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Psychological and Cognitive Effects of Esports Participation on Gamers

Bachelor of Business Administration, Esports Business

Spring 2025

KAMK • University of Applied Sciences

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Abstract

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Title of the Publication: Psychological and Cognitive Effects of Esports Participation on Gamers

Degree Title: Bachelor of Business Administration, Esports Business

Keywords: Esports, Psychological, Cognitive, Coping mechanism

Esports is growing and attracting younger generations, becoming a new type of sport that competes with traditional sports such as football for fans, sponsors, and players. Unlike traditional sports, which focus on physical activity, esports mainly take place online. Players spend long hours in front of screens and often stay in one place. Most studies have examined either the benefits or the negative effects of esports on psychological and cognitive levels without combining both sides to understand its overall value. This study used a mix of interviews and surveys to explore the impact of esports on gamers' psychological and cognitive development.

The data was collected from 5 interviews and 180 survey responses. The results proved that the benefits of esports for gamers' mental and cognitive health outweigh the drawbacks, if gamers use healthy gaming habits and coping strategies. About 66.1% of the survey participants, along with all interview respondents, recommended participation in esports for its psychological and cognitive benefits.

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1 Introduction

Esports has grown from a small hobby into a major global trend, attracting millions of players and fans. Esports competitions are held at both amateur and professional levels, attracting numerous participants and viewers from around the world. Additionally, esports have evolved beyond a simple leisure into a significant activity featuring professional leagues, sponsorships from wealthy individuals and companies, and dedicated fan bases across various countries (Ahn et al., 2020). For many people, esports is not just about competitive gaming; it is also a way to connect with others, develop new skills, and even build a career. Scholars have even classified esports as a form of sports (Jang & Byon, 2020, p.1-22). This is because just like sports have spectators and engagements, esports also have spectators, some of which places bet as a means of support for the activity. As more people join in, researchers are focusing on the psychological and cognitive effects of esports on players (Granic et al., 2014). Competitive gaming, or esports, can affect players' minds in both good and bad ways. While it can offer excitement, it can also create stress that may lead to problems like depression and addiction. Esports can offer benefits such as improving memory and building social connections. While playing esports does not automatically cause mental health problems, recognizing feelings of distress and using the right guidance and coping strategies can help players have a successful and fulfilling experience in esports.

The continuous growth of esports has a significant impact on the health and wellbeing of gamers (Benchebra et al., 2019). This influence includes both positive and negative effects on their psychological and cognitive welfare, highlighting a range of risks and benefits (Sousa et al., 2020). The impacts of gaming are multifaceted and complex. Some scholars argue that gaming has a positive influence on community sense, teamwork ability, and achievement. It can also enhance individual benefits such as self-esteem and social skills through collaborative gameplay. However, others contend that gaming can negatively affect mental health, leading to issues such as anxiety, stress, depression, and a reduced attention span, all these highlights the significant psychological and cognitive effects associated with gaming (Shum et al., 2021; Chan et al., 2022; Alloza et al., 2018). While some studies tend to focus on the positive impacts of esports participation on gamers, and others highlight the negative effects, this study aims to take a balanced approach. It will assess the psychological and cognitive effects of esports and explore how the findings can influence practices, policies, and future research to maximize the benefits of esports while minimizing its risks.

1.1 Background of Study

Over the years, the esports industry has experienced tremendous growth, fuelled by technological advancements that foster a collaborative relationship between players and their audience (Trotter et al., 2022). As a result, profitability has emerged as a by-product of esports engagement, where the primary goal remains the enjoyment of both gamers and spectators (Trottier et al., 2022). The viewership of esports is slightly being overshadowed by traditional sports; however, esports is gaining popularity, especially among younger audiences. A study conducted by Nielsen in 2019 found that half of all esports fans are between the ages of 13 and 24. The rising interest in esports, driven by its entertainment value and economic potential, has attracted attention from various sectors. According to a 2020 report, the esports market is valued at over $24 billion, boasts more than 450 million viewers worldwide, generates over $1 billion in revenue, and professional esports athletes can earn as much as traditional athletes. This indicates that esports is not just a passing trend, but a cultural phenomenon (Ahn et al., 2020; Finance Monthly, 2018).

