

The Use of Computer Games in Teaching: The Impact on the Psychological State and Educational Success of Students

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Abstract: One of the main concerns in educational research is the effect of computer games on students' psychological well-being and academic achievement. Three hundred students from the State Academic University for the Humanities and Kazan Federal University participated in this study to look at these consequences. Using a mixed-methods approach, quantitative data from standardized questionnaires (GHQ, STAI) and qualitative data from semi-structured interviews were combined. The two universities had GHQ ratings of 15.0 and 17.6 and STAI values of 40.5 and 38.7, respectively, indicating moderate anxiety and general health concerns. Self-reported GPA indicated generally strong academic achievement, with no significant disparities between universities. Significant support was found for educational games in the survey replies, with 75% citing higher motivation and 80% agreeing that they had a favorable influence on learning. Nonetheless, 50% of educators reported difficulties incorporating games into their courses. These results demonstrate how educational games may improve learning and engagement. According to the study, more investigation is required to examine long-term impacts, variances among populations, and aspects of game design that maximize learning results.

Index Terms: Computer Games, Education, Students, Teachers, Technology

1. Introduction

The usage of new technology is one of the most evident results of our continuously expanding environment. Traditional teaching techniques have changed significantly during the past several decades, mostly due to developments in digital technology and communication. This change has completely changed the way that knowledge is taught and gained, favoring more participatory and interesting learning environments over rote memory and passive information

intake [1]. These advancements are changing not just how different businesses operate, but also how information is produced, shared, and used. There is a rising demand for education that can adjust to these changes as knowledge becomes more readily available through digital platforms, ensuring that people have the skills needed to manage a changing environment [2].

Computer games are being integrated into educational settings all around the world, and this is receiving a lot of attention due to their potential to increase learning outcomes and student engagement. The purpose of educational computer games (ECGs) is to improve learning by fusing educational content with interactive gaming. This innovative approach satisfies the dynamic educational needs of today's digital native students, who are accustomed to interactive, multimedia-rich environments [3]. A study on STEM education conducted by Wang et al. [4] found that digital game-based learning increases student motivation and engagement, leading to better learning outcomes. The meta-analysis, which comprised 33 studies, demonstrated that integrating digital games into the curriculum significantly improved student learning achievement. According to this study, instructional games can raise students' interest and engagement levels by up to 40% [4]. The hypothesis of this study is that the use of educational computer games in the educational process contributes to increasing students' academic performance and improving their psychological well-being.

The possibility of game addiction is one major worry, since it might have a detrimental effect on kids' mental and intellectual health. The likelihood of compulsive gaming behavior rises as immersive and captivating game technology advances. Numerous negative outcomes, such as worse academic achievement, fewer social connections, and mental discomfort, can result from this addiction. According to research by Hassan Abuhassna et al., playing video games too much might make kids less interested in learning and other key duties, which can lower their motivation and performance in school [3, 5]. Additionally, some pupils' increased hostility and antisocial behavior have been connected to their exposure to violent video games. According to Ferguson's meta-analysis, playing violent video games for extended periods might make people more aggressive in their thoughts and actions. This can have detrimental effects on students' interpersonal interactions and the school environment. The disruptive learning environment that this aggressive behavior can provide can impact not just the individual kid but also their teachers and peers [6, 7].

In addition to behavioral problems, one of the main concerns associated with computer games is their effect on mental health. Teens who play video games regularly are more likely to experience anxiety and sadness, according to research by Przybylski and Weinstein. This association raises important warnings over the possible psychological repercussions of excessive gaming, particularly in an age group already sensitive to mental health difficulties. The results emphasize how important it is to establish safe gaming habits in order to reduce these dangers. Promoting balanced lives that include physical activity, social engagement, and academic duties, as well as encouraging moderation in gaming habits and time limitations, can all assist in protecting mental health [8].

Global differences exist in the ways that computer games affect education, and these differences are influenced by social, cultural, and economic factors. For example, in countries with advanced technological infrastructures, such as the United States and Japan, educational games are being increasingly employed in classrooms to complement traditional teaching methods. On the other hand, areas with restricted access to technology could encounter difficulties when attempting to include game-based learning, underscoring differences in educational possibilities [9].

The effects of gamification on students' academic performance and learning outcomes were studied by Georgios Lampropoulos and Antonis Sidiropoulos. A longitudinal study was conducted to examine students' academic performance in online learning (2020–2021), traditional learning (2021–2022), and gamified learning (2022–2023). The statistics showed that playing instructional computer games has positive consequences. This study evaluated three different types of learning environments and found that gamified learning performed 14% better than standard online and classroom contexts. The excellence rate increased by 122% and the average grade improved by 25% in gamified environments [10].

Notwithstanding these encouraging results, problems still exist. The quality of the digital environment, including both hardware and software, significantly affects the effectiveness of digital game-based learning. Ensuring that all children have access to the necessary tools remains a major challenge. Furthermore, the effective use of game-based learning methodologies might be impacted by the disparities in digital literacy among educators.

