The impact of electronic games on students' academic life: an analysis of a public school in the countryside of Minas Gerais

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***Abstract*—The video games sector has grown exponentially in recent years, adapting to an increasingly competitive and demanding market ranging from casual gamers to professionals. This has led to the universe of games being included in various scenarios like education. Although this concept can benefit some student's lives, others end up experiencing the negative side of games. This study aimed to analyze the impact of electronic games on students' academic lives. Results indicate that most student participants play video games regularly, with 94.4% engaging in e-Sports. Among them, 50% play daily, and 14.1% play for more than 7 hours a day. Prolonged exposure to electronic games has negative health impacts, with 69.6% of students reporting physical and mental symptoms such as eye strain, back and neck pain, as well as fatigue and discomfort. Additionally, 34.8% of students believe that gaming affects their studies, which is supported by academic data showing that only 20.7% fall within the "excellent academic performance" range.**

***Keywords*—E-sports; Education; Games on Education.**

I. INTRODUCTION

Electronic games have begun to be designed in such a way as to generate behavioral changes in their users over the years due to their great popularity in providing leisure and entertainment to players [2][3]. This has led the video game industry to grow exponentially in recent years, having to adapt to an increasingly varied and demanding market, ranging from casual gamers to professionals[10].

According to the 11th edition of the Game Brazil Survey, which took place in 2024, around 85.4% of the population consider electronic games to be one of their primary forms of entertainment, and 38.0% play them daily [9]. With this, it is worrying that 28% of young people use this method of entertainment in a problematic way, causing emotional, social, and physical damage [1][6].

However, with technological advances, concepts such as gamified learning have become increasingly discussed [7]. Education professionals are looking to electronic games to pass on knowledge playfully, impacting cognitive learning skills[11]. Although this practice is being adopted more and more, playing for long hours can cause health problems and a drop in academic performance [1][8].

In view of the context presented above, this paper aims to analyze the impact of electronic games on students' academic lives. The rest of the paper is structured as follows: Section 2 contextualizes the topic with related works; Section 3 describes the Methodology used; Section 4 presents the Results and Discussions; and finally, Section 5 discusses the final considerations, followed by the bibliographical references used.

II. RELATED WORKS

To establish an initial understanding and contextualization, three distinct works were analyzed, presented below.

The article ***"Extended hours of video game play and negative physical symptoms and pain"*** [1] primarily aims to analyze the association between prolonged gameplay and physical symptoms, as well as to examine how demographic factors, online gaming disorders, and professional aspirations in the gaming field influence this relationship. The "2022 International Gaming Study"[1](IGS22) had a total of 955 participants from countries such as Australia (111), Canada (215), the USA (418), and the UK (211). To participate in the study, candidates had to meet some requirements, such as: 1) being 18 years or older and 2) playing video games for at least 3 hours per week. At the end of the screening, 520 men, 431 women, and 4 others were included in the study, with ages ranging from 18 to 94

[1]https://thedebrief.org/new-study-reveals-the-hidden-health-cost-of-video-games-what-every-hardcore-gamer-needs-to-know/

years. As a result, the authors reported that playing video games for three or more hours is associated with negative physical symptoms, such as: Eye fatigue, reported by 46.1%; hand or wrist pain by 45.4%; and back or neck pain by 52.1% of participants.

In ***"Examining the Predictors of Video Game Addiction According to Expertise Levels of the Players: The Role of Time Spent on Video Gaming, Engagement, Positive Gaming Perception, Social Support and Relational Health Indices"***[5], the objective was to examine the predictive relationship between video game addiction (VGA) and the level of expertise among players. The study included 227 players over 18 (54.2% were female and 45.8% male), with 50.20% identifying as beginners and 49.80% identifying as experts. Data were collected through personal information and game-related questionnaires. The questionnaire questions were: How many hours do you spend playing video games per week?; How many hours do you spend watching video game streaming per week?; How many hours do you spend on Twitch watching video games per week?. The results showed that the relationship between video game addiction (VGA) and video game engagement (VGE) differs based on the participants' level of expertise in video games. Additionally, increased time spent watching Twitch content is associated with increased VGA level.

Finally, ***"E-sports playing and its relation to lifestyle behaviors and psychological well-being: A large-scale study of collegiate e-sports players in China"*** [4] addresses the practice of electronic sports among university students in China, investigating its relationship with lifestyle and psychological well-being. The study investigated whether e-sports participation behaviors differ among demographic groups and how these behaviors relate to participants' lifestyles and psychological well-being. Data from 1,441 university esports players in the country were analyzed. E-sports practice was associated with various aspects of students' lifestyles and psychological well-being, including mobile phone addiction, online gaming, life satisfaction, and stress. It is important to highlight that the time dedicated to e-sports practice and consuming these games also influenced the participants' behavior, lifestyle, and psychological well-being. Thus, the results suggest that proper time management and conscious consumption of e-sports are essential to promote a healthy lifestyle and psychological well-being among university students. Considering E-sports players, 86.1% had participated in e-sports for less than five years, 71% of students spent 1 to 4 hours playing e-Sports every day, and 83.2% of students practiced E-sports or engaged in sports activities every week.

