videos in the [burnout, depression, and suicide module] hit home. It makes you realize that all your colleagues are dealing with more than you know". Resident 3 agreed: "The video about the physician who had burnout because the practice style wasn't right for her. I definitely could identify with her". Resident 4 asserted that the videos were shocking and brought the content to life:

> The depression videos were very good. It is nice that in the end they all had conclusions. When I found out that one had committed suicide and was found by a resident in his office, it kind of shocked me. I think it was a pretty powerful use of the module.

Finally, Resident 8 felt the personalization of the videos helped normalize the issues of anxiety and depression. "I know they are not real and are staged but it almost makes you feel like they are normal parts of being a physician and I appreciated that.

Some participants felt that the scripted testimonials were not as effective as the authentic personal stories. Resident 2 alleged that while he believed the content of some of the scripted stories was excellent, the delivery and acting in the videos hurt their credibility:

> In the depression [module], those videos were very scripted. It was like the people were telling their own story but reading it from a script. It really hurts the credibility. They are good stories, but if they are reading a script you wonder why you couldn't just have read it.

Resident 14 agreed, "It would be better if it wasn't so scripted so it is their own. If they are struggling to tell it or if the people are jumping from one thought to another, I don't mind seeing that because it is realistic".

How do digital videos of content expert or host narratives nurture the motivation to learn in an online learning environment?

Participants didn't like the introductory videos and videos that were essentially "talking heads". These videos were included on the introduction and conclusion page of each of the 13 modules. In general, participants felt that video was used most effectively when the content could not be presented in written form. If the video was just someone conveying information that could be read faster and more efficiently, participants did not see added value and felt they wasted their time. Talking about one of the introductory videos, Resident 10 suggested, "Some of the videos I found were of someone talking on Parliament Hill I think [Exercise and Nutrition

module]. The video was a replacement for text but not much more than that". Resident 1 reiterated this point:

> There is some content in video form that I don't think needs to be in video form. The content for the beginning of the disruptive behaviour module. The past president of CAIR was telling people what disruptive behaviour is with a nice background but it doesn't add any value. Her standing there and telling us about it could be conveyed in text every bit as well.

In the interviews, some participants mentioned that the introductory videos were often too long and repeated content presented in the text. One participant wrote: "not sure what value opening/closing remarks [added], could be shorter to keep attention". Another participant agreed: "The videos of the physicians were nice to look at but not always time-worthy". Resident 11 recommended limiting video use to real life scenarios and testimonials:

> The videos that were used as a base for interactive exercises were a bit more useful; some of the case scenarios where you see things happening … that you can relate to in real life. But the introductory videos did not need to be as long as they were.

Resident 6 agreed:

> I like when videos have a little bit more dynamics to them. Having one person being interviewed sitting in a chair lacks dynamism. Whereas a voiceover with something that is moving and fun and relates to what is being said keeps my attention.

Discussion

The research data clearly indicate that the majority of the participants found that the digital videos were a valuable addition to ePhysicianHealth.com, as they made the learning environment more authentic, memorable, realistic, varied, and accommodating to different

learning styles. These findings are significant because the participants are all busy health professionals and students who want access to clear, concise online resources. For the most part, the digital videos proved to be an effective medium for conveying learning content to the participants. Perhaps the most important contribution of the digital videos was the notion of variety. This was significant in that variety of design in online resources was identified as important in the work by Watts (2007) and Krischner (2005). Participants went a step further and repeatedly identified that the digital videos provided pedagogical variety with regards to engaging their different learning styles.

Clearly, the preferred genre of digital video among the participants was the personal stories, which were identified as important for the "saying" outcomes (Schwartz & Hartman, 2007). These stories not only engaged the participants and led to self-reflection but they also served to "normalize" the personal experiences that are commonly not discussed among healthcare professionals, such as anxiety, substance abuse, and disruptive behaviour. Participants were most engaged when the personal stories in the digital videos were authentic testimonials from real physicians. This led to a greater acceptance of the material presented and an increased awareness of how the issues presented are real problems facing physicians. While dramatizations presented by an actor reading from a prepared script were also perceived as powerful, some participants felt they were not as genuine or realistic. They lacked the power of the personal testimonials, which hit home and allowed participants to internalize and associate with the presented information.

The findings for the digital videos that utilized the genre demonstrations and modeling were also favorable among the participants. Many reported they did learn new skills. Participants identified that they learned applicable personal skills from the running shoe and food label

videos, and that they learned applicable professional skills from the case study scenarios in the disruptive behaviour modules. Thus the videos were viewed as successful in teaching both the "hard skills" of the workplace and the "soft skills" of human interaction identified by Cherrett et al. (2009). The videos were also effective in achieving the first outcome that is critical for professional learning, namely: preparation for change (Sargeant et al., 2006). Due to the short time-frame of this study, it was not possible to see if the last two outcomes were also achieved: making the change, and solidifying or applying the change. A fascinating topic for future study would be to follow-up with participants and see if the change had indeed been made.

It is important to note that a few participants indicated that while the videos did raise awareness or increased knowledge regarding a certain topic, they did not develop any new skills that they could apply in their personal or professional lives. Perhaps modeling or demonstration videos with more problem-solving content or videos linked to follow-up exercises would be more effective in this regard. This would give the participants an immediate opportunity to apply what they had just learned, and thus solidify the learning experience.