Ahn et al., (2020) identified six major stakeholders of the esports industry: 1) teams, professional players, and streamers; 2) game publishers; 3) streaming platforms; 4) physical products; 5) leagues and tournaments; and 6) digital tools.

The growth of the gaming industry is largely driven by gamers who invest significant time and effort to improve their skills in online competitive gaming. Many players dedicate around 12 hours each day to practice, executing over 500 actions per minute, often without taking any mental or physical breaks (Hamari & Sjoblom, 2017). While this dedication is profitable for the industry, it can also lead to serious drawbacks, including prolonged screen time and sedentary behaviour. These factors can result in psychological and cognitive effects that may be both beneficial and harmful (Migliore, 2021, p.1-16).

Esports are more than just games; they demand a specific set of skills for competitive play. For example, in League of Legends, a multiplayer online battle arena (MOBA) game, teams compete against each other, requiring strong teamwork and strategic thinking to achieve victory (Alloza et al., 2018). Similarly, in a first-person shooter game like Overwatch, players must attack and defend against enemies to protect a fort (Alloza et al., 2018). Both games highlight essential skills

such as rapid decision-making, creative strategies, and quick reaction times. These skills are not only crucial within the gaming industry but also transferable to real-world situations, enhancing outcomes in various areas (Sousa et al., 2020).

Cognitive skills are developed during the competitive video gaming process; however, underlying psychological states such as stress or tension can arise due to changes in the autonomic nervous system (Sousa et al., 2020). A study by Benchebra et al., (2019) highlighted various physical injuries associated with esports, including joint pain, headaches, sleep disturbances, and vision problems. These physical issues can hinder the effectiveness of cognitive skills such as planning and critical thinking (Sousa et al., 2020). Research by Kowal et al., (2018, p.255-262) and Deleuze et al., (2017) demonstrated a significant impact of specific esports on executive functioning and response times, underscoring the psychological and cognitive effects that esports can have on gamers.

Additionally, while the popularity of esports is still emerging, it remains strong, with a significant number of participants being younger individuals, including adolescents, school-aged children, and college athletes (Hester, 2016; Sorokanich, 2014). These participants engage in extensive training to develop the motor, psychological, and cognitive skills necessary to be highly competitive and win games (Funk et al., 2017, p.7-13). While this training can lead to success in esports, it also poses risks of addiction, gaming disorder, and hazardous gaming, which Chung et al. (2019, p.384-394) identified as a growing public health concern.

Gaming disorder (GD) includes symptoms such as impaired control over gaming, prioritizing gaming over other activities to the extent that it replaces daily responsibilities and continuing to play despite negative consequences. Hazardous gaming (HD), on the other hand, is characterized by the potential risk of harmful physical or mental health effects on the gamer or those around them. This can manifest in various forms, including neglect of other important activities, risky behaviours related to gaming, and the adverse consequences that may result from these behaviours. Both GD and HD have been classified as mental health disorders by the World Health Organization (2018a, 2018b). Engagement in esports allows gamers to develop both beneficial and potentially harmful psychological and cognitive skills over time. This involvement can lead to various lifestyle outcomes, which may be negative, positive, or a combination of both (Chan et al., 2022). Therefore, promoting healthy lifestyle choices is crucial for ensuring the well-being of future generations who participate in this form of sport.

This study will utilize cognitive load theory to assess how gamers manage their cognitive resources and capacity, and how this management impacts their learning, performance, and decision-making (Tindall-Ford et al., 2020). Additionally, the stress and coping models established in this research will help identify strategies for balancing the outcomes of gamers' continuous engagement on online platforms. This approach aims to manage the stress associated with gaming, ultimately supporting the long-term psychological and cognitive well-being of the players (Tindall-Ford et al., 2020). The findings from this study will offer strategies to ensure that gamers' health and well-being are not compromised in pursuit of training and winning at esports. This will promote a balanced approach to participation in esports.

1.2 Aim of the study

To assess the psychological and cognitive impact of esports participation on gamers to provide evidence-based advice on how to maximize its positive impact on gamers, while significantly mitigating the negative impacts equally.

1.3 Research Question

1. What are the psychological effects of esports participation on gamers: (i) positive impacts and (ii) negative impacts?
2. How does esports participation affect the cognitive skills of gamers: (i) recognisable cognitive skills and their positive impact, and (ii) possible negative impacts of esports participation on cognitive skills?
3. Do individual differences such as age, gender, and social status, moderate the effects of the psychological or cognitive effects of esports participation on gamers?

