Chapter 6
Using Interactive Video Games to Enhance Physical Activity Among Children

Jennifer L. Rudella and Jennifer V. Butz

Introduction

Currently, children spend an average of seven hours every day on entertainment media including televisions, computers, and other electronic devices (American Academy of Pediatrics, 2015). Specifically, children between the ages of two and eight spend an average of two hours a day with screen media, such as video games (Common Sense Media, 2013). It is recommended that children engage in less than two hours of leisure screen time daily (American Academy of Pediatrics, 2013; National Heart, Lung, and Blood Institute, 2012). Furthermore, children should engage in at least 60 minutes of moderate to vigorous physical activity every day (World Health Organization, 2016). If children do not meet this recommendation, they are at a greater risk for chronic diseases including high blood pressure, high cholesterol, and obesity (Centers for Disease Control and Prevention, 2012). Nonsedentary activities associated with screen time are one way of addressing such concerns. Gaming consoles, such as the Nintendo Wii and Xbox, created a way to help children utilize their use of screen time to be more engaging through physical activity and can now be used in home and school settings.

Interactive video games, referred to as exergames, require physical movement to participate in the game. There are a variety of game play movements such as dancing, aerobics, and virtual personal trainer exercises. Actions are recorded using

J. L. Rudella (✉)
Department of Health Science, Lock Haven University of Pennsylvania, Lock Haven, PA, USA
e-mail: jlr1147@lockhaven.edu

J. V. Butz
Department of Health and Physical Education, Northern Lehigh School District, Slatington, PA, USA
e-mail: jbutz@nlsd.org

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a device that is connected to the video game console which provides individual feedback and scores. Some examples of how physical movements are recognized include a hand held device, dance pads, and cameras but vary based on the game and console. Exergames have been around for over a decade and the history of exergames began as an arcade game.

One of the first exergames, *Dance Dance Revolution*, started out in arcades. The popularity of this game showed that individuals were interested in playing video games that required whole body movement. The transfer of these games into home and school settings seemed expected, but not a first. The hefty price of the consoles made it nearly impossible to incorporate the concept of exergaming anywhere else except arcades. For many, it was not until more affordable versions were created that exergaming became popular outside of arcades, particularly for children.

Children can participate in exergames while increasing enjoyment, motivation, physical activity, gross motor skill ability, and academic performance. Children are motivated because they enjoy participating in the variety of activities exergames provide (Gao, Chen, & Stodden, 2015; Sun, 2012, 2013). The Just Dance series consists of at least 25 songs per game, including popular songs in which children are familiar. The Nintendo *Wii Fit* consists of four categories, such as yoga, and each category offers several activities to select. Furthermore, children are motivated because they can create a personalized avatar (Li, Lwin, & Jung, 2014). These avatars can look like the player or whomever the player wishes their avatar to look like. Interactive video games have the potential to increase heart rate levels up to a moderate to vigorous physical activity workout (Adkins et al., 2013; Gao, Zhang, & Podlog, 2014; George, Rohr, & Byrne, 2016). One study found that children spent more time participating in exergames than physical education (Gao et al., 2015). Even though exergames increase physical activity, children also have the potential to gain motor skill improvement. Recently, a study concluded that early elementary students in Greece experienced object control skill improvement after participating in Xbox Kinect exergames (Vernadakis, Papastergiou, Zetou, & Antoniou, 2015). Children also have health-related fitness and academic performance benefits. Gao (2013) suggested that children's one mile run, math standardized testing, and body mass index scores improved after participating in *Dance Dance Revolution*. In short, when children participate in exergames, they may experience physical and cognitive improvements.

Educators can choose appropriate exergames for their classroom and create a safe environment where students enjoy participating in physical activity. There are an abundance of exergames and gaming consoles at a variety of prices on the market, many of which are more affordable than the initial high prices from a decade ago. Selecting the best game and gaming console can be overwhelming. Once this decision has been made, the next challenge is how to effectively implement exergames and increase physical activity. Specifically, a holistic manner is an

effective methods for implementation to meet objectives (Hong, Tsai, Ho, Hwang, & Wu, 2013). Strategies for creating a safe environment while implementing a holistic approach to exergames need to be considered to meet the needs of the children. It is important to find the exergame or exergames that are suitable for leaners and determine the best practices for an enjoyable experience while meeting classroom objectives.

This chapter explains the benefits of using exergames including enjoyment, motivation, increasing physical activity, and implementation of exergames. The exergames that will be discussed are *Dance Dance Revolution, Nintendo Wii Fit, Just Dance,* and *Zumba*. Each exergame section includes instruction, classroom setup, assessment, and cost. Heart rate monitors and pedometers can be utilized in each of these exergames which will also be presented. By the end of this chapter, educators can make decisions for effective implementation of exergames to increase physical activity within their own setting.

Dance Dance Revolution

Dance Dance Revolution is often thought of as the foundation of exergaming in the physical education setting. This is mainly because of the increased interest in the dance vision that began in the early millennium. The idea of moving the entire body to control a video game was a welcome and refreshing change.

