

The Social and Emotional Impact of Videogames in the Classroom:  
A Meta-Synthesis

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### **Abstract**

As videogames become more and more prevalent in today's culture, the effects of gameplay on child development has grown as a concern for parents, educators, and researchers. The aim of this paper is to explore the possible social and emotional impacts of including videogames in the classroom. This paper specifically investigated the impact of videogame play on student self-esteem, social skills, and emotional well-being. This was done through a meta-synthesis of the existing literature on the social and emotional aspects of videogame play. Results indicate that there are likely both positive and negative impacts from gameplay but there is a need for more studies to be done. Research findings were often contradictory and based on data collection instruments that are vulnerable to participant interpretation and therefore less reliable than other methods of collecting data.

## 1. Introduction

### 1.1. Background

Videogames and controversy appear to go hand in hand. Whether it is their place in education or their impact on youth, most issues regarding videogames seem to be polarized. History has demonstrated that videogames, in general, have been met with opposition from the very start and continue to today (Pierson, 2011). While some videogames have grown increasingly violent, others have grown increasingly sophisticated; to the point that some off-the-shelf titles intended for entertainment only, may have a place in the classroom (Shreve, 2005). The history of controversy surrounding videogames, and our culture's preoccupation with the detrimental effects of gameplay, may lead educators to overlook an effective instructional strategy and intervention tool.

Videogames are nothing new to education. They were used in classrooms as early as 1967 with the use of *Logo Programming* (Heick, 2012). While not truly a videogame, it allowed students to create line drawings by moving a turtle icon through the use of coding. *Logo* was the first time interfacing with a computer and programming was presented to students as a "fun" and accessible activity. *Logo* was followed by *Lemonade Stand* (1979) which required players to purchase ingredients, set prices, and run a lemonade stand in search of the greatest profit (Heick, 2012). This was followed by *Snooper Troops* (1982) which focused on employing critical thinking skills to solve crimes (Heick, 2012). *The Oregon Trail* was released for the Apple II in 1985 and required players to make decisions regarding the weather, disease, supplies, and hunting to successfully survive the trip (Heick, 2012). Another title released in 1985 was *Where*

*in the World is Carmen Sandiego?* in which players' knowledge of geography aided in tracking down a master thief (Heick, 2012).

The success of these early games not only demonstrated that videogames held students' attention but revealed their versatility as an instructional tool through their ability to address such a wide variety of curricular content (Heick, 2012). Videogames continue to be developed for the classroom with the ultimate goal of creating games that students find so engaging and fun that they forget they are learning (Shreve, 2005). As far as educational games go, this has yet to happen. This may, in part, be due to the player ability to explore and problem solve that entertainment titles do so well, is often lacking in educational titles. Luckily, entertainment titles have become increasingly sophisticated over time and more accepted as a mainstream form of entertainment. This has led some educators to incorporate off-the-shelf entertainment titles in their classrooms, such as *Wii Sports*, *Guitar Hero*, and *Civilization III* (Blum-Dimaya, Reeve, & Reeve, 2010; Sevlever, 2013; Shreve, 2005).

Though this acceptance of videogames as a mainstream form of entertainment, and effective teaching tool, is far from universal, it has improved dramatically over the years. When video arcades were first gaining popularity in the late 1970's and early 1980's, many people saw these establishments as dens of depravity and sin, much like the pool halls and coin-operated peep shows of the time (Pierson, 2011). Some cities went so far as trying to ban arcades because they were thought to contribute to the delinquency of youth and encourage drug use (Pierson, 2011).

The controversy surrounding videogames continued to build in the 1990's with the release of *Mortal Kombat* and *Night Trap* (O'Holleran, 2010). The unprecedented realism and

brutality of these games resulted in the formation of the Entertainment Software Rating Board (ESRB) which evaluates the content of games and issues an age restriction much like the rating system the Motion Picture Association of America (MPAA) developed for the film industry (O'Holleran, 2010). In 2000, videogame censorship became part of the presidential campaign in the wake of the Columbine shootings (O'Holleran, 2010). Both Eric Harris and Dylan Klebold were avid players of the first-person shooter *Doom*. This raised nationwide concern regarding the effects of violent gameplay on youth. This concern has been perpetuated by titles such as the *Grand Theft Auto* series, which continues to push the limits of morality (O'Holleran, 2010). The question of gameplay's impact on aggression and violence is alive and well, as evidenced by the many research studies being conducted in this area.

Another aspect of videogame play that continues to be debated is addiction. Videogames by design are highly addictive and concerns for videogame abuse have been recognized by the medical community. The *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-V)* has included Internet Gaming Disorder as a condition for further study (American Psychiatric Association, 2013). The APA likens Internet Gaming Disorder to a gambling disorder but makes the distinction that this disorder does not include online gambling games or social media use, but focuses on gaming. The APA also indicates that Internet Gaming Disorder may include non-internet videogame play as well.

Overall, it seems that there is more information available today regarding videogames and their impact on youth. However, as I will discuss, there is a great deal of variability in the reliability and validity of the majority of research studies.

### *1.2. Author's beliefs and experiences*

My interest in videogames in education began in 1985, when I sat down in front of an Apple IIe and played *The Oregon Trail* for the first time. This newly introduced technology brought history to life; digitally at least. It was an exciting time to be a second grader. *The Oregon Trail* was a great motivator, it engaged us, and what I find most interesting looking back is that life on the trail continued beyond the confines of the computer lab. The choices that we made in the game, along with their typically dire consequences, were often the topic of conversation at the lunch table or playground. Through our shared experience, it provided a connection to some classmates that I might not otherwise have had. The trials and tribulations of life on the trail were also something that I was excited to share with my parents. After a few years of *The Oregon Trail* in elementary school, my experience with public education was nearly devoid of videogames. That is, until I became a teacher.

When I accepted a position as a middle school special education teacher, one of the first aspects of my classroom that I wanted to establish was a positive behavior support (PBS) system. To do this effectively, I wanted to utilize a reward system that all of my students would be willing to work towards. The cognitive, academic, and social abilities of this group varied a great deal. The eligibility categories that were represented on my caseload included Specific Learning Disability (SLD), Other Health Impairment (OHI), Multiple Disabilities (MD), Traumatic Brain Injury (TBI), Speech or Language Impairment (SL), and Emotional Disturbance (ED). Although this was such a diverse group, I found that there was a shared interest in videogames and used this as the foundation of my classroom positive behavior support.

At the end of each school week, everyone in my classroom, faculty and support staff included, had the opportunity to play group Wii games that were projected onto a smartboard. My intent on including the adults was to aid in modeling appropriate behavior while playing group games as well as strengthening positive relationships between student and staff. This social aspect of “Wii Friday,” as it became known, was more powerful than I had anticipated. Soon, I had students from three other special education teachers request to be a part of the reward system. There were enough opportunities to address social skills that a speech language pathologist incorporated the group into her service schedule. My students also began inviting typical peers to join in.

As the popularity of Wii Friday grew, it began to incorporate other, non-digital, games such as *Dungeons and Dragons*, which ultimately developed into an after school gaming club. Gaming, both digital and tabletop, was becoming the site at which age-appropriate, positive social interactions were taking place. I was seeing an increase in self-esteem and confidence, an increase in pro-social behavior, and an increase in appropriate communication. Despite seeing such positive growth, I wondered if there was a “dark side” to gaming of which I was unaware. Could the inclusion of gaming in my classroom inadvertently affect the social-emotional well-being of my students in a negative manner? I also questioned the role in which gaming played in the student growth I saw; how much could be attributed to gaming and how much was simply a result of going to great lengths to create a supportive classroom culture?

