ABSTRACT

Having computers so prevalent in the classroom is the direct result of the boom in technology. This paper will focus on the evolution of curricula through the incorporation of computers, computer games, educational games and non-educational games in grades K-12. Teacher professionalism is touched on as well as test score outcomes after the integration of different educational games. The behavior of at-risk children was, and still is, the motivation for newer instruction techniques. This, in combination with the rapid growth and market for educational games and computers, is the cause in a somewhat hasty curricula change in public schools. Several methods enabling at-risk children to find self-efficacy by means of motivation, cooperation and socialization through educational gaming are similarly examined. More children in first-world economies are increasingly considered at-risk students today than ever before due to the social construct previous generations have bequeathed them. As such, it is imperative that instructors and parents monitor how much computer interaction children have. Computer instruction in the classroom is necessary for the future due to the rapid evolution of technology, but is too much of a good thing bad? This question and others will be answered in this paper as well as look toward the plausible future of at-home education through Virtual Reality simulations for young adults with Intellectual Disabilities.
METHODS
I did an extensive literature review for my research on incorporating video games in the classroom. All of the studies involved educational gaming and, unintentionally involved, at-risk children. One study started in 1985, spanned a decade and involved behavioral games for first and second-graders without the use of computers. I used this study to gain a basis for comparison without video games in the classroom. Another study incorporated an active video game to encourage motivation and physical activity in elementary students. I used this study to incorporate motivation, or lack thereof, into the human variable. Additional research included a cooperative educational video game which encouraged socialization and motivation in elementary to junior high school students. I used this study to elaborate on a child's cooperation and motivation to help other children which lead to better socialization. Scientists elsewhere focused on the impact of technology use by children in public schools, grades K-12, and math test scores therein, and also measured the teachers' professional competency with the integration of educational games. With the technological boom in the education system, it is clear that the students were not the only ones learning the computer games—the teachers were too, and it is important to consider them as a variable in test scores. Finally, I looked at work done on remote home-based virtual training simulations for the intellectually disabled which focused on teaching younger intellectually disabled individuals how to do common, everyday activities. Having computers in the classroom is, by no means, a bad thing. Incorporating computers into everyday learning is a must in today's society due to the One Laptop per Child mission, however, too much of a good thing may have a negative effect on children. The key is moderation. Are teachers using games in the classroom as a deterrent for disruptive behavior or are they trying to encourage children to believe that the stale curriculum can be fun? This question will be explored along with pros and cons of educational games in the classroom and touch on discipline practices of at-risk children.

INTRODUCTION
With everything involving children, video games, and the effects of social interactions therein, the education system involving information and communication technologies, or ICT's, to help coordinate a child's enthusiasm towards education, I have come to realize that this topic is exceedingly under researched. Unintentionally, all of the core articles in this paper focus on at-risk children and the result of their changed behavior and academics while incorporating ICT's in the education system, with the exception of one. The one article that does not involve an ICT is a study which started in 1985 and spanned a decade. I chose this dated article because the truth is, the current education system is using technology to get children's attention, to make them behave and perform within state/teacher requirements. Ergo, this paper cannot start with the incorporation of computer games in the classroom without having evidence of how past education systems handled at-risk children.

Not only do current curricula focus on educational games in the classroom, but games that also encourage physical activity, encourage socialization and one that teaches an intellectually disabled person how to do common, everyday activities. Having computers in the classroom is, by no means, a bad thing. Incorporating computers into everyday learning is a must in today's society due to the One Laptop per Child mission, however, too much of a good thing may have a negative effect on children. The key is moderation. Are teachers using games in the classroom as a deterrent for disruptive behavior or are they trying to encourage children to believe that the stale curriculum can be fun? This question will be explored along with pros and cons of educational games in the classroom and touch on discipline practices of at-risk children.
are those in this group who have behaviors of disrupting and being aggressive towards non-at-risk children in class. Teachers attempting to instruct both types of children in the same class are typically overwhelmed. "The aggressive, disruptive behavior scale (the central SAS construct of interest to [Poduska's] paper) is composed of the following items: (1) breaks rules, (2) harms others and property, (3) breaks things, (4) takes others' property, (5) fights, (6) lies, (7) teases classmates, (8) yells at others, (9) is stubborn, and (10) has trouble accepting authority" (Poduska, S32). In 1985, "Six hundred eighty nine (75%) of the 922 students in Cohort 1 and 656 (76%) of the 867 students in Cohort 2 who were in intervention conditions relevant to [Poduska’s] paper” (Poduska, S32). Which means that in two entire grades over the course of two years, >75% [(689+656)/(922+867)=.752] of the students were considered at-risk. To put those numbers into a current perspective, a simple Google search will reveal that a child attending public school that qualifies for free or reduced lunch is considered to be at-risk. At the time of this study, there are 50.9 million students attending public schools and 30.3 million of those children are receiving free or reduced lunches in the United States which is >59% [30.3/50.9 = .595]. This does not include the children who are labeled at-risk who do not receive free or reduced meals at school, nor does it include private or home school numbers. It is safe to surmise that the percentage of children labeled at-risk in public schools is greater than 60%.

