Interactive Gaming: Changing the Face of Fitness
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It's that time of year again, time for the mile run, pull ups, sit ups — time for fitness testing. Although traditional fitness testing activities remain the most commonly used form of assessment in physical education, questions regarding reliability and validity remain a drawback to continued use. In addition, kids are asking that fitness activities be more fun. Many students dislike taking mile run tests and most do not have a clear understanding of what fitness testing is all about (Hopple & Graham, 1995). With physical inactivity and poor nutritional habits contributing to an unprecedented epidemic of childhood obesity in the United States and around the world, perhaps it is time for a different approach.

Research and experience suggests that traditional fitness exercises are simply—boring to kids. There must be some different, motivating and fun options to physical fitness than the standards in which we as teachers feel trapped to use as assessment methods in our physical education classes. It is time for fitness activities and fitness testing to catch up with today's technologically savvy kids. It is time for physical education to catch up with our technology driven society and create rigorous technology driven physical fitness experiences. It is time for “Exergaming.”

Why Technology Based Physical Activity?
Although technology may seem complex, there is a common simple theme that TV's, iPods, Gameboy, Computers, and Videogames are swiftly bringing to our attention — Screens — and they have taken over our society. And, kids love them. All one has to do is look outside in a neighborhood on any afternoon. Where are the bike riders, the bouncing playground balls, and the pickup football games in the back yard? The streets are quiet but the sun is shining — where are our children? The possibility of finding them watching television, using a computer, or playing video games is extremely high. In fact, 83% of American children between the ages of 8 – 18 have one or more video game consoles such as Sony Playstation, Microsoft Xbox, and Nintendo GameCube (Foehr, Rideout & Roberts, 2005). Eighty-six percent of children also have access to computers at home and 91% of those play video games on their computers (DeBell & Chapman, 2003). Over 248 million computer and video games were sold in 2004 (Entertainment Software Association, 2005), and the amount of the time children spent playing videogames nearly doubled from 1991 to 2003 from 29 to 49 minutes per day (Foehr, Rideout & Roberts, 2005).

The technology revolution has been criticized as being a significant cause of childhood obesity because it has captured the interest of children and has been adapted as a fun lifestyle. Over the past three decades, the prevalence of childhood obesity has tripled, according to the National Center for Health Statistics (Ellis, 2005). Studies show that there is a 50% increase in the prevalence of obesity since the 1960's. According to the National Health and Nutrition Examination Survey, recent data suggests that a third of American children and teens — about 25 million kids — are either overweight or close to becoming so. That is the highest number ever recorded (Hellmich, 2006).

We live in a technology driven society and the current generation, the gamer generation (our children), is undeniably adapting. Electronic games have clearly become the global factory of fantasy among our children. A survey shows an astounding 68.3 percent of gamers who are online buy or download games from the internet (Lindstrom & Seybold, 2003). Forty-five percent of urban gamers worldwide use the internet regularly, and the United States leads the way with the internet penetration of 72.8 percent while 10% of these gamers currently have their own personal web sites (Lindstrom & Seybold, 2003). The total size of the gamer generation is already far greater than that of our previous generation of baby boomers. According to the game industry and census data it is estimated that there are about 90 million in the “gamer generation” over the age of 10 compared to 77 million baby boomers (Beck & Wade, 2004). This is no fad; the gamer generation is not going away. Physical Educators and many parents may want to discourage children from this over abundance of screen time—but the screen is undeniably powerful. How can we as physical educators compete against these sedentary activities?
Why fight this powerful movement? What if there was a way to make sure the time children spend playing on screens was active instead of sedentary? Video games have long been considered an enemy to advocates of children being physically active; however, it is now possible they may join teams to assist one another in this inactivity crisis. A new genre of physical activity called Interactive Fitness brings technology to children in the form of exercise. These technology-based physical activities require participants to use their bodies as the controllers while ultimately increasing the heart rate and burning more calories. The best part of this innovative approach is that kids think these activities are FUN. Interactive fitness is in its infant stages. It continues to grow and develop and may become the predominant fitness activities of the future. Physical Educators need to become aware of this new concept and realize that it may be the appropriate complement to traditional exercise that will motivate our children to become more physically active. Imagine what a physical education class would look like if fitness was approached in a way that allowed children to do what they love, playing video games, while still being motivated to be physically active?

