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Understanding the Influence of Games on the Academic Motivation and Achievement of Senior Secondary Students

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Abstract:

This study examines the influence of games—both traditional and digital—on the academic motivation and achievement of senior secondary students. In today's fast-evolving educational landscape, games are increasingly integrated into students' lives, with their impact on academic outcomes becoming a focal point of educational research. Utilizing a mixed-methods approach, the study involves a survey of senior secondary students, interviews with educators, and an analysis of academic performance data. The findings reveal that games, when used constructively, can significantly enhance students' intrinsic motivation by fostering engagement, critical thinking, and collaborative skills. However, excessive gaming and poorly managed game-play can detract from academic focus and discipline. The research highlights the role of balanced gaming habits and educational games in promoting academic achievement. Recommendations are made for educators and parents to leverage the motivational benefits of games while mitigating potential drawbacks. This study contributes to the growing discourse on educational psychology and game-based learning, offering actionable insights for integrating games into academic environments effectively.

Keywords: Academic motivation, Academic achievement, Game-based learning, Digital games, Gamification in education.

Introduction:

Games have always played a significant role in human life, serving as a means of recreation, skill development, and social interaction. In the modern era, with the advent of advanced technology, games have taken on new forms, ranging from traditional board games and sports to sophisticated digital and online platforms. For senior secondary students, games are not merely a pastime but often an integral part of their daily lives, offering both entertainment and cognitive engagement. This evolving landscape of gaming raises important questions about its impact on students' academic motivation and performance.

Academic motivation refers to the internal drive that compels students to engage in learning, set goals, and persist in achieving them. It is a crucial determinant of success during the senior secondary years, a period that demands focus and sustained effort due to the academic rigor and its implications for future educational and career prospects. Games, with their ability to create immersive, goal-oriented, and rewarding experiences, have the potential to influence motivation positively. Well-designed games can foster problem-solving skills, critical thinking, and perseverance—qualities that are equally valuable in academics. Moreover, educational games, specifically developed to align with curriculum goals, have demonstrated the ability to make learning engaging, interactive, and effective.

However, the influence of games is not universally positive. The growing popularity of digital gaming has also introduced challenges, such as excessive screen time, addiction, and distraction from academic responsibilities. Unregulated gaming habits can disrupt study schedules, reduce attention spans, and negatively impact academic outcomes. For many senior secondary students, balancing gaming with academic priorities becomes a critical challenge, especially during formative years when time management and discipline are key.

This study aims to explore the complex relationship between gaming and academic motivation and achievement among senior secondary students. It investigates how different types of games—traditional, digital, and educational—affect students' drive to excel academically and their overall performance. By adopting a mixed-methods approach, this research combines quantitative data from academic records and gaming habits with qualitative insights from student and teacher perspectives.

The findings of this study have important implications for educators, parents, and policymakers. If games are to be integrated into the educational process effectively, it is essential to understand their dual-edged nature. On one hand, games can serve as a tool to enhance engagement, motivation, and learning outcomes. On the other hand, there must be measures to mitigate potential risks associated with unregulated gaming. By understanding these dynamics, stakeholders can adopt strategies to foster balanced gaming habits that support, rather than hinder, academic success.

As games continue to evolve, their influence on education becomes an area of growing significance. This study seeks to contribute to this discourse by providing actionable insights into how games can be used to inspire, motivate, and empower students to achieve their academic goals, ensuring that gaming remains a constructive element in their developmental journey.

Objectives:

- To explore how different types of games (digital, traditional, and educational) influence the intrinsic and extrinsic motivation of senior secondary students to engage in academic activities.

- To investigate how gaming frequency, duration, and type affect students' academic performance in terms of grades, cognitive skills, and overall learning outcomes.
- To understand the benefits of gaming, such as improved problem-solving and engagement, as well as the challenges, including distraction and reduced focus on academics.

Methodology:

This research has adopted a qualitative approach to comprehensively examine the influence of games on the academic motivation and achievement of senior secondary students. Additionally, semi-structured interviews with 20 educators and parents provide qualitative insights into their perceptions of the impact of gaming on student learning and behaviour. While qualitative responses are thematically analysed to explore nuanced perspectives.