With this meta-synthesis, I hope to investigate the following research questions:

1. Is there a relationship between videogaming and student self-esteem and/or confidence?

2. Is there a relationship between videogaming and student social skills?

3. Is there a relationship between videogaming and student social-emotional well-being?

### *1.3. The purpose of this meta-synthesis*

This meta-synthesis, which focused on the social and emotional impact of including videogaming in the classroom, had multiple purposes. One purpose was to review journal articles related to student self-esteem and confidence, specifically can gaming make a positive impact on these areas. A second purpose was to review journal articles related to student social skills, specifically can gaming positively impact student ability to appropriately engage in social interactions and increase communication with peers. A third purpose was to review journal articles related to gaming's effect on behavior, specifically can including gaming in the classroom have an inadvertent, negative impact on student social-emotional well-being. A fourth purpose was to classify each article by publication type, to identify the research design, participants, and data sources of each research study, and to summarize the findings of each study. My final purpose in conducting this meta-synthesis was to identify significant themes in these articles and to connect those themes to my own instructional practice as a special education teacher.

## **2. Methods**

### *2.1. Selection criteria*

The 27 journal articles included in this meta-synthesis met the following selection criteria.

1. The articles explored issues related to the impact of video gaming on self-esteem and/or confidence.
2. The articles explored issues related to the impact of video gaming on communication and social skills.
3. The articles explored issues related to the impact of video gaming on the social-emotional well-being of gamers, specifically game addiction and the effects of violent games.
4. The articles were published in peer reviewed journals related to the field of education and psychology.
5. The articles were published between the years 2000 and 2015.

### *2.2. Search procedures*

Database searches and ancestral searches were conducted to locate articles for this meta-synthesis.

#### *2.2.1. Database searches*

I conducted Boolean searches within the Educational Resources Information Center (ERIC, Ebscohost) and PsycINFO using these specific search terms:

1. (“videogame” OR “computer game”) AND (“social skills” OR “self-esteem” OR “adolescents”) AND (“education”).

These database searches yielded a total of 91 articles. Five articles were removed when the publication year of 2000 was used as a limiter resulting in 87 articles. Eight articles were removed as duplicate articles resulting in 79 articles. Five articles were unavailable through interlibrary loan resulting in 74 articles. Two articles were removed due to the need for translation leaving 72 articles. Finally, 51 articles did not meet the selection criteria resulting in 21 articles to be included in this meta-synthesis (Ayas, 2012; Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Blum-Dimaya, Reeve, & Reeve, 2010; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Ceranoglu, 2010; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin, Boyle, Hunter, & Conti-Ramsden, 2013; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Griffiths, 2010; Homer, Hayward, Frye, & Plass, 2012; King, Gradisar, Drummond, Lovato, Wessel, Micic, Douglas, & Delfabbro, 2013; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Miller & Robertson, 2010; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014).

### *2.2.2. Ancestral searches*

An ancestral search involves reviewing the reference lists of previously published works to locate literature relevant to one’s topic of interest (Welch, Brownell, & Sheridan, 1999). I conducted ancestral searches using the reference lists of the previously retrieved articles. These ancestral searches yielded six additional articles that met the selection criteria (Durkin, 2010;

Durkin & Barber, 2002; Ferguson, Gillis, & Sevlever, 2013; Houghton, Milner, West, Douglas, Lawrence, Whiting, K., Tannock, & Durkin, 2004; Lawrence, Houghton, Tannock, Douglas, Durkin, & Whiting, 2002; Ritzhaupt, Poling, Frey, & Johnson, 2014).

### 2.3. *Coding procedures*

I used a coding form to categorize the information presented in each of the 27 articles. This coding form was based on: (a) publication type; (b) research design; (c) participants; (d) data sources; and (e) findings of the studies.

#### 2.3.1. *Publication types*

Each journal article was evaluated and classified according to publication type (e.g., research study, theoretical work, descriptive work, opinion piece/position paper, guide, annotated bibliography, review of the literature). *Research studies* use a formal research design to gather and/or analyze quantitative and/or qualitative data. *Theoretical works* use existing literature to analyze, expand, or further define a specific philosophical and/or theoretical assumption. *Descriptive works* describe phenomena and experiences, but do not disclose particular methods for attaining data. *Opinion pieces/position papers* explain, justify, or recommend a particular course of action based on the author's opinions and/or beliefs. *Guides* give instructions or advice explaining how practitioners might implement a particular agenda. An *annotated bibliography* is a list of cited works on a particular topic, followed by a descriptive paragraph describing, evaluating, or critiquing the source. *Reviews of the literature* critically analyze the published literature on a topic through summary, classification, and comparison.

### 2.3.2. *Research design*

Each empirical study was further classified by research design (i.e., quantitative, qualitative, mixed methods research). *Quantitative* research utilizes numbers to convey information. Instead of numbers, *qualitative* research uses language to explore issues and phenomenon. *Mixed methods* research involves the use of both quantitative and qualitative methods to present information within a single study.

### 2.3.3. *Participants, data sources, and findings*

I identified the participants in each study (e.g., gender, age, disability). I also identified the data sources used in each study (e.g., rating scales, paper and pencil surveys, observation, interviews). Lastly, I summarized the findings of each study (Table 2).

### 2.4. *Data analysis*

I used a modified version of the Stevick-Colaizzi-Keen method previously employed by Duke (2011) and Duke and Ward (2009) to analyze the 27 articles included in this meta-synthesis. Significant statements were first identified within each article. For the purpose of this meta-synthesis, significant statements were identified as statements that addressed issues related to: (a) student self-esteem and/or confidence; (b) gaming's impact on social skills and communication; (c) gaming addiction; and/or (d) the effects of violent gameplay. I then generated a list of non-repetitive, verbatim significant statements with paraphrased formulated meanings. These paraphrased formulated meanings represented my interpretation of each significant statement. Lastly, the formulated meanings from all 27 articles were grouped into theme clusters, represented as emergent themes. These emergent themes represented the fundamental elements of the entire body of literature.

### 3. Results

#### 3.1. Publication type

I located 27 articles that met my selection criteria. The publication type of each article is located in Table 1. Twenty-two of the 27 articles (81.5%) included in this meta-synthesis were research studies (Ayas, 2012; Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Blum-Dimaya, Reeve, & Reeve, 2010; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Ferguson, Gillis, & Sevlever, 2013; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Homer, Hayward, Frye, & Plass, 2012; Houghton, Milner, West, Douglas, Lawrence, Whiting, K., Tannock, & Durkin, 2004; King, Gradisar, Drummond, Lovato, Wessel, Micic, Douglas, & Delfabbro, 2013; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Lawrence, Houghton, Tannock, Douglas, Durkin, & Whiting, 2002; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Miller & Robertson, 2010; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014). Three of the articles (11.1%) were reviews of the literature (Durkin, 2010; Durkin, Boyle, Hunter, & Conti-Ramsden, 2013; Ritzhaupt, Poling, Frey, & Johnson, 2014). One article (3.7%) was a guide (Griffiths, 2010). One article (3.7%) was a position paper (Ceranoglu, 2010).

