Review

Use of videos to support teaching and learning of clinical skills in nursing education: A review

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ABSTRACT

Information and communications technology is influencing the delivery of education in tertiary institutions. In particular, the increased use of videos for teaching and learning clinical skills in nursing may be a promising direction to pursue, yet we need to better document the current research in this area of inquiry. The aim of this paper was to explore and document the current areas of research into the use of videos to support teaching and learning of clinical skills in nursing education. The four main areas of current and future research are effectiveness, efficiency, usage, and quality of videos as teaching and learning materials. While there is a clear need for additional research in the area, the use of videos seems to be a promising, relevant, and increasingly used instructional strategy that could enhance the quality of clinical skills education.

1. Introduction

Information and communications technology (ICT) is increasingly influencing the delivery of education in tertiary institutions (Arguel and Jamet, 2009; Johnson et al., 2010) and is attractive to contemporary students who have been exposed to technology use from an early age (Duncan et al., 2013; Kelly et al., 2009). In line with the above, there is an accelerating shift towards utilising online, mobile and handheld technology in health education (Hansen, 2011; Koeniger-Donohue, 2008). This may be opening new directions of research especially in health disciplines such as nursing.

Educators and academic developers may use blended learning methods to enhance the acquisition of both cognitive knowledge and practical skills in health disciplines. Nursing education warrants extensive preparation and training for nursing students to acquire competency in clinical skills prior to student exposure to clinical settings (Cardoso et al., 2012; Hibbert et al., 2013). Research shows that nursing students benefit from exposure to simulation situations both when learning basic clinical skills such as cardiovascular haemodynamics and advanced clinical skills that are more complex to obtain like management of pulmonary embolism (Good, 2003). ICT strategies such as video use could

thus assist the development of psychomotor clinical skills (Holland et al., 2013) that are critical for patient care and challenging to teach to students (Lynch et al., 2012). Teaching strategies that include videos provide a visual demonstration of clinical skills in a simulated close to real setting (Cardoso et al., 2012; Hansen, 2011), offering context to the skill (Sowan and Idhail, 2014) and allowing students to experience performance of the skill by linking classroom (face-to-face) learning to clinical practice (Duncan et al., 2013; Holland et al., 2013).

Ensuring high level of competency in clinical skills acquisition may reduce healthcare costs, patient morbidity, and mortality rates and increase patient safety (Hibbert et al., 2013; Holland et al., 2013; Koeniger-Donohue, 2008). In particular, the use of videos for teaching and learning clinical skills in nursing may be a promising direction to pursue, yet we need to better document the current research in this area of inquiry.

The aim of this paper was to explore and document the current areas of research in regards to the use of videos to support teaching and learning of clinical skills in nursing education.

2. Current Areas of Research

Four key directions of research (Fig. 1) have been identified in the literature in regards to the use of videos to support teaching and learning of clinical skills in nursing education. The four directions of research are effectiveness (Cardoso et al., 2012; Hansen, 2011; Hibbert et al., 2013; Holland et al., 2013; Kelly et al., 2009; Lee et al., 2007), efficiency (Arguel and Jamet, 2009), video usage patterns (Chan, 2010;

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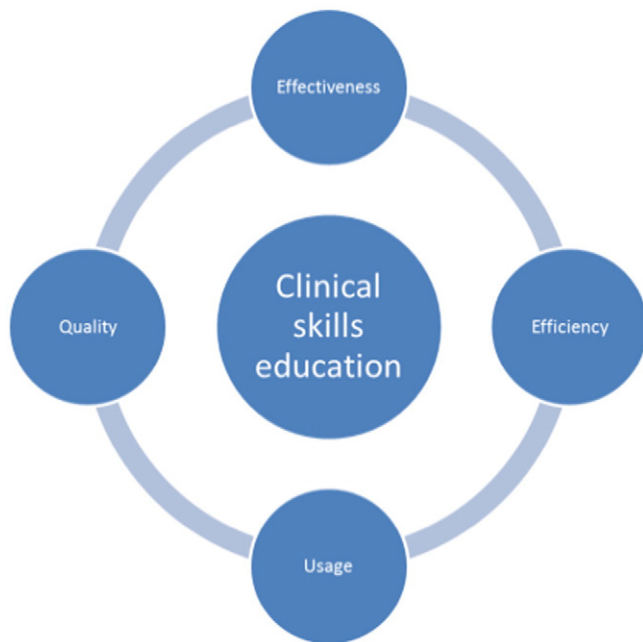ivisser@usc.edu.au (I. Visser).

Fig. 1. Key areas of research for video use for clinical skills education in nursing.

Koeniger-Donohue, 2008), and quality of videos (Clifton and Mann, 2011; Duncan et al., 2013). They are described in more detail below.