Dance Dance Revolution is a dance-based exergame where the player matches their movements to the arrows on the screen that correspond with the beat of the song. Arrows scroll up the screen so players can see upcoming movements. The player is to perform the arrow movement when the arrow reaches the highlighted part of the screen. Their movements are recorded using a connected mat that calculates if the player not only placed their foot at the correct time but on the correct arrows on the mat. The difficulty levels can be changed according to ability. The beginner versions may simply use two different arrow movements. The more advanced setting uses eight different arrows with some arrows needing to be activated simultaneously. Music varies from songs made specifically for *Dance Dance Revolution*, to that of popular culture, to Disney songs depending of the game version being played. While participating in *Dance Dance Revolution*, children can engage in a moderate to vigorous level of physical activity (Adkins et al., 2013; Gao, Huang, Liu, & Xiong, 2012; Graf, Pratt, Hester, & Short, 2009). Not only do children increase physical activity, but the amount of sedentary screen time significantly decreases (Maloney et al., 2008). *Dance Dance Revolution* is available on the Wii and Wii U systems from Nintendo, Kinect for Xbox 360 and Xbox One, and PlayStation Move for PlayStation 3 and PlayStation 4. There are also computer-based versions as well as television plug and play systems.

Classroom Setup

Most of the arcade version game consoles allow only two dance pads to be connected at once, while several of the home versions allows for up to four dance pads to be connected simultaneously. Since between two to four students can dance at a time, a station format works best for upper elementary students and working in groups provides a more holistic environment (Rudella & Butz, 2015; Hong et al., 2013). Depending on equipment, children can break into groups of four if using the two pad version, and groups no larger than eight for the four pad version. Some students will use the dance pads connected to the console, while the others practice on the unconnected pads. Once the song is over, students on connected dance pads can record their scores and move to the practice pad. If students are too young to record their own scores, adult assistance can be offered as needed. Students on the practice pads will then move to the scoring pads. This activity allows for students to be physically active and engaged while other assessments, such as fitness testing, can be conducted (Rudella & Butz, 2015). This is a great mobile activity that can easily be moved into a classroom or small space. The difficulty level of each song can also be changed to accommodate ability level by choosing settings from "beginner" through "challenge," allowing all students to participate (Rudella & Butz, 2015).

Instruction

Dance Dance Revolution instruction is dependent on the age group. Primary students should begin practicing the rhythm of the dance movements. This can be done by marching and clapping with the beat of a "beginner" level song (Rudella & Butz, 2015). Arrow movements can be explained followed by having children perform a stomp in accordance to the arrows on the screen (Rudella & Butz, 2015). When the students appear to be ready to move forward, they can begin using the dance pad arrows to move along with the song (Rudella & Butz, 2015). Children need to tap the correct arrows on the pad in accordance to the arrows on the screen. With continued practice pads, the difficulty level can be increased as experience and familiarity increases. As children continue to be more comfortable with the dances, students can become the leaders of the class. The leaders will be on the connected dance pads to demonstrate the dance. It is important to be mindful and allow all students the chance to be leaders. Children can lead the song from beginning to end, or they can rotate during the song being sure to pause the game if there is a large class size. The game also incorporates arm movements, however, it is recommended to provide this as a challenge to the students as their coordination is still developing and it may be difficult to focus on their feet and arms simultaneously.

Assessment

Student performance can be assessed by documenting the dance difficulty level, final score, pedometers, and heart rate monitors. These scores could be used as a form of formative and summative assessment. It is important to note that the score given at the end of the dance does not assess student's ability to dance, and therefore, should be used as formative assessment (Rudella & Butz, 2015). Summative assessment can include keeping track of pedometer and heart rate scores as these results are an effective tool for measuring physical activity (Rudella & Butz, 2015). To maintain student interest and motivation, a tournament dance off can be implemented where teams of students compete against others for the highest scores from the game, pedometer, and heart rate monitor. This could be done as a collective team score where the sum of the teammates is the score for the team. Or, it could simply be the person that scores the highest would advance. Teams with higher scores would continue advancing through the tournament with one team being eliminated at the completion of each song. Remind students that it is a friendly competition and reiterate good sportsmanship.

Cost

The game itself averages approximately $20, with the each new dance pad averaging about $30. Used versions of the dance pads can be purchased online. In some cases, additional dance pads need to be purchased to have four players dancing at once. These vary depending on if the home version or arcade versions of the pads are purchased. Practice pads come at an additional cost of $22. Practice pads do not necessarily have to be the costly ones from the manufacturer. They can be anything from old or unattached dance pads to old linoleum samples. New technology allows for an entire class to play the game at once using wireless dance pads. Each pad keeps score and at the end of the song, tops scorers are visually announced. This comes at a cost of $47,850 for a set 24 (US Games, 2016). However, in many situations, this price is not a feasible option without the assistance of grants or outside funding. A big cost saving measure that some schools have utilized involves a *Dance Dance Revolution* PowerPoint. Students would dance on practice pads while a PowerPoint presentation with arrows appear on a screen along with music. This is another cost saving measure but does not keep track of movement and scores like traditional exergames.