**Table 1**

<b>Author(s) &amp; Year of Publication</b>	<b>Publication Type</b>
Ayas, 2012	Research Study
Bajovic, 2013	Research Study
Bijvank, Konijn, & Bushman, 2012	Research Study
Brenick, Henning, & Killen, 2007	Research Study
Breuer et al., 2015	Research Study
Blumberg & Altschuler, 2011	Research Study
Blum-Dimaya, Reeve, & Reeve, 2010	Research Study
Ceranoglu, 2010	Position Paper
Chou & Tsai, 2007	Research Study
Drummond & Sauer, 2015	Research Study
Durkin, 2010	Review of the Literature
Durkin & Barber, 2002	Research Study
Durkin, Boyle, Hunter, & Conti-Ramsden, 2013	Review of the Literature
Ferguson, Gillis, & Sevlever, 2013	Research Study
Genile & Gentile, 2008	Research Study
Gentile, Swing, Lim, & Khoo, 2012	Research Study
Griffiths, 2010	Guide
Homer, Hayward, Frye, & Plass, 2012	Research Study
Houghton et al., 2004	Research Study
King et al., 2013	Research Study

Koezuka et al., 2006	Research Study
Lawrence et al., 2002	Research Study
Maass et al., 2011	Research Study
Maras et al., 2015	Research Study
Miller & Robertson, 2010	Research Study
Ritzhaupt, Poling, Frey, & Johnson, 2014	Review of the Literature
Van Rooij et al., 2014	Research Study

### *3.2. Research design, participants, data sources, and findings of the studies*

As previously stated, I located 22 research studies that met my selection criteria (Ayas, 2012; Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Blum-Dimaya, Reeve, & Reeve, 2010; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Ferguson, Gillis, & Sevlever, 2013; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Homer, Hayward, Frye, & Plass, 2012; Houghton, Milner, West, Douglas, Lawrence, Whiting, K., Tannock, & Durkin, 2004; King, Gradisar, Drummond, Lovato, Wessel, Micic, Douglas, & Delfabbro, 2013; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Lawrence, Houghton, Tannock, Douglas, Durkin, & Whiting, 2002; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Miller & Robertson, 2010; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014). The research design, participants, data sources, and findings of each of these studies are identified in Table 2.

**Table 2**

<b>Authors</b>	<b>Research Design</b>	<b>Participants</b>	<b>Data Sources</b>	<b>Findings</b>
Ayas, 2012	Quantitative	365 High School students randomly selected from a pool of 8485 students (189 male, 176 female) in Turkey	Scale for Adolescents' Computer Addiction (Self-reporting Likert scale questionnaire developed by author) and a Shyness Scale (Likert) developed originally by Cheek and Buss (1981)	The study found a positive correlation between computer game addiction and Internet use addiction. It also found a positive correlation between Internet-computer addiction and shyness. These results were not explained in further detail and were not reported with data.
Bajovic, 2013	Quantitative	109 8 <sup>th</sup> grade students (61 male, 48 female, 13-14 years of age)	Media Self-Report Questionnaire Moral Judgment Interview Kaiser Family Foundation Survey Sociomoral Reflection Measure SRM-SF	Results suggest that adolescent gamers who habitually play 3 or more hours of violent videogames a day may demonstrate lower levels of sociomoral maturity. It should be noted that a lower level of sociomoral maturity was not demonstrated in gamers that played 1-3 hours a day or not at all.
Bijvank, Konijn, & Bushman, 2012	Quantitative	830 males (11-17 years of age) chosen to equally represent three	Rating scales and self-reporting questionnaire	Results suggest that males in this age range of lower educational ability prefer to play violent videogames,

		educational ability levels identified in the Dutch school system		stand-alone games vs multiplayer games, identified more with characters from the game, and perceived the games to be more realistic. There was also a connection made between lower levels of educational ability and higher levels of aggressiveness and sensation seeking.
Blumberg & Altschuler, 2011	Qualitative	47 urban fourth, fifth, sixth, and eighth graders representing self-identified frequent video game players (those who play at least three times a week) and infrequent players (those who play twice a week or less)	Questionnaire designed to elicit student approaches to problem-solving during school and during videogame play	The study suggests that students view game playing as a legitimate learning activity on par with academic tasks. It also suggests that students who are identified as frequent players employed trial and error strategies and had deeper insight into their gameplay and strategies than their infrequent playing counterparts. Whether this tendency to use trial and error transfers to academic tasks remains to be determined.
Blum-Dimaya, Reeve, & Reeve, 2010	Quantitative	4 participants (3 male, 1 female), ages 11-12, with Autism diagnosis,	Observer-recorded data measuring schedule completion, on-task behavior, and social validity	The study demonstrated that the methods used were an effective approach to teaching children with Autism an age-

		attending private school for children with Autism.	(Likert-type scale); % accuracy data measured by game system	appropriate leisure skill, playing the video game <i>Guitar Hero</i> , which was able to be generalized to the home setting. Results of the social validity testing suggest that the children appeared to be engaged with the game as their peers would be.
Brenick, Henning, & Killen, 2007	Quantitative	87 students (41 male, 46 female), 19 years of age, in their first or second year at a large, public, mid-Atlantic university	Social Reasoning About Video Games Interview and a Video Games Survey	The study suggests that male and female participants evaluate stereotypes in video games differently. "Individuals who play video games with high frequency, particularly males, were more likely to condone negative stereotypic images, to be less critical of negative images, and to view that game content should not change than were individuals who play video games with low frequency."
Breuer et al., 2015	Quantitative	824 self-identified videogame players age 14 and older (464 male, 360 female) in Germany selected from an original	Three-wave, 3-year, longitudinal panel study using Likert scales measuring videogame use and the German translation of the sex-role orientation scale	"Although the findings from the present study are certainly not conclusive, the absence of any longitudinal links between videogame use and sexist attitudes at least suggests two things. First, similar to what

		survey of 50,012 individuals	by Brogan and Kutner	has been suggested for aggression, it is likely that there are factors, such as personal experience and family and peer influences, that affect the development, proliferation, prevention, or reduction of sexist attitudes more strongly than (fictional) media content. Second, general and broad cultivation effects of videogames are somewhat unlikely, as players differ in the games they play, and the interactivity of the medium also causes the experience of the same game to differ between players.”
Chou & Tsai, 2007	Quantitative	535 participants (372 male, 163 female), 15-18 years of age, self-identified as video game players, from Taiwan	1150 paper-and-pencil questionnaires, Likert-type scales used, 535 identified as usable for this study	As hypothesized, male and female participants were shown to play video games for different amounts of time, enjoy different aspects of video games, and play video games for different reason. The one commonality was that both groups felt that playing video games significantly improved their relationships with

				friends.
Drummond & Sauer, 2015	Quantitative	193,000 students across 23 countries, 15 years in age	Re-analyzed subset data from 2009 Programme of International Student Assessment of participants who reported single player videogame use (section of questionnaire rating metamemory and metacognitive strategies)	Students who played videogames on a daily basis had slightly lower metamemory and metacognitive summarizing scores. Scores were lower for students who participated in online multiplayer games. However, there was no significant difference in academic performance. Mechanism at work is unclear and many variables not controlled for. More research in this area is suggested.
Durkin & Barber, 2002	Quantitative	1304 participants in 10 <sup>th</sup> grade (approx. 16 years of age) 10 predominantly white middle- and lower-middle-class school districts in Southeastern Michigan	Data from Wave 5 of the Michigan Study of Adolescent Life Transitions (MSALT) obtained through self-reporting questionnaire and school record data	No evidence of negative outcomes among students who played videogames. In fact, game players scored more favorably on measures of family closeness, activity involvement, positive school engagement, positive mental health, substance use, self-concept, friendship network, and disobedience to parents. (data is 28 years old though)
Ferguson, Gillis, &	Quantitative	7 males between the	Data collected for the occurrence or	Participants showed a significant