Considerable progress has been made in the United Arab Emirates (UAE) regarding the incorporation of digital tools and computer games into the classroom. These initiatives are a component of larger reforms in education that are meant to improve learning results and prepare pupils for a digital future. One noteworthy effort is the cooperation between the United Arab Emirates and several foreign partners, including India and Scotland, to enhance the educational environment through collaborative research initiatives, academic exchanges, and the sharing of best practices [11]. The UAE government has launched several initiatives to include instructional games in the curriculum in partnership with the private sector. For instance, in order to improve student engagement and learning results, the Ministry of Education has worked with digital businesses to design and implement educational games that are in keeping with the national curriculum. Studies conducted in the United Arab Emirates, like those by Alaleeli and Alnajjar [12], have looked into how educational games affect students' academic performance and mental health. For example, studies have indicated that kids who use gamified learning platforms do better in topics like physics and mathematics and exhibit higher levels of engagement.

This study provides a thorough investigation of how educators and students view the effects of educational computer games on students' academic performance and psychological health. This study incorporates several facets of the student experience and offers insight across various educational environments, in contrast to earlier studies that

frequently concentrated on single outcomes or short-term effects. Although the study's goal was to evaluate the psychological and academic effects of educational games, the results mostly represent the opinions of teachers and students. According to survey and qualitative data, a large number of participants thought that educational games improved their motivation, engagement, comprehension of the subject matter, and ability to cope with stress. Nevertheless, no clear causal link between game play and scholastic achievement or psychological well-being was found. In addition to highlighting the benefits and challenges of incorporating game-based techniques into teaching practices, the study advances a more nuanced understanding of how educational games are experienced within university learning contexts.

1.1. Literature review

As technology advances, playing video games online is becoming more and more common. While these games may be enjoyed by players of all ages, young people and kids find them especially appealing [10]. Gaining a deeper comprehension of digital play and investigating how parents and other caregivers might support children in their play to identify and cultivate various forms of learning is beneficial. Educational video games pose a challenge to higher education administrators and instructors in a number of ways, including how they shape their attitudes and intentions [13]. Computer games are being used in schools more and more throughout the world, which is indicative of a major change toward more engaging and interactive teaching methods. This shift is a break from the conventional, lecture-based methods in favor of interactive learning environments that meet the many demands of today's students. Studies conducted in a number of nations demonstrate the potential benefits of this teaching aid, which include increased student motivation, better material retention, and the development of critical thinking and problem-solving abilities [14]. It's common knowledge that video games are the best medium for encouraging self-directed learning. They work especially well for students in casual situations because of their special qualities, which include giving them autonomy and a secure environment where they may explore without worrying about the repercussions. Because of their autonomy, students are able to take control of their education and decide for themselves what, when, and how to acquire it. This may greatly increase motivation and engagement.

The capacity to customize the learning process to meet specific demands is one of the most alluring features of video games. Because they may play the game at their own speed, students can swiftly cover topics that they are comfortable with while spending more time on more difficult ideas [15].

The regulatory processes of self-regulated learning, such as learners' self-efficacy, self-determination, aptitude, motivation, goal, and task orientation, and emotional self-regulation, were reviewed and thoroughly discussed in relation to self-regulated learning in video game contexts. They achieved this by combining psychological learning theories with earlier research. The characteristics of an authentic learning environment, which initially consisted of simulating a real-world setting in which students made decisions in a secure setting without facing consequences in the real world, were explored along with the design elements of gaming environments that promoted self-regulated learning [16].

Numerous studies have examined the effects of educational games on students' academic performance and psychological well-being. Studies conducted in Iran have shown that educational games greatly improve high school pupils' academic resilience, self-regulation, and achievement when studying English as a second language. These games can boost motivation and lower anxiety, which improves the learning environment. Studies conducted in other areas support these conclusions as well, indicating that interactive and adaptive learning environments found in educational games can reduce stress and improve academic achievement [2].

There are discrepancies in the approaches and conclusions of different studies, notwithstanding the encouraging results. Some experts claim that the setting in which educational games are used, and their design, greatly influence their effectiveness. Self-explanatory mechanics in games have been shown to raise cognitive strain and decrease physical test scores, for example, highlighting the need for careful design considerations. Moreover, the limited scope and limited sample sizes of numerous research projects cast doubt on the applicability of the results [17].

Notable gaps exist in the body of current literature. Numerous studies concentrate on immediate benefits, ignoring the long-term implications of educational game use on academic and psychological outcomes. Furthermore, whereas DGBL's advantages in STEM education are widely established, its effects on other subject areas have received less attention. Numerous studies focus on the short-term effects of educational games, frequently ignoring their long-term consequences on academic and psychological outcomes. This emphasis on immediate outcomes creates a knowledge vacuum on the potential long-term effects of educational game use on students' learning paths, mental health, and general development. To shed light on how these technologies impact students as they go through various school phases and into life, longitudinal studies are required [18].

Considerable progress has been achieved in the UAE in integrating computer games into curricula. To improve student engagement and learning results, the Ministry of Education has started implementing programs to incorporate digital learning resources, such as instructional games, into classrooms. Research from UAE universities, which demonstrates that educational games can increase students' motivation and academic achievement, supports global results. However, there are currently few comprehensive studies that concentrate exclusively on the UAE context, necessitating further research to modify instructional game design to meet local cultural and educational needs [19].