1.4 Research Objectives

1. To determine the benefits of esports participation on the psychological and cognitive wellbeing of gamers.
2. To assess the negative psychological and cognitive impacts of esports on gamers.
3. To establish a relationship between esports participation and lifestyle outcomes or emotional development of (young) gamers.
4. To identify factors that contribute to healthy or unhealthy gaming habits.
5. To recommend strategies or develop evidence-based guidelines for promoting the healthy participation of gamers in esports.

1.5 Significance of Study

The psychological and cognitive impacts of esports on gamers can be difficult to assess because some researchers tend to focus more on either the benefits or the risks (Chan et al., 2022; Sousa et al., 2020). This research aims to analyse both the positive and negative psychological and cognitive effects while also recommending strategies that can be utilized by institutions, gamers, and psychology researchers and educators to balance these pros and cons associated with competitive online gaming.

Given the growing popularity and long-term economic significance of esports, this research also aims to contribute valuable suggestions to the academic literature regarding the psychological and cognitive well-being of gamers. This is particularly important since many gamers start their journey in their teenage years, making it essential to mitigate the development of negative lifestyle behaviours over time, such as aggression, a sedentary lifestyle, and poor nutrition.

The findings from this study will be beneficial for scholars studying the long-term impacts of esports on gamers' overall well-being, as it will explore various patterns of both positive and negative behaviours and skills identified throughout the research.

1.6 Scope and Limitation

This study will examine the psychological and cognitive effects of participation in esports on gamers. It will explore both the positive and negative impacts, including mental health challenges, relevant transferable skills gained through gaming, behavioural patterns, and potential lifestyle outcomes such as social interactions, decision-making processes, and teamwork abilities. These elements will provide insights into the psychological states and development of gamers.
The research will consider various factors associated with gamers' participation, including age, gender, social status, gaming genres, and levels of engagement. Additionally, the study will incorporate data from diverse racial backgrounds to achieve a more comprehensive representation of gamers across different demographics.

The limitations of this study that can affect the scope and generalizability of the research include:

- The sample representation of this study may not capture the entire population of gamers because of their diversity in esports participation such as the age, gender, cultural background, etc.
- There is a possibility of overrepresentation or underrepresentation of professional gamers who are minority in the gaming population.
- There is a possibility of self-reporting bias in the form of inaccurate recall or social desirability due to the subjectiveness of identifying psychological or behavioural outcomes of gamers.
- The cultural differences across gamers can influence what is deemed as psychological or cognitive impacts which can prevent the findings of the study from being generalizable.
- Assessing the cognitive and psychological impacts of esports participation on gamers is subject to the technologies available to propagate organised and competitive video gaming activities, advancements in technologies or the addition of disruptive technological tools in gaming can outpace the findings of this study.

2 THEORETICAL BACKGROUND

This section of the study explores the theoretical underpinnings of the research interest, particularly on the respective schools of thoughts and frameworks for internalizing and conceptualizing the patterns of behaviour of gamers of esports. In the end, this section will explore the cognitive load theory and the stress and coping models to further juxtapose the psychological and cognitive impacts of esports participation on gamers, in both the positive and negative measures.

2.1 Conceptual Framework

Esports, or competitive video gaming, has developed into a structured industry complete with professional players, teams, sponsorships, and international tournaments (Ströh, 2017). This growth has sparked increased interest among researchers in exploring the psychological and cognitive effects of gaming. To understand these effects, it is important to examine how gaming influences cognitive functions, psychological well-being, and adaptive behaviours in high-pressure situations (Reyes, 2022).

From a cognitive standpoint, esports require quick decision-making, time management, working memory utilization, and problem-solving skills (Bediou et al., 2018, p.77-110). Gamers are tasked with processing vast amounts of visual and auditory information while responding to ever-changing in-game scenarios. In contrast to traditional sports, esports involve prolonged screen time and rapid hand-eye coordination rather than physical endurance (Pirklova, 2023). This results in unique patterns of cognitive load distribution.

