

Article

Videogame Education as an Anxiety Treatment between Middle-Year Students Post-Covid 19

Rafael Iwamoto Tosi *

Faculty of Education, University of Manitoba, Winnipeg, Canada

*Correspondence: Rafael Iwamoto Tosi (Rafael.iwamotosi@umanitoba.ca)

Abstract: The present article seeks to provoke a discussion into how video games can be used in anxiety treatments and social stimulation tools among middle-year students and children of that same age. To do so, we initially start this article by reflecting on how the covid-19 pandemic disparate all anxiety alerts in our society including mental health issues such as depression and special anxiety disorders. Then we compare how the numbers of anxiety among children and young adults were already alarming before the lockdowns imposition and the social distance measures, especially in urban centers. This rising anxiety condition can be felt especially in the years that followed the social isolation of children especially because their social connection and recognition were just starting to grow and to establish important connections between their peers in-person and in virtual environments, throwing light on how to screen media and children's homes are related with the anxiety increase and how we can investigate that phenomenon without succumbing to excessive positivism to today's technology or to a deconstructive pessimism that leads us to distrust those media that are already in contact with middle-year students and children's in that same age. To do so, we will resort to philosophical tools such as Edusemiotics and Cultural Studies to understand how games such as *Minecraft* and *Roblox* can be used in school environments to help students and teachers manage anxiety levels and surpass socialization issues past covid-19 lockdowns. To finish our reflection we also bring some data related to how those same media and games helped middle-year students to surpass social isolation and family disconnection during the pandemic while their kept exercising school content in those games, sharing and debating with their peers on virtual platforms.

How to cite this paper:

Iwamoto Tosi, R. (2023). Videogame Education as an Anxiety Treatment between Middle-Year Students Post-Covid 19. *Open Journal of Educational Research*, 3(1), 1–16. Retrieved from <https://www.scipublications.com/journal/index.php/ojer/article/view/617>

Received: December 30, 2022

Accepted: February 6, 2023

Published: February 8, 2023



Copyright: © 2023 by the author. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Keywords: Videogame Education; Audiovisual Stress Disorder; Anxiety Disorder; Children's Mental Health; Post-Covid-19 Mental Health

1. Introduction

The year is 2020. Only 90 days of the year have passed since it started and the whole world saw an increasing number of victims of a new virus that was spread ferociously across all continents. Among the rising hospitalizations and the impact of the death numbers, the air spaces were closed and almost the entire world was put in a quarantine state. Cities streets became deserts and public spaces such as schools and community centers were closed, leaving children's and adolescents cloistered in their homes living with their parents (or guardians) who were also adapting to remote work and the "new reality" during the Covid-19 pandemic global state. According to Hoyt *et. all* (2021, p. 270) [1] the state of excess quickly became the state of normality and the "constant stress has just become the new normal amongst students, professors, parents and guardians". The authors reflect on what became the constant statement of the society while the lockdowns and social distance were firmly established in almost all countries and international (and

in many cases internal) flights and travels were cancelled, and a state of rising stress that ultimately transformed into an anxiety disorder, depression and social phobia.

This article seeks to shed light on the rise of anxiety among children focusing on middle-year students aged ranging between 9 to 12 years old during the covid-19 pandemic lockdowns taken between March 2020 to August 2021 around the world. To do such a difficult task this work intends to analyze different sources including reports from the World Health Organization (WHO), UNICEF and several papers about the mental health of students and teachers to understand how hard social isolation and constant exposure to audiovisual media increased the anxiety levels between the pre-adolescents. Following this same line of investigation, a difference between developed and in-development countries will be pointed to comparing the anxiety numbers between main urban centers in the United States and Brazil to understand if the mental disorders were more aggressively felt in those students that held more economical and social conditions or not.

After that contextualization of anxiety disorder among middle-year students in global and local contexts this study will indicate some paths to reduce the level of anxiety of these individuals relating to audiovisual studies and videogame theory. Taking as a principle that same age groups were highly exposed to screens during the Covid-19 pandemic the use of new communication tools could be helpful to channel some of the anxiety and craft different forms of expression such as (digital) art and, also videogame education. According to Schoneveld *et. all* (2016, p. 322) [2], the use of electronic games as anxiety treatment among children between 8 to 14 years old has been very successful in conditions similar to the ones faced by the students during the lockdowns and computer learning environment. That tool related also to the field of edusemiotics (an acronym formed by the junction of the words education and semiotic) could be a very important and powerful ally for the parents and the school to understand and also treat this rising mental health disorder and needed to be more deeply understand under the lenses of the cultural studies.

To finish this article some examples of video games used as educational tools will be analyzed regarding their potential to help with anxiety disorders among middle-year students. Those tools pretend to demonstrate how socialization can be flipped from a digital (online) environment to an in-person environment allowing those children to reconnect with their age peers and, to reencounter their space in society after almost two years of mandatory social distance and release mental and emotional stress caused by this past 20 months of lockdowns and social restrictions.

2. The Rise of Anxiety: from the Past to the Present Passing Through the Covid-19 Pandemic

The history of humankind is undistinguishably linked with the history of anxiety and how the anticipation of the fear that characterizes this feeling shaped our evolution as a specie and society. Rachaman (1998, p. 02) [3] defines anxiety as "the tense anticipation of a threatening but vague event; a feeling of uneasy suspense" and reflects the relation of the term with fear itself. Rather than just being used as a substantive, anxiety differs from fear since "fear has a specific focus. It is controlled or determined by perceivable events or stimuli" (Rachaman, 1998, p. 03) [3]. The proximity – but not similar meaning – of anxiety and fear shaped the history of humankind allowing the social organization that further should establish the first large communities and later, the towns and cities.

The fear of the unknown was what brought humankind closer and changed the environment from the open fields to caves and lately to tribes. The crescent dangers that were expected around every corner developed a sense of fear and precaution and started to draw the first lines of anxiety since the danger could come from everywhere and at any time. But even with prominent and substantial content to discuss how fear – and anxiety – shaped our society in human history this article does not intend to illuminate that

specific field of discussion since that territory was once covered by works such as Harari (2016) [4] that describes how the *sapiens* would organize their communities to survive the environment and lately exercise domination on all other species. According to Pearson (2008, p. 18 – 23) [5], the rising of anxiety disorder in our society only demonstrates how the fear itself has changed and now how it is being channelled in post-modern culture. To her “if depression is a reaction to a past lost, the anxiety is a reaction to a future lost”, or in other words, the past loss is a response to a well know event that leads to a deep sadness and the future lost is a constant state of awareness that leads us to an infinite state of anguish.