Sevlever, 2013		ages 7 and 11, middle-class Caucasian students enrolled in mainstream classrooms in public school (6 with diagnosis of ASD, 1 ADHD)	nonoccurrence of targeted skills for each trial. Data was then consolidated by computing a percentage.	improvement in the targeted social skills and the targeted skills generalized from <i>Wii</i> baseball to outdoor <i>Wiffle Ball</i> . Results support the viability of videogames as an intervention tool for teaching social skills.
Gentile & Gentile, 2008	Quantitative	430 (7-11 years of age), 607 (14 years of age), 1441 (19 years of age) from Minnesota schools	Violent Video Game Exposure questionnaire, Cook & Medley Hostility Scale, Buss–Perry Aggression Questionnaire, Social Interaction Survey (all Likert-type)	Study suggests that students who play multiple violent video games are more likely to learn aggressive cognitions and behaviors than those who play fewer and students who play violent video games more frequently across time are more likely to learn aggressive cognitions and behaviors than those who play the same types of games for equivalent amounts of time but less frequently.
Gentile, Swing, Lim, & Khoo, 2012	Quantitative	3,034 students from 12 different schools in Singapore, ages 8–17	Questionnaires completed in 3 waves (each 1 year apart): Likert-type scale for video game use, Current ADHD Symptoms Scale	Study suggests a positive correlation between amount of videogame play and decreased ability to control attention and impulsiveness. Total time playing was

			Self-Report, and Barratt Impulsiveness Scale-11, all Likert-type.	greatest predictor of attention problems/impulsiveness supporting displacement over excitement hypothesis. Study also claims bidirectional causality between attention/impulse control problems and increase in videogame play.
Homer et al., 2012	Quantitative	213 students (56% male, 44% female), ages 10-15, from urban schools in the northeastern part of the U.S.	2 Surveys: Demographics, Attitudes and Player Activity (DAPA) and the BASC-II Self-Report of Personality (SRP)	Study suggests that participants spend considerable time playing video games (average = 4–6 h/day), significant gender differences in playing time and game type preference, playing video games is not associated with negative psychological adjustment, girls who play first-person shooters have positive feelings about themselves, boys who play MMORPGs have decreased internalizing difficulties like depression and anxiety. (Funded by Microsoft)
Houghton et al., 2004	Quantitative	98 males between the ages of 6 years 3 months and	Data collected using event-related coding	The control group outperformed the ADHD group when there were no distractions or

		16 years 1 month (49 diagnosed ADHD, 49 free of any diagnosis) all with Verbal IQ scores of 80 or above measured by the WISC-III	sheets	working memory load. However, participants with ADHD and the control group performed nearly identically on the video game tasks that required additional working memory and had the most complex motor sequencing. This is contrary to the general clinical perception of ADHD and suggests that clinical measures of these traits may need to be revised.
King et al., 2013	Mixed Methods	17 males ages 15-17, from Australia	Polysomnography-measured sleep and heart rate and self-report on sleep quality	150 minutes of gameplay (vs. 50 minutes of gameplay) prior to normal bedtime resulted in decreased sleep efficiency, total sleep time, reduction in REM sleep, and reduction in self-reported sleep quality. Study suggests that repeated gameplay may lead to the cognitive deficits associated chronic sleep reduction.
Koezuka et al., 2006	Quantitative	7982 students (4034 males, 3948 females) across Canada (mean age:	Leisure time and physical activity questionnaires and secondary data analysis of the 2000–2001	Television viewing was significantly associated with physical inactivity for both males and females. However, computer usage was

		15.61 years)	Canadian Community Health Survey (CCHS cycle 1.1)	associated with physical activity among males, and reading was associated with physical activity among females.
Lawrence et al., 2002	Quantitative	114 males between the ages of 6 and 12 (57 diagnosed with ADHD, 57 free of any diagnosis)	Data collected using event-related coding sheets	In the videogame context, the ADHD group exhibited no deficits in behavioral inhibition, but deficits in nonverbal working memory and motor control, compared to the control group. The opposite happened at the zoo; deficits in behavioral inhibition but none in working memory or motor control.
Maass et al., 2011	Quantitative	83 female and 94 male students with a mean age of 17.6 years	Memory tested using recall of 18 words and 18 images presented prior to gameplay and 10 screenshot images of actual gameplay. Physiological measures included heart rate, alpha-amylase and cortisol levels from saliva sample	Results suggest playing or watching violent video games has a negative short-term impact on the ability to recall information presented just prior to gameplay. Non-violent gameplay had little effect. The study did not reveal the mechanisms at play that caused this result and further research is suggested.
Maras et al.,	Quantitative	2482 students (1048 male,	Self-report questionnaires and	Study suggests that time spent engaging in

2015		1434 female), with a mean age of 14.10 years	data from the survey Research on Eating and Adolescent Lifestyles ( <i>REAL</i> ) – school participation rate of 34% and student rate of 45%	sedentary screen-based activities was significantly associated with severity of depression and anxiety. Videogame playing and computer use were significantly associated with depressive symptoms, while only videogaming was significantly associated with anxiety.
Miller & Robertson, 2010	Quantitative	71 primary school children (10–11 years of age)	Pre-Post measure of computation (100-item test) and Burnett Self Scale	The use of an off-the-shelf brain training videogame appears to have improved the speed and accuracy of math computation and increased global self-esteem among the users.
Van Rooij et al., 2014	Quantitative	8,478 adolescents	Paper and pencil survey and Videogame Addiction Test (VAT)	There are some weak indications that online gaming is associated with decreased depressive mood and improved self-esteem. Online gamers are more likely to present behaviors associated with problematic video gaming (PVG) but these behaviors co-occur with other problematic behaviors such as substance abuse and decreased psychosocial

				functioning. PVG might be a manifestation of an underlying issue.
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### 3.2.1. Research design

Twenty of the 22 studies (91%) used a quantitative research design (Ayas, 2012; Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blum-Dimaya, Reeve, & Reeve, 2010; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Ferguson, Gillis, & Sevlever, 2013; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Homer, Hayward, Frye, & Plass, 2012; Houghton, Milner, West, Douglas, Lawrence, Whiting, K., Tannock, & Durkin, 2004; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Lawrence, Houghton, Tannock, Douglas, Durkin, & Whiting, 2002; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Miller & Robertson, 2010; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014). One of the studies (4.5%) used a qualitative research design (Blumberg & Altschuler, 2011). One of the studies (4.5%) used a mixed methods research design (King et al., 2013).