Psychologically, esports involve elements of competition, reward anticipation, stress, and social interaction, all which impact emotions, motivation, and mental well-being (Khusenskaya, 2023). The esports environment can create significant pressure due to high expectations, long training hours, and competition-related anxiety. However, esports can also produce positive psychological effects, such as increased self-esteem, social connections, and cognitive resilience (Lobel et al., 2017). Research indicates that players who participate in structured gaming activities tend to develop improved mental flexibility and problem-solving abilities, which can benefit them in real-world situations (Kari & Karhulahti, 2016, p.53-66).

The psychological effects of esports can differ significantly based on individual differences, gaming intensity, and coping strategies. Some players may experience increased stress due to high-performance demands, while others are able to develop effective stress management techniques, which in turn enhances their overall mental resilience (Reyes, 2022). Cheng and Bayasgalan (2024) suggest that players who engage in esports in a balanced manner—avoiding excessive gaming—enjoy cognitive benefits, including improved multitasking abilities and enhanced memory retention.

To analyse the cognitive and psychological dynamics of esports participation, two key theoretical frameworks are important: Cognitive Load Theory (CLT) and Stress and Coping Models. CLT explains how cognitive resources are allocated during gaming, emphasizing the need to balance processing demands with mental capacity (Kirschner et al., 2018). Stress and Coping Models examine how players manage stressors related to competition, team dynamics, and performance pressure (Tindall-Ford et al., 2020). By applying these theories, researchers can gain a better understanding of how cognitive overload, mental fatigue, stress responses, and adaptation strategies affect esports players.

2.2 Cognitive Load Theory

Cognitive Load Theory (CLT) provides a framework for understanding how cognitive resources are managed when individuals engage in complex tasks (Kirschner et al., 2018). The theory suggests that cognitive capacity is limited, and excessive demands can hinder learning, performance, and decision-making (Tindall-Ford et al., 2020). CLT identifies three types of cognitive load: intrinsic, extraneous, and germane, all of which play a role in esports performance.

Intrinsic Cognitive Load: This refers to the inherent complexity of a task (Orru and Longo, 2019, p.53-48). In esports, different games impose varying levels of intrinsic load based on their mechanics, decision-making requirements, and strategic depth. For example, real-time strategy games like `StarCraft II` demand multitasking, resource management, and rapid situational awareness, creating a higher intrinsic load than casual games (Malmquist, 2023). Players need to simultaneously track multiple moving elements, make strategic adjustments, and anticipate their opponents' actions.

Extraneous Cognitive Load: This involves additional cognitive demands that are not essential for task completion but arise from poor interface design, unclear instructions, or environmental distractions (Orru and Longo, 2019, p.23-48). In esports, extraneous load can stem from cluttered user interfaces, overwhelming graphical effects, or poorly structured game mechanics. Developers can reduce extraneous load through intuitive user interface design, structured tutorials, and customizable in-game settings (Tindall-Ford et al., 2020). Players can also manage this load through training, experience, and the use of assistive gaming tools.

Germane Cognitive Load: This relates to the mental effort directed toward processing and integrating new information into long-term memory (Orru and Longo, 2019, p.23-48). In esports, germane load is evident when players engage in deliberate practice, strategy analysis, and pattern recognition to refine their skills. High-level players dedicate cognitive resources to predicting opponent behaviour, executing precise mechanical actions, and coordinating with teammates in multiplayer settings (Diaz, 2017).

When cognitive load exceeds a player's capacity, performance declines due to mental fatigue, slower reaction times, and impaired decision-making (Matsui et al., 2024). Esports players employ various strategies to manage cognitive load, such as focusing on relevant stimuli, automating repetitive tasks, and using pre-learned heuristics for decision-making. Thillier et al. (2023) indicate that training programs focused on cognitive adaptability, progressive difficulty scaling, and real-time feedback improve cognitive efficiency in esports.

2.3 Stress and Coping Model

Stress and coping models provide a structured approach that shows how esports players handle the psychological and physiological pressures associated with competitive gaming. Given the high-intensity environment of esports, players frequently experience stress due to performance expectations, time constraints, and the unpredictability of in-game scenarios. The ability to manage stress effectively determines long-term success, mental well-being, and cognitive performance in esports (Tindall-Ford *et. al*., 2020). Two widely applied theoretical perspectives in stress

and coping research are the Transactional Model of Stress and Coping and the Conservation of Resources (COR) Theory. These models explain how players perceive, interpret, and manage stressors in the gaming environment.