The most contradictory data discovered in this study involved the videos of the content expert narratives. The majority of the participants were not engaged by these videos and found them to be lengthy, redundant, and unnecessary if the content could be presented in text form. The literature review identified that these videos should have served to motivate and engage the participants (O'Connell, McCarthy & Hall, 2004; Wieling & Hofman, 2010). Participants did note that they enjoyed the variety and experience of the subject matter experts, but not one participant mentioned that the inclusion of the video of the expert made the module feel more personal or engaging. This is puzzling as the inclusion of the experts was intended to make each module feel like it had a unique host, and allow the expert to give their personal opinion on the

topic at hand. Participants indicated that the videos designed for this study did not achieve the "engaging" learning outcome identified by Schwartz and Hartman (2007). Participants suggested that to be more effective and interesting, the content of these videos should be short, serve as a personal introduction, and give a brief perspective on the topic but not serve as a lecture or presentation of material

It is also worth noting that a great deal of time and resources were invested in videoing experts in front of aesthetically pleasing national land marks (such as Parliament Hill, the Rocky Mountains, Signal Hill, skating on the canal in Ottawa; the CN Tower in Toronto) and that these scenes were all in the introductory videos which were not popular. Participants did not seem to appreciate the effort made in this regard. So, when it comes to video, the message and how effectively it is delivered is what is important to learners. Visual aesthetics and backgrounds appeared to be unappreciated in this study. Again it would be interesting to pursue this finding further and inquire why the participants did not find the Canadian backgrounds pedagogically or aesthetically interesting. For example, is it just the case with physicians who are so busy or is this the case in general with online learners? Would participants benefit from and appreciate an inexpensive graphical background equally as a more recognizable landscape? This information could be used to dramatically cut travel and production costs for future modules.

Recommendations

There are numerous recommendations for the future design and delivery of digital videos in pedagogical settings as a result of this study. They include:

- Use personal testimonials and stories that focus on authentic stories and minimize the scripted scenes

- Present problem-solving scenarios involving modeling and demonstrations that link to follow-up exercises and activities where participants can practise and apply the skills that are presented
- Use more point-of-view camera shots (where the narrator is looking into the camera) in order to immerse the participants in the content of the demonstration videos
- Tailor the modeling scenarios to the specific needs of learners and use a "role-playing" format (e.g., a resident's transition into a practising physician, a medical student's first year as a resident physician)
- Keep subject matter expert videos short
- Do not repeat content in the videos that is already available in text
- Create subject matter expert videos to serve as concrete conclusions in which material is summarized in a few key "takeaway points"
- Make the video links visually consistent
- Do not provide access to the same video from multiple locations
- Include all the videos on a final resource page where they can be accessed easily for future reference
- Remember that the message in the video and how effectively it is delivered is valued far more than aesthetics

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Appendix A

Table 2.1

Participants' Responses to the Content Items on the Post-Module Survey for ePhysicianHealth.com (N=63)

	Min[a]	Max	Mode	Mean	SD
1. The videos present ideas and information that are useful for dealing with problems I face in my personal and/or professional life	0	4	3	3.15	0.601
2. The videos present strong links between theory and practice	0	4	3	3.16	0.734
3. The videos display information that was new to me	0	4	3	2.77	0.745

[a]Response options: 0 = not applicable; 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

Table 2.2

Participants' Responses to the Media Items on the Post-Module Survey for ePhysicianHealth.com (N=63)

	Min[a]	Max	Mode	Mean	SD
1. The choice of technological tools facilitate a meaningful learning experience	2	4	3	3.41	0.586
2. The choice of technological tools allow me to learn using my preferred learning style	2	4	3	3.29	0.607
3. The videos present information that engaged me	0	4	3	3.11	0.733
4. The videos include information that stimulates imagination and curiosity	0	4	3	2.92	0.802
5. The videos promote a more meaningful learning experience	0	4	3	3.27	0.756

[a]Response options: 0 = not applicable; 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

Table 2.3

Participants' Responses to the Service Items on the Post-Module Survey for ePhysicianHealth.com (N=63)

	Min[a]	Max	Mode	Mean	SD
1. Website features provide relevant and appropriate use of technology	2	4	3	3.48	0.535
2. Presentation of material utilizes aesthetically pleasing graphics	0	4	4	3.56	0.533

[a]Response options: 0 = not applicable; 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

Table 2.4

Participants' Responses to the Structure Items on the Post-Module Survey for ePhysicianHealth.com (N=63)

	Min[a]	Max	Mode	Mean	SD
1. As a result of the videos I have gained useful new techniques and skills	0	4	3	2.72	0.799
2. As a result of the videos I will apply new knowledge in the workplace	0	4	3	2.75	0.801
3. The videos built my confidence in problem solving	0	4	2	2.60	0.753

[a]Response options: 0 = not applicable; 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

Table 2.5

Participants' Responses to the Outcomes Items on the Post-Module Survey for ePhysicianHealth.com (N=63)

	Min[a]	Max	Mode	Mean	SD
1. The videos encourage reflection	0	4	3	3.32	0.742
2. The videos promote self-awareness	0	4	3	3.39	0.686
3. As a result of viewing the videos I have developed new skills	0	4	3	2.67	0.690
4. As a result of viewing the videos my attitude has changed	0	4	2	2.58	0.700
5. As a result of viewing the videos I will share new knowledge with colleagues	0	4	3	2.82	0.537

[a]Response options: 0 = not applicable; 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree

Appendix B

W(e)Learn Framework