### 3.2.2. Participants and data sources

The majority of the 22 research studies included in this meta-synthesis analyzed data from students who were not specifically identified as having a disability. Eighteen of the 22 research studies (81.8%) did not specifically identify subjects as having a disability (Ayas, 2012;

Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Homer, Hayward, Frye, & Plass, 2012; King, Gradisar, Drummond, Lovato, Wessel, Micic, Douglas, & Delfabbro, 2013; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Miller & Robertson, 2010; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014). The remaining four studies (18.2%) clearly identified the subjects as having a disability (Blum-Dimaya, Reeve, & Reeve, 2010; Ferguson, Gillis, & Sevlever, 2013; Houghton et al., 2004; Lawrence et al., 2002). Two of the studies (9.1%) included subjects who have a medical diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) (Houghton et al., 2004; Lawrence et al., 2002). One of the studies (4.5%) included participants with a medical diagnosis of Autism Spectrum Disorder (ASD) (Blum-Dimaya, Reeve, & Reeve, 2010). One of the studies (4.5%) included participants with a medical diagnosis of either ADHD or ASD (Ferguson, Gillis, & Sevlever, 2013).

Surveys and interviews provided the bulk of the data sources used in the research studies. Eighteen of the 22 research articles (81.8%) included some type of survey or interview as a data source (Ayas, 2012; Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Blum-Dimaya, Reeve, & Reeve, 2010; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Homer, Hayward, Frye, & Plass, 2012; King, Gradisar, Drummond, Lovato, Wessel, Micic, Douglas, & Delfabbro, 2013; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Maras, Flament, Murray,

Buchholz, Henderson, Odeid, & Goldfield, 2015; Miller & Robertson, 2010; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014).

Fifteen of the studies (68.2%) relied solely on surveys and interviews (Ayas, 2012; Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Brenick, Henning, & Killen, 2007; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012; Homer, Hayward, Frye, & Plass, 2012; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014).

Of those 15 studies relying on interviews and surveys, five (22.7%) specifically identified the data collection instrument as a Likert-type scale (Ayas, 2012; Breuer, Kowert, Festl, & Quandt, 2015; Chou & Tsai, 2007; Gentile & Gentile, 2008; Gentile, Swing, Lim, & Khoo, 2012) while the remaining ten studies relying on interviews and surveys (45.5%) did not specifically identify the scales used as a Likert-type (Bajovic, 2013; Bijvank, Konijn, & Bushman, 2012; Blumberg & Altschuler, 2011; Brenick, Henning, & Killen, 2007; Drummond & Sauer, 2015; Durkin & Barber, 2002; Homer, Hayward, Frye, & Plass, 2012; ; Koezuka, Koo, Allison, Adlaf, Dwyer, Faulkner, & Goodman, 2006; Maras, Flament, Murray, Buchholz, Henderson, Odeid, & Goldfield, 2015; Van Rooij, Kuss, Griffiths, Shorter, Schoenmakers, & Van de Mheen, 2014).

Of the 22 research studies included in this meta-synthesis, only seven (31.8%) included data on observable and measurable aspects of videogame play (Blum-Dimaya, Reeve, & Reeve, 2010; Ferguson, Gillis, & Sevlever, 2013; Houghton et al., 2004; King et al., 2013; Lawrence et

al., 2002; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011; Miller & Robertson, 2010). Three of these studies (13.6%) included surveys and interviews as a data source in addition to the observable measures (Blum-Dimaya, Reeve, & Reeve, 2010; King et al., 2013; Miller & Robertson, 2010). Only four of the studies (18.2%) relied solely on observable and measurable aspects of videogame play (Ferguson, Gillis, & Sevlever, 2013; Houghton, Milner, West, Douglas, Lawrence, Whiting, K., Tannock, & Durkin, 2004; Lawrence, Houghton, Tannock, Douglas, Durkin, & Whiting, 2002; Maass, Kollhorster, Riediger, MacDonald, & Lohaus, 2011).

### *3.2.3. Findings of the studies*

The findings of the 22 research studies included in this meta-synthesis can be summarized as follows.

1. The findings of the research studies are quite contradictory. This is evidenced when comparing the findings listed under numbers 2 and 3 of this section. This is an indication that the findings from the research studies included in this meta-synthesis, and research on this subject in general, should to be viewed through a cautious and critical lens.

2. Engaging in videogame play may have a positive impact on many aspects of student development. Studies suggest positive correlations between videogame play and increased measures of family closeness, academic performance, engagement in school activities and clubs, positive mental health, quality of friendships, physical activity, self-esteem, and a decrease in substance use. Some studies suggest no correlation exists between videogame play and sexist attitudes among both males and females. It has been suggested that there is a positive correlation to an increase in the ability to control attention and impulsive behavior, specifically in students

diagnosed with ADHD. It has also been suggested that there is a positive correlation to a decrease in internalizing difficulties such as depression and anxiety.

3. Engaging in videogame play may have a negative impact on many aspects of student development. Studies suggest positive correlations between videogame play and increased measures of aggressive behavior, substance use, acceptance of stereotypic images and sexist attitudes, and decreased measures of metamemory and metacognition, “sociomoral” maturity, short-term memory, and the quality and quantity of sleep. It has been suggested that there is a positive correlation to a decrease in the ability to control attention and impulsive behavior, specifically in students diagnosed with ADHD. It has also been suggested that there is a positive correlation to an increase in internalizing difficulties such as depression and anxiety.

4. Videogames are pervasive in today’s youth culture. Findings suggest as many as 99% of primary and secondary students have played videogames on a computer, game console, or phone at least once, with as many as 75% playing on a weekly basis. Weekly players are both male and female, though males tend to play more frequently and for longer periods of time. Weekly players tend to value videogame play as an authentic learning experience, as worthy of their attention as traditional academics.

5. Videogames have been an effective intervention tool to teach social skills and is a leisure activity that may improve the quality of life for students with exceptional needs. The social skills learned through videogame play appear to have a high probability of generalization to multiple settings, like a peer’s home, and have been shown to generalize from the digital realm to the physical. For example, the social and physical skills learned by playing baseball using *Wii Sports* generalized to physically playing *Wiffle Ball* on a field. In addition, playing videogames is

an activity that many students with exceptional needs can participate on a level commensurate with peers.

6. There are qualities of videogames that are highly addictive by design, like frequent rewards on an unpredictable schedule, that present an opportunity to develop an addiction very similar to a gambling addiction. Research indicates that developing a true addiction to videogames, which would require physical withdrawal symptoms to meet the definition of addiction, is very rare, as is a true gambling addiction. However, problematic videogame play, which negatively impacts other aspects of a person's life, occurs in roughly the same percentage of the population as does problematic gambling.

7. An unexpected finding is in the research methods themselves. The majority of the research studies (81.8%) utilized surveys and interviews as the primary data source; 68.2% relied entirely on this method. Only 18.2% of the studies relied solely on observable and measurable aspects of videogame play. In addition, only 18.2% of the studies included participants who have an identified disability.

### *3.3. Emergent themes*

Five themes emerged from my analysis of the 27 articles included in this meta-synthesis. These emergent themes, or theme clusters, include: (a) questionable intent and validity of research; (b) positive impact on social interaction; (c) transfer of skills; (d) becoming an accepted leisure activity; and (e) meeting psychological needs. These five theme clusters and their formulated meanings are represented in Table 3.