Wii Fit

The Nintendo *Wii Fit* consists of a variety of different games and incorporates all five components of health-related fitness; flexibility, body composition, muscular strength, muscular endurance, and cardiovascular endurance. Versions of Wii Fit include *Wii Fit*, *Wii Fit Plus*, *Nickelodeon Fi*t, and *Wii Fit U*. The *Nickelodeon Fit* includes characters children are familiar with including Dora, Diego, Kai-lan and The Backyardigans and consists of 30 exercise games. Children who participate in the *Wii Fit* activities can achieve a moderate intensity level and have positive benefits including an increased heart rate, accelerometer counts, and perceived exertion (Gao et al., 2015; O'Donovan, Roche, & Hussey, 2014; Perron, Graham, Feldman, Moffett, & Hall, 2011). For example, children from Dublin participated in the Nintendo *Wii Fit Free Jogging* activity and achieved a moderate intensity physical activity level (O'Donovan et al., 2014). Yoga, balance games, strength training, and aerobics are the categories to choose from and each includes an array of activities so children can stay motivated. Student enjoyment also increases because of the video game components and variety of activities (Gao et al., 2014). Furthermore, Sheehan and Katz (2012) found that third grade children from Canada improve postural stability when participating in the gymnastics and dance segments of the *Wii Fit* games. Profiles can be created to set goals, test balance, and track progress making it more appealing for assessment and tracking progress. With a variety of *Wii Fit* games, educators can choose the version that best fits their student's age and interests without affecting the positive benefits of exergaming.

A recent Nintendo *Wii Fit* game, called the *Wii Fit Plus,* is an extension of the *Wii Fit* and can be played on the Nintendo Wii console. This game also has a website dedicated to keeping track of the players progress, including routines and trainers, which can be visually documented on a graph using the color coded fit credits (Nintendo, 2015). There are 15 new activities added to train and increase physical activity, including Bird-Eye, Bulls-Eye, and Obstacle Course (Nintendo, 2015). These additional games maintain the interest of children by providing a variety of games in which the player can participate.

The most recent game, *Wii Fit U*, is for the Nintendo Wii U game console and has additional features including a Fit Meter device, Personal Trainer Mode, Virtual Gym Communities, and Dance Category. The Fit Meter device uses an acceleration sensor and atmospheric pressure to more accurately determine and document physical activity progress and calories burned (Ubisoft, 2015c). Each device is designed for up to 12 individual profiles so children can share the device. The Personal Training Mode allows users to customize their routines and get workout recommendations based on goal preferences (Ubisoft, 2015c). The Gym Communities is a social networking site that allows a personal gym and can be shared with other Gym Community members (Ubisoft, 2015c). The Dance Categories include salsa, hip-hop, and jazz dances (Ubisoft, 2015c). Also, children

will be exposed to dances of other cultures, such as salsa, to incorporate a cross-curricular component within the lesson.

The *Wii Fit Plus* has similar options as the *Wii Fit U* include personalized exercise routines while keeping track of calories burned and performance. Recently, a Training Plus mode was added that consists of 15 new activities including obstacle courses, driving range, and island cycling (Ubisoft, 2015a, 2015b, 2015c). These activities provide children with more activity choices to increase motivation and enjoyment. The equipment needed for *Wii Fit* includes a balance board and if using the *Wii Fit U*, the balance board is essential but the Fit Meters are optional. The *Wii Fit* series is exclusively for Nintendo Wii consoles.

Classroom Setup

Since the Nintendo Wii and *Wii Fit* accessories can be costly (further explained in this chapter), one console will most likely be purchased. Therefore, a station format is a more effective classroom setting, as only one person can use the balance board at a time (Rudella & Butz, 2015). Students can be divided into small groups and allow one person to virtually play while the others follow along with the movements on the screen. Students will take turns using the balance board to track their progress, which is at the discretion of the educator. One student will use the balance board and the remaining students follow accordingly. Other stations need to be created to allow the entire class to take turns at the Nintendo *Wii Fit* station. These stations can include fitness-based exercises that utilize the health-related fitness components (Rudella & Btuz, 2015). For example, in a class of 20 students, there will be five groups of four. Stations consist of the Nintendo *Wii Fit* station, upper body exercises, lower body exercises, exercise video for cardiovascular endurance, and stretching exercises. These stations provide the opportunity for each student to utilize all health-related fitness components by the end of class.