2.3.1 Transactional Model of Stress and Coping

The Transactional Model of Stress and Coping, developed by Lazarus and Folkman in 1984, defines stress as a dynamic interaction between an individual and their environment (Tindall-Ford et al., 2020). This model is especially relevant in esports, where players constantly assess challenges and create coping strategies. Under this framework, stress occurs when a player perceives a mismatch between the demands of the game and their available resources to cope with those demands (Poulus et al., 2020). The model outlines two key processes:

1. Primary Appraisal: This process involves evaluating whether a situation in a game is perceived as a threat, a challenge, or a benign event (Leis et al., 2023). For example, a player participating in a crucial match during an international tournament might view the scenario as an opportunity to showcase their skills (challenge) or as an overwhelming source of pressure (threat). Players who adopt a challenge-oriented mindset typically demonstrate better performance and greater psychological resilience (Leis et al., 2021).
2. Secondary Appraisal: Once stress is recognized, players evaluate their ability to manage the challenge. This assessment involves analysing personal skills, past experiences, and available support systems. Professional gamers often depend on structured training, team coordination, and adaptable strategies to reduce stress and maintain focus (Poulus et al., 2020).

   Additionally, players adopt different coping mechanisms based on their appraisals. Problem-focused coping involves taking proactive steps to alter the stressful situation, such as improving reaction speed, refining strategies, or enhancing communication with teammates (Leis *et. al.,* 2021*)*. Emotion-focused coping includes managing emotional responses through relaxation techniques, mental reframing, or motivational self-talk (Poulus *et. al*., 2022).

2.3.2 Conservation of Resources (COR) Theory

The Conservation of Resources (COR) Theory emphasizes that stress occurs when individuals perceive a threat to their valued resources, such as time, energy, or self-confidence (Hobfoll *et. al.,* 2016*)*. In esports, resource depletion—such as prolonged mental strain, loss of motivation, or burnout—can significantly impact performance (Beres, 2024). COR theory suggests that players manage stress through resource investment and recovery strategies:

1. Resource Investment: Competitive gamers invest in training, cognitive skill development, and psychological conditioning to enhance their stress resilience. For example, structured practice schedules and cognitive training programs help players develop better attention control and adaptive responses to in-game stressors (Thillier *et. al*., 2023).

2. Resource Recovery: Since excessive resource depletion leads to burnout, effective recovery strategies are crucial. Esports teams emphasize sleep hygiene, physical exercise, and relaxation techniques to prevent exhaustion. Leis *et. al*., (2023) highlights the role of structured breaks and mindfulness exercises in reducing stress and sustaining long-term performance.

2.4 How both theories interact in Esports

The interaction between Cognitive Load Theory (CLT) and Stress and Coping Models is particularly evident in high-pressure gaming scenarios. CLT explains how cognitive resources are allocated during gameplay, while Stress and Coping Models emphasize how players deal with psychological challenges. When players engage in complex decision-making, their intrinsic cognitive load increases as they process multiple in-game variables simultaneously (Tindall-Ford et al., 2020). For instance, in multiplayer online battle arena (MOBA) games like Dota 2, players must monitor team positions, anticipate enemy strategies, and execute precise mechanical actions. The added pressure of competition can elevate stress levels, which further strains cognitive resources and may lead to performance degradation (Kari & Karhulahti, 2016, p.53-66).

According to Lazarus and Folkman's Stress and Coping Model, individuals experiencing stress appraise situations as either a challenge or a threat (Tindall-Ford et al., 2020). Players who perceive in-game stress as a challenge are more likely to engage in problem-focused coping, directing their cognitive resources toward strategic adjustments and improving gameplay (Leis et al., 2023). Conversely, players who perceive stress as overwhelming may experience cognitive overload, resulting in impaired reaction times and poor decision-making.

Extraneous cognitive load, which arises from unnecessary information processing, can amplify stress in esports. For example, cluttered user interfaces, excessive visual effects, and unclear game mechanics can introduce additional cognitive strain (Tindall-Ford et al., 2020). Under stress, players with lower cognitive flexibility may struggle to filter relevant in-game stimuli, leading to increased anxiety and decreased performance. However, experienced players often develop coping mechanisms to manage this extraneous load, such as adjusting game settings, using efficient key bindings, and training to improve selective attention (Bediou et al., 2018, p.77-110). This aligns with the transactional stress model, where players adapt their approach to stressors through learned strategies (Tindall-Ford et al., 2020).