2.1. Effectiveness

This category included research projects that focused on the effectiveness of using video as a form of instruction and report videos as an equal or more effective teaching method for advanced clinical skills compared to traditional face-to-face teaching (Cardoso et al., 2012; Hansen, 2011; Hibbert et al., 2013; Holland et al., 2013; Kelly et al., 2009; Lee et al., 2007). Use of videos was reported as effective both in terms of skill acquisition (Cardoso et al., 2012; Hansen, 2011; Hibbert et al., 2013b; Holland et al., 2013; Kelly et al., 2009; Lee et al., 2007) and student satisfaction (Cardoso et al., 2012; Kelly et al., 2009; Lee et al., 2007; McKinney and Page, 2009).

Kelly et al. (2009) tested student knowledge and skill performance in relationship to three nursing skills. This research confirmed that teaching of clinical skills supplemented with online videos was as effective as face-to-face teaching with the added benefit of higher student satisfaction with the learning experience (Kelly et al., 2009). In a similar study focused on the teaching of Puncture and Heparinisation of Totally Implantable Access Ports (PHTIAP) clinical skills using supplementary video materials, Cardoso et al. (2012) reported increased cognitive and procedural knowledge of nursing students, high student satisfaction with teaching experience, and lower anxiety levels.

Multiple studies testing various clinical nursing skills appraised the effectiveness of video instruction as being superior in ensuring performance outcomes, student confidence and satisfaction compared to traditional methods used in nursing education (Hibbert et al., 2013; Holland et al., 2013; Lee et al., 2007). Students perceived videos to be particularly useful as a revision tool and as a good preparation method for practice (Holland et al., 2013), preferring this teaching method for its flexibility, self-management, and repetition (Barratt, 2010; Kelly et al., 2009).

2.2. Efficiency

The cognitive load theory focuses on how the mind processes multimedia information, explaining this variance by drawing on evidence from the two types of human working memory processes (visual and auditory or verbal). Due to limited memory capacity, overload may occur when presented with information that requires processing by the two memory types simultaneously and hinders learning (Homer et al., 2008; Sweller, 2003). One direction in research was the focus on learning efficiency of dynamic video content compared with static images and their combinations to teach and learn procedural content (Arguel and Jamet, 2009; Höffler and Leutner, 2007; Wong et al., 2009). Arguel and Jamet (2009) concluded that videos enabled learners to create a better internal representation of the learning content than static images. However, the literature presents some contradictory evidence regarding efficiency of videos in supporting teaching with variation in results associated with video format and/or content (Höffler and Leutner, 2007; Mayer et al., 2005).

According to the static-media hypothesis, knowledge retention is improved by presentation of static information rather than dynamic media (videos) (Mayer et al., 2005). Improvement in knowledge retention is due to fewer cognitive processes being involved (Homer et al., 2008; Mayer et al., 2005). However, Wong et al. (2009) confirmed that instructional animations consistently ensured superior learning when videos depicted human movement. Wong et al. (2009) hypothesised that human evolution through learning by imitation has led to the development of a separate component of working memory dealing with human compared to mechanical movement, which has contributed to people being able to readily manage video content that shows human performance. This is promising for future development of videos that teach students clinical skills by expert demonstration.

Current research indicates that cognitive load can be managed through the use of appropriate educational design principles. The literature supports a number of video development strategies to reduce cognitive overload, increase learner attention span, and improve learning efficiency. These measures include combining static pictures together with videos (Arguel and Jamet, 2009), using narrations (Homer et al., 2008), annotations (Plass et al., 1998), adding captions (Chan, 2010), chunking information into smaller parts (Chan, 2010; Hasler et al., 2007) or discrete steps (Rieber, 1990), and enabling user control (Hasler et al., 2007; Schwan and Riempp, 2004; Wong et al., 2009). Mayer et al. (2005) concluded that engaging learners by giving them control over sequence and speed of video presentations enables more active processing of information and enables comprehension before proceeding with the video (Schreiber et al., 2010; Wong et al., 2009). Students appreciated the freedom to pause, rewind, and replay videos to accommodate their learning needs (Schreiber et al., 2010).

Regarding video content, multiple authors confirm that videos improve learning outcomes when they are realistic (Alfes, 2008; Höffler and Leutner, 2007) and allow concentration on essential information only (Lowe, 2003). Literature indicates that video resources that are efficient in instigating a feeling of social presence may lead to deeper learning (Homer et al., 2008). Moreno and Mayer (2000) established that multimedia that communicated with the learner directly and informally using narratives from a first-person point of view were more efficient in engaging students cognitively and socially, resulting in increased application of new knowledge. Exploration of how to best utilise social and emotional factors to support cognitive processing of video content may prove to be a relevant direction of research for clinical education (Homer et al., 2008).

2.3. Usage

Chan (2010) studied video usage and student beliefs about video instructions for 'beyond classroom' learning and concluded that videos are preferred by students as learning tools compared to other online learning media. The literature confirms that instructional videos are particularly useful for learning nursing skills, as the videos enable a visual representation of clinical care situations viewed safely in a controlled environment (Cardoso et al., 2012; Williams et al., 2009). Videos contribute to quality nursing care as they enable learners to develop clinical