Instruction

It is important that students understand how to use the Nintendo *Wii Fit* before using the equipment. First, the educator will explain and demonstrate how to use the *Wii Fit* including the purpose of the game, proper use of the balance board, and how to incorporate the additional purchased accessories, such as the fit meter. Children can get acclimated to the balance board and the game by taking fitness assessments that measure balance, body mass index, and body control that are quick and easy. These tests can be used to determine base levels and students retest periodically, such as every marking period to document improvement. Profiles can be created on the *Wii Fit* by grouping children of similar heights and weights. These students can share

the same profile while the educator helps children keep track of their individual results separately. Children will then follow along to a chosen game, such as a *Nickelodeon Wii Fit* exercise game, while the educator uses the balance board. A simulated balance board can be added for students to use, utilizing equipment of their choice, such as aerobic steps, or they can follow along the game without using any equipment. Learners can begin participating by using lower body movements, and then add arm movements as they get better at the games. While participating in the activities, some of the moves might be difficult. To reduce this difficulty, children can focus on lower body movements. Children who are familiar with the Nintendo *Wii Fit* can volunteer to lead and can be grouped with children who are unfamiliar. By doing this, the classroom environment includes socialization and leadership opportunities.

As students become more familiar participating in the fitness activities, educators can introduce other games. Since each Nintendo *Wii Fit* game can incorporate on one or more of the five components of health-related fitness, children can participate in activities to meet specific objectives. For example, to improve flexibility, children can engage in one of the balance games for *Wii Fit Plus* or to increase cardiovascular endurance, educators can choose dance activities from the *Wii Fit U*. To meet muscular strength objectives, children can participate in the training sessions. Since there are a variety of training sessions to choose from, educators can select the sessions for the children to introduce them to the exercise. As learners become more familar, they can choose the sessions thus increasing motivation. It is important to note that only one balance board is purchased with the *Wii Fit* game which means that only one student can use it at a time. As mentioned earlier, a station format is recommended and it is important to be mindful of time and ensure each student gets an opportunity to use the balance board. Children can take turns during an activity session if there are time constraints, however, the results given at the end of the activity will not be an accurate portrayal of the individual student performance. Therefore, pedometer or heart rate monitors are recommended for individual assessment. When transitioning to the next station, music can be played and children can march or free dance on a poly spot to maintain safe distances to increase activity. Lastly, the educator should be in charge of the controller to increase activity time.

Children may find the *Wii Fit* challenging, as their gross motor skills are continuing to develop. To help children have a positive experience, some of the games need to be modified along with choosing age appropriate activities. Educators should use the controller while children participate in the activities. This allows children to focus on executing the movement rather than quality of the performed movement. First, children can imitate some of the more basic yoga poses from *Wii Fit*. The bridge, half moon, downward facing dog, and palm tree are all great poses that should not require movement modifications. Each pose can take up to five minutes to complete so students should try each pose for around 10 seconds due to short attention spans. Other yoga poses can be performed with some adjustments. The standing knee pose can be modified by having children practice lifting one leg off the ground for approximately one to two seconds. Educators can provide a folded

mat or tumbling wedge to assist children with balance as needed. The chair pose can be modified by having students practice sitting onto an actual chair and return to a standing position. Rather than focusing on balance, children can count the number of times they stand and sit while maintaining balance. Educators can provide a ballet bar or small table for children to hold onto to help balance as well.

The *Wii Fit U* dance segments help children with rhythm and movement while being exposed to many styles of music. The activities introduce a variety of different dances such as hula, jazz, and salsa. Educators should use the controller while children perform the modified dance movements. To introduce children to how the game is played, educators can choose the beginner dance activity. Then, children can either clap or march when introducing new dances. As children become more familiar with the tempo, educators can have them focus on upper or lower body modified movements during each dance at one time, rather than both as the dance requires. For example, children can tap their foot forward for the jazz dance and move their hips side to side for the hula dance. Dancing can be a suitable activity for children of all ages and abilities and *Wii Fit U* dance helps provide a visual of dance movements. Educators can have students focus on upper and lower body movements separately as well. Another modification would be to allow the older children to use the controller while participating in the activity; however, the educator needs to ensure they are well versed in the movements and comfortable with the music tempo. Overall, if a child has difficulty at any time, the educator can go back to the beginner dance activity which is the least challenging setting.

Assessment

When children become exposed to the *Wii Fit* games and balance board, they can participate in the fitness tests for baseline testing and utilize the Personal Training Mode to create goals. When retesting, throughout the school year, these results can be used as formative assessment. Children can be formally graded or the educator can provide informal feedback to help children understand physical activity and how their bodies respond to exercise. The Personal Training mode can be used as a form of assessment by having children set and achieve goals and revise as needed to improve their fitness. However, these goals need to be age-appropriate and realistic which may require educators to take on more of an integral role in this process. Children can be assessed on setting, achieving, and revising goals.

The *Wii Fit* games can be used to keep track of student performance. The *Wii Fit Plus* website has a section called My Wii Fit Plus that customizes and personalizes routines while recording calories and fit credits (Nintendo, 2015). As another form of assessment, children can participate in the *Wii Fit Plus* activities focusing on calorie expenditure. This will also introduce young children to numbers for a cross-curricular lesson. Children will need adult assistance logging in the calories burned for the day. Educators can assign this as an in class activity or homework. If there are large class sizes, it may be time consuming to allow every student to

participate in an activity from start to finish and log scores, therefore, pedometers and heart rate monitors are highly recommended for assessment. Students can keep track of these scores as opposed to the activity scores received in the game. A step by step instruction list is recommended to send home along with the amount of calories the child expended if assigned for homework.