2.5 Psychological Effects of Gaming

Esports participation significantly impacts gamers' psychological well-being, affecting their emotions, cognition, and overall mental health. The competitive nature of gaming environments presents both challenges and benefits, depending on individual differences, training intensity, and coping mechanisms. Granic et al. (2014) suggest that structured and moderate engagement in esports can enhance cognitive flexibility, social connections, and self-esteem, while excessive gaming may lead to stress, anxiety, and emotional dysregulation.

One of the most discussed psychological effects of esports is the increased stress and anxiety levels among players. Competitive gaming subjects' players to constant pressure to perform at high levels, which can lead to heightened physiological arousal, increased heart rate, and cortisol release (Reitman et al., 2019). High-stakes tournaments further amplify these responses, causing some players to experience performance anxiety and mental exhaustion.

Gaming also influences mood regulation, resulting in both positive and negative outcomes. Kou and Gui (2020) indicate that participation in esports can lead to emotional fluctuations, ranging from excitement and motivation to frustration and anger, particularly during high-intensity matches. Positive reinforcement mechanisms, such as reward anticipation and achievement recognition, can boost motivation and encourage persistence in competitive play (Kari and Karhulahti, 2016, p.53-66). Conversely, frequent losses, toxic online interactions, and social comparisons may contribute to negative emotional states, including frustration and diminished self-worth (Kwak et al., 2015).

Social interaction is another crucial psychological aspect of esports. Online gaming platforms foster virtual communities where players can develop friendships, teamwork, and social bonds (Liao et al., 2020). Multiplayer games promote cooperation and communication, enhancing social skills and emotional intelligence. However, prolonged screen time and excessive engagement in online communities may reduce real-world social interactions, leading to social isolation for some individuals (Tushya et al., 2023).

Additionally, gaming can influence emotional resilience. The ability to recover from setbacks and maintain focus under pressure strengthens psychological endurance, a valuable trait that extends beyond gaming contexts (Cheng and Bayasgalan, 2024).

2.6 Cognitive Effects of Gaming

Esports gaming has significant cognitive effects, influencing attention, problem-solving, memory, and decision-making. The fast pace of competitive games requires high-level cognitive engagement, leading to both short-term and long-term mental adaptations. Studies indicate that gaming can enhance cognitive flexibility, spatial reasoning, and reaction time, making it a valuable cognitive training tool (Bediou et al., 2018, P,77-110).

One of the most notable cognitive effects of gaming is improved attention control. Competitive players must simultaneously process multiple stimuli, tracking game elements while responding to opponents' actions. Imanian et al. (2024) suggest that esports players demonstrate better selective attention and sustained focus compared to non-gamers. These skills can transfer to real-world tasks, such as driving and academic performance, where attention control is essential.

Gaming also strengthens problem-solving skills. Many esports' titles, particularly strategy and role-playing games, require players to analyse complex situations, develop strategies, and adapt to changing conditions. Studies have shown that gamers exhibit superior analytical thinking and faster decision-making under pressure (Bediou et al., 2023,). This ability to evaluate scenarios and implement effective strategies benefits cognitive development and enhances professional decision-making. Memory function is another area affected by gaming. Esports require players to retain and recall vast amounts of information, including game mechanics, opponent behaviour, and map layouts. Long-term engagement in gaming can improve working memory and procedural memory, especially in players who participate in games with complex rules and fast-paced environments (Asgari et al., 2025).

Furthermore, participation in esports fosters improved reaction time and hand-eye coordination. Competitive games demand precise motor responses and quick reflexes, refining players' abilities to execute split-second decisions (Palaus et al., 2017). Research shows that expert gamers exhibit faster neural processing speeds, which can translate into improved motor performance in non-gaming activities, such as sports and medical procedures requiring fine motor skills. However, excessive gaming may also lead to cognitive drawbacks. Some studies suggest that prolonged exposure to fast-paced digital environments may reduce impulse control and increase cognitive fatigue (Carpita et al., 2021, p.775). Additionally, reliance on digital stimuli for problem-solving might weaken traditional cognitive processes, such as deep reading and extended concentration on non-digital tasks (Wilmer et al., 2017).

