

Chapter 14

SMART

Stop–Motion Animation and Reviewing Tool

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ABSTRACT

Animation shares many of the educational advantages of digital video production. However, both activities can be time consuming, are non-trivial to implement as whole class activities and there are aspects of the process that are not well scaffolded by currently available software tools. The design, implementation, and evaluation of a mobile learning application called the Stop-Motion Animation and Reviewing Tool (SMART) are described. The application enables users to create animations on a mobile phone and is part of a larger generic suite of open-system software we are developing to facilitate the development of cross platform applications in the area of digital narrative production.

INTRODUCTION

Digital video production can provide many opportunities for learning (Buckingham, 2003; Buckingham, Harvey, & Sefton-Green, 1999; Hofer & Swan, 2005; Kearney & Schuck, 2005; Posner, Baecker, & Homer, 1997; Reid, Burn, & Parker, 2002). Animation is a related, yet simpler, activity that shares many of the educational advantages of digital video production (Madden, Chung, & Dawson, 2008). However, both activities can be time consuming, involve using a diversity of devices

and are non-trivial to implement as whole class activities. This chapter advocates developing a dedicated application for mobile phones that uses the cameras, communications facilities, and ready-at-hand nature of mobile phones to help overcome these problems.

The specific focus of this chapter is the design, implementation, and evaluation of a mobile learning application called the Stop-Motion Animation and Reviewing Tool (SMART). The application enables mobile phone users to create animations using the stop-motion animation technique. SMART adheres to the constructionist, collaborative, contextualized and constructivist approach to developing learning

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applications for mobile devices argued for by (Patten, Arnedillo Sánchez, & Tangney, 2006). SMART allows users to capture images, sequence the images using a filmstrip paradigm, insert title cards, and view the completed movie, all on the mobile phone. From a technical perspective, an XML document represents the animations, which can be transferred to a PC with Bluetooth for further editing by third-party applications if required. SMART is part of a larger generic suite of open-system software, called Mobile Unified Storytelling Environment (MUSE) (P. Byrne, Arnedillo Sánchez, & Tangney, 2008), which we are developing to facilitate the development of cross platform applications in the area of digital narrative production. MUSE includes a middleware that implements a service-oriented architecture, which provides a reliable platform to support collaborative applications on mobile phones, PCs and the internet. MUSE includes several services to support digital narrative production, including services to generate video files from still images and sound. The Digital Narrative Tool (DNT) (Arnedillo-Sánchez, 2008) is a tool, built on MUSE, to support users creating digital narratives. The DNT includes shared workspaces on both the PC and the mobile phones comprising collaborative concept-mapping tools to scaffold the digital narrative process, and a collaborative timeline to edit the digital narrative.

SMART is evaluated according to the framework described by (Sharples, Lonsdale, Meek, Rudman, & Vavoula, 2007), and further expanded on in (Vavoula, 2007; Vavoula & Sharples, 2008), which advocates evaluating mobile learning projects according to three levels of granularity, the micro level (usability), the meso level (educational), and the macro level (organisational). This evaluation will focus on the micro and meso levels from this framework, with the macro level being outside the scope of the research. At the micro level, the question asked is it possible to design an application to allow users to create animations on mobile phones? Further questions examine the

usability and utility of the application. At the meso level the question asked is does the application enable constructionist, collaborative, contextualized and constructivist approaches to learning?

The current trend in mobile and software development is towards generic open-systems that use the service-oriented architecture paradigm. This chapter concludes by acknowledging this trend, and considers the advantages of integrating SMART to use MUSE and interoperate with the DNT.

BACKGROUND

There is a growing body of evidence in the literature that digital video production can facilitate powerful learning experiences. Digital video projects support collaborative learning, problem solving, critical thinking, and creativity, while encouraging development of media literacy, communication, and presentations skills e.g. (Buckingham, 2003; Buckingham et al., 1999; Hofer et al., 2005; Kearney et al., 2005; Posner et al., 1997; Reid et al., 2002; Swain, Sharpe, & Dawson, 2003). Furthermore, digital video presents opportunities for student-centered, inquiry-based projects (Hofer et al., 2005). Digital video production and animation, and more generally moving image media, are familiar even to pre-school children (Marsh & Thompson, 2001) and “learning activities which incorporate them may help to connect school life with the wider world” (Madden et al., 2008) (p. 901).

Animation is an analogous process to digital video production that shares many of the potential educational advantages while being a simpler activity. Collin et al. consider animation a subset of video, of which they recognise three such divisions: live action; animation; and talking heads, e.g. face-to-face video conferencing (Collins, Neville, & Bielaczyc, 2000). The important distinction between live action and animation is that live action records real life events as they occur

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