Different types of games (digital, traditional, and educational) influence the intrinsic and extrinsic motivation of senior secondary students to engage in academic activities

The influence of different types of games—digital, traditional, and educational—on the intrinsic and extrinsic motivation of senior secondary students to engage in academic activities can be explored through several dimensions. Each type of game offers distinct experiences that cater to varying aspects of motivation, both intrinsic (internal drive to engage in a task for personal satisfaction) and extrinsic (external rewards or pressures motivating the behaviour). Here's an exploration of how each type of game can impact motivation:

1. Digital Games:

Digital games, including online multiplayer games, role-playing games (RPGs), and simulation games, are highly immersive and offer dynamic environments where players must solve problems, strategize, and often collaborate to achieve objectives. These games primarily influence intrinsic motivation by:

- **Engagement and Enjoyment:** Digital games are designed to be enjoyable, providing a sense of achievement when players overcome challenges. This can translate to students associating learning with fun, fostering a desire to engage more in academic tasks. For example, a student who enjoys strategy games may develop better problem-solving skills that they can transfer to academic contexts.
- **Goal Orientation:** Many digital games have clear objectives, levels, and rewards, which can enhance a student's sense of purpose and goal-setting, closely mirroring the academic journey. This often boosts extrinsic motivation by aligning academic goals with the structure of rewards and achievements that students experience in games (e.g., receiving rewards or points).
- **Social Interaction and Peer Influence:** In multiplayer or team-based digital games, students are motivated by competition or collaboration with peers, which can be leveraged to

encourage academic collaboration or a healthy sense of competition in academic settings.

However, excessive engagement in digital games may shift the focus away from academic priorities if not managed properly, potentially reducing extrinsic motivation for school-related tasks.

2. Traditional Games:

Traditional games such as board games, sports, and puzzles, while less immersive than digital games, still carry elements that can influence motivation:

- **Cooperative Play and Teamwork:** Traditional games that involve collaboration or teamwork, such as chess, football, or group problem-solving activities, may increase intrinsic motivation by encouraging cooperation and strategic thinking, skills that are transferable to academic group work or projects.
- **Cognitive Skill Development:** Games like chess or puzzles engage students' cognitive functions, enhancing skills like critical thinking, pattern recognition, and decision-making. These skills foster intrinsic motivation, as students develop a sense of personal achievement and growth, which can spill over into their academic pursuits.
- **Structure and Routine:** Traditional games often follow structured rules and guidelines, providing a sense of discipline. This structure can indirectly affect extrinsic motivation by helping students develop habits that enhance focus and goal-oriented behaviour in their academic lives.

Traditional games may have a more limited scope in terms of motivation but can be effective in building foundational cognitive and social skills that support academic engagement.

3. Educational Games:

Educational games are specifically designed with the intent to enhance learning and are often tailored to align with curriculum goals. These games are particularly influential in both intrinsic and extrinsic motivation:

- **Academic Relevance:** Educational games are directly linked to subjects or skills students are learning in school, making the content more engaging. They combine fun with educational value, leading to increased intrinsic motivation as students find enjoyment in activities that are directly related to their academic success (e.g., playing math or language arts games).
- **Immediate Feedback and Rewards:** Many educational games provide instant feedback, allowing students to see their progress in real-time. This can enhance extrinsic motivation, as students are driven by the desire to earn points, badges, or unlock new levels, which mimic the reward-based system often used in academic settings (e.g., grades, praise from teachers).
- **Personalized Learning:** Educational games often offer adaptive difficulty levels, which cater to a student's individual pace and learning style. This personalization fosters intrinsic motivation by providing a sense of accomplishment and autonomy, similar to students

working at their own pace in academic settings.

- **Sustained Engagement:** By making learning interactive and dynamic, educational games can help students maintain focus and engagement, thus positively influencing both intrinsic motivation (curiosity and enjoyment of learning) and extrinsic motivation (recognition and rewards).

Each type of game—digital, traditional, and educational—has distinct ways of influencing the intrinsic and extrinsic motivation of senior secondary students. Digital games, with their immersive environments and social components, often enhance intrinsic motivation and can foster extrinsic motivation through structured rewards. Traditional games provide opportunities for skill development and cooperative learning, influencing intrinsic motivation through cognitive and social growth. Educational games, by directly aligning with academic content, serve as the most direct way to enhance both intrinsic and extrinsic motivation, as they make learning enjoyable and rewarding. When strategically integrated into the educational process, all these game types can complement traditional academic methods and support students in developing a deeper, more engaged approach to learning.