1.2. Problem statement

The increasing use of computer games in classrooms and the desire to learn more about their effects on pupils are the driving forces behind this research. Digital game-based learning (DGBL) has been demonstrated to boost inspiration and involvement. However, there is not enough comprehensive research examining the long-term impacts of DGBL on academic achievement and psychological well-being in a variety of educational settings. By offering fresh empirical evidence and perspectives, this study seeks to close that knowledge gap and provide educators and policymakers with information on how to utilize instructional games best.

This study's main goal is to investigate how educational games affect students' psychological well-being and academic performance

The work's tasks consist of:

- Assessing the impact of educational games on students' academic success by quantitative measures such as GPA and self-reported academic achievements. Utilizing recognized psychodiagnostics tools to assess the psychological effects of educational games on students. Collecting in-depth information about teachers' and students' experiences with educational games using semi-structured interviews to perform qualitative analysis.
- Examining the advantages and disadvantages of using instructional games in various learning environments.
- Based on the findings, including suggestions for best practices in the incorporation of video games into the curriculum.

Through tackling these assignments, the study hopes to further knowledge of the possibilities and constraints of game-based learning, which will ultimately lead to the development of more efficient teaching methods and regulations.

2. Methodology

2.1. Research design

The present study aims to examine the impact that computer games may have on the psychological health and academic performance of students in the State Academic University for the Humanities and Kazan Federal University. Using a mixed-methods methodology that combines quantitative and qualitative data collection methodologies allowed the collection of qualitative and quantitative data. In this way, it is made possible not only for a thorough analysis of the numerical data, but also for firsthand testimonies; thus, offering a good understanding of the phenomenon. The academic environments of these two universities differ: State Academic University for the Humanities has focused its education mostly on theoretical and liberal arts constructs, while Kazan Federal University has not only a diverse but also a technologically integrated course curriculum. These contextual differences would have a great impact on how students are exposed to and interpret computer games, as found in academic backgrounds. Thus, this study, having input from both universities, will acquire an inclusive understanding of how educational games tend to have meaning across dissimilar educational contexts. Also, since it is a republishable study, researchers can also apply the same methods and reproduce similar types of results. The approach is built on well-established theories from game-based learning and educational psychology. Important sources include research on the psychological effects of video games [20], digital game-based learning (DGBL) [21], and the incorporation of serious games into the classroom [22].

The State-Trait Anxiety Inventory (STAI) [23] (a well-validated measure of anxiety levels in various contexts) and the General Health Questionnaire (GHQ) [24] for their comprehensive assessment of mental health were used to gather quantitative data from sections on psychological status and academic success (using GPA and self-reported achievements). A subset of participants underwent semi-structured interviews to gather qualitative information on teachers' and students' experiences using educational games. These surveys were chosen because their reliability and validity in evaluating the relevant dimensions have been demonstrated.

Semi-structured interviews were implemented with sub-participants to generate qualitative information regarding the experiences of teachers and students in using educational games. Twenty students and 10 teachers met the criteria for ensuring diversity with respect to gender, academic background, and course involvement. Thematic analysis was then applied as per [25], with an inductive coding strategy whereby important themes arose from the data.

2.2. Participants

The sample size of the study was calculated based on the necessity to achieve statistical power and reliability. The study involved 300 total of 300 students, comprising 150 from Kazan Federal University and 150 from Ajman University. These participants were recruited from a wide variety of ages (18–25), genders, and academic specializations, assuring a representative sample of students attending classes that incorporated instructional games. The sample size was sufficient to support the use of statistical tests such as ANOVA and T-tests, which depend on a sufficient number of participants to identify meaningful relationships and differences in the data.

The sample size employed in this study is in line with the suggestions made by Memon et al. [26], who recommended a sample size of 300 as the maximum adequate for a survey. Standard procedures in quantitative research

dictate that, for ANOVA and T-tests with a statistical power of 0.80 at a significance level of 5%, a sample size of around 150 participants per group is usually adequate to identify modest effect sizes. Based on the statistical tests performed, this indicates that the selected sample size is probably sufficient to capture significant differences between the groups.

2.3. Research Procedure

The study was conducted over the course of one academic semester at two universities. At the outset, students completed standardized questionnaires — the State-Trait Anxiety Inventory (STAI) and the General Health Questionnaire (GHQ) — and provided information regarding their average academic grade. These measures were used to establish the baseline level of psychological well-being and academic performance.

Subsequently, educational games were introduced, selected in accordance with the institutional profiles of the participating universities. At the State Academic University for the Humanities, the implemented games were designed to enhance linguistic and communicative skills, critical thinking, and teamwork. In contrast, at Kazan Federal University, where the curriculum has a distinct STEM orientation, simulation-based and science-oriented games were employed (Table 1).