**Table 3**

<b>Theme Clusters</b>	<b>Formulated Meanings</b>
<b>Questionable Intent and Validity of Research</b>	<ul style="list-style-type: none"> <li>• Excessive computer and internet use has a negative effect on students' psychological, physical, and academic success.</li> <li>• There is a positive correlation between the amount internet use and measured levels of "shyness."</li> <li>• There is a positive correlation between computer addiction and measured levels of "shyness."</li> <li>• Students who spend a significant amount of time watching violence represented in television or movies are more likely to exhibit aggressive behaviors and use less advanced moral reasoning skills.</li> <li>• Violence in videogames is not only presented as acceptable but often justified and rewarded.</li> <li>• Empathy and attitudes towards violence are key components in moral reasoning that may be negatively impacted through desensitization to violence through overexposure in videogame play.</li> <li>• A negative correlation has been found between violent videogame play and student's perspective-taking and ability to sympathize.</li> <li>• Immersion in violent videogame play may replace the typical process of moral reasoning with scripts for aggression.</li> <li>• Students playing 3 or more hours every day demonstrated lower sociomoral maturity.</li> <li>• Time in the virtual world is time away from the real life positive social experiences that develop a positive sense of what is right and wrong.</li> <li>• Playing violent videogames is a risk factor for aggression.</li> <li>• Students with lower cognitive functioning are more attracted to violent videogame content than higher functioning peers.</li> <li>• Students with lower cognitive functioning are more likely to identify with videogame characters and find the games more realistic than higher functioning peers.</li> <li>• Students with lower cognitive functioning may be especially at-risk for the effects of violent videogame content.</li> <li>• Students with lower cognitive functioning may come to the belief that aggression is an effective way of solving conflicts and use the violence in videogames as a guide for their own behavior and problem solving strategies.</li> <li>• Violent videogames may feed comorbid aggression problems.</li> <li>• Violent videogame play leads to increases in physiological arousal, aggressive thoughts, aggressive behaviors, aggressive affect, and decreases in prosocial behavior and empathy.</li> <li>• Males who play videogames frequently are more likely to condone negative stereotypes of women and be more accepting of aggressive behavior and sexual harassment.</li> </ul>

	<ul style="list-style-type: none"> <li>• Daily videogame play is associated with decreased metacognitive scores and a poorer understanding of effective memory and summarizing strategies.</li> <li>• Violent videogame play leads to a decreased ability to maintain attention.</li> <li>• Students with impulse and attention problems spend more time playing videogames than their peers.</li> <li>• Prolonged videogame playing prior to going to bed leads to a decrease of total sleep time and a decrease in time spent in REM sleep.</li> <li>• Violent videogame play has a negative effect on the ability to retain information that is presented directly following gameplay.</li> <li>• Prolonged videogame play may result in a gaming addiction very similar to a gambling addiction.</li> </ul>
<p><b>Positive Impact on Social Interaction</b></p>	<ul style="list-style-type: none"> <li>• No substantiated correlation between sexist attitudes and videogame use for both men and women.</li> <li>• Male and female players report that videogames have had a positive impact on their relationships with friends.</li> <li>• Videogame play promotes interpersonal relationships by allowing players to make new friends who play the same game, by developing a sense of belonging to a group, and by gaining self-confidence through peer recognition of gameplay successes.</li> <li>• Videogame play has been successfully used in the therapeutic setting to quickly develop a positive relationship between therapist and patient through the shared experience of the game.</li> <li>• Students who reported playing videogames frequently met with friends outside of school hours more often than infrequent players.</li> <li>• Both male and female students play videogames but to different extents. Males consistently play more frequently and for longer durations than do females.</li> <li>• Students who reported playing videogames have an overall decrease in depressive mood and increase in self-esteem as compared to peers that do not play videogames. This was found to be especially true for girls who play first-person shooters.</li> <li>• Videogame playing meets the general criteria for a positive leisure activity in that it is motivating, structured, and challenging.</li> <li>• Engagement in a positive leisure activity can help promote personal wellbeing, social cohesion in family and peer groups, and affirmation of self-identity.</li> </ul>
<p><b>Transfer of Skills</b></p>	<ul style="list-style-type: none"> <li>• Despite the numerous studies examining students' interactions with videogames, little is known about what they may learn through gameplay.</li> <li>• Little is known about how and if learning during videogame play transfers to academics.</li> <li>• Studies into the educational potential of videogames have linked videogames to improvements in spatial ability, problem solving, inductive</li> </ul>

	<p>reasoning, visual attention, metacognition, perspective taking, mental rotation skills, and spatial attention skills.</p> <ul style="list-style-type: none"> <li>• The majority of the research to date regarding the transfer of skills has focused on spatial ability using games such as Tetris.</li> <li>• Frequent game players are more inclined to use trial-and-error when faced with a novel situation or problem to solve versus seeking the help of others or reference materials.</li> <li>• The repeated use of first-person shooters has resulted in improvements in visual attention skills, specifically the ability to track multiple objects in motion.</li> <li>• As frequency and duration of gameplay increases, players become significantly more insightful in their self-talk, shifting from comments about game mechanics to comments about problem solving and game strategies.</li> <li>• Students view learning in videogames as comparable to learning in school indicating that students view videogame play as a legitimate learning activity involving practice, education, and challenges.</li> <li>• Videogame use may increase performance on tasks requiring metacognition, specifically tasks requiring selective attention, attentional switching, and sustained attention.</li> <li>• Students who experience ADHD have been shown to perform higher on executive function measures when presented in a videogame format versus standardized tests.</li> <li>• Students who play on a regular basis tend to have higher GPAs than non-players.</li> <li>• Videogame play is a natural exercise in working memory.</li> <li>• Students who experience ADHD have been shown to inhibit responses to a commensurate level as non-disabled peers while playing videogames.</li> </ul>
<p><b>Becoming an Accepted Leisure Activity</b></p>	<ul style="list-style-type: none"> <li>• Videogames are pervasive among students. 25% of all video game players are 18 years of age and younger. 88-99% of students aged 8–18 have played a video game.</li> <li>• 50% of game console owners are children aged 2–17.</li> <li>• 75% of adolescents play videogames on a regular basis.</li> <li>• Videogames have been referred to as “a gateway to the peer community.”</li> <li>• Some students who experience Autism have successfully learned how to play videogames to a commensurate level as peers to facilitate independent, positive social interaction with typical peers.</li> <li>• Research has shown that students experiencing Autism are often times attracted to screen-based entertainment and their attraction to video games and time spent engaged in videogame play is commensurate to that of typical peers.</li> <li>• A moderate amount of videogame play is consistent with the idea that well-adjusted students seek to explore as many experiences as they can.</li> <li>• Students who regularly play videogames are more likely to be involved in</li> </ul>

	other clubs/sports than non-playing peers.
<p><b>Meeting Psychological Needs</b></p>	<ul style="list-style-type: none"> <li>• Videogames may appeal to students experiencing Autism because it may lack social factors, it is consistent and predictable, and it affords active control over the experience.</li> <li>• Students who experience Autism often have difficulties with social interaction and communication that interferes with leisure activities that can be mediated through the use of videogames.</li> <li>• Videogames may appeal to students experiencing Autism because of the tendency towards systemizing information and the need to do this in videogames when presented with cause-and-effect relationships, route-following skills, and the detection of repeated visual patterns.</li> <li>• Videogames may appeal to students experiencing ADHD because of the rapid reinforcement it offers.</li> <li>• Rapid reinforcement may be one reason why students experiencing ADHD have been observed as having an increased ability to maintain attention while playing videogames.</li> <li>• Videogame play stimulates dopamine release which may increase the ability to sustain attention and self-regulate behavior in students experiencing ADHD, who are believed to have a dysfunctional dopamine system.</li> <li>• Videogames may be one of the activities in which students feel success; as compared to academics or sports.</li> <li>• Sports videogames provide students with physical disabilities, such as cerebral palsy, with an opportunity to engage in physical activity and peer interaction.</li> <li>• Videogames allow students to present an abled identity verses a disabled identity.</li> <li>• The immersive and disassociate aspect of videogames may play a therapeutic role.</li> <li>• Students from lower socioeconomic status have less access to computers but more access to videogame consoles than peers from higher SES.</li> <li>• Videogaming is an activity in which players may experience “flow” or complete immersion in an activity.</li> </ul>