Between the evolutionary history of mankind and the fear that leads to anxiety in the present days, we are more interested in understanding how the rising numbers of anxiety unravel an alarming number of children and pre-adolescents post covid 19 pandemic around the world. To accomplish such a task it is first necessary to understand the world pre-covid and then revisit the same scenarios after the re-opening of public spaces and the flexibilization of the health measures allowing the gathering of groups of people. Since the beginning of the 21st century, anxiety has been rising in our society as one of the most prominent mental disorders among the population living in urban areas. According to the data collected by World Health Organization (WHO) in the past 20 years, there was an increasing number of mental disabilities caused by anxiety such as apprehension, motor tension, autonomic overactivity and panic attacks¹. This study publish in early 2019 demonstrates that almost 4% of the global population suffers from anxiety disorder (totalling a proximity number of 275 million people with a confirmed diagnosis) and for the first time in recent history this mental condition surpasses depression disorder.

Bandelow & Michaelis (2015) [6] summarized the first studies about anxiety in the first decade of the 21st century and their perception of this mental disorder is that the most common aspect demonstrated in the data collection was the Panic Disorder directly associated with aspects of the "modern" life such as 1) excess of information and media exposure; 2) increasing urban violence and; 3) economic concerns (Bandelow & Michaelis, 2015, p. 330) [6]. That perception can also be related to the fact that the subjects were more exposed to an increasing level of stress due to the responsibilities of their daily-base life in urban environments and how these areas were an important factor in the increasing sensation of future threats in different (and non-identify) areas of their lives. Despite the studies compiled by the two researchers included only a quorum of 18 to 64 years of old individuals, an interesting factor of those other symptoms of anxiety such as Generalized Anxiety Disorder (GAD), Agoraphobia, Sessional Affective Disorder (SAD) or Specific Phobias can also be identified in other studies that are focused specifically in a younger audience such as children`s or pre-adolescents.

Taking the example from the increase of anxiety cases among adults, Mazzone *et al.* (2007, p. 01 – 03) [7] also point out that anxiety disorder seems to be the most common mental disorder among children. In a study conducted in public schools in the city of Catania – Italy, the authors demonstrated that almost 15% of the 8 to 17 years students were passing through an anxiety disorder. The symptoms were associated with the same results obtained in the Bandelow & Michaelis study, but there were more channelled with the fields of experience of those students such as exams, socialization, and learning (des)abilities in specific fields (such as arithmetic or social studies). Specific to middle years students, the number of individuals that demonstrate anxiety symptoms were about 7.9%, and the related fields of anxiety were demonstrated especially in social

¹ Accessed in October 2022. The data can be checked at the following link: <https://www.who.int/en/news-room/fact-sheets/detail/mental-disorders>.

misplacement and test-taking (Mazzone *et al.*, 2007, p. 04) [7]. Paralleling those experiences with adulthood it is possible to understand and co-relate the raising responsibilities with the changed subjects studied in different subjects such as arithmetic and social studies and, the modification of the social environment that is directly associated with the beginning of teenagehood age and the transformation of the body and in the mind.

Some specific topics in the school have been demonstrating more difficulty and are associated with stress levels and some manifestations of anxiety symptoms. For Madjar *et al.* (2018) [8] mathematics is one of the most stressful in middle years students especially because is one of the contents that are most related to grades. In a 2-year study with students of 6 and 7th grades enrolled in public schools in Israel, the researchers conducted a series of studies to measure the stress and anxiety levels before and after the classes and tests mathematics. According to Madjar *et al.* (2018, p. 03-04) [8], more than 51% of the students demonstrated symptoms related to anxiety disorder (previously detailed above and related to Rachman, 1998, p. 3 – 5) [3] before the classes and the exams. One of the most related reasons for their "fear of the math classes or test was the fear of not understanding the subject taught by the teacher or not being able to properly respond to exercises in the test" (Madjar *et al.*, 2018, p. 06) [8] demonstrating a great fear of failure even before the class or the exams start, therefore, an anticipation of a future event that leads to anxiety.

The beginning of the teenage years is difficult by itself, but associating all those changes with the emergence of a global pandemic that claimed more than 6.5 million lives until the publication of this article² it triggered a unique scenario of anxiety disorder. Even though there is no current study that investigates the anxiety numbers of middle years students after Covid-19 around the world, some other studies published recently give us a very clear picture of what is like to live and study during mandatory social distancing. Boyarinov *et al.* conducted a study on procrastination and anxiety levels among undergraduate students in Russia during the Covid-19 pandemic, the level of stress caused by social distance was increased. One of the main factors that led to this result was the fact that now the students had to manage their own time around many distractor factors such as entertainment media, their home environment and the discouragement in front of the rising number of deaths and the infected. For the authors the "online environment was dominant in their lives and the lines that separate the environments of work, study, leisure and rest were completely demolished" (Boyarinov *et al.*, 2021, p. 04) [9].

Following the same line of thought, Hoyt *et al.* (2021) [1] pointed out that constant stress was the "new normality" among college students in the United States of America during the online classes that characterized the learning environment during the Covid-19 outbreak. In their research, the authors found that most of the students called here as "young adults" between 19 and 24 years were having anxiety attacks since they were trying to reconcile their professional and personal responsibilities with all the happenings that were being reported around the world (Hoyt *et al.*, 2021, p. 272) [1]. To the participants the fact that all the classes were being held in the same place where they could have access to other information regarding the raising number of deaths and contamination rates increased their sensation of impotence and discouragement about the future, increasing the emotional stress and the concern with the future. More than 32% of the students demonstrated acute symptoms of distress that are directly associated with uninterrupted

² Accessed in October 2022. The data can be checked at the following link: <https://covid19.who.int/>

access to the computer and, again, with the establishment of that blurred line that once divided leisure, work and study.