Cost

Cost should be considered when deciding whether to purchase new or used equipment. If purchasing the equipment brand new, the *Wii Fit* and balance board price is around $40 while the *Wii Fit U*, balance board, and Fit Meter is around $55. The Fit Meter costs around $10 each if purchased separated. To decrease this cost, equipment can be purchased on other websites, such as Amazon. The *Wii Fit U* balance board and accessories used equipment rate is around $28. The *Wii Fit Plus* with balance board used equipment price is around $25. The Nintendo Wii used starts at $36 and the Nintendo Wii U costs around $130 used which is significantly more expensive. A more cost-effective approach is for educators to bring their own Nintendo *Wii Fit* equipment from home to use at their discretion. This also allows the educator to preview the effectiveness of that specific product with their students before adding it to their budget to purchase. However, it is recommended that educators be aware their personal equipement may become damaged.

Just Dance

The premise behind the *Just Dance* Series is very similar to that of aerobic dance videos. Currently, games include *Just Dance Disney* and *Just Dance for Kids* with approximately 25 songs per game (Ubisoft Entertainment, 2015a). There are physical and emotional benefits including improvement of motor skills, particularly manual dexterity, achieving moderate to vigorous activity, and increasing motivation and enjoyment (Adkins et al., 2013; Gao et al., 2015; George et al., 2016). To play the game, the player mirrors the choreographed dance movements on the screen produced by the hologram dancer. The exergaming technology embedded in the game is what differentiates it from an instructional video. The gaming system keeps track of the number of occurrences each player performs the movements on cue. Dance level difficulty can also be altered by allowing players to choose their own level of play while moving to the same song. Some dances are group dances, which allow the students to interact with each other while performing a choreographed dance number providing a holistic experience. Songs vary from those in popular culture to songs made specifically for the game. The *Just Dance* series is compatible

with the Wii and Wii U systems from Nintendo, Nintendo Switch, Kinect for Xbox 360 and Xbox One, and PlayStation Move for PlayStation 3 and PlayStation 4.

Classroom Setup

Most platforms allow for a maximum of four players dancing simultaneously. In some cases, such as with the Nintendo and PlayStation systems, players are required to hold a hand held remote. Other systems like the Xbox Kinect do not require hand held controllers, instead the players must be in visual sight of the Xbox Kinect camera. Because only four players can be connected for synced play, a station format is recommended.

It is recommended to begin separating children into groups no larger than eight per group. All students at the station, even those not synced for that song may participate in the dancing. To make this possible, all students at that station need to see the screen so unsynced players can practice the dance moves until it is their turn. Once the song is over, students who were synced can document their score and the next four students can participate. These stations keep students active and engaged during a fitness testing lesson or on a cardiovascular fitness day (Rudella & Butz, 2015).

Instruction

Instruction of the *Just Dance* activities depends on the grade level. For students at the early childhood elementary level, it would be best to start using this activity simply as a warmup to help familiarize children with the concepts (Rudella & Butz, 2015). Have students learn the dance moves in a teacher-directed chunking format (Rudella & Butz, 2015). Students will then dance along with the visual cues on the screen while the educator provides individualized support (Rudella & Butz, 2015). Students will learn how to sync up with the game console, handle the remotes, and select a song. Students can be selected to dance while synced up to the game, while other students practice the moves with their classmates. It is important to ensure proper safety and handling of the controllers and console is thoroughly explained followed by how to sync up, select difficulty levels, and appropriate songs. Once students become more familiar with the use the equipment and participation components of the game, students can volunteer to use the controllers and lead the class (Rudella & Butz, 2015). Students without controllers will dance along with the movements on the screen. Finally, educators need to allow students to select songs which increases enjoyment and ultimately increases physical activity (Rudella & Butz, 2015).

There are a few techniques that can assist in creating a positive dance experience. First, the toddler songs need to be selected in the *Just Dance Kids* series along with

modifying and practicing dance moves. Then, the educator needs to use the controller and participate the dances with the children while demonstrating modifications along with verbal cues. *The Freeze Game* (*Just Dance Kids 2014*) is one great way to introduce children to imitating dance moves which can be followed by *Five Little Monkeys* (*Just Dance Kids 2*). *YMCA* would also be a great introductory dance from *Just Dance Kids 2*. When practicing the dance with children, focus on one to three movements at a time. To modify dance moves, focus on the upper or lower body movements. To keep children interested during the entire length of the dance, which are approximately two to four minutes in length, students can march, clap, or freestyle dance until the practiced dance moves are performed. Educators need to give verbal cues and demonstrate as needed to help children prepare and perform the dance moves. As children become more comfortable, additional dance movements can be added. The older children can use the controller while playing the game once they are comfortable performing the dance moves to the song. *Despicable Me* (*Just Dance Kids 2*) and *Give Your Heart A Break* (*Just Dance Kids 2014*) are popular dances and appropriate for the older children. If a child gets frustrated at any time, have them march, clap, or freestyle dance to the music and practice the corresponding dance moves without the music once again.