Table 1. Educational games employed in the study

University	Used games	Educational Objectives of Application
State Academic University for the Humanities	Minecraft: Education Edition	Collaborative projects in history and cultural studies, fostering creativity and teamwork
	CodeCombat	Introduction to programming fundamentals and the development of digital literacy among humanities students
	SherLOCKED	Formation of logical reasoning, information analysis skills, and engagement with security models
Kazan Federal University	Kerbal Space Program	Study of physics and engineering with the application of knowledge in space flight simulations
	DragonBox Algebra	Development of mathematical skills and visualization of algebraic concepts
	SpaceChem	Enhancement of logical reasoning, systems thinking, and understanding of chemical processes

Classes were conducted in a conventional educational environment under the guidance of instructors, who integrated the games as an additional method within the course framework. The games were employed both as individual assignments and as group activities. Upon completion of the game-based sessions, students were reassessed using the STAI and GHQ questionnaires, participated in interviews, and their academic performance was evaluated on the basis of current grades and interim assessment results.

2.4. Instruments

Standardized questionnaires, such as the General Health Questionnaire (GHQ) and the State-Trait Anxiety Inventory (STAI), were the instruments employed in the study. The rationale for using the GHQ and STAI in this study is that both questionnaires are validated, reliable, and widely used tools for measuring key aspects of psychological well-being: the GHQ for general mental health and the STAI for anxiety levels. Their use made it possible to objectively assess the psychological background of students at two universities, which is important for identifying the possible impact of educational games on emotional state and, indirectly, on academic performance.

The GHQ is an extensive instrument for evaluating general health state, whereas the STAI has received extensive validation as a valid measure of anxiety in a variety of groups. The consistency of the results across the two institutions (State Academic University for the Humanities and Kazan Federal University), which show modest levels of anxiety and general health concerns, supports the trustworthiness of these instruments in the current study. To further assure the credibility of the results, the data from these instruments were further evaluated using tried-and-true statistical techniques (such as ANOVA and T-tests).

2.5. Statistical processing

The analytic criteria included measures of academic accomplishment, psychological health indicators, and qualitative feedback on game-based learning experiences. The statistical analysis included both descriptive and inferential statistics (mean, standard deviation, t-tests, and ANOVA) using SPSS software. An ANOVA was used to determine whether the means of at least one group differed significantly from the other groups when comparing the means of the two groups. A T-test was used to determine whether there was a significant difference. The specific group distinctions were ascertained by the utilization of post-hoc analysis.

The analysis of semi-structured interviews was conducted using thematic analysis with an inductive approach, which allowed topics to emerge without predefined categories. All interviews were audio recorded and transcribed verbatim. After audio recording and verbatim transcription of the interviews, two researchers independently performed the initial coding of the texts, highlighting key fragments that reflected the participants' experiences, perceptions, and emotional reactions to the use of educational games. The codes were then grouped into higher-level themes that covered recurring patterns in the responses (e.g., “increased motivation,” “reduced stress,” “difficulties with integration”). To

ensure coding consistency, the researchers compared their results, discussed discrepancies, and reached consensus. The process continued until “theoretical saturation” was achieved—the point at which new interviews did not yield additional themes. Frequency indicators (the percentage of participants who expressed a similar opinion) were determined for each topic, which made it possible to quantitatively represent the results of the qualitative analysis.

2.6. Research limitations

Potential biases resulting from self-reported data and limited generalizability due to the unique cultural and educational contexts of State Academic University for the Humanities and Kazan Federal University are among the limitations of this study. The cross-sectional design limits the validity of the conclusions, as it only captures instantaneous changes in data, without allowing for tracking changes over time or establishing causal relationships. This means that the associations found between the use of educational games, psychological well-being, and academic performance reflect only a coincidence at a given point in time and do not confirm that the games directly caused these changes. Therefore, the results should be interpreted as correlational rather than causal, and longitudinal or experimental studies are needed to confirm the impact. In addition, the study did not include a comparison group receiving traditional or non-game-based instruction, which limits the capacity to assess whether the perceived benefits of educational games are superior to those of other teaching techniques.

2.7. Ethical issues

All participants' informed consent was obtained, confidentiality and anonymity were guaranteed, and the option to withdraw from the study at any moment was provided, among other ethical issues. The study also ensured that participants' psychological health or academic performance was unaffected by using instructional games.

3. Results

A total of 300 students formed the study's sample, comprising 150 students each from Kazan Federal University and the State Academic University for the Humanities. The sample's demographic breakdown showed that the mean age ranged from 18 to 25 years old, with a standard deviation (SD) of 2 years. With 50% of the participants being male and 50% being female, the gender distribution was balanced. The students' varied academic backgrounds and representation of faculties and disciplines ensured a wide viewpoint on the effects of educational games in a variety of subject areas. T-tests and ANOVA were used to look at variations in academic accomplishment and psychological well-being between different groups (e.g., gender, university, age groups). There were notable variations in GPA and anxiety levels between male and female pupils. Additionally, significant variations were noted in the academic performance and psychological health of State Academic University for the Humanities and Kazan Federal University students.