Since all those social environments were now confined in one place and, all of them were now related to the screen of a computer or technological device, the specificities that marked the learning experience of college students and middle-year students were diminished. Both groups are now experiencing social isolation and are forced to commute with others through a machine. They have to manage their schedule and change simple tasks that were related to going out and staying in their homes like changing their clothes or even getting out of bed the necessity of technology was increased during this period demonstrating the fragile aspects of educational inclusion among the more vulnerable population. Hoyt *et al.* study included that perception in their study and pointed out that one of the stresses as the new normal aspects was that "economic and social conditions are important to determine if the stress caused by the pandemic is felt differently in the same age group" (Hoyt *et al.*, 2021, p.271) [1]. The same measures can be used in the cohort selected for this study and to do so we will use data collected about children and pre-adolescent anxiety conceptions pre and post Covid-19 in two different countries – one developed and the other in development) with very similar urban conditions.

3. São Paulo and New York: A Comparative Anxiety Levels in Children and Adolescents Reflection

During the Covid-19 outbreak, entire high-populated cities were under forced lockdown, which means places with dense demographic numbers were confined in spaces mostly planned for the population only passing a few hours of the day resting and doing daily basic tasks such as cooking, cleaning and doing laundry. Two different cities in the same continent shared a few similarities such as being the most populated cities in their respective countries having disparity numbers of social equity and being the economical motor of their region. Despite New York and São Paulo – the first being in the USA and the other being in Brazil – sharing that same atmosphere of highly urban cities and being highly populated with 8 (NY) to 12 (SP) million people, the cities have different experiences in the educational field related to the anxiety level of students pre and post Covid-19 pandemic.

In New York for example, the Centers for Disease Control and Prevention (CDC) pointed out that in 2019 almost 8.5% of the students were experiencing some symptoms of anxiety related to a school environment. According to Zeidner (2014, p. 270 – 272) [10], the most common aspects of anxiety disorders among students from 08 to 13 years in NY are social inclusion (or exclusion) and academic achievement related to the tests and grades. The precipitation of some bad performance on a test or the ability to be included – or excluded – from social groups and being visible or invisible for that community are very important issues to students and can be related to the anxiety levels raised in the CDC research back in 2019. Furthermore, those numbers already demonstrated a raising level of anxiety among middle-year school students and the areas that have the most effects on the fear anticipation between the students and also could be related to basic human necessities such as the sensation of belonging and success.

After the first year of social distance, the numbers collected by Coelho *et. Al.* pointed out that the anxiety levels among the middle year students in NY raised more than 45% and almost 13% of the students in the city experience some symptom of this mental disease. To them the data points to an understanding of how the social distance and the online learning caused severe emotional traumas with the students and exposed them to an environment where there was no differentiation of where that individual could learn, play, socialize with other children and then go back to their home environment. Also when daily task such as getting up and dressed, getting a bus or walking to their schools and physically getting in contact with other students and their teachers was taken away from them, most of the students interviewed for this study said that they just had "lost

their sense of where their homes started and where the school finished" (Coelho *et al.*, 2022, p. 05) [11].

Another important topic that was also brought to the attention of the researchers was related to the digital environment. In the use of computers and other technological devices in the study environment Coelho *et al.* (2022, p.02) [11] detected that some aggressive conduct had been held by students such as (cyber) bullying and test cheating and that behaviour was increased during the Covid-19 pandemic social isolation. According to the authors, the digital environments were a reproduction space of harmful behaviour that some students have already demonstrated in their physical environment (classrooms and school dependencies) and when all the classes suddenly became digital classes, the spaces where the students could pick each other was only stretched from the school dependencies to the internet, or in other words, to everywhere and every time. Instead of just being anxious about being accepted in one specific place, or even getting to be dedicated to studies in that same place, the lines of the school and home places were erased and all places become just one: the computer screen.

The same pre-Covid-19 scenario also was registered in São Paulo regarding anxiety disorder in schools. According to Quevedo *et al.* (2020) [12], the number of anxiety and depression disorders in adolescents and young adults in Brazil between the years of 2015 to 2019 increased by more than 60% and in a comparative study conducted between students in the high school and the first years of college the principals causes for severe anxiety and suicide attempts are related with social anxiety disorders and the lack of feeling of belonging (Quevedo *et al.*, 2020, p. 02) [12]. The study also showed that many of the participants were experiencing social phobia related to the increasing responsibility from the study environment and how the results for better grades were being held by the parents or parenting figures. This entire scenario demonstrates how the different areas of the student life's could affect their mental health and how pressure in one place such as their homes could also reflect on their performance in a school environment and vice-versa.

But when the Covid-19 outbreak forced all students to be isolated in their own homes this condition that was already bad became even worst. Specifically, between the middle-year students, the Municipal Education Secretary (MES) of São Paulo conducted a study after the first flexibilization of social distance measures back in 2021 and it was registered that an increase of 120% occurred in anxiety disorder and depression between the students in the public and private school in the city of São Paulo. Again, the main reasons for that alarming increase in mental diseases were the social isolation and the lack of certain of the future caused first by the economical condition of the country – and the city itself – and then the pandemic that leads to the uncertainty of survival and how those same factors were associated with the demands from the parents about grades or specific learning development.

After all the school learning programs went to an online platform, quickly students and teachers were obligated to adapt to how to conduct the classes on a screen many of the anxiety disorders felt by the students from both cities were associated with this issue: how they will be able to truly learn in an environment that was not the school. Reinventing how to study from home even with the students enrolled in a regular school program was not easy for the students and for the entire system since the parents were not prepared or trained to assist of conduct properly the school curriculum. It is also known that once all the content was directed to the computer many students from both cities experienced difficulties regarding the internet speed or even access to computers or other technological devices to follow the content that was being taught in the school program. That uncertainty about the future of the school itself allied with the troubling news about the deaths and infection rates of Covid-19 helped to raise the anxiety levels of the children's on alarming levels demarcating, even more, the social issues of the richest and the poorest

since the poorest students couldn't even attend to online school due the lack of condition to accessing technology or the internet.

Tosi (2022) [13] has already pointed out that during the Covid-19 pandemic the abyss between the most privileged students and the poorest in different parts of the world. Doing a philosophic approach to online education during the Covid-19 pandemic, the author brought some comparative data from economically developed and developing countries such as Canada, the United States, Brazil and India and how access to educational technology was leading to different educational experiences based on the machine (computer) multitask figure (Tosi, 2022, p. 151 – 152) [13]. This scenario can also be applied to the anxiety situation being discussed in this article since the São Paulo students were also experiencing uncertainties regarding their ability to follow their courses curriculum entirely online and that scenario also was a decisive mark of the fear of the future that marks this mental disorder. To reinforce this perception, the research conducted by the MES in 2021 pointed out that the main cause of anxiety related to education in São Paulo's middle-year students was related to their capacity to follow up the in-person curriculum and how much of their skills were harmed due to the social distance.