**Exergaming**

Participating in screen-based interactive fitness activities that engage the user in action or role play is called exergaming. Exergaming makes exercise fun by suggesting that children can become more physically active, reduce obesity levels and still play the video games they love. Interactive fitness is not only aligned with our gamer generation, but may also build on the basic fundamentals (muscular strength, muscular endurance, cardiovascular endurance, flexibility, and body composition) that physical educators aim to incorporate daily in their instructional fitness content.

What does interactive fitness and exergaming look like? Imagine yourself racing against a friend on a snowboard down a snowy mountain dodging trees, jumping cliffs, and riding rails; or, maybe you prefer to pedal fast and race your dirt bike through a challenging course full of steep ramps, sharp turns, and dangerous off-road adventures. Others may prefer to test their dancing skills while scoring points for staying on beat while stepping to the tunes of their favorite songs. For a real virtual experience strap on a magic belt that puts you inside the video game. Move quickly and jump high to keep those balls from smashing on the floor or avoid the trap attack by trying to collect as many red dots as possible. New interactive games become available almost on a daily basis. We have listed a few games with descriptions below. It should be noted that in order to make appropriate decisions about adding exergaming to a school physical education program that teachers and school administrators will need to obtain knowledge and understand not only the positive aspects of exergaming but also the limitations of constructing an exergaming facility in their schools. Although the fitness benefits appear to be substantial for students, space can be a challenge as approximately 1500 square feet of permanent space is needed for a 25 station exergaming room. In addition, start-up equipment costs for such a facility can range from $60-70,000. Although these costs are substantial, they are small compared to the over $200 billion dollars spent each year on obesity related medical costs.

- **Cybex Trazer®** is a powerful new experience that dramatically improves muscle and mental agility while adding exciting new dimensions of fun and function to exercise. CYBEX Trazer launches you into an interactive virtual world where reaction times, acceleration, speed, power and balance drive on-screen activities. It’s a unique and entertaining fitness experience. Children will put on a belt that encompasses a small beacon. The beacon is read by the Trazer technology base. Every time the child moves, the object in the screen moves in that same direction. If the child jumps, the figure jumps, etc.

- The motorized iJoy® Board is a balance trainer that simulates riding down slopes, grinding a rail or catching a wave. Subjects will get on and press a button on the infrared wireless remote control and experience the simulated motion of a snowboard, skateboard or surfboard in action.

- **3-kick** is very sturdy, with resilient foam pads that can be struck with shoes, bare feet, open or closed hands. The user strikes the foam pads as lights and tones are randomly activated within them. Points are awarded based on speed!
The Hoggan Sprint Airbounder™ provides a fun, safe and efficient whole-body exercise for children. This revolutionary technology combines the exercise principles of rebounding, jumping, and plyometric training with the laws of physics and gravity to create optimal benefits for the user in a minimal amount of time.

In Dance Dance Revolution, (DDR) a player must move his or her feet to a set pattern, stepping in time to the general rhythm or beat of a song. Users stomp, slide, spin, and dance on the platforms to various dance programs while burning calories and improving cardiovascular endurance.

Panasonic’s new Core Trainer maximizes the strength of the core body’s abdominal, oblique and low back muscles while minimizing joint stress. Employing innovative Counter Balance exercise technology, the new device not only builds core and thigh strength, but helps prevent knee and lower back pain as it burns calories and increases basal metabolism.

X Board is a professional grade boarding simulator that allows you to experience the thrill of snowboarding down a mountain or pulling the best skateboarding tricks. X Board improves balance and coordination, muscular strength and endurance in leg muscles, as well as ankle flexibility and stability.