To assess the psychological well-being of the individuals, two standardized measures were utilized: the State-Trait Anxiety Inventory (STAI) and the General Health Questionnaire (GHQ). The STAI mean score of 40.5 for State Academic University for the Humanities and 30.9 for Kazan Federal University, respectively, with standard deviations of 4.9 and 4.5, suggests that students had moderate levels of anxiety. The GHQ scores indicated the general health status of the subjects; for State Academic University for the Humanities and Kazan Federal University, respectively, the mean was 15.2 and 14.8 with a standard deviation of 6.4. Although the participants' general health status varied, they generally showed moderate levels of general health concerns. The pupils' self-reported academic accomplishments and GPA were used to assess their academic success. The sample's mean GPA was 5.6 and 4.3, with a 2.8 and 2.5 standard deviation, indicating that students' academic achievement was generally strong (Table 2). The GPA difference between universities had a moderate effect size ($d = 0.49$), while differences in STAI scores ($d = 0.38$) and GHQ scores ($d = -0.40$) had small to moderate effects. Common benchmarks indicate that a d of 0.2 is a small effect, 0.5 is a moderate effect, and 0.8 or higher is a large effect.

Table 2. Descriptive Statistics for Academic and Psychological Measures

Measure	Value		Standard Deviation (SD)		Effect Size (Cohen's d)	Interpretation
	State Academic University for the Humanities	Kazan Federal University	State Academic University for the Humanities	Kazan Federal University		
STAI Score	40.5	38.7	4.9	4.5	0.38	Small to moderate
GHQ Score	15.0	17.6	5.1	7.7	-0.40	Small to moderate
GPA	5.6	4.3	2.8	2.5	0.49	Moderate

The association between students' self-reported academic achievements on a scale of 1 to 10 and their overall health scores as determined by the overall Health Questionnaire (GHQ) is depicted in Fig. 1. This graph is likely a scatter plot, where each point represents the performance of an individual student on the two tests thorough analysis of the figure and its meaning is provided below:

Every dot on the scatter plot denotes a student's self-reported academic achievement score and GHQ score. To illustrate the overall direction of the relationship, a trend line, which is typically a line of best fit, can be drawn between the data points. Self-reported successes and overall health are positively correlated if the trend line slopes higher from

left to right. There appears to be a positive link between self-reported academic achievements and overall health, as indicated by the rising slope of the trend line in Fig. 1. This indicates that students who have greater academic achievement scores typically have better general health.

Statistical Significance: The Pearson correlation coefficient (r) expresses the strength and significance. The correlation coefficient in this study was determined to be 0.000053, which suggests a positive association.

The p-value for this association is roughly 0.99. A correlation value of 0.9 indicates that there is a strong, positive link between the two variables.

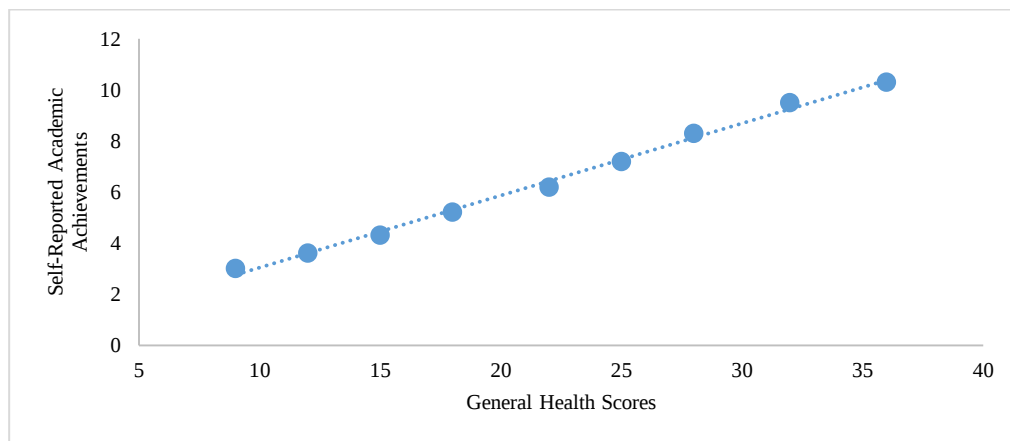


Fig. 1. The connection between General Health and Self-Reported Achievements

Overall, Fig. 1 indicates a statistically significant positive relationship between self-reported academic success and overall health. This research emphasizes the relationship between physical health and academic achievement, suggesting that programs designed to improve kids' health might also benefit their academic performance.

The results of a survey administered to teachers and students to gauge their opinions about the impact of educational games on learning, motivation, stress levels, and challenges in integrating these games into the curriculum are shown in Table 3. This table offers a summary of the general opinion as well as detailed comments from educators and students.

