

**3D VIRTUAL WORLDS AND LEARNING: AN  
ANALYSIS OF THE IMPACT OF  
DESIGN AFFORDANCES AND LIMITATIONS IN  
ACTIVE WORLDS, BLAXXUN INTERACTIVE, AND  
ONLIVE! TRAVELER;  
AND A STUDY OF THE IMPLEMENTATION OF  
ACTIVE WORLDS FOR FORMAL  
AND INFORMAL EDUCATION**

**DISSERTATION**

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By

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## **Abstract**

Within this decade there has been a proliferation of computer technologies that allow users to communicate and collaborate over time and space. These emerging technologies have had a great and resounding impact on the field of education by not only influencing practices within the classroom, but by expanding and challenging our notions of how we learn. During the past few years, educators have begun to experiment with the use of text-based virtual worlds to both supplement and expand classroom practices. While text-based virtual worlds offer many unique opportunities for collaborative and cooperative learning, they lack the visual opportunities afforded by such technologies as virtual reality. 3D virtual worlds represent an emerging technology that offers the communicative opportunities of text-based virtual worlds, but with a 3D environment that provides a visual representation of space and place for users to interact within. This thesis is a two-part study into the design and implementation of 3D virtual worlds for educational purposes. Part one of this study provides an analysis of the impact of design affordances and limitations of three popular 3D virtual worlds (Active Worlds, blaxxun interactive, and OnLive! Traveler) by addressing the way the user is constructed. This study relied on the use grounded theory methodology to analyze the various design features that serve to construct presence, representation, and

embodiment of users. The findings indicated that although all three 3D virtual worlds had roughly comparable design affordances and limitations, each functions in different ways. In turn, it was revealed that these three worlds provide interesting and different potential as learning environments. Part two of this study is an investigation of how Active Worlds is currently being used for both informal and formal education. The two case studies provided in this investigation are an AW object modeling class offered by Active World University (informal) and an undergraduate business-computing course offered by the University of Colorado–Boulder College of Business (formal). Findings revealed that in both case studies the use of a 3D virtual world provided unique learning opportunities that would be difficult to replicate in a physical classroom. Implications of this study can be applied to the design, practice, and future research of the educational use of 3D virtual worlds.

Dedicated to my parents in  
appreciation of all of their support.

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Interacting in a 3D virtual world is an experience in community and collaboration on all levels. Conducting research into these environments is not a solitary endeavor. It would be impossible for me to list all the individuals who enabled my research, however, I would like to try.

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