



Usability assessment of a mobile app for art therapy



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ABSTRACT

Art therapists recently assembled a list of desirable features for an art therapy app. The *Art Therapy Draw!* app includes two of them in its design: a portfolio option, and stronger security. Five art therapists evaluated the app through a System Usability Scale (SUS). The evaluation revealed both positive qualities of the program and areas requiring improvement. Overall, the layout of the app proved easy to navigate and required little knowledge to operate. It offered more security measures than other apps. In addition, the expert users commented that the app would likely be suitable for use with disabled persons or those allergic to conventional art materials. This study marks a step toward instituting design considerations for emerging mobile art therapy.

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Introduction

Over 91% of all adults in the United States own cell phones (Rainie, 2014). A growing percentage of these individuals actively search for healthcare information on their phones. With the advent of smartphone technology, over 100,000 health apps have been developed to address a wide range of medical issues (Kamerow, 2013). Mental health apps constitute a specialized portion of the ever-growing app market. As such, the possibilities for developing and testing these apps are expansive.

In a recent study on app use in the field, art therapists determined a list of desirable features to guide the development of an art therapy app (Choe, 2014). They included (a) a therapist's control over tools, (b) a portfolio option, (c) visual recording of art processes, (d) the integration of mixed media, (e) art analysis, and (f) strong security features. The *Art Therapy Draw!* app in this study addresses the portfolio feature and the need for increased security by incorporating these components into its design. The purpose of this study is to explain the usability evaluation of these features.

It is important to develop an art therapy app for several reasons. For one, art therapists do not currently have an app designed for their needs (Choe, 2014). The development of such apps could lead to potentially useful tools for the field. Other mental health professionals, such as psychologists, are already beginning to use apps in treatment. Studies have revealed that mobile devices used to track

moods reduced overall client stress (Dennis & O'Toole, 2014; Morris et al., 2010). Newly developed apps also provide real-time therapist support, physiological sensors, and mood recorders. The interactive nature of these apps encourages client participation in treatment (Kim, Lin, & Sung, 2013; Morris & Aguilera, 2012). Moreover, with the rising costs of healthcare, the portable and cost-effective implementation of therapy apps extends treatment to individuals with limited access to mental health resources (Donker et al., 2013; Handel, 2011).

Second, the use of digital technology in the art therapy field appears to be following an upward trend (Malchiodi, 2011; Orr, 2012). A growing generation of users has been raised on digital art technology (Choe, 2014; Rosen, 2011). Children as young as 3 years are using iPads, and digital technology is fast becoming a regular part of preschool curriculum (Beschoner & Hutchison, 2013; Falloon, 2013).

Third, with current technological innovations, therapists can explore new ways to produce and interact with art media (Carlton, 2014; Choe, 2014; Malchiodi, 2011; Orr, 2005). Making digital art differs from conventional art in ways yet to be explored. Such exploration is critical to the future of art therapy (Moon, 2010).

There are few studies related to the development of art therapy apps. Most art therapists elect to use drawing apps not indicated for use in art therapy. There is, however, an art therapy-themed mobile app called *Computer Art Therapy* (Malchiodi, 2012). It offers tools for the analysis of the mandala picture, Kinetic Family Drawing (KFD), and free drawings (AAALab, 2014). Another program is the *Engaging Platform for Art Development (ePad)*, which is a touch-screen app for use with mature art therapy clients (Leuty, Boger,

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Hoey, & Mihailidis, 2013). This app detects the client's level of engagement during the art making process enabling clinicians to further individualize art therapy tools.

One of the initial steps in developing an app is to perform a test of usability (Zhang & Adipat, 2005). A usability evaluation is a test of product design and features according to the feedback of specified users (Rebelo & Soares, 2013, p. 106). This is an important but often neglected precondition for assessing the design and efficiency of software applications (Hamborg, Vehse, & Bludau, 2004; Nielsen, 1993). The results of usability evaluations conserve resources and reduce overall system errors in the early stages of app development (Dumas & Redish, 1999; Hamborg et al., 2004).

Overview

Much of this paper outlines the process of app evaluation during development. The first section describes the theoretical framework of the app's development, along with the tools used in its construction. It then reviews the portfolio and security requirements derived from a previous study. The methods section follows. At the core of the methods is the usability scale and its properties. The methods section also describes the questionnaire, the participants, and the usability scale scoring procedure. A discussion of the results and future directions follows.

App features

Theoretical background

The author developed the *Art Therapy Draw!* app through the framework of the first four phases of the Mobile Application Development Lifecycle Model (MADLC, Vithani & Kumar, 2014). The first phase was identifying the need for an app, which resulted from the growing body of literature on art therapy and technology use. The second phase included the initial design. A study on desirable art therapy app qualities by Choe (2014) inspired its design and functionality. The third phase is where the actual coding of the features occurred. The fourth phase included initial testing and feedback from a usability evaluation. The remaining three phases of field testing, deployment, and maintenance depend on an iterative design processes and are the subject of ongoing work.

