

Chapter 24

Distance Learning for Students with Special Needs through 3D Virtual Learning

James M. Laffey

University of Missouri, USA

Janine Stichter

University of Missouri, USA

Krista Galyen

University of Missouri, USA

ABSTRACT

iSocial is a 3D Virtual Learning Environment (3D VLE) to develop social competency for students who have been identified with High-Functioning Autism Spectrum Disorders. The motivation for developing a 3D VLE is to improve access to special needs curriculum for students who live in rural or small school districts. The paper first describes a number of innovative features developed to translate a targeted curriculum and to undertake teaching and learning to meet special needs in a 3D Virtual Environment. Secondly the paper describes results from a field test of iSocial at 3 sites with 11 students. The results show promise for improvements in social competence, but also challenges for distance learning delivery of 3D VLE.

INTRODUCTION

A 2005 survey (Hannum, Irvin, Banks & Farmer, 2009) conducted by the National Research Center on Rural Education Support identified distance learning (DL) technology as a key strategy of rural schools to provide a full range of courses and to overcome difficulties in attracting and maintaining qualified teachers. Typically rural and small schools use DL technology to meet the needs of students for courses such as foreign language and advanced credit. However, rural and small schools also are limited in their ability to provide evidence-based programs for students with special needs.

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Our primary objective is to build a distance-based virtual learning program that can improve social competence for youth with an Autism Spectrum Disorder (ASD). The broader goal is to build new knowledge and shape technology so that DL technology can bridge the gap between the high quality evidence-based programs being developed for youth with special needs and the challenges of bringing these programs and high quality specialized teaching to small and rural schools. For learning technology researchers the challenge of translating existing or developing evidence based programs for DL for students with special needs means that we need mechanisms for active and social learning and we need to support specialized teaching and behavioral management practices while addressing constraints of distance, time and available local support.

CONCEPTUAL FRAMEWORK

DL technology has great promise for helping sustain small and rural schools by meeting the needs of students for specialized instruction, but there are a number of barriers to effective use that need to be overcome. A first set of barriers is in the availability of “current” technology. Schools may have lots of computers but their computers are unlikely to meet the processing and graphics requirements of applications such as 3D virtual learning. Additionally the US Department of Education (Gray & Lewis, 2009) noted that while 100% of districts were connected to the Internet only 12% had an ISP connection of T3 or DSL3, and that rural communities are 3 times more likely to have lower performance networks than more urban districts.

A second set of barriers can be characterized as logistical and personnel oriented (Hannum et al., 2009) including difficulty in scheduling courses and lack of personnel with necessary technical training. One of the implications of this second type of barrier is that many of the DL technologies employed to date for small and rural schools are simple forms of information distribution with only minimal social interaction. These forms of DL, such as traditional course management systems and one-way video, typically have high incidents of drop out because students feel isolated or unsupported (Frid, 2001; LaPadula, 2003; Hannum et al, 2009). Work by Rice (2006) and Irvin, Hannum, Farmer, de la Varre & Keane (2009) show a need for more attention to social interaction and the affective domain of DL. The need for attention to affect and social interaction is especially important when addressing students for whom social interaction and relationships are problematic and when effective social interaction is part of the curriculum process and/or objectives. In summary, distance-learning technology such as 3D VLE holds potential for addressing the needs of small and rural schools for specialized instructional interventions, but delivering this type of special needs instruction into schools is a new frontier.

iSocial (Laffey, Schmidt, Galyen, & Stichter, 2012; Laffey et al., 2009) is a 3D Virtual Learning System for school-based implementation of a curriculum in support of social and behavioral outcomes for youth with an ASD. The iSocial intervention is a technological translation of a face-to-face (F2F) curriculum (Social Competence Intervention for Adolescents: SCI-A) with demonstrated efficacy for youth diagnosed with ASD (Stichter, et al., 2010; Schmidt & Stichter, 2012; Schmidt, Stichter, Lierheimer, McGhee, & O'Connor, 2011). iSocial translated the SCI-A curriculum to a 3D VLE to provide access over the Internet to youth who have no or limited access to high quality F2F programs. The SCI-A curriculum follows a cognitive behavioral approach that has proven to be an effective intervention for our target students (Croke, Hendrix & Rachman, 2008; Tse, Strulovitch, Tagalakakis, Meng, & Fombonne, 2007). SCI-A is small group instruction that utilized a trained educator or clinician to deliver a highly

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