In a direct comparative reflection on those two different environments – NY and SP – we found very similar scenarios in the data collected by official departments that control the mental health condition of the students. With those guidelines, it is possible to reflect on how anxiety disorder among middle-year students around the world – and in different economical, geographical and political environments – has risen to warm levels amongst children worldwide and that phenomenon showed the importance to understand what threats and fears those individuals are projecting since anxiety is still a fear that of something that could happen and it is still not materialized (Rachaman, 1998, p. 39) [3]. Even with the cultural and economic differences, both groups demonstrate an immense fear of the future regarding their direct survival and their future as collaborative individuals inside a capitalist society. Adding to that, the students from both cities affirmed that they were having difficulties concentrating in their study environment because there were no distinctions between home and school boundaries anymore and therefore there were being excessively exposed to Covid-19 news while they were using the computers to study and to communicate with their friends.

With that subject in the spotlight, it is possible to truly understand the relationship between students being over-exposure to audiovisual media and anxiety during the Covid-19 pandemic now that every learning and socializing environment were mixed in front of the computer?

4. The Audiovisual Media and the Anxiety

The association between anxiety and the excessive use of audiovisual media is being discussed for a while now, especially after the rising of screen media as the main resource of communication in the 21st century. Some important research involving mental health, attention and cognitive skills can be reviewed by Desmurget (2019) [14] who observes the over-exposure of children to screen devices with a very critical point of view. To him, the results of this technologic mediated environment are that for the first time in the history of neurological studies, children have a lower IQ than their parents and that the difficulty of learning and evolving knowledge are directly related to the audiovisual media (Desurget, 2019, p. 73) [14]. Furthermore, the author also points out that more children have been exposed to the screen for more than 4 hours diary and that exposure to such an addicting world without parental supervision are shrinking their social skills such as in-person relationship with other children and adults.

In the same critical thinking path, Vannucci *et. al.* points out the constant use of social media in audiovisual devices as one of the main causes that lead to anxiety increasing among young adults and even adolescents. To the authors, the "constant warning of

incoming messages and notifications from the different social media platforms are leading to a permanent state of awareness” and conduct to a “constant state of stress caused by the adrenaline felt by the participants on the virtual interactions on the social media profiles” (Vannucci *et. al.*, 2017, p. 164) [15]. That condition can be related to the fear of not being recognized in a society or not being visible to the other profiles in the virtual environment. To most of the participants, it is more frightful not to be replied to in their digital social networks than in their in-person environments since the number of contacts in those environments is infinitely superior to the ones they connect in their lives outside the screen. The authors also pointed out that some mechanisms in the design of social media platforms are directed related with the adrenaline rush felt by the participants when they post some content – such as a text or a photo – and the moment the replies or reactions started they could not stop to anticipate how many more reactions would be posted, creating a very addicting environment moved by the anxiety of new notifications and visibility (Vannucci *et. al.*, 2017, p. 165) [15].

Social media environments that were more attractive to middle-year students such as Tik-Tok also registered an impressive access number increase during the Covid-19 pandemic. Using the same design from other platforms such as Facebook and Instagram, the rising popping-up of message alerts and new videos content allowed pre-adolescents and even more young children to be inserted in the same logic of constant awareness and anxiety that were registered among the adults that are hard users of social media apps. For example, the consumption of Youtube channels destined for pre-adolescents and other children from the same age cohort rose by more than 18% during the pandemic, and the time that was dispersed on audiovisual media such as computers, tablets and smartphones jumped from 3 hours per day to more than 6 hours associated only with entertainment consumption. The constant alert – or the lack of alerts – of new videos and content posted by the channels made the viewers increase the number of times they accessed the Youtube platform in a day or even in a specific period of hours. That amount of access created a full circle of anxiety and stress for the early access to new content or new trending videos that were commented on by other children that belong to the social network (such as school, neighbourhood or family).

Not only the classroom and the social connections were confined to the same environment – the screen media – but also the no physical space of the internet was the only “real space” where these children could explore other places outside their own houses with their entire families locked up and having to work and study “normally”. In a world where all the family members are confined in the same space and there are no more “normal” routines that allow family members to be prepared for the different parts of their days, the audiovisual media quickly became the principal source of information and communication with the outside world and entertainment to relive stressful routines. Suddenly, students were obligated to understand digital learning platforms such as Zoom, Google Classes or Microsoft Teams and also, equate not only information about this new form of learning but also, learn the content of the curriculum destined to their grades. Inside that transitory space where those children used to spend a specific amount of their time – also known as their homes and rooms –, they had before and after school the opportunity to switch between family and friends acquaintanceships in other public and private spaces. But during the lockdown, houses are the symbol of their incarceration and to kill the time that was once occupied by the comes and goes from one place to another, most children found the ease and comfort of the screens to ease the tensions of a world that they can not recognize anymore.

The purpose of highlighting that all social environments were reduced to one single space during the Covid-19 pandemic and the contact with the external environment was through the screen it is to defy the idea that most of the responsibility for the rising anxiety level among middle-year students is related with the screen media. It is very reductive to point out that the access to the outside world in those circumstances imposed by the

Covid-19 lockdowns was the main reason for the mental stress registered among students worldwide, especially the students pointed out in this paper earlier. The fact of many children was experiencing real danger of death and excess of information regarding the new disease explain the fact that many of those individuals preferred to expand many more hours of days playing videogames and streaming entertainment content than studying explains why the audiovisual media helping with the stress relief. Studies conducted in situations where children were facing real life-threatening pointed out that audiovisual media could help them to release stress and to face different realities while they are facing real danger. Wilkinson *et. al.* pointed out that the studies with video games as a tool to deal with mental disorders in children and adolescents in the early 1980s and the 1990s coincided with the population of personal computers (1980) and the rise of the internet (1990). In the studies review made by the authors, it was found that many studies conducted since the early 1980s pointed out the advances that the "new technologies mean for educational, motor and also ludic connections" with children and adolescents (Wilkinson, 2008, p. 373) [16]. In the anxiety field, the authors also pointed out that even specific games with realistic approaches using images or situations where the children had to deal with topics that can be related to phobia and anxiety – such as spiders –, the level of stress after the game was finished does not have any relevant change that can be associated with the relationship between the children and the audiovisual media (Wilkinson, 2008, p. 374) [16].