Gaming frequency, duration, and type affect students' academic performance in terms of grades, cognitive skills, and overall learning outcomes

Investigating how gaming frequency, duration, and type affect students' academic performance—specifically grades, cognitive skills, and overall learning outcomes—requires a nuanced understanding of the interactions between gaming behaviours and academic achievement. Each of these variables (frequency, duration, and type) plays a critical role in shaping how games influence a student's educational experience.

1. Gaming Frequency:

Frequency refers to how often students engage in gaming activities. The impact of gaming frequency on academic performance depends on whether gaming is used constructively or detracts from academic priorities.

- **Positive Effects of Moderate Gaming Frequency:** Engaging in games on a moderate basis can enhance students' cognitive skills, such as critical thinking, problem-solving, and spatial awareness, which are transferable to academic tasks. For example, students who play games involving strategy and logic, such as puzzles or role-playing games, may develop skills that improve performance in subjects like mathematics and science. The key is moderation—when gaming is balanced with academic responsibilities, it can serve as a tool to enhance learning and stimulate interest in academic subjects, contributing positively to cognitive development and overall academic performance.
- **Negative Effects of High Gaming Frequency:** Excessive gaming—especially if it becomes

a daily routine—can negatively impact academic performance. Prolonged gaming sessions may lead to decreased focus on schoolwork, resulting in lower grades and incomplete assignments. Gaming can also disrupt sleep schedules, which is essential for cognitive function and memory consolidation, ultimately leading to poor academic outcomes. High gaming frequency is also linked to reduced time spent on academic tasks, leading to poorer overall learning outcomes.

2. Gaming Duration:

Duration refers to the length of time spent on gaming in each session. The duration of gaming sessions directly impacts the amount of time available for academic engagement and can influence both short-term and long-term learning outcomes.

- **Short, Controlled Sessions:** When gaming sessions are short and well-regulated, they can serve as a rewarding break, helping to recharge students' attention and reduce burnout from academic work. This balance can positively affect academic performance, as students return to their studies feeling more focused and refreshed. Cognitive skills such as attention to detail, multi-tasking, and strategic thinking can be honed during these shorter gaming sessions, contributing to improved problem-solving abilities in academic settings.
- **Extended Gaming Duration:** Longer gaming sessions—particularly when they extend for hours—can have detrimental effects on academic performance. Students may experience cognitive overload, fatigue, and reduced attention span when transitioning back to studying after extended gaming. Long gaming sessions also detract from the time needed for academic tasks such as homework, revision, and independent learning. As a result, prolonged gaming durations are often correlated with lower academic achievement and diminished cognitive performance in critical areas like reading comprehension, writing, and analytical thinking.

3. Type of Games:

The type of games played by students—whether they are digital, traditional, or educational—has significant implications for their academic performance, cognitive development, and overall learning outcomes.

- **Digital Games:** The effects of digital games on academic performance vary widely depending on the nature of the games. Games that require strategic thinking, problem-solving, and decision-making (such as strategy games, puzzles, or simulations) can enhance cognitive skills that are transferable to academic tasks. For example, action and adventure games can improve spatial awareness and multitasking abilities, which can benefit students in subjects such as geometry, engineering, or computer science. However, games that are highly immersive and repetitive, such as those based on violence or simplistic mechanics, may lead to cognitive fatigue, reduced attention span, and a focus on immediate rewards rather than

long-term academic goals.

- **Traditional Games:** Games like chess, board games, and sports contribute to cognitive development by encouraging strategic thinking, teamwork, and discipline. These types of games also help build perseverance and focus, skills that are critical in academics. For instance, playing chess helps improve logical reasoning and critical thinking, which are valuable in subjects like mathematics and philosophy. Sports can foster time management and stress resilience, promoting a healthy balance between physical activity and intellectual work. Traditional games, when balanced with study, tend to have a positive impact on grades and cognitive outcomes.
- **Educational Games:** Educational games—those designed to teach specific academic concepts—have the most direct influence on academic performance. These games typically target areas such as math, language, and science, providing interactive and engaging platforms for students to practice and reinforce learning. Because educational games align directly with the curriculum, they can enhance both intrinsic motivation (through enjoyment) and extrinsic motivation (through rewards and progress tracking). By offering personalized, adaptive learning experiences, educational games can significantly improve students' academic outcomes, particularly for students who may struggle with traditional learning methods.