A student being considered at-risk is a social construct that has come to prevalence within the last 40 years but the definition has been constantly evolving with the evolution of technology, and not coincidentally either. “In a recent study, elementary school teachers cited disruptive classroom behavior as the largest mental health problem in their schools” (Poduska, S31). Brining to light what some teachers consider disruptive behavior has me thinking that the teachers involved in that particular study should not be teaching children. Being disruptive is not a mental health disorder. Nevertheless, a disruptive child is noticeable, a depressed child is not. There is a flaw in this teacher to student observation system. A quiet child, seen as obedient in the teacher's eyes, does not necessarily mean a healthy child. A loud or seemingly disruptive child, does not necessarily mean a sick child—and vice versa. In the earlier years of American education, negative behavior was dealt with swiftly and physically. As time progressed, punishments became less harsh and less physical. The implementation of the Good Behavior Game, or GBG, in 1985 was a step in the right direction to, not only discipline but also, help children focus on schoolwork. The GBG focused more on rewarding positive behavior versus disciplining bad behavior. “At the beginning of the year, the GBG is played three times a week for 10 min each time. Over the course of the year, the amount of time GBG is played increases” (Poduska, S31). In the following year, when the children are in the second grade, the game continues, and researchers work with second-grade teachers just as they did with the first-grade teachers. The first-grade teachers continued playing the GBG.

As time went on, so did the evolution of the punishment and reward system teachers use in the classroom. The education system became a more liberal place to learn. With the boom in technology in the late 80's and early 90's, schools incorporated computers more and more and knew the importance of familiarizing children with technology. Many teachers now include non-educational video games as a reward option for good behavior. Several programs were also developed for educational purposes and dubbed educational technology. “Educational technology defined as a variety of technology-based programs or applications that help deliver learning materials and support learning process in K-12 classrooms to improve academic learning goals [...] It was also found that, though all K-12 students benefit from educational technology applications, secondary instruction does not benefit from technology as much as primary instruction” (Havard, 1899). Teachers began to, for the most part, start to give the children freedom to learn this new educational technology at their own pace. At the same time, the teachers were learning how to use the computer games as well, so it was easy to be lax on rules and deadlines. When a child is not
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constrained by trivial rules placed upon them, it can have a positive effect on their motivation. Instead of shutting down and acting out, a child may, instead, blossom with the right guidance. "In Hanghøj's study, they investigated the "School at Play" approach for using commercial videogames to support inclusion of students at-risk, which we define as students who are perceived by teachers as being inactive participants in the classroom mainly due to social difficulties—for example, shyness, disruptive behaviour [sic] or social exclusion by classmates—but also due to lack of motivation to learn and low academic performance" (Hanghøj, 777). Lack of motivation and low performance go hand in hand with children. If they do not want to do something, they will not do it. If children are forced to do something they do not want to do, they will do it haphazardly. Every. Time.

Motivation can be a powerful inspiration to do anything. The want to do something versus the need to do something will win with children more times than not. The Active Video Game study, or AVG, focused on motivation through various physical activity videogames. "It has been documented that students' motivation has a close relationship with their fitness level [...] It was hypothesized that the motivational variables would also increase concurrently with health-related fitness and school day step counts; however, no effect was observed. This makes it theoretically difficult to explain why the AVG group improved on all other variables [compared to the control group]. The lack of effect in motivation could be because of the length of the intervention, which may have initially increased motivation, but ultimately inherently decreased motivation over time due to the lack of novelty and interest over an 18-week time period. Long periods of doing the same activity, in addition to high frequency of activity exposure, may have subjectively decreased AVG activity interest in children. Additionally, the lack of motivation change may be an artifact of the psychometric properties of the questionnaires" (Fu & Burns, 468). In short, even though this particular study was well meaning, it did not anticipate the variable of boredom, which is a constant change in young children. The Activity Theory, or AT, "is a general theory of the history of mind, consciousness, and human behavior [...] that explores the inclusion of the individual in socially organized goal-oriented actions in order to explain the development of cognition as well as personality, affect, and motor skills" (Keating, 529). If children have everything they could possibly need or want in a game or activity designed to motivate them towards a goal, it is still possible that the human behavior variable of the AT will change and the motivation to participate will be lost. The same can be said for socialization. If the goal changes, so will human behavior and vice versa.