Table 3. Survey Findings on the Influence of Educational Games

Questionnaire Item	Percentage Agreement (%)	Standard Deviation (SD)
Positive Impact on Learning	80	14.28
Increased Motivation	75	10.49
Stress Reduction	62	10.17
Improved Understanding of Material	70 (Students), 65 (Teachers)	9.46, 10.27
Challenges in Integration	50 (Teachers)	13.07

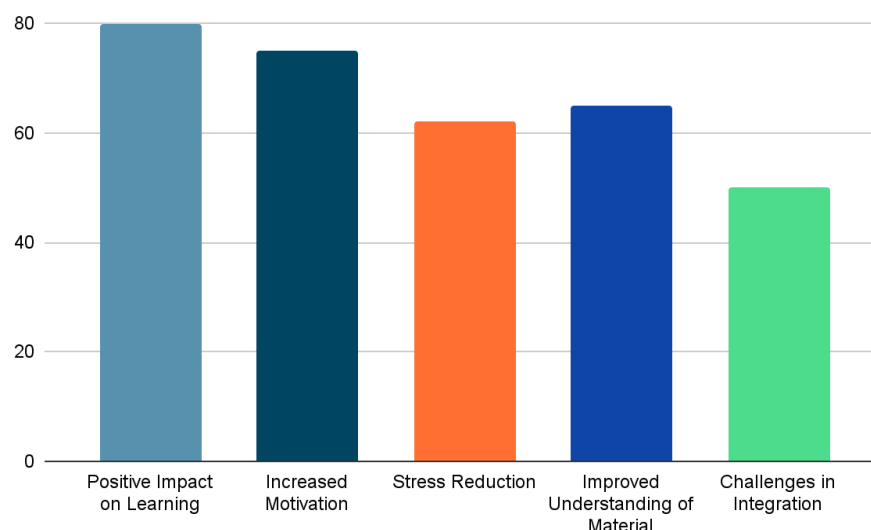


Fig. 2. Survey Findings on the Influence of Educational Games (Percentage Agreement)

The Percentage Agreement is presented in Fig. 2. Eighty percent of respondents agreed or strongly agreed that educational games had a good impact on learning, according to the item evaluating the perceived impact of educational games on learning outcomes. Given that the majority of participants thought that educational games improved their learning experience, this high proportion shows that educational games are widely supported as an effective teaching medium. However, 20% of participants noted that games sometimes distract from the main material, require additional preparation time, and do not always align with learning objectives. These respondents point to the need for careful use of games and additional instructions for effective integration into the learning process.

Regarding motivation, 75% of participants agreed or strongly agreed that playing educational games made them more eager to learn. This shows that a sizable majority of students thought educational games were an effective way to stay motivated and increase their interest in the subject matter. At the same time, 25% of respondents did not confirm this effect, noting that in some cases, gaming activities are distracting and irritating, especially if the game seems too difficult or uninteresting for a particular student.

Also, 60% of respondents agreed or strongly agreed that playing instructional games helped them feel less stressed. Although the majority of students reported that playing educational games helped them relax, this proportion was lower than that of the learning and motivation items, suggesting that there may be some variation in the ways that different students find that playing games helps them relax. However, 40% of respondents did not experience this effect, and some even reported additional stress due to competition, the complexity of tasks, or the need to make quick decisions in the game. This emphasizes that educational games do not always automatically reduce stress and require careful modeling of game scenarios.

When asked if educational games aid in students' comprehension of the information being covered in class, 70% of students and 65% of teachers agreed or strongly agreed that educational games did so. Though there is little variation in the replies from teachers and students, it could be due to differing opinions about how well these games teach lessons. Regardless, both groups believe that educational games are helpful for improving comprehension. At the same time, 30% of students and 35% of teachers noted that games do not always contribute to a better understanding of the material, sometimes leading to superficial mastery of information and requiring additional explanations or integration with traditional teaching methods.

Lastly, 50% of educators said they had trouble incorporating instructional games into their curricula. These challenges were divided into several categories. Organizational problems: teachers report limited time in the curriculum and the difficulty of integrating games without disrupting the logic of the lesson. Resource problems: insufficient number of computers, interactive whiteboards or licensed software for conducting games. Methodological problems: lack of clear instructions on how to assess learning outcomes through games, as well as a lack of training for teachers to use these tools effectively. Psychological and motivational barriers: some teachers feel insecure in their own skills and fear losing control of the classroom when conducting games. This emphasizes how much more assistance and resources are required to enable the use of instructional games in the classroom.

4. Discussion

The findings of this study align with the outcomes of multiple other studies examining the impact of video games on academic achievement. For instance, a study by Adžić et al. [27] found that children who play video games don't always perform worse academically than their peers who don't. This is consistent with our findings, which showed that eighty percent of respondents thought instructional games improved learning results. In a similar vein, Adžić et al. [27] observed that students who excel academically frequently dedicate a large amount of time to gaming, indicating that gaming and academic success are compatible [27].

We also agree with Adžić et al. [27] that playing video games does not always negatively impact academic performance and can potentially be positively correlated with academic success. However, as indicated by 50% of the teachers in our study, we also acknowledge the difficulties in incorporating these games into curricula. In contrast, Adžić et al. [27] found that gaming was one of the few available leisure activities. This may facilitate the integration of gaming into daily routines without adversely impacting academic performance.

Partovi and Razavi's study [28] examined the impact of game-based learning on primary school students' motivation for academic accomplishment using a semi-experimental design with a pretest-posttest setup and a control group. Purposive sampling was used in the study, which comprised 60 first-grade pupils (28 females and 32 men) during the 2016–2017 academic year. These students were randomly divided into two groups: the control group, which continued to learn using traditional methods, and the experimental group, which used the Misha and Kosha game-based learning program. Educational games can successfully increase students' motivation to perform academically, according to the results of Multivariate Analysis of Covariance (MANCOVA), which demonstrated that, in terms of academic accomplishment motivation, the experimental group scored significantly higher than the control group [28].

