Motion-based Video Gaming: Fitness, Pedagogy & Technology Support Considerations

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Xbox One MBVG

Xbox Fitness

Kinect Sports Rivals

Zumba Fitness World Party

Just Dance 2014

Fighter Within
Video Gaming Statistics

- 59% of Americans play Video Games:
  - Average Age – 31 years old
  - 48% Female

- 83% of American children between the ages of 8 and 18 have one or more video game console:
  - 49% of these children have one in their own bedroom

- Approximately half of parents or guardians reported that their kid(s) aged 2 to 17 played video games 6 to 16 or more hours per week

(Entertainment Software Association, 2014; Rideout, Roberts, & Foehr, 2005; Riley, 2007; Wilson, Darden, & Meyler, 2010)
Sedentary Gaming
What are Motion-based Video Games (MBVG)?

- Video games that are also a form of exercise that rely on technology that tracks human body movements and reactions.

- Utilize software and motion-sensor cameras, flooring, or an infrared sensor and displays them via an onscreen avatar.

A.K.A.
- Active Video Gaming
- Interactive Video Games
- Exergames

(Jenny, Hushman, & Hushman, 2013)
Energy Expenditure & MBVG
In a study with 8 to 12 year olds it was found that:

- **EE more than doubles** when sedentary screen time is converted to active MBVG screen time

(Lanningham-Foster, Jensen, Foster, et al., 2006)
MBVG & Energy Expenditure (EE)

- MBVG has been shown to produce:
  - Training heart rate levels and caloric expenditure during 30-minute sessions well within the ACSM guidelines for daily physical activity with college students (Siegel, Haddock, Dubois, et al., 2009)
  - EE consistent with moderate-intensity walking with children aged 10 to 13 years (Graf et al., 2009)
MBVG clearly produces greater EE than sedentary gaming and rest, but...

...is considerably lower than authentic versions of the sport or physical activity questioning MBVG as a valid EE substitute

(Daley, 2009)
Origins of MBVG
Dance Dance Revolution (DDR)
Commercial MBVG Systems
• Can also have students wear HRM’s or pedometers to track additional movements
Other forms of MBVG
Interactive Gaming Bikes
Virtual Sport Gaming System: **Xavix**

[Image of the Xavix gaming system and accessories]

http://xavixstore.com/
MBVG: Nintendo Wii
Balance board simulators: Wii Fit Plus
Other Sample Balance Board Simulators

Skigym
Interactive Video Gaming

(WITH NO SCREEN DISPLAYS)
Lightspace Active Gaming Wall
Fit Interactive 3 Kick
Intrinsic Motivation - Hinson’s 5 C’s

1) **Control** - individualized nature in which a child participates in MBVG’s

2) **Challenge** - a necessary aspect of any quality MBVG

3) **Curiosity** and uncertainty about the next MBVG level or entirely new MBVG game aids in keeping a child motivated

(Sheehan & Katz, 2010)
4) **Creativity** and curiosity - how a child plays the game can often be an expression of their personality

5) **Constant feedback** is apparent throughout a MBVG experience

6) Added: *competition*, - underlying premise, choose the difficulty level to ensure experience is rewarding and demanding...success = self-confidence?

(Sheehan & Katz, 2010)
MBVG in K-12
Sample MBVG PE Set-up

Fruit Ninja

Kinect Party
MBVG Rentals

- **Start a c’motion**
  - Led by c’motion staff
  - Aimed at K-12 PE or after-school program
  - 3-day session = $7 per student
  - 4-day session = $8 per student

- **Includes:**
  - Professional Audio/Video System
  - Cobalt Flux (dance) Platforms
  - Digiwalker II Pedometers
  - Exceptional Fitness Software

http://start-a-cmotion.com/
Summary Standpoint

- MBVG’s can be used to supplement a PE program, not replace it!
- May help increase PA
Exergaming Labs
Sample School Exergaming Lab

Exergaming: Improve Academics, Social Development, and Health & Fitness (3:10)

https://www.youtube.com/watch?v=WSRyXqiscow
Sample Exergaming Lab

[Diagram of an exergaming lab with various equipment and signage.

- TRX Training
- Heavy Ball
- Railyard Fitness
- TWall
- Exergame TV
- 3 Kick
- iDance
- Exerbike GS
- Square 3.0

(http://exergamefitness.com/)
“Gamers Corner” at Winthrop University

(NOT JUST FOR MBVG)
MBVG at Winthrop
More Support Considerations

- **Audio** – may need to adjust game system settings, or use wireless headsets
- Can use **digital projectors** – lighting always an issue
- **HDMI to VGA Converters**
- **Security** system for system and games
- Need more **physical space** to play MBVG compared to sedentary games
- **Safety** – PAR-Q questionnaire, breaking monitors with PA
Cons to MBVG in PE

- Children could become even more **dislocated from their natural environment**, avoiding more traditional outdoor sports. Inaccurate feedback.
- Movements not always **biomechanically correct** (not creating skill competencies).
- No **force of implements** provided (e.g., weight of a baseball bat or bowling ball, etc.).
- **Time on Task** (only a few people at a time).
- **Expense** of Equipment.
- Children may become dependent on **extrinsic rewards**.
- Risk of “Busy, Happy, Good” environment (Placek, 1983).
- **Affective** learning may be missing.

(Wilson, et al., 2010; Shoemaker, 2009)
Concerns of adding MBVG in PE

- Why encourage more screen time?
  - (avg. American spends over 40 hours in front of some sort of screen per week)

- Regular physical activity is more beneficial

- Active gaming takes more space

- Possible lack of durability and reliability of the equipment and technology (Expense)
Pros to MBVG

- **MBVG are FUN!**
- Can replace sedentary time for “video gamers”
- Can supplement—not replace—traditional physical activity…
  - in bad weather (i.e., winter)
  - in some unsafe (urban) environments
  - Provide opportunities for activities not easily accessible by some students (e.g., bowling, etc.)
- **Potential for Increased Motivation for PA**
- Differentiated Instruction
- Continuous Concurrent Feedback
- Can assist with Goal Setting in PA

(Wilson, et al., 2010; Shoemaker, 2009)
References


**Photos take from Google Images**
Questions?

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If time... **PE of the Future???

- Technology in Physical Education at Wood Road Elementary (9:53)
  - [https://www.youtube.com/watch?v=8aCfgVS4JsE](https://www.youtube.com/watch?v=8aCfgVS4JsE)