Assessment

Assessment can take place in a variety of ways. In the traditional sense, students can document the song, difficulty level and score. An increased difficulty level and higher gameplay score would indicate overall dancing improvement. To help encourage students, a motivational board could be put in place to help the educator note each child's achievement. Children who cannot write can receive a sticker or some type of object that can stick to the motivational board. Table 6.1 is a visual representation of the motivational tool using *Just Dance* scores.

Or, a chart can be created consisting of each student's name and colored stickers can be placed beside their name depending on how they scored. The Xbox 360 version has a "just create" feature which allows the user to create a dance challenge that other players play. This allows for assessment in a different form. By creating a rubric with required components, students can create a dance rhythm and input the created dance into Xbox 360 console Kinect. It is important students are assessed on the created dance and not their ability to follow this dance. Furthermore, the created dance assessment works best in small groups and needs an age-appropriate dance rhythm to increase the chance of success.

Table 6.1 Keeping track of student results using a motivational board

Just Dance Score – A	*Just Dance* Score – B	*Just Dance* Score – C
Students sign names or put stickers here when they score an A.	Students sign names or put stickers here when they score a B.	Students sign names or put stickers here when they score a C.

Cost

The system consoles vary in price based on memory, they range from $169 for the Xbox 4GB version to $240 for Xbox 500GB. Used and refurbished versions could always be purchased online. In some cases, additional accessories need to be purchased to have four players dancing at once. The average cost of the wireless hand held controllers is $34. The Kinect is purchased separately from the Xbox for $164. The games vary depending on the console. For example, the *Just Dance Kids 2* games for PlayStation 3 costs about $35. If these prices are too expensive for the annual budget, educators can use the internet and locate other means to utilize these exergames in their classrooms.

Cost saving measures include an internet search or sharing the equipment with other faculty. For example, YouTube allows free access to some songs including, but not limited to, *Gummy Bear, Despicable Me*, and *Five Little Monkeys (YouTube, 2015)*. This would allow the teacher to see how children respond and become more familiar with implementing the technology. These videos can introduce the *Just Dance* series to increase the amount of students who can participate in the dances at the same time. While educators would lose the exergaming scoring capability, large groups of students could dance along to the videos online. Therefore, heart rate monitors and pedometers can be used to track individual physical activity and as assessment, depending upon the teacher-created objectives. For international students, there are YouTube songs from other countries including *International Love, Loba,* and *Run the Show* available in languages other than English, such as Spanish and French. *Just Dance* has Japan and China exclusive games available to purchase as well. Another cost saving measure would be to purchase one console and exergame or exergames for the district and rotate the materials around every building. This would provide the opportunity for other faculty to try the console and see how the children respond to the games before adding it into their budget. Also, student teachers could borrow the console, with school district permission, for their classrooms.

Just Dance Now App

Just Dance Now app is from the *Just Dance* series and has many advantages to increasing physical activity in the classroom through the use of technology devices. The *Just Dance Now* app offers the *Just Dance* dances but only requires a mobile device, such as a cell phone, and a computer device, such as a laptop. Once the free app is downloaded, users need to open the app on their device and access the website on their computer device (Ubisoft Entertainment, 2015b). The connection of the website with the app is almost instantaneous, thus increasing the amount of time students spend being physically active. Educators can then project the dance from the computer for children to mimic. The app uses a mobile device instead of a controller to

participate in the dances. One of the best features this app has to offer is that it has unlimited players. Therefore, as long as one mobile device has the VIP access, there is no limit to the amount of additional players as long as they have the app downloaded onto their mobile device. Students can play with each other in the classroom or users from all over the world. The connection of multiple players to the dance game is instant as well, which ultimately increases physical activity time. Educators can organize their classrooms throughout the school so students can play with or against other students from fellow classrooms of the same school or even other schools.

Instruction

A few steps can be taken to make the *Just Dance Now* app more effective in their classroom. First, the dances should be projected from the website onto a larger surface, like a smartboard, for optimum viewing. Most school districts have mobile smart boards or projectors that can easily be hooked up with a computer or laptop. Second, the cell phones are the controllers which are not safety attached to the user's wrist. It is important to ensure that children have a firm grip on their cell phones when participating in the dances. It is recommended that educators use the mobile device themselves while the children follow along to create a safer environment as children may struggle keeping the mobile device secure while performing dance movements. However, using a phone arm band may assist in keeping mobile devices secure. Secondly, educators need to make sure students have enough space in the classroom and from each other to safely participate. Poly spots are a great way for students to maintain this space or floor tape can be used to write "X"s. Finally, the app does not include dance level difficulty so educators need to participate in the dances and create a list of songs to match the ability-level of the children. A list can be created in the favorites section of the app to organize and easily access the songs, increasing the amount of time students are physically active. Age appropriate songs for younger children include *Alphabet Song, The Lion Sleeps Tonight,* and *Mary Had A Little Lamb*. *Jingle Bells, Hickory Dickory Dock, I Like to Move It,* and *We Go Well Together* may be more age appropriate for children later in early childhood. The *Just Dance Now* App website contains a list of *Just Dance Kids* songs and explains how some of the moves are performed. Educators can utilize the same methods for teaching dance movements in the *Just Dance* instruction section including modifying dance movements, teaching one to three dance moves at a time, demonstrations, and verbal cues.