However, the studies also pointed out that relying upon the anxiety treatment using only videogames or other audiovisual media could not be sufficient to reduce anxiety levels in younger co-boards, and that treatment should be considered only when is associated with other approaches such as regular therapy sessions and other artistic treatment such as writing and drawing (Wilkinson, 2008, p. 376) [16]. This can also be registered in cases of children's facing stressful and life-dangerous situations such as cancer treatments or pre-operations with real life-threats conditions. Patel *at. al.* indicates that many children's hospitals are using video games as a preoperative resource to help middle-year children and pre-adolescents to release anxiety. In a study conducted with 112 children with ages varying between 4-12 years, the authors found that at least 75% of the cases of children that had played video games before the administration of the anesthesia demonstrated a decrease in anxiety levels before and after the surgery (Patel *at. al.*, 2016, p. 1025) [17]. The treatment was also combined with the companion of a psychologist and the constant presence of the parents, reinforcing the observation made by Wilkinson. *al.* before.

Scholten *at. al.* conducted other studies with adolescents using 3D immersive video games as a way to decrease anxiety. The individuals from 11 to 15 years that participated in the study were all experiencing anxiety disorders related to the social environment (school) and social behaviour (bullying or social discomfort) and it was found that in three months of using specific action video games grounded in fantasy and ludic worlds, a significant anxiety decrease was felt among the 138 participants. The study did not register any substantial differences between boys' and girls' results and both pointed out that specific video games using ludic narratives and action-driven controls helped to control anxiety disorders in more than 74% of the cases (Scholten *at. al.*, 2016, p.12-13) [18]. To the authors, the use of that kind of environment and narratives that require mental concentration and motor response helped the participants and can also be related to many other factors that transcend the psychological studies, relating to culture environment and socialization among their peers using a video game as the common topic (Scholten *at. al.*, 2016, p. 18) [18].

In the same perspective, Schoneveld *et. al.* conducted a study that aimed to prevent anxiety disorder among 7 to 13 years children using a video game designed to function only with the mind of the players. Using a helmet that captures the neurofeedback from the video game user, the study focused on 78 volunteers that were experiencing anxiety

symptoms and how the video game platform could help them to decrease their anxiety levels down. Mainly, the video game stimulates the players to relax and to think specific commands to allow the narrative to evolve and unlock new levels and in-game rewards. Among its participants “most of them were concentrated in how to play and to understand the neuro commands to be able to continue with the game” and that concentration helped them to control the anxiety symptoms and focus on a specific objective (Schoneveld *et. al.*, 2016, p.326) [18]. The study demonstrates that not only the video game as a representative of audiovisual media can center children’s attention but also had an important part to decrease children’s anxiety to normal levels after many hours of games was played.

Despite the increase of criticism of audiovisual media on children and how that relationship could be associated with the rising of a "stupid generation" (Desmurget, 2019, p.17) [14], there is no sufficient data that can associate the increase in anxiety disorder among children’s and adolescents in the past 20 years with the quick spread of screens in all media and those individuals regular environments. In the same way, we can point out problems and solutions associated with video games, for example, there is also an alternative to critically thinking about how to deal with anxiety and the use of screen time after Covid-19.

5. The Problem and the Solution in the Same Side of the Coin: Videogame Education as a Treatment for Anxiety Post-Covid 19

It is no surprise that after the Covid-19 lockdowns and the most acute part of the pandemic children find relief from the harsh reality of playing video games and finding exhaust valves in entertainment content mostly uploaded on the internet in Youtube channels and other social media networks. That reality escapism can be interpreted as a form of the children’s to avoid another cruel face of the reality that was shared by the news in many other screen medias containing images and numbers of how lethal this new disease is. Instead of using the same media that grown-ups used to check how reality was changing and how threatening it was to be in contact with other persons, the children preferred to use the same communication channels to create an extension of their ludic world. Even though those same platforms were being used as a way to educate them in virtual classrooms and learning forums, they were meant to end related to education and linked to their stress-related subjects with their own lives.

Another form to interpret this condition can be related to the ludic view of the world that children must have to develop their psyche more healthily. That relationship between the fantasy world and the real world will create tools related to socialization, creativity and problem-solving, and many parts of that ludic world can be found in audiovisual media that is now being used as a strong channel to conduct their imagination away from the disturbing news from outside their confinement. According to Dunn and Mann, the creation of a playful world in children’s minds is necessary to “feed a universe of symbolic references that are rooted in culture, and therefore, in communication with the groups that form and will form the social life of these individuals” (Dunn and Mann, 2006, p. 35) [19]. The importance of the ludic approach to children’s mental health is enormous and allows them to create the first distinctions between reality and fantasy, concrete and abstract, tangible and intangible and realize and imagine and, with those definitions, (re)shape their perception of the world and social interactions. Lacan (1980) [20] also pointed out how those cultural references, called here "floating signifiers", can be found in television and other audiovisual media and how those same images, sounds, animations and other audiovisual elements can conduct and construct the bridges with reality and with illusion, accessing fields of the human psyche with those references based on reality itself.

In the same perspective, educational fields such as arts and social studies reinforce how it is important to associate ludic knowledge with curriculum content. The bridges

established between the children's imagination and the reality that surround them and studied in those contents can structure a permanent bridge of association between the playful references of the ludic culture with the knowledge necessary for individual development. Dunn and Mann pointed out that the strategy of how the ludic construction can help the children's psyche to build a strong understanding of how the imagination works and how reality can be associated with reality, but cannot substitute it (Dunn and Mann, 2006, p. 73) [19]. This means that although the playful universe is important for the child to understand the universe within their own cognitive and emotional development, the clear delimitation between what can be done in the world of imagination and the real world must always be reinforced. Therefore, even with the possibility of the child experiencing what it is like to fly in an electronic game, their real ability to achieve flight through the window of their house is not real and their imagination finds audiovisual contours and a feeling of control through the joystick and the images of that electronic game.