3 Research Methodology

The methodology of research involves investigating the research questions, assessing and exploring relevant data, and analysing and interpreting that data to address research problems while achieving the research objectives (Mohajan, 2020). It outlines how to arrive at the study's justification in a manner that allows an independent researcher to obtain the same or similar findings (Mohajan, 2020). This research will utilize a mixed methodology approach, which involves both quantitative analysis through surveys or questionnaires and qualitative analysis through interviews. This mixed methodology is essential for understanding the psychological and cognitive effects of esports participation on gamers, as it combines both quantitative and qualitative methods to uncover gaming behaviours and habits, along with the complex relationships between these behaviours and their cognitive and psychological outcomes.

The quantitative aspect will gather data on variables such as age, gender, screen time, and frequency of play. In contrast, the qualitative data will delve into the more nuanced aspects of individual differences and motivations, exploring their impact on lifestyle and behaviours relevant to real-world applications.

3.1 Research Design

The research design outlines the methods and approaches that the researcher will use to address the research questions (Leavy, 2017). Adopting a mixed methodology approach, a survey will be conducted featuring carefully curated questions directed at a large sample of gamers. This survey aims to gather measurable data on psychological well-being, cognitive skills, and gaming habits. It will be distributed online through esports platforms, gaming forums, and social media channels. The questions will cover various aspects, including game genres, screen time, age, gender, and education level. Gamers will also participate in online cognitive tests designed to simulate game-like scenarios. Most of the survey questions will be close ended, utilizing Likert scales to assess information about esports participation that is pertinent to the research questions and objectives.

Additionally, the lived experiences of gamers, including their opinions, scepticism, and perceptions of esports participation, will be explored through semi-structured interviews. This type of interview is used to foster open dialogues and conversations with participants, allowing for a

deeper understanding of their subjective contexts in eSports participation. This approach may even reveal relevant questions that the researcher had not previously considered and explore other dimensions of their experiences that could enhance the research findings. Furthermore, the qualitative interviews will provide additional depth to the quantitative data collected.

3.2 Data Collection

Given that the potential limited number of gamers in the University community, a more pragmatic and realistic semi-structured interview will involve approximately 5 gamers, while the survey will consist of 16 questions directed at students, some of whom are casual, and professional esports gamers. This survey will be distributed via email and social media, with the aim of gathering responses from a minimum of 150 participants and a maximum of 250 participants. Both the interview and survey will focus on the psychological experiences, cognitive challenges, and skills developed through gaming, as well as the potential benefits and risks associated with esports participation.

Participants for the interviews will be selected from a subset of the survey respondents. To facilitate this, we will include an additional section in the survey that allows interested participants to volunteer for follow-up interviews. These interviews will be conducted virtually via Zoom, which will enable participants from various regions to join. Additionally, the conversations will be recorded for later transcription.

3.3 Sampling Method

The sampling method in research refers to the specific process used to select key participants from whom the findings of the study can be generalized (Rai & Thapa, 2015). The sample is derived from a segment of the population that is directly affected by the research interests (Rai & Thapa, 2015). In this case, the population encompasses all student esports gamers. However, since it is impractical to survey or interview every student gamer worldwide, a representative sample reflecting various demographics—including age, gaming frequency, and levels of

engagement—will be sufficient. This sampling method ensures that the data collection process is carefully monitored and controlled.

Given the nature of this study, which involves both subjective experiences and measurable habits of gamers, the purposive sampling method will be employed. This approach will allow for the selection of a diverse group of gamers based on classifications such as age, gender, and gaming experience. This sampling technique is justified as it targets participants who have a direct relationship to the research interests (Rai & Thapa, 2015).

3.4 Data Analysis

This section of the research will include a thematic analysis, narrative analysis and the analysis of quantitative data. In the narrative analysis, individual experiences, stories and opinions from the interview will be analysed to assess unique experiences and perspectives. This is followed by the analysis and sorting of the quantitative data to uncover similarities and consistencies of information across the survey participants. Both patterns and trends assessed from the narrative analysis and analysis of the quantitative data will be arranged and sorted into themes that reflect the research objectives and answers specific questions of the research relative to the psychological and cognitive effects of esports participation on gamers. Results from the qualitative data analysis will be compared with the quantitative data to develop the findings of the research, and further determine their possible similarities and/or difference.