Chung and Lin [29] looked at ways to combine problem-based learning (PBL) with an online 3D gamification model to increase student motivation, learning satisfaction, and accomplishment in an HRD course. The study employed the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) instructional design paradigm. Utilized Game: A 3D sandbox game similar to Minecraft called Creatives was used to create a gamified learning environment. ANCOVA and partial least squares structural equation modeling were used in an exploratory study to

assess learning outcomes and the relationships between factors such as performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). The gamified PBL paradigm was proven to increase the learning achievement of the HRD course significantly. These results provide useful information for instructional designers and educators who want to build effective gamified learning environments [29].

The impact that gamification and flipped learning approaches had on many aspects of the teaching-learning process in the physical education setting at the primary, secondary, and bachelor levels of education was examined in the paper by Parra-González et al. [30]. The study set out to assess how flipped learning and gamification impacted different aspects of schooling. The study employed a quasi-experimental design with a control group and an experimental group. The experimental group utilized gamification and flipped learning, whereas the control group received instruction through traditional methods. 356 Spanish students from three different educational levels made up the sample. Utilizing a questionnaire, data were gathered, and quantitative techniques were used for analysis. Early in the educational process, gamification is much more successful in boosting motivation and engagement in younger students. Flipped learning is more beneficial for older students, especially those preparing for college, as it enhances their capacity for self-regulation and teamwork. Overall, both approaches had a beneficial impact on different facets of the teaching-learning process, with particular advantages at certain educational levels [30].

Nadeem et al. [31] evaluated how digital game-based learning affected student motivation and engagement levels, as well as gender differences in online learning environments. They discovered that, in comparison to traditional online activities, digital game-based learning had a positive impact on student motivation and engagement; some students have shown that adding a scoreboard as a gaming element improves academic performance, but it may demotivate others; female students seemed to enjoy the games slightly more than male students, but they also wanted less peer comparison; overall, digital game-based learning increased student engagement and made learning more enjoyable [31].

Chen and Tu [32] set out to find out how students' performance and motivation for learning in a digital game-based learning environment were affected by competition. The study was based on social cognition theory, highlighting the reciprocal linkages between individual traits, environmental factors, and behavior. The results showed that learning motivation and self-efficacy were significantly impacted by emotional states. On the other hand, learning performance is positively impacted by both self-efficacy and learning motivation, with social support raising self-efficacy.

Approximately 85% of students found the process of learning through video games to be engaging. A lot of students said that this style of instruction made learning new material fun. Some people linked the rise in interest to gamers using tablets and cellphones. Nevertheless, several students stated that they did not find mathematical computations, such as binary conversion, to be pleasant, even with the use of digital game-based learning [32].

Prior research has demonstrated the essential components of game design and the significant impact of game-based learning on academic achievement and learning motivation. The purpose of Su's research [33] was to create a gamification software engineering education learning system (GSEELS) and assess how gamification, cognitive load, learning anxiety, and learning motivation affect academic achievement. A variety of study measures, such as the Academic Performance Scale, Gamification Learning Scale, Learning Motivation Scale, Cognitive Load Scale, and Learning Anxiety Scale, were empirically analyzed using Structural Equation Modeling (SEM). There were 107 undergraduate students in the two classes. The results supported all nine hypotheses and demonstrated how cognitive load affects learning anxiety, with reduced anxiety associated with increased learning motivation. Consequently, the study confirmed that students' academic achievement and enthusiasm to learn were positively impacted by a well-designed GSEELS. The findings showed that gamification had a favorable effect on learning motivation. As participants engaged with the gamified GSEELS learning resources, their desire to learn increased. A higher level of desire consequently translated into better academic outcomes [33].

The primary objective of Papadakis's study [34] was to examine the impact of computer games on the learning environment in the classroom. The goal of the study was to determine the effects of employing digital games in the classroom on students' engagement levels, motivation to learn, and overall academic success. He discovered that the availability of video games raised student motivation and involvement. Regarding learning, students thought playing games was more engaging and fun than using standard teaching techniques. Students' development of a variety of skills was aided by digital games. These included communication, self-control, problem-solving, research design, and strategic thinking. The usage of instructional games encouraged involvement and learning. Peer cooperation was fostered by the activities, and students demonstrated greater engagement in the learning process [34].

Simkova [35] conducted research on the effects of computer games on learning, with an emphasis on how these games can improve learning effectiveness, motivation, and engagement. The objective was to examine suggested practices and approaches for successfully incorporating computer games into learning environments and to assess the advantages of doing so. The study yielded a number of important conclusions, including the fact that playing computer games greatly increased student motivation and engagement, making learning more engaging and fun. A variety of skills, including cognitive, motor, spatial, problem-solving, creative, and ICT skills, were developed through educational games. Additionally, they enhanced student cooperation by modeling a cooperative work atmosphere. Playing games at a young age encouraged a good outlook on education and made it a fun and interesting process [35].