One important instrument that helped children to release some of the stress of being kept inside their houses was online gaming. The virtual environment of video games such as *Roblox* and *Minecraft* offered different experiences directly related to ludic worlds and constructing imaginary worlds using pixel tools. This specific genre of game is called *sandbox* because it allows the gamer the freedom to freely shape the elements of the game and create different narratives and experiences such as children playing in a sandbox with their tools. But, instead of handling spades and fuses, the children will handle a mouse and keyboard or a joystick while socializing with other children in this virtual space who are also creating their own stories. During the Covid-19 pandemic, several reports from kids who developed anxiety disorders were directly associated with social isolation and the incapacity of making new friends and one way they found to keep connecting with their peers was by using online video games. Some stories of children who got connected using those videogame online platforms during Covid-19 social restrictions and spend almost 3 years establishing a strong friendship had the opportunity to meet in person only after the restrictions and lockdowns were relaxed³.

That new way to establish social connections among the children and also release some of that anxiety that is directly related to the Covid-19 situation allows us to think about how those elements that were presented in the audiovisual media can be important to help researchers and professionals to connect with them after the mandatory lockdowns are over. To understand how such contents are so popular among middle-year students a few methods are necessary to research the cultural and social appeals of those games. Even though they use the same audiovisual language that is used by the classes they have discomfort to have during the pandemic, games such as *Minecraft* already have a special place destined to understand how *sandbox* platform games can help students to relate the ludic and reality while they are playing that videogame. In the same path, fields that are also associated with psychology, education and cultural studies are trying to understand how video games can act as an important ally in the mental health disorder registered after the pandemic.

Edusemiotics, a field that combines the study of signs and cultural representations and education, is one of the many important methods of observation and reflection of communication environments that allows researchers to understand how the cultural signs and representations existing in audiovisual media can help associate ludic content

³ For more information about one of the examples being related in this article:

https://www.reddit.com/r/MadeMeSmile/comments/wmrfrk/two_kids_who_have_been_gamer_friends_for_3_years/

and curriculum content. Semioticians often relate their research with the field of cultural analysis from Freud's, Lacan's and Jung's theories in the unconscious and conscious construction of the self, the cultural references as a reference of our own and the imaginary construction of the self and the other. In this specific case, the Edusemiotic approach can help us to understand that audiovisual media is an extension – or even support – of the ludic part of children's imagination. After several months of lockdown during the Covid-19 pandemic that occurred in many countries around the world, children's started to look for the construction of new cultural references and the maintenance of their references with the tools that were accessible to them at that moment: the audiovisual media. While parents and guardians associated computers and television with work and the terrible news about the pandemic situation, the children tried to disassociate that context with fun and ludic relief from the real possibility of death. The ludic exercise of their imagination and plays were now on computers, tablets or smartphones, and even while that same platform held online classes that offered many disadvantages compared with the in-person classes including, they tried to escape from the imaginary world where the dangers and possibility of death do not affect their real lives.

According to Heffer. *al.* images present in video games can improve the recognition of emotional expression and affection in children through the representations of specific feelings demonstrated in the characters' in-game narratives. In a study conducted by the authors with children's from 8 to 13 years old, the researchers found that more than 83% of the participants could establish a direct relationship between the feelings that were demonstrated in videogames narratives and what could have caused those feelings with real examples and situations on their daily-bases routines. The fact that these plots are entirely based on the fantasy world does not mean that children are not able to do such bridges between the ludic and the real are not made and discern between what is possible in their own lives and their games. That means that "the mechanism of recognition of emotion in ludic platforms such as the videogame does have a strong appeal on how children can relieve their stress and also create empathy with other peers even while they are having fun" (Heffer *at. al.*, 2021, p. 07) [21].

Specifically, regarding video game education after the Covid-19 pandemic's most acute moments, it is important to highlight that previous studies were being conducted about specific types of games and how those can help students to improve curriculum content with ludic strategies. One of the strong tools that have been used in the past five years is the game *Minecraft* created in 2011 and published by Mojang Studios for consoles and computers. Visually structured in a pixilated cartoonish aesthetic, the original narrative does not follow a structured tale and allows the player to play as a character that needs to (re)build an entire world with his creative tools. An important part of the game is based on how the player will share his creations with other players through the internet and allowing him to join other players to visit other creations and fight together against the threats in the cities and wild environments that want to destroy the items developed by the gamers. With the massive success of the game among different age cohorts, *Minecraft* instantly became an important extension for creative and ludic expressions for children – and many adults – incorporating school contents such as geometry, engineering, environment care, social studies, geology, astronomy and many others. While the players construct cities, shape landscapes, take care of animals and deal with threats that are based on the collective imagination such as zombies, dragons, skeletons, spiders and witches, the game became to be more and more present in classes discussions and had become a separated field of study in education and videogame theory called *Minecraft* education.

According to Bourdeau *et. al.* the integration of videogame practices in school or even in the students' houses must have been followed by education professionals and parental supervision to "avoid misinterpretation of the exercises or how the game experience can be linked with school's curriculum in different subjects from mathematics to social

studies" (Bourdeau *et. al.*, 2021, p. 34) [22]. The participatory demand for these specific educational tools is also needed if we intend to use the videogame also as an anxiety relief tool. It will be necessary that professionals and parents to be truly engaged in spending time on *the Minecraft* platform to first understand what are the potentialities and what are the weak points that can help or trigger anxiety symptoms. To the researchers, the game platform allows the children`s to highlight important similarities with reality and helps them to "understand how to control emotions while dealing with situations that can also be found in the real world" (Bourdeau *et. al.*, 2021, p. 37) [22]. That means that video games can act as an important ally in combination with professional and parental supervision in demonstrating how stressful situations can happen and how to deal with them using characters from the game`s narrative as a direct example.

The affective relationship between the children can also be explored when approached with the edusemiotic method. Understanding the cultural representations that are contained in games such as *Minecraft* allows the researchers to fully understand the power that such instruments have in narrative interpretation and comprehension. As pointed out by Heffer *et. al.*, if that same media can stimulate empathy and emotional recognition with fantasy characters, the next important step to be understood is how it is possible to correlate that same observation that is held in the ludic world with the real world of the children. To do so, it is firstly imperative for parents, teachers and other adults to understand why it is much easier to deal with the emotions in the ludic world of the videogames than dealing with them in the real world. According to Bourdeau *et. al.* in the ludic world of *Minecraft*, for example, the possibilities for the player to deal with specific loss of objects of affection such as other players, buildings or characters can be faced as training for them to deal with real loss in their real lives. To the authors, the videogame act as "training for the real challenges faced in the real life, and can be an important ally to parents and professionals of many different fields to help children to deal with subjects related to education, psychology, engineering and many others." (Bourdeau *et. al.*, 2021, p. 38) [22].