III. METHODOLOGY

For the development of this study, four systematic stages were defined. **Stage 1:** Literature review; **Stage 2:** Definition of questions for data collection; **Stage 3:** Data collection; **Stage 4:** Creation of the study database; **Stage 5:** Analysis of the collected data. After completing **Stage 1**, the research began defining the data collection methodology and the questions to be addressed, characterizing **Stage 2**. It was decided that the study would be a quantitative research with 11 questions, 2 of which were qualitative, as follows: What is your gender?; What is your age?; What is your current level of education?; Do you play any electronic games?; Which electronic games do you play? (qualitative); On which days of the week do you play?; How many hours per day do you play?; Do you experience any discomfort from playing for several hours?; What kind of discomfort do you experience? (qualitative); Do you believe that electronic games interfere with your studies?; What is your current GPA (Grade Point Average)?.

In Stage 3, data was collected through physical forms at a state school in the region (to be presented in the final version due to blind evaluations), targeting 6th and 7th-grade elementary school classes and two 1st-year high school classes. In the end, 143 responses were obtained: 67 from elementary and 76 from high school. It is important to note that no personal data was collected from the participants during the data collection process. Additionally, the research adhered to Brazilian legislation as described in Resolution No. 466/12 of the National Health Council [12], where the collected information is being used solely for academic and scientific purposes, in compliance with the guidelines of Law No. 13.709/2018 (General Data Protection Law (LGPD)) [13].

In **Stage 4**, a database was created in Google Sheets, containing all the responses collected from physical forms, with careful attention to ensure that the data was entered accurately. For proper data analysis, two distinct categories were defined: people who play electronic games and those who do not.

VI. RESULTS AND DISCUSSION

After data collection, **Stage** 5 began. As mentioned in the previous section, participants were divided into two groups: those who play some electronic games and those who do not. As expected, given the target audience to which the research was applied, most participants played some electronic game, as shown in Figure 1. For the analyses presented later, 5.6% of the sample was not included, as they belong to another group that plays electronic games.

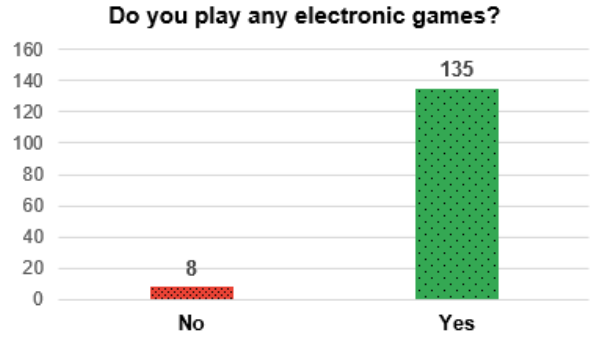

Fig. 1. Answers to the question: Do you play any electronic games?

Additionally, it was observed that 94.4% of the respondents play some electronic game. A study conducted by Game Brazil [9] in 2024 indicated that 62.9% of gamers in Brazil are men, which aligns with the current survey sample, where 53.1% of the respondents are male, 2.1% chose not to declare, and 44.8% are female, as illustrated in Figure 2.

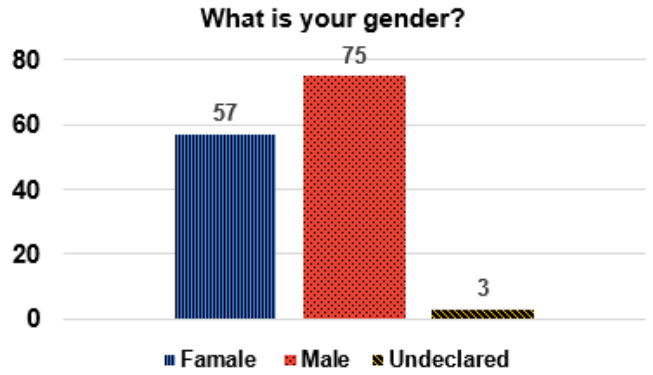

Fig. 2. Answers to the question: What is your gender?

Regarding the educational level of the participants, since the research was conducted at a state school, specifically in 6th and 7th-grade elementary school classes and 1st-year high school classes, two categories were defined: elementary school, which received 67 responses (representing 46.9%), and high school, with 76 responses (53.1%).

Considering the classes where the research was conducted, in terms of age range, the data indicate that E-sports activities are prevalent among children and young people, with the largest group being young people aged 11 to 20 years, representing 98.5%. A small percentage (1.5%) represents children aged 5 to 10 years. Regarding gameplay frequency , 31.8% of respondents play only on weekends, while 50% play daily and the other participants tend to play sporadically on other weekdays. Another important point is that 51.1% play for 1 to 2 hours per day, while 28.1% play for 3 to 4 hours per day, and 14.1% play for more than 7 hours per day, which could be concerning due to excessive screen exposure and potential long-term damage (Figure 4).

