

## Chapter 9

# Active Video Games: Potential for Increased Activity, Suggestions for Use, and Guidelines for Implementation

**Barbara Chamberlin**

*New Mexico State University Learning Games  
Lab, USA*

**Rachel R. Gallagher**

*New Mexico State University Learning Games  
Lab, USA*

**Ann Maloney**

*University of Massachusetts Medical School,  
USA*

**Michelle L. Garza**

*New Mexico State University Learning Games  
Lab, USA*

### ABSTRACT

*Concerns over rising obesity rates and increased sedentary lifestyles are fueling interest in ways to increase physical activity, including video games. Videogames that encourage physical activity, called active video games or exergames, have the potential to increase daily physical activity and provide recommended vigorous activity. As a result, they may play an important role in the home, schools, after-school and community programs for contributing to weight loss, social interaction, family goal setting, and academic achievement. Here, the authors review the current state of research on exergames, make recommendations on best uses for implementing them in a variety of settings, and provide examples of how exergames have been used in a variety of settings.*

### INTRODUCTION

Recently, exergames, games that encourage movement and activity, have grown in popularity among many audiences, from consumers using the games at home, to schools and community programs using them to increase physical activ-

ity or program participation. Where some critics encourage limited screen time for youth (Krebs & Jacobson, 2003), it is important to differentiate between traditional sedentary videos game screen time and those games that encourage movement and activity.

Games that encourage both upper and lower limb movement (such as dancing games or games

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that include motion sensors for full-body movement) allow the game player to reach moderate and even vigorous levels of activity and caloric expenditure (Graves, Stratton, Ridgers, & Cable, 2008). Many currently available exergames demonstrate no or only moderate increases in activity levels and provide only light to moderate physical activity, rather than the recommended vigorous activity (Biddiss & Irwin, 2010). Despite the obvious appeal and engaging nature of exergames, like most physical activity interventions, exposure to exergames with no additional personal intervention, encouragement or incentives, is not enough to increase physical activity (Baranowski, 2011). This supports the belief that exergames are not appropriate substitutes for traditional physical activity or the desired panacea that would finally get users of all ages moving and more active. Promising research indicates that, when used as part of a larger program with social interaction and support, exergame use can lead to weight loss and sustainable increases in physical activity (Staiano & Calvert, 2011).

Indeed, much of exergaming support lies in *the potential* of games in this newly emerging field. Research documents which types of games lead to moderate to vigorous activity, and anecdotal evidence speaks to personal weight loss, games as a gateway to other activity, and an increase in behavior in those who are less likely to be active or choose traditional activities. Exergaming advocates have reason to be enthusiastic: exergames provide fun, engaging opportunities for activity that have been used successfully at home, in classrooms, and in after school or community programs. The earliest research in exergames demonstrates increased caloric expenditure over traditional video game play, and the types of activity that lead to moderate and vigorous activity (Baranowski, 2011; Biddiss & Irwin, 2010; L. Graves, G. Stratton, N. Ridgers, & N. Cable, 2008; B. Haddock, S. Siegel, & L. Wilkin, 2010; S. R. Siegel, B. L. Haddock, A. M. Dubois, &

L. D. Wilkin, 2009; L. Silberman, 2009; Wang & Perry, 2006; Warburton et al., 2007).

## BACKGROUND

### History of Exergames

Although many game development companies began creating active games as early as the 1980s, the continued popularity of *Dance Dance Revolution* (DDR), originally an arcade game introduced in 1998, has helped fuel the popularity of other exergames today. The dance game requires players to dance on a large pad, the controller, while following directions on screen to music. Players can increase speed and steps as they improve, and therefore the intensity of their activity, along with their caloric expenditure.

Other game development firms continued to combine the idea of traditional exercise with videogames using non-standard (non-thumb-based) controllers, including those mimicking traditional exercise tools such as a tennis racket or golf club. In 2003, Sony's EyeToy, a camera used with their PlayStation and using players movement to control gameplay, allowed player's bodies to become the controller as they waved their arms and moved their heads to control gameplay.

### Reaching New Audiences with Exergames

Despite advances in active gaming and controllers such as DDR and the Eye Toy, exergames did not reach conventional gaming status in homes until 2007 when Nintendo introduced its revolutionary console, the Wii. This console's wireless hand-held Wiimote controllers employed accelerometers and infrared light to measure swing, distance and movement of the device. Using the Wiimotes, gamers can make more life-like, intuitive movements in game play such as swinging a bat or tennis racket, rolling a ball, punching, dancing and shaking.

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