Continuously having motivation malfunctions trying to get children to do their school work will result in new methods to motivate children to do their assignments. The evolution of the education system is the direct result of the evolution in technology. Children's interest's change along with technology and so must the curriculum. Educational computer game production, mainly math and literature games, have skyrocketed in the last two decades in order to keep up with children's interests. Therefore, we must adopt "the working assumption that curriculum-relevant elements found within COTS [commercial off-the-shelf] games can be used by teachers to reframe students' experience of school subjects, in order to provide a new sense of shared meaning and individual motivation [...] we wish to focus on how students become motivated when making social and disciplinary meaning out of their game experiences" (Hanghøj, 780). There is a large market for educational games—from physical education video games to math games and vocabulary games to socialization games, there will always be educational games in production, ready to compete with evolving technology. The socialization aspect of games in the classroom is the cooperation. For children that may be otherwise considered anti-social, connecting with other children who play the same game or use the same ICT give the children some common ground. "Understanding the organizational and social consequences of having, using, and developing ICTs is increasingly important for contemporary professional practices and social policies," Kling goes on to say that
"the educational and social consequences of school leaders enabling their students to use the Internet is a topic of discussion among politicians, educators, and parents, as well as researchers" (Kling, 13). It has already been established that children need computers in the classroom for their future lives; now, the current debate is, should children have as much computer time as they do now? Since there is no turning back to an era of classrooms without educational games, researchers are now looking to the results of using such technologies. The social cognitive theory is used to try and predict a child's motivational performance. "Social cognitive theory claims that social cognitive variables (ie, self-efficacy, outcome expectancy, and social support) may influence individuals' physical activity participation and persistence via self-regulation behaviors. Literature has suggested that higher self-efficacy leads to greater persistence and better performance in elementary physical education settings" (Fu & Burns, 644). Self-efficacy plays a major role in the development of how a child interacts socially. Socializing plays a major role in the development of how motivated the child is. Motivation plays a major role in how well the child performs in class. In a study that focused on child cooperation, it was stated that incorporating video games in the classroom is called the School at Play approach. "The School at Play approach can be summed up as a combined pedagogical use of commercial games, game-related assignments and analogue gamification of classroom behaviour [sic] in order to address curricular and social aims concurrently" (Hanghøj, 778). The outcome of a child's motivation greatly depends on the educational approach taken. Just because the education system is now dependent on educational video games, does not mean the children are any more motivated to learn anything except how to play the game and how to socialize with their peers who play the same game.

In the cooperative video game study, it was noted that the students either did the same or only slightly worse in math and Danish but did exceptionally well with social inclusion. The researchers set the difficulty of the roleplaying game, or RPG, on Elite so the children were forced to work together—their character would die otherwise.

"[W]e strongly recommend the use of co-op games as pedagogical tools for creating playful and socially inclusive classrooms, which can level the playing field and position at-risk students as active participants in overcoming shared challenges with their classmates" (Hanghøj, 796). After each cooperative game session, Portal assignments were given regarding gameplay. It turns out, the children were more interested in helping their teammates during a simulated battle scene versus learning math or Danish. After the study, researchers noted that the game "lead to the development of new positive relations, fewer conflicts and sometimes even new friendships with their classmates. This finding corresponds well with the teachers' assessment of the at-risk students' increased well-being" (Hanghøj, 792). Even though it was a side effect, the socialization portion of computers and games in education is an important finding.

Though many studies used in this paper focus on different aspects of computers and education, it seems they have something in common; the use of computers is now required to succeed in education, but, ironically, they are also the reason for sub-par grades. "Students who use computers moderately at school tend to have somewhat better learning outcomes than students who use computers rarely. But students who use computers very frequently at school do a lot worse in most learning outcomes, even after accounting for social background and student demographics. Extensive use of technology was found to be detrimental to academic performance" (Havard, 1900).
This information is relatively new to the academic world since this is a relatively new study. Since not much time has passed since the beginning of the educational game usage, results are just now coming to light. Referring to a study of computers in general, "Most of the empirical social research was conducted within organizations because they were where the computers and the people who used them most intensively were located [...] By the 1980s, research about the social aspects of ICTs was conducted by academics in a number of different fields, including information systems, information science, computer science, sociology, political science, education, and communications" (Kling, 5). Now, researchers focusing on these subjects are finally able to branch out and study people who use computers, other than peers.