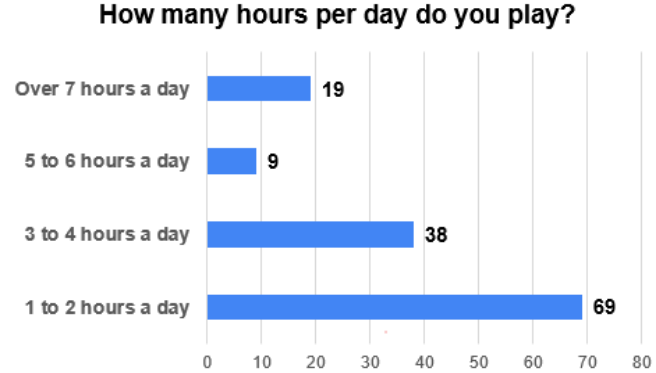

Fig. 4. Answers to the question: How many hours per day do you play?

Figure 5 shows that the most played video games by the audience are competitive (those that encourage competitiveness among participants). The "others" category includes casual games, such as survival games and RPGs (Role-Playing Games).

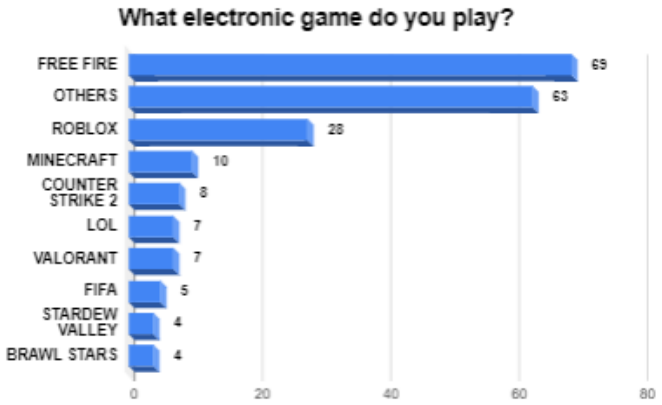

Fig. 5. Games most played by survey participants. In the "other" category, the three most played games are: Efootball, Subway Surfers, Grand Theft Auto V.

Although 30.4% of participants do not feel discomfort, 69.6% report experiencing some symptoms already described in the literature [1]. The most commonly cited symptoms include eye pain, back pain, headaches, neck pain, dizziness, physical and mental fatigue, discomfort, and eye strain (Figure 6). However, some students report feeling nausea, anger, and frustration.

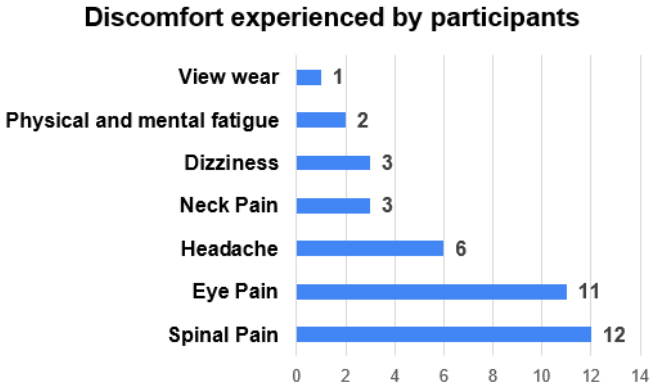

Fig. 6. Discomfort experienced by participants.

Thus, the more hours invested in video games, the higher the chances of experiencing negative symptoms (both physical and mental) at some point due to high video game usage. Regarding electronic games in the educational environment, 34.8% of respondents consider that they somehow impact their studies.. One way of supporting the above statement is through the Return Coefficient (RC), a measure of students' academic performance during school terms. Of the results, 20.7% of students fall into the “Excellent” range of the index, while 77.8% are in the “Good” range and 1.5% in the “Poor” range.

V. CONCLUSION

This study aims to analyze the impact of electronic games on students' lives, focusing on the potential consequences for physical and mental health, and their effect on academic

performance. A strong preference for competitive games was observed among the survey participants. Frequent exposure to games is also evident, with 94.4% of the 143 respondents engaged in E-sports, 50% playing daily, and 14.1% playing more than 7 hours per day. As previously mentioned, excessive video game use and prolonged screen exposure can lead to various health issues. This trend is supported by the study's findings, where 69.6% of participants reported experiencing physical and mental symptoms, the most common being eye strain, back and neck pain, headaches, dizziness, physical and mental fatigue, discomfort, and vision deterioration.

Additionally, 34.8% of students believe that the habit of playing for several hours, multiple times a week, impacts their studies in some way. This perception is reinforced by academic performance data: only 20.7% of students fall into the "Excellent" range when analyzing performance metrics, indicating that, although many believe their studies are unaffected, only a small percentage excel academically. As a future work, it is proposed to administer the surveys in more public and private schools in the region, with the aim of expanding the study's data set and conducting a comparison between different educational environments, which could potentially lead to more effective strategies for managing electronic game use among students.

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