Assessment

This app can be used as various forms of assessment. Children are able to sync their scores after each dance to their own health apps. For example, if a student has an iPhone, the app has the option of sending the activity to the health app which tracks

physical activity. This would be an effective form of personal assessment although a barrier to this approach is that it would require the child to have his or her own iPhone. Another form of assessment requires students to wear a pedometer and keep track of the number of steps taken after each song. Children can also wear a heart rate monitor to track heart rate levels from each dance which can be taken before, in the middle, and at the end of the dance to show the different heart rate levels. Children can learn which dances increase their heart rates and begin to understand the concept of exercise intensity. It is important to be aware that even though the dance app gives a score at the end of the dance, it should not be used as a formal assessment because the score does not reflect the user's ability to dance effectively. However, educators can use student scores to increase motivation by having students write their names, or place stickers, on the motivational board for their scores using the same method mentioned in the Just Dance assessment section.

Cost

The *Just Dance Now* app is a less expensive avenue when compared to the cost of purchasing game consoles, such as the Nintendo Wii, and the *Just Dance* games. Downloading the app is free, however, only one free song is available. There are over 300 available songs currently, this number continues to increase with each update of the app. These songs can be purchased "in app", with the option of purchasing access to all songs or purchasing songs individually. The price for VIP access is $29.99 per year which includes all songs without advertisements. If this price is too expensive, a monthly pass can be purchased for $4.99. Another alternative is to purchase the songs for 3 months, which costs $12.99. This price is still less expensive when compared to purchasing a Nintendo Wii console and *Just Dance* games. In order to participate in the dances, the mobile device is synced with a computer device. A computer device is most likely located in every classroom and educators can choose a mobile device to download the app. Therefore, the cost is only for the downloading of a 1 year, 1 month, or 1 week subscription depending upon funding and discretion of the educator. Regardless of which avenue is chosen to purchase the game console and accessories or the app, children can participate in multiple dances to increase physical activity in the classroom.

Zumba

Zumba is a dance workout that has influences from many different cultures and dance styles. *Zumba Fitness* is an exergaming dance series that consists of actual choreographed *Zumba* dances, without needing to attend a face-to-face class. The Latin music can motivate students and larger classes can participate as students do not need equipment to participate (Toscano, Ladda, & Bednarz, 2014). Physical activity level increases to enhance cardiovascular fitness while increasing physical

competence in the practice mode (Martin, Ameluxen-Coleman, & Heinrichs, 2015). Like other traditional exergames, the player follows along with the movement of the hologram on the screen. The system keeps track of the movements that were performed correctly and at the appropriate time. Many of the movements and songs are simular to those included in a traditional *Zumba* class. Difficulty levels for this game cannot be customized. Instead, different songs are rated at different difficulty levels. All players can dance to the same difficulty level assigned to that song. *Zumba Fitness* is available on many consoles including the Wii, Kinect for Xbox 360 and PlayStation Move Motion Controller. There are also iPad versions of the game available.

Classroom Setup

The classroom setup is similar to *Just Dance*. Between two and four players can sync at a time depending on the game console. With *Zumba Fitness*, larger groups could play this game together because of the nature of the dancing. Children can be divided into groups of up to 12. Have students sync to the game while the other students are in a place where they can visually see the screen. After the song is over, children switch positions so another group of students can be synced to the game. Students at other stations could be participating in other cardiovascular activities, such as jogging or jumping rope. Another station idea would consist of students engaging in step aerobics or yoga. This would also work great for fitness assessment activities.

Instruction

Educators need to practice the *Zumba* dances before implementing them in the classroom and slowly introduce the *Zumba* dance moves to children for effective implementation. The educator would first introduce the dance movement combinations to the class. After some practice, the educator would lead the class through the whole dance by connecting segmented movement combinations. Students will then practice dancing along to the song by matching their movements to the images on the screen. This will be completed on the beginner level but at a regular tempo. After children are familiar with the dances, they can take turns leading the class by using the Quick Play option. This allows only one song to be played at a time, rather than having a block of songs play for a specific period of time like during Full Party play. As students improve on the dances, the difficulty level of the song choice can be increased. One way of differentiating instruction is by selecting student leaders to dance at different levels; beginner, intermediate, and advance. Children can then be placed based on their ability level while providing an opportunity for individual instruction as needed. Eventually, children will be able to practice with their other classmates with minimal remediation and enrichment instruction.