Written in 2005, Kling stated, "Researchers, professionals, consultants, journalists, and pundits have produced a large and growing body of writing about these topics. However, this writing is often difficult to access, much less to comprehend" (13) when he was referring to research on professional and social use of ICT's. In 2010, Havard stated, "One possible reason for students' low performance in mathematics might be deficits in mathematics teacher professional development regarding the integration of technology into teaching and learning [...] Research in this area is lacking, and because of that, some technology integration programs have not been successful in terms of student learning due to an absence of best practices" (1898). Due to the human variable, it is hard to find an answer in the are computers and ICT's good for you? debacle. It is clear that games, and ICT's, in the classroom do help children on a few levels—so long as the computers are used in moderation and the teachers are providing proper instruction. Firstly, the use of computers and the internet in the classroom teaches children how to interact with them—a skill desperately needed in adulthood in this day and age. Secondly, socialization in the digital world teaches children how to act and react to online manipulators in a way that could never be taught without a computer. Lastly, the teacher and child relationship, even though strained at times through the technological barrier, may strengthen—as long as the teacher has the skillset and knowledge required of them in dealing with, not just computer games and ICT's, but also other platforms that are not in the state mandated curriculum, to better connect with the children. Children managing and becoming experienced in many forms of technology is necessary for their future in any first world country.

Considering the future, there are Virtual Reality (VR) programs and educational games dedicated to helping young adults with Intellectual Disabilities. "VR is acquiring increasing credibility as a useful tool for teaching independent living skills to persons with Intellectual Disability (ID) in a safe environment; furthermore, generalization into real environments of skills acquired during VR training seems to be feasible" (Panerai, 2). The positive possibilities are endless on having technology teach people how to do everyday things that many people take for granted. A new VR simulation is available for at-home use:
“Four apps [for VR] were developed: (1) to provide information (30 questions in verbal and written form, including general knowledge, personal, family, spatial and temporal orientation, and with multiple-choice answers appearing on the screen in written form); (2) taking medicines at appropriate times [...] (3) preparing the suitcase for a weekend away from home [...] and (4) shopping at the supermarket following a shopping list and remains available on the screen; the first scene is a kitchen, with the shopping list, money and wallet; the second scene includes a supermarket shelf with different products and a shopping cart; the third scene includes the cash counter to pay for products)” (Panerai, 2-3)

Knowing there are programs like this capable of assisting in the education of people with an ID gives me anticipation for the future of all education. I question if the use of classrooms will be obsolete in the distant future. Many parents are being ridiculed by other parents for sending their children to public schools because of the controversy revolving around the use of certain technology, public education and the system indoctrinating children. So what if the next step in the homeschooling solution is VR simulation? If parents had a guaranteed way to teach their children at home for relatively little cost, would they? With the success rates of VR simulation, it is not hard to contemplate a scenario when a parent looks over the shoulder of their child to view the simulation in progress that they would be guiding their child to a better education than the one currently available in a public school. If the VR aspiration in homeschool is too farfetched, then it is undeniably feasible that researchers will study and direct teachers to better educational games in public schools, now that the research field is abundant with subjects. Perhaps with the number of available subjects, it will be conceivable to figure out a decent game to raise test scores.

CONCLUSION

When it comes to parents’ critique of computers in the classroom, some like the idea and some do not, while others are indifferent. For the parents that do not, a good portion of them blame computers themselves for the disobedience of their own children. “It is widely acknowledged that nonhumans participate in activities with moral import [...] the salient question here is whether they possess, all by themselves, the mental qualities generally accepted as necessary for moral responsibility” (Hanson, 93). With all of the evidence presented, it is clear that computers are necessary to a child’s education. That being said, a computer, nor its technology, cannot be to blame for a child’s lack of education. The fault is in the system geared towards using only computers as part of the curriculum. The fault is also in the parents who do not take responsibility in limiting their child’s internet, ICT and gaming intake. With a little more instruction and advocacy from teachers, it is not impossible to get children thriving in core subjects like math again. Math is behind every single facet of a first world society, and now, so are computers. It is unlikely this subject will dry up with the amount of knowledgeable researchers available having the disposition to study it. “Studying the influence of technology use and professional development on student mathematics achievement, and whether the influence is positive or negative, informs future professional development practice. The results could provide direction for professional development that supports teachers and students as they make use of technologies for the teaching and learning of mathematics” (Havard, 1902).

The keys to the successful education of children are: strong educational technology in moderation, motivation or a child’s want to do something, socialization and cooperation among teachers and other students, self-efficacy or the ability of children to believe in themselves, parental involvement and knowledgeable teachers who advocate for all students.
Bibliography