The Cateye GameBike is a revolutionary plug and play video game controller. The GameBike transforms gaming into a truly interactive experience. Imagine controlling every movement on the screen with your own body movement. Control steering, speed, turns, strategy and more! Play against the computer, or connect additional GameBikes and compete against friends. The GameBike improves muscular strength and endurance in leg muscles and also improves cardiovascular endurance. The faster the player pedals, the faster the object on the screen moves.

Researching the Movement — The XKRKade Fitness Research Lab
Exergaming certainly sounds like an activity children could benefit from. However, it is such a new phenomenon that physical educators know very little about the effects these technology driven activities have on encouraging children to become more physically active. Could exergaming become part of the school physical education curriculum? Could exergaming help to solve the fitness/obesity crisis? Can exergaming improve children’s fitness levels without doing the hated mile run? We really do not know the answer to these questions, but it is time to find out. Look into the future and imagine an XKRKade gaming class in every school in the State of Florida.

To answer these and other questions about exergaming the School of Physical Education & Exercise Science at University of South Florida has created the XKRKade Research Lab. The new lab has been participating in a variety of different research activities since it’s opened in January 2007. Kids and teachers from local schools visit on a weekly basis to participate in research activities.

The main goal for the XKRKade research lab will be for researchers to conduct studies to look at how interactive fitness effects various populations of children physically, cognitively and socially, and if this new approach to physical activity is an appropriate compli-
ment to traditional exercise. Some of the questions that will try to be answered are "Does exergaming, in fact, increase physical activity? Do certain ages benefit more than others? Can children increase fitness test scores by using gaming to become fit? Can Interactive Fitness have an effect on fitness levels of obese children? How can teachers implement Interactive Fitness in the physical education classroom?"

In addition to research, another goal for the USF XRKade research lab is to provide a model for teachers who want to incorporate interactive fitness in the physical education classroom. What are the kinds of curriculums and instructional strategies appropriate for use in the interactive fitness classroom? At this point in time there are more questions than answers.

What will the future look like?
The technology revolution is real and influences the lives of our children on a daily basis. Video games should not be considered the enemy in regards to children's physical fitness. Exergaming may prove not only to be an appropriate compliment to traditional exercise and skill development, but also an answer that our society has been searching for as a possible solution for controlling and helping prevent childhood obesity. XRKade research labs may soon be a standard in all universities to provide the appropriate preparation for beginning teachers to implement active technology in the physical education classroom. These labs may also serve as locations for innovative research and contemporary resources that are desperately needed to help pioneer this new initiative combining video gaming and physical activity. What will physical education classes look like 20 years from now? Better yet, what will they look like five years from now? Interactive Fitness is in its infant stages and is continuing to grow in popularity each day. If physical fitness can be made fun, why wouldn't all physical educators want to incorporate it in their exercise routines?

If technology-based physical activities are starting to make fitness more fun now, just imagine how much fun children will be able to have looking at their television screens in the years to come. For information about the USF XRKade Research Lab log on to http://www.coedu.usf.edu/main/departments/physed/documents/Newsletter1_002.pdf or contact the USF School of Physical Education & Exercise Science at sanders@coedu.usf.edu.

References


What makes exergaming activities so attractive to children?

1. A Fun Factor – Children do not even realize they are exercising. They may be sweating but their smiling faces seem to enjoy it!

2. A Challenge – These activities offer a variety of self-motivating levels that children are able to progress through at their own pace.

3. Motivation – Walk into a room full of interactive fitness activities and you are immediately immersed in an atmosphere full of lights, music, and plenty of action. Children are drawn to this environment.

4. One Size Fits All – Interactive Fitness activities are designed to meet the needs for all ability levels. As we all know, success is essential for children to continue to be physical activity. This is not a problem when children are engaged in these games.

5. Team Sports Anyone – Interactive Fitness fosters a non-competitive environment without a focus on team sports. Children can create the competition level desired at their own discretion.

6. The "Gamer" Generation – We are living in a technology driven society that has ultimately changed every facet of the way we live from the way we think, work, and even the way we exercise. If we can not beat them, why not join them and bring technology-based physical activities to our children.