## 4. Discussion

In this section I have summarized the emergent themes from my analysis of the 27 articles included in this meta-synthesis. These emergent themes were then connected to my own practices as a special education teacher.

### *4.1. Questionable intent and validity of research*

After reading the 27 articles included in this meta-synthesis, there appears to be a preoccupation amongst the authors with the possible negative impacts of videogame play. This begins to become evident in the language used and the intent of the research. For instance, articles attempting to find a correlation between videogames and aggression, sexist attitudes, moral reasoning, stereotypes, attention problems, impulsiveness, depression, anxiety, substance use, etc. A researcher looking to find correlations to these areas may unintentionally, or knowingly, design a study that guarantees one is found. One study stood out among the rest as not falling into this trap. The 2012 study by Homer et al. approached the issue of videogames from a more neutral standpoint. The researchers set out to first identify the psychological needs of the participants and then determine what was filling those needs. Only after this was determined did they look for correlations. This study found some unexpected positive impacts of videogame play but it was also funded by Microsoft, which makes me question the agenda of this side of the research spectrum. Microsoft not only creates games for personal computer platforms but it is also the developer of the X-Box gaming platform, one of the three main videogame consoles on the market.

Another aspect of the research studies that I question is the reliance on surveys and interviews. Of the studies, 81.8% included surveys and interviews as primary data sources while

68.2% relied solely on these methods. Surveys may not be the most reliable data collecting instrument because many of the survey items presented are open to some type of interpretation by the research subject. Interviews, a qualitative method by design, are entirely the participant's interpretation of the research question. Furthermore, many of the claims made struck me as being very difficult to verify. One article even proposed a correlation between videogame play and measured levels of "shyness" without presenting any data (Ayas, 2012). Another research article went as far as claiming bidirectional causality between videogame playing and difficulties with attention and impulsiveness (Gentile et al., 2012). The emergent themes from this body of literature led me to question the intent of the authors and the methods employed in the research studies.

Just slightly more than half of the studies (54.5%) suggest positive correlations between videogame play and a negative impact on some aspect of students' psychological, physical, and/or academic success. There are suggested correlations between violent videogame play and a reduction in measured levels of moral reasoning, perspective-taking, ability to sympathize, sociomoral maturity, ability to maintain attention, ability to control impulsiveness, and empathy. There are suggested correlations with increased measures of aggressive thoughts, aggressive behaviors, aggressive affect, acceptance of negative stereotypes of women, acceptance of sexual harassment, depression, and anxiety. In addition, there are suggested correlations with decreased measures of academic success, cognitive functioning, memory, summarizing strategies, and metacognition.

Some of the reasoning supporting these findings is that empathy and attitudes towards violence are key components in moral reasoning that may be negatively impacted through desensitization to violence through overexposure in videogame play. Immersion in violent

videogame play may replace the typical process of moral reasoning with scripts for aggression. Finally, time in the virtual world is time away from the real life positive social experiences that develop a positive sense of what is right and wrong.

There are some possible negative aspects of videogame play that I find myself questioning less. First, I agree that in many videogames violence is not only presented as acceptable but often justified and rewarded. Even videogames as innocuous as *PacMan* or *Super Mario Brothers* have elements of violence; but then again, so does football and many activities commonly viewed by our culture as healthy. Secondly, prolonged videogame play prior to going to bed leads to a decrease of total sleep time and a decrease in time spent in REM sleep. This statement is the result of data gathered from polysomnography-measured sleep and monitored heart rate (King et al., 2013). Though the sample size is small and the study would benefit from longitudinal data, the data was not open to the influence of participant interpretation like a Likert-type scale. Thirdly, violent videogame play has a negative effect on the ability to retain information that is presented directly following gameplay. Again, this statement is supported by data gathered through a traditional assessment of knowledge which may not be as vulnerable to interpretation by the participant as a Likert-type scale (Maass et al., 2011).

Another possible negative aspect to videogame play that should be noted is videogame addiction. There are qualities of videogames that are highly addictive by design, like frequent rewards on an unpredictable schedule, that present an opportunity to develop an addiction very similar to a gambling addiction. Research indicates that developing a true addiction to videogames, which would require physical withdrawal symptoms to meet the definition of addiction, is very rare, as is a true gambling addiction. However, problematic videogame play, which negatively impacts other aspects of a person's life, occurs in roughly the same percentage

of the population as does problematic gambling. Given this statistic, I feel that including non-violent videogame play in my classroom for 40 minutes a week has as much chance of leading to problematic gaming as does rolling dice in math class leading to problematic gambling.

#### *4.2. Positive impact on social interaction*

There are a number of ways in which videogames can have a positive impact on social interaction, especially when viewed as a leisure activity. Engagement in a positive leisure activity can help promote personal wellbeing, social cohesion in family and peer groups, and the affirmation of self-identity. This is where I find the greatest potential for videogames in the classroom. Videogame playing meets the general criteria for a positive leisure activity in that it is motivating, structured, and challenging. It is one activity in which students can present an abled self as opposed to a disabled self (Durkin et al., 2013).

Videogame play promotes interpersonal relationships by allowing players to make new friends who play the same game, by developing a sense of belonging to a group, and by gaining self-confidence through peer recognition of gameplay successes. Students who reported playing videogames frequently met with friends outside of school hours more often than infrequent players and reported that playing videogames had a positive impact on their friendships. Students who reported playing videogames have an overall decrease in depressive mood and increase in self-esteem as compared to peers that do not play videogames. Interestingly enough, this increase in self-esteem was found to be especially true for girls who play first-person shooters.

Videogames have also been used in the clinical setting in place of traditional play therapy to quickly develop a positive relationship between therapist and patient through the shared

experience of the game. This all supports my interest in using videogames as a site for positive social interactions for students with exceptional needs and their non-disabled peers.

#### *4.3. Transfer of skills*

Despite the numerous studies examining students' interactions with videogames, little is known about what they may learn through gameplay and whether or not learning during videogame play transfers to academics. Studies into the educational potential of videogames have linked videogames to improvements in spatial ability, academic performance, problem solving, inductive reasoning, perspective taking, mental rotation skills, and spatial attention skills. The repeated use of first-person shooters has resulted in improvements in visual attention skills, specifically the ability to track multiple objects in motion. However, the majority of the research to date regarding the transfer of skills has focused on spatial ability using games such as *Tetris*.