4. Overall Learning Outcomes:

The overall learning outcomes of students are influenced by a combination of gaming frequency, duration, and type. When students engage in games that promote cognitive development and align with their academic interests, gaming can act as a complementary tool that supports their learning. In contrast, unregulated or excessive gaming can hinder academic success by reducing time for study, disrupting sleep, and negatively affecting concentration.

- **Positive Impact on Cognitive Skills:** Games that involve strategy, memory, and problem-solving can enhance cognitive functions such as attention, memory retention, and logical reasoning. These improvements can directly benefit academic performance in subjects that require analytical thinking, such as mathematics, science, and language arts.
- **Motivation and Engagement:** Games—especially educational ones—can enhance students' motivation and engagement in academic tasks by making learning enjoyable and interactive. This increased engagement can translate into improved grades and deeper comprehension of academic subjects.
- **Balanced Approach:** The most favourable outcomes in terms of academic performance and cognitive development are seen when students maintain a balanced approach to gaming. A moderate gaming frequency with shorter durations of educational and strategic games tends

to enhance academic performance and learning outcomes. Conversely, excessive gaming or gaming that doesn't promote cognitive skills can detract from academic focus and achievement.

The impact of gaming frequency, duration, and type on academic performance is multifaceted. Gaming, when approached thoughtfully, can significantly enhance cognitive skills and academic motivation, leading to improved grades and overall learning outcomes. However, when gaming becomes excessive or misaligned with academic goals, it can result in detrimental effects on academic performance. By carefully managing gaming habits and focusing on educational or cognitively challenging games, students can maximize the benefits of gaming while mitigating potential drawbacks.

The benefits of gaming, such as improved problem-solving and engagement, as well as the challenges, including distraction and reduced focus on academics

Understanding the benefits and challenges of gaming, especially in the context of senior secondary students, requires a comprehensive view of how gaming influences academic motivation, cognitive development, and time management. While gaming can provide several advantages in terms of skill development and engagement, it also poses significant challenges that can affect academic outcomes if not carefully managed.

1. Benefits of Gaming:

- **Improved Problem-Solving Skills:** Many games, particularly strategy games (such as puzzles, chess, and role-playing games), require players to think critically, make decisions, and solve complex problems. These activities help improve cognitive abilities like analytical thinking, reasoning, and the ability to foresee the consequences of actions—skills that are highly transferable to academic tasks. For instance, playing games that require players to navigate challenges can enhance students' problem-solving abilities in subjects like mathematics, science, and even humanities, where logical reasoning is crucial.
- **Increased Engagement and Motivation:** One of the most significant benefits of gaming is its ability to engage students and enhance motivation. Games are designed to be immersive and rewarding, with immediate feedback and goals to strive for. This creates a sense of achievement and progress, which can translate into increased intrinsic motivation for other activities, including academic tasks. For example, students who engage in educational games that align with academic subjects (e.g., math puzzles, language games) are likely to feel more motivated to engage in similar academic tasks, as the process becomes enjoyable and less tedious.
- **Enhanced Cognitive Skills:** Gaming can improve various cognitive functions, such as spatial awareness, memory, multitasking, and attention to detail. For example, action and

adventure games that require fast decision-making and coordination can improve hand-eye coordination and spatial reasoning, which are beneficial for subjects like geometry or computer science. Similarly, games that involve memory and strategy can enhance students' recall abilities and help them approach academic problems from different perspectives, fostering creativity and critical thinking.

- **Social and Collaborative Skills:** Multiplayer and team-based games offer opportunities for students to collaborate, communicate, and work in groups. These social interactions can improve teamwork, leadership, and negotiation skills, which are valuable in academic group projects and presentations. For instance, students who participate in online multiplayer games or cooperative board games may learn how to share ideas, manage conflicts, and achieve common goals—skills directly applicable to collaborative academic work.
- **Stress Relief and Mental Well-Being:** Games can offer a healthy escape, helping students manage stress and unwind from the pressures of academics. Short breaks with engaging games can help students feel more refreshed and refocused when they return to their studies. Reducing stress through gaming can improve overall well-being, which in turn can lead to better academic performance and more positive attitudes toward learning.