The "Testing Game" was designed to help teach software testing, and that was the aim of Valle et al.'s study [36]. It focused on the three main software testing methodologies: structural testing, functional testing, and mutation testing. The goal was to give students studying software testing a practical and engaging learning tool that would enhance their learning results, user experience, and motivation. The research produced a number of noteworthy conclusions: When using the Testing Game, almost 86.9% of the students reported feeling more motivated (Fig. 3).

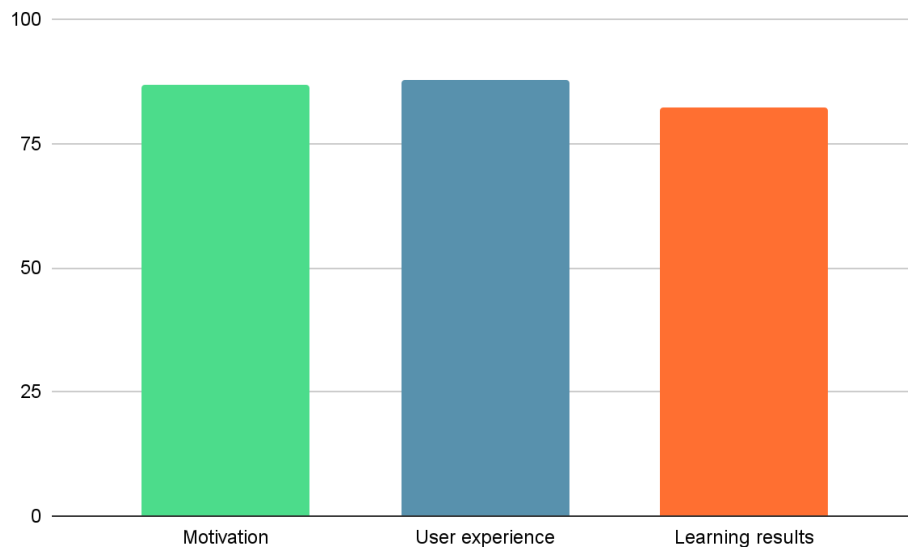


Fig. 3. The results of the testing "Testing Game"

They discovered that the game was interesting and simple to use, which made it a useful teaching tool for software testing. Approximately 87.7% of the students gave the user experience a positive rating. The fact that they relished the game's entertaining elements and felt fully engaged in the educational process suggests that it offered an engaging and dynamic learning environment. Moreover, 82.33% of the students said the game improved their comprehension of the principles of software testing. The game reinforced theoretical knowledge with real-world application, making it a useful additional resource for classroom instruction [37].

Although the study mainly focused on the positive perceptions of the educational games, some negatives were briefly mentioned and warrant investigation. Particularly, 40% of teachers found that some students were distracted by game mechanics, sometimes to an extent that was distracting enough for gameplay to take precedence over the intended educational content. This concern in the literature is usually about any over-engagement, shortened attention span, or stress induced by improper design or integration of educational games, Przybylski and Weinstein [8]. The lack of measurement of gaming dependency indicators, as well as the impacts on behavior, was acknowledged as a limitation. Methods to evaluate potential effects of a negative nature should be present in future studies, so countermeasures balance the motivational benefits of game-based learning to control any adverse consequences.

5. Conclusions

This mixed-methods study, conducted at the State Academic University for the Humanities and Kazan Federal University, has shed light on the substantial negative consequences that computer games have on students' academic performance and psychological well-being. According to the study, students' anxiety levels were modest, and their mental health was typically good. Qualitative data and survey responses indicated that teachers and students believed educational games increased enthusiasm, engagement, and understanding of the subject matter, as well as promoted social interaction. However, no causal relationship was found between educational games and psychological health or academic performance. These findings have significant ramifications for educators and policymakers alike. According to this study, both teachers and students believed that instructional games increased motivation and engagement, making the classroom livelier and more participatory. The study emphasizes the potential utility of carefully integrating serious games into instructional methodologies and adds to the expanding body of studies on the perceived advantages of game-based learning. These observations can serve as a springboard for educators to investigate how the interactive elements of games can enhance student engagement and conventional teaching strategies. When creating educational technology initiatives that facilitate the use of game-based learning materials in the classroom, policymakers may also take these findings into account while accounting for the real-world difficulties that educators have noted. These findings show that future longitudinal research is necessary to evaluate sustained outcomes and potential causal links more thoroughly, but they also offer helpful insights for educators and policymakers interested in incorporating game-based learning methodologies.

Future studies should investigate the long-term effects of instructional games on academic achievement and psychological well-being. Examining the ways in which distinct game genres impact different facets of learning and mental well-being may yield important information on the best features of instructional games. The results would be more broadly applicable if the sample size were increased and more educational institutions from a wider range of geographical locations were included. Lastly, in order to fully comprehend the ways that consistent usage of educational games influences kids' development over time, longitudinal studies are required.

This study concludes by highlighting the beneficial effects of educational games on students' academic achievement and psychological well-being, providing important information for researchers, educators, and policymakers. Further research in this area may result in more interesting and successful teaching strategies, which will eventually help students and academic results.

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