Development tools

The author funded all of the expenses incurred from developing the app. Programming of the app occurred through an Integrated Development Environment (IDE), which is a program that offers tools for developing mobile software (Niemeyer & Knudsen, 2005). Open source code provided a structural base for the program (Smith, 2013; Yuk, 2013). Programming occurred on an ASUS X75A powered by an Intel Core i3 processor with 4GB of RAM. The app is intended for adults using Android 4.4-based mobile phones who receive drawing-based directives in existing art therapy treatment. An overview of the app and its features are in Fig. 1. Its basic structure includes a linear layout of tools, a drawing area, and color palette. It addresses two of the art therapists' concerns for app design (Choe, 2014): the addition of a portfolio feature, and increased security measures.

Portfolio feature

Many apps used by art therapists lack a folder system where clients can organize their stored artwork. The *Art Therapy Draw!* app features a *save* icon on the top border of the main drawing area. This gives the user the option to save the image to an existing

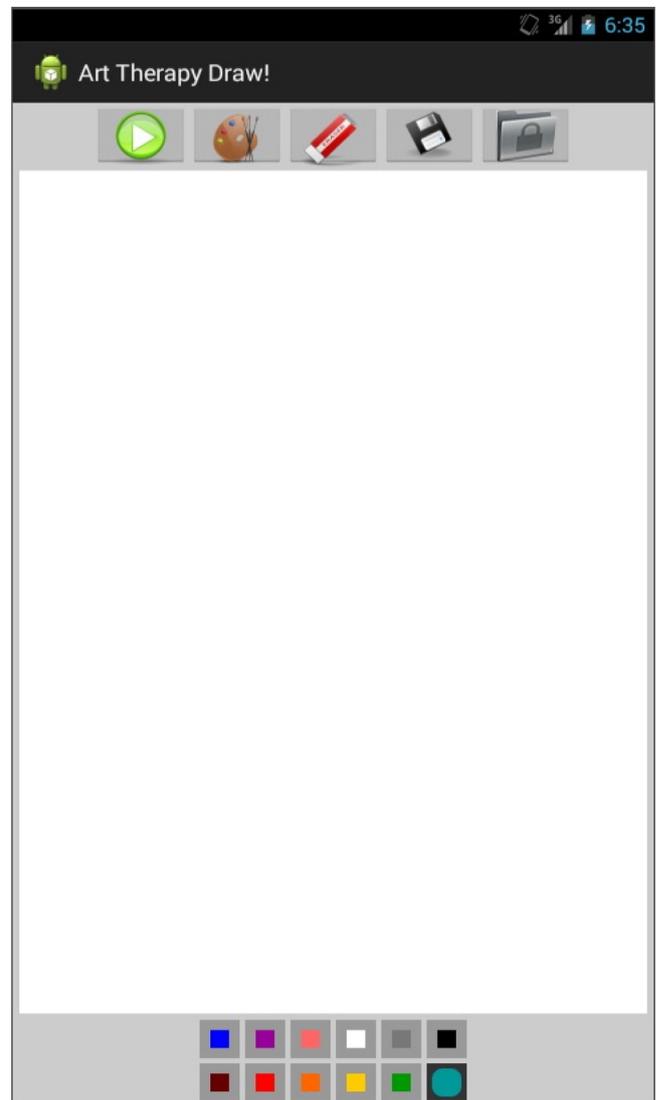


Fig. 1. An overview of the app showing its features.

photo gallery or custom folder within a mobile device. The other tools include an icon for starting a new drawing, choosing a brush size (see Fig. 2), choosing an eraser size, and securely saving an image.

Security measures

Mental health app security in general is a major concern (Luxton, McCann, Bush, Mishkind, & Reger, 2011). The structure of the code within mobile devices are susceptible to malicious programs, such as the Heartbleed bug, which recently invaded mobile devices and made national news headlines (O'Connor, 2014). Art therapists are also concerned about the security and privacy of artwork rendered on mobile devices. Most apps used by art therapists lack a secure folder for stored artwork. In response the requirement for added security, the initial login page of the *Art Therapy Draw!* app allows the client or therapist to set a password up to 14 mixed characters long. This makes it much more difficult for others to hack the password, thereby gaining entry into the app (Bidwell, 2002). After completing a drawing, a client can click on the lock icon, which calls the *ArtLocker* menu (see Fig. 3). Either the client or the therapist can then set another password to the stored image file, rendering the artwork irretrievable to outside users.

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