Videogame use may increase performance on tasks requiring metacognition, specifically tasks requiring selective attention, attentional switching, and sustained attention. Videogame play is a natural exercise in working memory and students who experience ADHD have been shown to perform higher on executive function measures when presented in a videogame format versus standardized testing measures. Students who experience ADHD have also been shown to inhibit responses to a commensurate level as non-disabled peers while playing videogames.

Videogame use may have an even greater, overall impact on student development than the transfer of discrete skills or improved performance. Studies suggest that videogame play may influence how students problem solve. There are some indications that frequent game players may be more inclined to use trial-and-error when faced with a novel situation or problem to solve

versus seeking the help of others or reference materials. It was also found that as the frequency and duration of gameplay increases, players became significantly more insightful in their self-talk, shifting from comments about game mechanics to comments about problem solving and game strategies. Students reported that learning in videogames is comparable to learning in school, indicating that students may view videogame play as a legitimate learning activity involving practice, education, and challenges. This may make the transfer of trial-and-error problem solving tactics from gameplay to academics more likely. Though these findings are encouraging, as with all of the research studies included in this meta-synthesis, data collection instruments and potential author bias should be considered when gauging the reliability of the findings.

#### *4.4. Becoming an accepted leisure activity*

If there was one common thread throughout all of the articles included in this meta-synthesis, it was the pervasiveness of videogames in today's youth culture. Videogame play has become an accepted leisure activity among today's youth and can be looked upon as "a gateway to the peer community" for students with exceptional needs (Durkin et al., 2013). The research indicates that 25% of all videogame players are 18 years of age and younger, 88-99% of students aged 8–18 have played a videogame on a computer, game console, or phone, 50% of game console owners are children aged 2–17, and 75% of adolescents play videogames on a weekly basis.

With such prevalent use, videogames can be looked upon as an opportunity for students with exceptional needs to participate in an activity equally enjoyed by their peers. In addition, the widespread use of videogames has reduced the notion that gameplay is an unconventional

endeavor and increased its acceptance as simply one of many ways in which students can positively interact with one another. Research suggests that a moderate amount of videogame play is consistent with the idea that well-adjusted students seek to explore as many experiences as they can. Research has also suggests that students who regularly play videogames are more likely to be involved in other clubs or sports than non-playing peers, reinforcing the notion that a healthy, well-adjusted student will seek as many new experiences to learn from as they can.

For students experiencing autism, videogames can be an especially powerful avenue for social inclusion. Research has shown that students experiencing autism are often times attracted to screen-based entertainment and their attraction to videogames and time spent engaged in videogame play is commensurate to that of typical peers. Some students who experience autism have successfully learned how to play videogames to an equal, and sometimes advanced, level of mastery as their typical peers which facilitates independent, positive social interaction in an activity that is seen as commonplace by their peers.

#### *4.5. Meeting psychological needs*

The popularity of videogames may have a great deal to do with the psychological needs being met by gameplay. This may be especially true for students with exceptional needs. Videogames may be one of the few activities in which students feel success, as compared to academics or athletics. For instance, sports videogames can provide students with physical disabilities, such as cerebral palsy, with an opportunity to engage in physical activity and peer interaction. Though only four articles (Blum-Dimaya et al., 2010; Ferguson et al., 2013; Houghton et al., 2004; Lawrence et al., 2002) out of the 27 included in this meta-synthesis contained an element comparing the gameplay of students with disabilities to students without

disabilities, the findings suggest that the level of gameplay can be commensurate between the two groups. Though peer interaction was not the focus of the bulk of the literature included in this meta-synthesis, the research that did include this element is encouraging. From my personal experience with a videogame-based positive behavior support system, an outside observer would be hard pressed to distinguish the students with a disability from those students without a disability during gameplay. Videogames can be an opportunity for students to present an abled identity verses a disabled identity.

There may also be more specific aspects of videogame play that make gameplay appealing to students with exceptional needs. Videogaming is an activity in which players may experience “flow” or complete immersion in an activity. This immersive and disassociate aspect of videogames may play a therapeutic role. Videogames may appeal to students experiencing autism because it may lack social factors, it is consistent and predictable, and it affords active control over the experience. Students who experience autism often have difficulties with social interaction and communication that interferes with leisure activities that can be mediated through the use of videogames. Videogames may appeal to students experiencing autism because of their tendency towards systemizing information and the need to do this in videogames when presented with cause-and-effect relationships, route-following skills, and the detection of repeated visual patterns. In addition, videogames may appeal to students experiencing ADHD because of the rapid reinforcement it offers. Rapid reinforcement may be one reason why students experiencing ADHD have been observed as having an increased ability to maintain attention while playing videogames. Videogame play stimulates dopamine release which may increase the ability to sustain attention and self-regulate behavior in students experiencing ADHD, who are believed to have a dysfunctional dopamine system.

## 5. Conclusion

The findings of this meta-synthesis were a nearly even distribution of positive and negative impacts. To be more precise, many of the findings were in fact contradictory. This led me to take a closer look at research design and data sources to better understand why this polarization existed. The majority of the research relied heavily on Likert-type scales and surveys as primary data sources. The questions and answer choices comprising this type of data collection instrument are often open to some level of interpretation by the participant. This should lead to the researcher employing caution when using the data to make correlations, but this was not always the case.

This led me to question the intent of the researcher and the possibility of personal agendas influencing the research. Many of the studies were designed to find correlations between videogames and any number of negative attributes from aggression to sexist attitudes to moral reasoning. A researcher looking to find correlations to areas such as these may unintentionally, or knowingly, design a study that guarantees one is found, particularly when the study is based on surveys. The same can be said for studies identifying positive impacts of videogame play. As a result, the findings from the research studies included in this meta-synthesis, and research on this subject in general, should to be viewed through a cautious and critical lens.

Of all of the possible negative impacts of videogames identified through the studies included in this meta-synthesis, I find myself taking stock in only two. I believe prolonged videogame play directly before going to sleep may negatively impact total sleep time and time spent in REM sleep. In addition, I believe videogame play may have a negative impact on the recall of information presented directly following gameplay. The two research studies that came

to these conclusions based these correlations on observable and measurable phenomena, as opposed to surveys or interviews.

The studies that suggest the most positive impacts of videogame play were also based on data collected from observable and measurable actions. The positive impact that applies most to my teaching practice is the effective use of videogames as an intervention in the teaching of social skills. In addition, these skills, along with the physical skills required to play, have successfully generalized to other settings and real-life activities. Students with disabilities have been shown to engage with videogames on a commensurate level with their peers. Videogame play is often an opportunity for students to present an abled self as opposed to a disabled self. This is at the heart of my use of videogames in the classroom.

Recently, I have seen an increase in the number of students without disabilities who ask to participate in my videogame-based PBS system. There has also been an increase in requests from my students to invite their non-disabled peers to participate. At this point, the reward activity is often attended by an equal number of special education and general education students; compared to participants being solely from my caseload when I started the PBS system. Whether the students are actively involved in gameplay or observing and discussing the gameplay of others, the distinction between abled and disabled diminishes significantly during the reward activity. This success with using videogames in the classroom leads me to believe that more research into the social applications of videogames is warranted and desperately needed. Research regarding videogames as the site for positive social interaction between students with disabilities and their peers is particularly lacking. This is especially important in special education since, as Durkin states, videogames may be “a gateway to the peer community” (2013).

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