2. Challenges of Gaming:

- **Distraction from Academic Responsibilities:** One of the primary challenges of gaming is the potential for distraction. If students spend excessive time gaming, it can interfere with their academic duties, such as completing homework, studying for exams, or engaging in other productive activities. Games that are particularly immersive and time-consuming may lead students to prioritize gaming over their academic work, causing a decline in grades and performance. For example, a student who spends several hours playing digital games may find it difficult to focus on assignments or study sessions, leading to missed deadlines and incomplete tasks.
- **Reduced Focus and Attention Span:** Excessive gaming can also affect students' ability to focus on longer, more demanding academic tasks. Games that offer immediate rewards and constant stimulation may make it harder for students to engage with tasks that require sustained attention, such as reading lengthy textbooks or writing essays. Over time, students may develop shorter attention spans, which can hinder their ability to concentrate during schoolwork and negatively impact their academic performance.
- **Sleep Disruption:** Extended gaming sessions, especially if played late at night, can disrupt students' sleep patterns. Lack of sleep is directly linked to decreased cognitive function, memory retention, and overall academic performance. When students stay up late playing games, they may struggle to stay alert and focused during school hours, leading to fatigue and

a decline in academic performance. Sleep deprivation can also affect emotional regulation and decision-making, further complicating students' ability to manage academic responsibilities effectively.

- **Addiction and Over-reliance on Gaming:** The addictive nature of certain games, especially those with reward systems (e.g., points, levels, or virtual currencies), can lead to over-reliance on gaming for emotional fulfilment. This dependency can result in students neglecting their academic responsibilities, social interactions, and other important aspects of life. Gaming addiction can also affect mental health, leading to feelings of isolation, anxiety, or depression, particularly if students prioritize gaming over meaningful real-world interactions and academic success.
- **Impact on Physical Health:** Extended periods of gaming, especially in sedentary positions, can also negatively affect students' physical health. Lack of physical activity can lead to issues such as weight gain, poor posture, and eye strain. Students who spend hours gaming may neglect physical exercise, which is essential for overall well-being and academic performance. A lack of physical health can further impact mental performance, as physical and cognitive health are interconnected.
- **Balancing the Benefits and Challenges:** The key to reaping the benefits of gaming while mitigating its challenges lies in moderation and balance. By setting boundaries around gaming frequency, duration, and type, students can enjoy the cognitive and motivational advantages of games without letting them interfere with their academic success.
 - a) **Time Management:** Students can set time limits on gaming sessions and ensure they have dedicated time for academic activities. Structured breaks that incorporate gaming can enhance focus and refresh the mind, leading to better productivity in academic tasks.
 - b) **Educational Games:** Focusing on educational games or games that promote cognitive development (such as puzzles, strategy games, or subject-specific games) can help students enhance their academic skills in an engaging way. These games can provide both intrinsic and extrinsic motivation to pursue academic learning.
 - c) **Parental and Educational Guidance:** Parents and educators can guide students in selecting games that align with their learning goals and monitor gaming habits to ensure that they are beneficial rather than detrimental to academic outcomes.

Gaming can have both positive and negative effects on academic motivation, cognitive development, and performance. On the one hand, it can improve problem-solving skills, engagement, and cognitive abilities. On the other hand, it can lead to distraction, reduced focus on academics, and unhealthy gaming habits. By carefully managing gaming behaviour and selecting games that align with educational goals, students can maximize the benefits of gaming while minimizing its potential

risks.

Conclusion:

This research highlights the complex relationship between gaming and the academic motivation and achievement of senior secondary students. While gaming has often been viewed as a source of distraction, this study reveals that, when balanced appropriately, it can offer significant benefits in terms of cognitive development, problem-solving skills, and academic engagement. Games—particularly those that are educational or promote strategic thinking—can enhance students' intrinsic motivation by making learning enjoyable and interactive, while also fostering critical thinking, memory, and attention to detail. These cognitive benefits can positively influence academic performance, leading to improved grades and overall learning outcomes.

However, the study also emphasizes the potential challenges associated with gaming. Excessive gaming, particularly if it becomes a distraction or disrupts time management and sleep schedules, can negatively impact students' focus, academic performance, and well-being. The key to maximizing the positive effects of gaming while minimizing its risks lies in maintaining a balance between gaming and academic responsibilities. Gaming can be used as a tool to enhance motivation and cognitive skills when approached thoughtfully, with clear boundaries on time and type of games played.