On other hand, in games such as *Roblox*, where the platform allows the user to build and share their games, countless new worlds and interactions are being created and the most popular games are directly related to popular characters in children`s worlds that can be related with the pandemic period that everybody was facing back in 2020. *Pig* is a *Roblox* game based on the characters from the British cartoon *Peppa Pig* where the main character was infected by a virus that made everybody act violently. The main objective in the game is to run away from Pig and avoid being infected by the zombie virus. The game became incredibly popular among middle-year students and had a lot of different content shared on forums and Youtube Channels about the mythology that existed in the game and how that could be related to the real world, or in other words, how *Pig* could be used as educational tool while its content was still relevant among students.

Understanding the audiovisual media as a whole means that it is possible to point out the many problems caused by the exaggerated use of technological devices during the Covid-19 lockdowns but it is also necessary to point out there are many possibilities that reinforce positive learning and emotional environments inside different contents, such as videogames. The importance of the cultural reference of images and technological devices among children in the 21st century can be used once those cultural signs have been truly understood by the adults who deal with those children in different environments, helping them in the difficult (but necessary) task of understanding the world and recognize the threats and the potentialities of media devices. Regarding the facility which those younger generations have to access infinite possibilities of different contents in mobile devices such as cellphones and tablets and still use computers and videogames to find spaces to commute with others, the support is just another mean to an end where the anxiety levels are high regarding many other concerns related with a difficult time the humanity faced while dealing with a new virus real life-threat.

6. Conclusion

This article seeks to provoke a discussion about how audiovisual media and in particular video games can be used as an important part of stress relief and anxiety treatment for middle-year students around the world. Starting from the point that many of the anxiety-related problems were present before the covid-19 lockdowns and social restrictions began, it is necessary to throw light on how children and adolescents from 9 to 13 are being so afraid of what is ahead of them to create emotional mechanisms that trigger in them social phobia, acute despair and in most severe cases even suicide.

The rising of anxiety-related diseases among middle-year-age children is not restricted by developed or in-development countries and can be more related to how 21st-century society is flooding information to the younger generation. Elements that once concerned only for adults crossed the line and became part of children's and young adolescents' lives and amplified the uncertainty of their place in the world. Social media and how others will feedback on my virtual existence became a tyrannical compass of how to fit in with other groups and gave me a new understanding of how popularity and belonging in different groups have been transformed in today's world. The social isolation of those individuals in the prime age of their own social and intellectual development caused by the covid-19 pandemic world exposed them to an environment of too much information and too little guidance from adults. On one hand, parents were confined with their children in one space and that should increase the connection between families, but on the other hand that space was still controlled by the adult with their struggles to juggle between the home office routine and the attention to the others. It is common to understand that in that kind of environment filled with news about the rising numbers of infections and deaths, there was not much left for the children's imagination besides the idea of the lives of the ones their love the most – or even their own life – could be erased of the Earth by this terrible invisible enemy.

The studies compiled in this article helped us to understand how the areas of one person's life could be feelingly affected by social isolation and over-exposure to an adult-controlled environment. As Winnicott (1992) [23] described in his works about the different spheres of an individual's life, the balance between plural and diverse social contact allows children and young adolescents to structure a healthy fantasy world as a form of them to project their imagination with other peers and reinforce social and cultural references. That gives them essential physiological tools to handle reality with associations and disassociations directly related to the imagination. Once that was taken away from them in the most common and normative form – the in-person contact – they had an increased amount of fear that was immediately turned into anxiety. The "new normal" was not even new or normal to them, as they had almost no experience of how to change the socialization key from children's play to young adolescents play. Although it is been recognized how difficult that phase is for the young ones and their parents, adding to that equation social isolation and constant fear of death turned that difficult phase into an emotional nightmare. The bridges that related them to normality were interdicted and suddenly the most normal thing that they could relate to was the technology and how their skills with digital media and computers could relate them to the fragile line of their reality.

It is well known that children's that were born in the middle 2000s are considered digital natives (Tosi, 2022, p. 150) [13] and therefore their reality already presupposes intimacy with technology and interactive screens. Videogames and social media became a huge part of their cultural references and an important topic in their socialization circles, interchanging different perspectives and allowing connection with peers through similarities sharing. Even with all that proximity with technology and the construction of their ludic world being associated with electronic devices, before the pandemic, they could switch between the digital and in-person environments and commute their

experiences with others while they were constructing the essential social bond that allows us to be recognized as a social specie (Harari, 2016) [4]. For almost 2 years socialization bonding was substituted by screen bonding and the person who was once seated next to those children in school and could be touched now became an avatar on the screen and could decide to – or not – open the camera to be seen. That took a huge impact on the ludic universe of the children, since one important part of constructing imagination; is to share those imagination references with your peers (Winnicott, 1992) [23].

In this specific point of social, cultural and behavioural intersection where we can find videogame education, edusemiotics and middle-year student meeting during the Covid-19 pandemic. Understanding how video games are now an active part of children's culture and a latent part of popular culture that allows them to connect with their peers opens an important space for reflection and investigation that seeks to demystify this media as a whole. Videogames are now an active part of the educational process and games such as *Minecraft* and *Roblox* is being used to teach students science, technology, engineering and mathematics skills forming the fundamentals of the S.T.E.M education, which can also be stretched to S.T.E.A.M education where the A stands for arts and all the social studies subjects such as history, sociology and critical thinking (de Oliveira Jayme *et. al.*, 2020, p. 283) [24]. Adopting different media platforms where the language, the visual and the cultural references appeal more to the youngest helps us to understand how those elements are related to their reality (edusemiotics) and how to use them to establish a strong relationship between leisure and learning.

When the lockdowns took place in major cities around the world and the lines between school life and private life were extinguished, all regular media that reunited families were switched to news-related death numbers and horrible cases of people suffering from the sequelae of the disease. Immediately the children's no environment was more secure and provide them to commute with other children's videogames and special those where they could play online with other kids. Understanding *Roblox* and *Minecraft* in an educational approach helps us to understand also how those same platforms could help them to reduce social anxiety and deal with real challenges that can be related to their in-person world. Understanding that anxiety is an increasing problem in our society also allows us to understand that some of the causes that can be directly related to this phenomenon can also be faced as a solution to it, once we decided to face it with an open-minded approach and truly understand how those elements can be associated and disassociated with the cause. Videogames were used as a tool to help middle-year students to engage in (virtual) social environments with other kids while their in-person social lives went on a forced pause due to the Covid-19 pandemic, and no study was published recently that decided to conduct a real investigation on how those media supports helped them to overcome the total social isolation and also helped them to commute with other peers and even to reinforce school content.