Some caution needs used when selecting an appropriate *Zumba* game version for the elementary age group. Not all version of the game are rated "E", which is appropriate rating for students age six and over. *Zumba Fitness: Join the Party, Zumba Fitness: World Party*, and *Zumba Kids* were all awarded the "E" rating. This rating ensures that the music will be age appropriate and dance movement patterns are acceptable for younger students.

Assessment

Student performance based assessment can be done through a variety of assessment means. By simply documenting the child's dance score and difficulty'' level for the selected song, improvement can be monitored. The scores and difficulty levels can also serve as a form of formative and summative assessment for a dance or cardiovascular fitness unit. Improvement of both score and difficulty level would indicate that a student has improved. The learner's dance ability is not formally assessed through the final score given by the game. Teacher or peer assessment through the use of a rubric or checklist could be useful in assessing individual dance ability. This could be done by assessing specific characteristic of dance (e.g. rhythm, flow, movement, and body awareness). Another form of assessment could involve children creating their own dance combinations by utilizing movements that they learned by participating in the *Zumba* activity. This summative assessment could be completed as a group or individually, and would connect the dance movement that were practiced through a virtual means back to reality. Rubrics could be used to help assessment dance combination and allow students to better understand the requirements of the activity.

Cost

The cost of the *Zumba* game itself varies by system and release date of the game. Older versions of the game cost less both in new or used condition. *Zumba Kids*, which is intended for elementary students, costs $9.99. The Wii and PlayStation Move versions of the game includes a hands free belt that allows the dancer to perform movements without keeping ahold of a game controller. This could be a useful tool for children with difficulty or simply allowing them to move more freely. Purchasing additional belts costs $9.99 per belt. An app version of *Zumba* is available for the Apple iOS, Android, and Windows phone. There is a "lite" version of the app, *Zumba Dance*, which is available for $1.99. A full version of the *Zumba Dance* app costs $24.99, which unlocks additional songs and includes full three classes. The app version of *Zumba* requires a smart device, such a tablet or phone, to initiate game play.

Conclusion

Educators need to be patient as they are finding themselves becoming more comfortable with the technology and implementing it into the classroom. It is important to note that it will take time to get acclimated to creating an effective learning environment for optimal exergame implementation. Classroom routines and specific exergaming procedures are extremely important. For example, when students enter the classroom or gymnasium, they are not permitted to use the equipment unless instructed to do so at the beginning of the unit. Then, as the unit progresses, children can immediately begin using the equipment when they enter the area to increase physical activity time. In lieu of being in a classroom at recess, students can participate in exergames in the gymnasium.

Technology is a part of daily life. The new generation of children have been raised, and surround by this ever advancing technology. It is now common place for these technologies to be integrated into educational instruction to engage all learners. The same strategies can apply into the physical education classroom setting. Exergaming systems can be used as a tool to help address academic content standards. These systems can be utilized by all students, regardless of age, size, ability, or fitness level. This is very important when the student population comes from a large variety of backgrounds (socioeconomic, multi-cultural, religious, and different household dynamics). Exergames also appeal to different learning styles by displaying interactive challenges in the form of a projected image. The very visual, technology-based instruction has the potential to change a lot of learner's views and attitudes about being physically active.

As technology continues to evolve, education needs to reform to meet the needs of the learners. The current exergames motivate learners while increasing physical activity in their classroom. By following the recommendations outlined in this chapter, educators can create positive classroom environments where students can enjoy being physically active.

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Dr. Jennifer L. Rudella is currently an Assistant Professor at Lock Haven University of Pennsylvania in the Department of Health Science and has been teaching in higher education for over three years. Her teaching career began in public education where she taught elementary physical education, adapted physical education, high school health education, high school physical education, and lifetime fitness for five years. Research interests include exergames, fitness testing, integrating technology in health and physical education curricula, skills-based health education, and student motivation. Her Pennsylvania licensures include an Instructional II teaching certification in health and physical education and a supervisory certification in curriculum and instruction. She is also a Certified Health Education Specialist from the National Commission for Health Education Credentialing, Incorporated. Dr. Rudella completed her undergraduate degree at Lock Haven University of Pennsylvania in the Health and Physical Education program. Her master's degree in Exercise Science and Health Promotion was acquired from California University of Pennsylvania. Her doctoral degree in Curriculum and Instruction was completed at Indiana University of Pennsylvania.

Ms. Jennifer V. Butz is a health and physical education teacher at Northern Lehigh School district. Research interests include exergames, lifetime fitness, increasing physical activity in children, academic achievement and physical activity, and innovative technology practices in health and physical education. She is certified in health and physical education and currently holds an Instructional II permanent teaching certification from Pennsylvania. She has been teaching elementary health and physical education in the public school setting since 2007. Ms. Butz completed her undergraduate degree at Lock Haven University in the Health and Physical Education program. Her master's degree in Classroom Technology was completed at Wilkes University and she is currently an all but disseration (ABD) doctoral candidate in Curriculum and Instruction at Indiana University of Pennsylvania.