Educational games, in particular, stand out as a promising approach to aligning gaming with academic goals, providing students with both enjoyment and relevant learning experiences. Teachers, parents, and educators can play a crucial role in guiding students toward healthy gaming habits and selecting games that support their educational development.

In conclusion, this research demonstrates that the influence of games on academic motivation and achievement is multifaceted. While gaming has the potential to enhance learning, its impact ultimately depends on how it is integrated into students' daily lives. A balanced, mindful approach to gaming can help senior secondary students leverage its benefits, ensuring that it complements and enhances their academic journey rather than detracting from it.

References:

1. Akinsola, M. K., & Animasahun, I. A. (2007). The Effect of Simulation-Games Environment on Students Achievement in and Attitudes to Mathematics in Secondary Schools. Online Submission, 6(3).
2. Annetta, L. A., Minogue, J., Holmes, S. Y., & Cheng, M. T. (2009). Investigating the impact of video games on high school students' engagement and learning about genetics. *Computers & Education*, 53(1), 74-85.
3. Akanmu, M. A., & Adeniyi, C. O. (2021). Effects Of Mathematical Games on Senior Secondary Students' Academic Performance in Mathematics in Ejigbo, Osun State, Nigeria.

- ATTARBAWIY: Malaysian Online Journal of Education, 5(1), 1-9.
4. Babang, V. M. M. F., Yuliantini, N. P. R., & Amir, L. S. (2024, April). The Impact of Utilizing Educational Games on Students' Learning Motivation and Academic Achievement. In *Proceeding of International Seminar on Student Research in Education, Science, and Technology* (Vol. 1, pp. 172-181).
 5. Camacho-Sánchez, R., Serna Bardavío, J., Rillo-Albert, A., & Lavega-Burgués, P. (2023). Enhancing motivation and academic performance through gamified digital game-based learning methodology using the ARCS model. *Interactive Learning Environments*, 1-18.
 6. Josen, K. (2023). Adolescent Motives, Gaming Behavior and Its Implications to Learning: The Case of Junior and Senior High School Students. *JETT*, 14(5), 466-476.
 7. Kebritchi, M., Hirumi, A., & Bai, H. (2010). The effects of modern mathematics computer games on mathematics achievement and class motivation. *Computers & education*, 55(2), 427-443.
 8. Kobari, S. R., Shayeb, S. J., & Dawood, I. K. (2022). The Effect of Using Games in Teaching on Students' Achievement and Motivation. In *Radical Solutions in Palestinian Higher Education: Research from An-Najah National University* (pp. 29-38). Singapore: Springer Singapore.
 9. Papastergiou, M. (2009). Digital game-based learning in high school computer science education: Impact on educational effectiveness and student motivation. *Computers & education*, 52(1), 1-12.
 10. Risnawati, R. (2021). The Effects of Online Video Gaming on Students' Motivation and Their English Learning Achievement at Islamic Senior High School Daarul Mu'minin No. 12 Doping Wajo Regency (Doctoral dissertation, UNIVERSITAS NEGERI MAKASSAR).
 11. Sun, R. Q., Sun, G. F., & Ye, J. H. (2023). The effects of online game addiction on reduced academic achievement motivation among Chinese college students: the mediating role of learning engagement. *Frontiers in Psychology*, 14, 1185353.
 12. Salami, O., & Spangenberg, E. D. (2024). Effect of Mathematical Games on Senior Secondary School Students' Achievement in Mathematics According to Gender: Effect of Mathematical Games on Students' Achievement in Mathematics According to Gender. *Journal of Mathematics Education at Teachers College*, 15(1), 1-12.
 13. Turner, P. E., Johnston, E., Kebritchi, M., Evans, S., & Heflich, D. A. (2018). Influence of online computer games on the academic achievement of nontraditional undergraduate students. *Cogent Education*, 5(1), 1437671.
 14. Tella, A. (2007). The impact of motivation on student's academic achievement and learning outcomes in mathematics among secondary school students in Nigeria. *Eurasia Journal of Mathematics, Science and Technology Education*, 3(2), 149-156.
 15. Wahyuni, E., Eko Tanuso, N. A., Waruwu, Y., Mata, Y., & Susanto, A. N. (2023). The Role of Educational Games in Increasing Student Motivation and Engagement. *Al-Hijr: Journal of Adulearn World*, 2(4).