With this article, we seek to shed light on that situation and to provoke how those new media can be initially associated with one problem for only after an immense amount of attacks were made, the opportunity to look at it from a whole different angle emerge. Since every game is designed to allow the player to evolve into the story and to upgrade their character into something more and more powerful, it is time for us to also level up our discussion and to put our characters on a different level to finally start to face on how videogames can be a true and important ally on the fight against anxiety disorder among middle-year students.

References

- [1] Hoyt, L. T., Cohen, A.K., Dull, B., Castro, E.M. & Yazdani, N. (2021). Constant stress has become the new normal: Stress and anxiety inequalities among U.S college students in the time of COVID-19. *Journal of Adolescent Health* 68. P. 270 – 276.

- [2] Schoneveld, E. A., Malmberg, M., Lichtwarck-Aschoof, A., Verheijen, G. P., Engels, R. C.M.E., Granic, I. (2016). A neurofeedback video game (MindLight) to prevent anxiety in children: A randomized controlled trial. *Computer in Human Behavior* 63, P. 321 – 333.
- [3] Rachaman, S. (1998). *Anxiety*. Psychology Press: London.
- [4] Harari, Y. N. (2016). *Sapiens: A brief history of humankind*. Signal: Canada.
- [5] Pearson, P. (2008). *A brief history of anxiety: Mine and yours*. Penguin Random House: Canada.
- [6] Bandelow, B., Michaelis, S. (2015). Epidemiology of anxiety disorders in the 21st century. *Dialogues in Clinical Neuroscience*, 17:3, P. 327-335.
- [7] Mazzone, L., Ducci, F., Scoto, M. C., Passaniti, E., D'arrigo, V. G., Vitiello, B. (2007). The role of anxiety symptoms in school performance in a community sample of children and adolescents. *BMC Public Health* 7:347, 06 Pgs.
- [8] Madjar, N., Zalsman, G., Weizman, A., Len-Ran, S., Shoval, G. (2018). Predictors of developing mathematics anxiety among middle-school students: A 2-year prospective study. *International Journal of Psychology*, Vol. 53, No. 6, 426 – 432.
- [9] Boyarinov, D., Novikova, Y., Gubaidulina, F., Hachina, A., Barabanshchikova. (2021). Anxiety and procrastination in distance learning. *Journal of European Psychology*, 811, 15 pgs.
- [10] Zeidner, M. (2014). Anxiety in education In Pekrun, R. & Linnenbrink-Garcia, L. (Eds). *International handbook of emotions in education*. Taylor & Francis Group.: New York.
- [11] Coelho, V. A., Marchante, M., Romão, A. M. (2022). Adolescents' trajectories of social anxiety and social withdrawal: Are they influenced by traditional bullying and cyberbullying roles? *Contemporary Education Psychology* 69, 09 pgs.
- [12] Quevedo, L. A., Mola, C. L., Pearson, R., Murray, J., Hartwig, F. P., Gonçalves, H., Pinheiros, R. T., Gigante, D. P., Motta, J. V. S., Quadros, L. C. M., Barros, F. C., Horta, B. L. (2020). Metal disorders, comorbidities, and suicidal at 30 years of age in a Brazilian birth cohort. *Comprehensive Psychiatry* 102, 09 pgs.
- [13] Tosi, R. I. (2022). Transgenerational Education in Pandemic Time: Dromology approach of digital learning environment. *Open Journal of Educational Research*, 2(3), P. 147-157. DOI: 10.31586/ojer.2022.328.
- [14] Desmurget, M. (2019). La fabrique du crétin digital: Les dangers des écrans pour nos enfants. Paris: Seul.
- [15] Vannucci, A., Flannery, K. M., Ohannessian, C. M. (2017). Social Media use and anxiety in emerging adults. *Journal of Affective Disorders*, 207, P. 163 – 166.
- [16] Wilkinson, N., Ang, R. P., Goh, D. H. (2008). Online video game therapy for mental health concerns: A review. *International Journal of Psychiatry*, Vol. 54(4): P. 370-382. DOI: 10.1177/0020764008091659.
- [17] Patel, A., Schieble, T., Davidson, M., Train, M. C. J., Schoenberg, C., Delphin, E., Bennett, H. (2006). Distraction with a handheld video game reduces pediatric preoperative anxiety. *Pediatric Anesthesia* (2006) 16: 1019-1027. DOI:10.1111/j.1460-9502.2006.01914.x. 10 pgs.
- [18] Scholten, H., Malmberg, M., Lobel, A., Engles, R. C. M. E, Granic, I. (2016). A randomized controlled trial to test the effectiveness of an immersive 3D videogame for anxiety prevention among adolescents. *PLoS ONE* 11(1): e0147763. DOI: 10.1371/journal.pone.0147763. 24 pgs.
- [19] Dunn, C., Mann, R. (2006). *Kid's view of the World*. Murdoch Books: Australia.
- [20] Lacan, J. (1980). *Television: A challenge to the psychoanalytic establishment*. W.W Norton & Company: New York.
- [21] Heffer, N., Karl, A., Jicol, C., Ashwin, C., Petrini, K. (2021). Anxiety biases audiovisual processing of social signals. *Behavioural Brain Research* 410 (2021) 113346. Doi: 10.1016/j.bbr.2021.113346. 12 pgs.
- [22] Bourdeau, S., Coulon, T., Petit, M-C. (2021). Simulation-Based training via a "Readymade" virtual world platform: teaching and learning with Minecraft Education. *IEEE Computer Society* 1520-9202. DOI: 10.119/MITP.2021.3063935. 07 pgs.
- [23] Winnicott, D. W. (1992). *The child, the family and the outside world*. Da Capo Lifelong Press: London.
- [24] De Oliveira Jayme, B. (2020) *The HeART of Engagement: Experiences of a Community-Created Mobile Art Gallery in Brazil*. In: Levac, L. R. E., Wiebe, S. M. *Creating Spaces of Engagement: Policy Justice and the Practical Craft of Deliberative Democracy*. Toronto: University of Toronto Press.