Technology and Mental Health

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INTRODUCTION

One in four adults, approximately 61.5 million American, experience mental illness in a given year; one in 17, approximately 13.63 million, lives with a serious mental illness (NIMH). Serious mental illness costs America $193.2 billion in lost earnings per year (Insel, 2008). The numbers are staggering. Not all individuals experiencing mental illness, even serious mental illness, receive treatment from professionals, e.g., psychologists, medical doctors, nurse practitioners, social workers (Department of Health and Human Services, 2012). Even though the foregoing mental health professionals may approach the care and treatment of mental illness from different theoretical perspectives, the services they provide fall into four categories: training; therapy; assessment; and prevention. In order to address the demand for services, the shortage of mental health professionals along with their varying theoretical perspectives, the authors of this article posit that technology has and will continue to become an integral part in improving psychological health and, more generally, addressing the mental health needs of society. There is a need, however, for more research and develop, and, in particular, empirical testing to assess and evaluate the use of technology in the delivery of mental health services (Andrews, Joyce, & Bowers, 2010; Mader, Natkin, & Levieux, 2012; Sanchez, Cannon-Bowers, & Bowers, 2010, Sawyer & Smith, 2008). This article seeks to provide an example of how two apparently different disciplines might work together to solve an important problem.

BACKGROUND

Mental health professionals provide services for diverse disorders such as stress and anxiety, which includes post-traumatic stress disorder and phobias, and addiction-based disorders of alcoholism, substance abuse, and gambling. A task force on mental health sponsored by the Department of Defense in June 2007 concluded that the mental health care system of the U.S. military is currently unable to meet the mental health needs of its service members. The task force concluded that military health system lacks the resources and fully trained staff to meet the mental health care needs for troops and their families.

Technology designed specifically for health has proved useful as a complementary form of providing mental health services. Serious games, mobile device applications, and simulations have been recognized for their persuasiveness *via* their ability to deliver engaging empathy-infused content, a key component for mental health services (Andrews, Joyce, & Bowers, 2010, Reid et al., 2012). In addition, serious games are able to extend the accessibility of services and treatment programs, which is not only beneficial for those seeking services, but also for those providing services (Fernández-Aranda et al., 2012; Kocsis et al., 2009). More specifically, serious games for mental health can be a cost-effective method for delivering services. The patient potentially benefits through increased access, reduced stigma associated with seeking mental health services, increased education about the behavioral nature of their problems, and improved data processing during initial patient evaluations. The provider potentially benefits by enhanced dissemination of clinically validated practices to a wide range of audiences (Andrews et al., 2010; Blumberg, Almonte, Anthony, & Hashimoto, 2012; Burns, Durkin, & Nicholas, 2009; Brekinka, 2012; Fernández-Aranda et al., 2012; McDonald, 2010; Shegog, 2010).

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How Do You Integrate Technology and Mental Health?

Research finds self-determination theory and its subset cognitive evaluation theory, provide support for the use of technology in mental health services addressing an individual's need for autonomy, competence, and relatedness (Boyle, Connolly, Hainey, & Boyle, 2012; Deci & Ryan, 1985, 2000; Garris, Ahlers, & Driskell, 2002; Kenny & Gunter, 2007; Ryan & Deci, 2000; Sitzmann, 2011). Technology facilitates a person's learning, in part, because it activates prior learning (using previously learned information to move to higher levels of play), provides goals, proffers immediate feedback in scoring, as well as in visual and auditory stimuli, which allows immediate behavior modification, enhances skills transfer to real life applications, and fosters motivation amongst a majority of learners. Of course, a preeminent advantage of technology and specifically, game-based technology is that it is inherently fun. As previously discussed, technology based platforms designed specifically for mental health prove useful as an alternative form of providing mental health services.

Andrews et al. have identified key design characteristics for serious games in the mental health domain. It is our belief these same principles, which are set forth below, can be applied to other platforms and embedded into the software such as mobile devices and tablets, and embedded into the software development life cycle process for such devices.

1. Instructionally sound serious game concept. Similarly to any training development effort, a serious game concept must be based upon a series of analyses to determine, the training goals, learner characteristics, desired learning outcomes, and assessment strategies. Designing a serious game is a creative process that must be based upon a number of calculated decisions with the ultimate focus on maximizing the learning value.

2. A solid construct of explicit and implicit instructional events and activities that support clearly defined learning objectives. It is important to remember that the learning objectives must be

driving any serious game design effort. Identify your goals before starting the design and development. Unfortunately, there are too many examples of serious games where the learning goals and objectives appear to be more of an afterthought.

3. Use of state-of-the-art gaming technologies to ensure realism and immersion and provide sensory stimuli. With the recent advances in the gaming technology field, serious game developers have endless possibilities for selecting the appropriate technology solution for any training context and budget. It is up to the designers to determine the degree of justified immersion and sensory stimuli. Game modding and machinima remain amongst the most popular techniques to develop quality serious games while keeping development costs low.

4. A robust storyline that is both relevant and engaging. Contextual relevance is the key enabler for learner motivation and engagement. The ability to "hook" the learner from the very beginning is an unwritten guarantee that he or she will follow through the entire instructional treatment. A powerful storyline can also compensate for low-fidelity sensory experience due to its ability to engage the learner on the emotional level to the extent that the visual fidelity may become irrelevant.

5. The "Fun Factor." This ingredient has always been subject to interpretation and divided opinion due to diverse perspectives on what constitutes "fun." Does it relate to learner engagement, competition, use of humor within the game, or other entertainment elements? Our answer would be "all of the above." Effective serious game play must be constructed to engage the learner via creative use of entertainment means, which, if used appropriately, will encourage the learner to make not only a time investment in this game, but also take away the critical nuggets of experience from it.

Why Create a Taxonomy?

We believe technology taxonomy, based upon platforms for mental health needs to be created. We propose taxonomy based on the four categories of mental health services: training; therapy; assessment; prevention. A

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