4 Results

This section emphasises the results from the study arranged into themes that align with the study objectives and questions. The process of the thematic arrangement is obtained from the interview questions, where answers with similar interests and points of focus make up a theme. It is also worthy to note that the quoted comments represent the answers of the respondents and are codified using R1 to R5 for respondents 1 to 5. Not all answers are selected, but only responses that capture the entirety of what other respondents have said or shed more light on new ideas or opinions.

Theme 1: Cognitive effects of esports participation on gamers

The questions in which this theme was obtained was asked to assess how gamers have improved their cognitive functions via their participation in esports. The questions were framed in a way to assess either the positive or negative impact esports has on their cognitive states overtime. This theme is all about their state of mind including mental processes like thinking, reasoning, memory and learning. It takes into consideration their attentive skills, problem-solving skills and memory skills such as focus, time management, reaction time, problem solving, memory, concentration, attention span, multitasking, and decision-making abilities in general life outcomes.

The respondents agree that esports have affected them cognitively in both positive and negative ways. However, the degree to which it has impacted them varies across respondents. To thoroughly assess the cognitive impact of esports on gamers, this theme will further be broken down into negative effects and positive effects.

- Negative effects:

"Esports has affected me negatively; I'm not going to lie. … there are periods when you will be so involved in an online tournament, you're trying to finish it up, and you also have something else to do, then unfortunately, you'll be carried away. … It has affected me in a way that my sleep schedule is disrupted..." (R1)

".. lack of sleep. It affects when you lose a game, and you know, you begin to make bad decisions because it affects how you feel, and sometimes even how you react to your partner" (R3).

"... it has affected my time management negatively because sometimes I play almost all night, and I end up sleeping late." (R4)

"... it affects my relationship. There was a time I took two months of my time playing so I could improve, and my partner was not really comfortable with it because I was not giving much attention and time to her, and maybe when she wants to watch her own programme or go for cinema with me and I'm unavailable because I want to play and improve my skills" (R5).

- Positive effects:

"Your decision making can be very prompt, like it will be very quick because you are under pressure sometimes, and that skill has helped me in my academic life because you know when you're doing the projects, you just have to break it bit by bit to be able to come out excellent in whatever you're doing." (R1).

"*The positive side is that it helps me to be quicker and also to realise and figure out things more easily… it also makes you a lot more prepared for tasks"* (R2).

- Cognitive skills gained, developed or improved:

The respondents explained that their cognitive skills such as faster reaction times, problem solving and decision-making, multitasking, and learning memory have improved because of their esports gaming activities. The key responses that summarise the cognitive skills gained by gamers are outlined below:

"When my partner brings a serious discussion during peak gaming hours to distract me from winning, but I still manage to focus on that and also focus on gaming and still be successful in both." (R5)

"It has helped me to think very fast when making an urgent decision." (R4).

"My multitasking abilities and making quick decisions under pressure has greatly been enhanced. I find it easier to switch between tasks, stay organised and make fast decisions without feeling overwhelmed. It has also taught me how to stay calm and, you know, assess situations quickly." (R1)

Theme 2: Psychological effects of esports participation on gamers

This theme explores how esports affect the emotional and behavioural response or patterns of gamers. It assesses how they feel and act in different situations. It considers skills such as emotional regulation like *stress management, social interaction, addiction, anxiety, frustration, and motivation*.

All respondents agreed that their motivation, anxiety, stress or frustration is not set in stone but influenced by some factors like the outcome of the game, if they won or lost; the type of players they faced, and the sort of game they played. Some of their responses are expressed below:

"... it all depends on how the game went, how the session was, you get? Sometimes I might feel stressed depending on who I'm playing, like a tougher opponent were trying to find a way to beat them might make you feel stressed. …sometimes I can be anxious, maybe playing somebody for the first time, and I've heard things about the person, how skilled the opponent is". (R1)

"I think most times for everything we do the outcomes determine our reaction. … well, let's say it's a bad game and you feel frustrated especially when you feel you should have won, or you could have done better. So, the outcome determines how I feel about it in general." (R3)

The respondents also commented on how participation in esports has influenced their social interactions and relationships over time. While R1 says it has not affected them significantly, it only highlighted more of their introverted personality, R2 highlighted how it may improve teamwork virtually, but affect physical communication because people may lack the language needed to interact offline because of the overload of robotically interfaced communication signals online while gaming.

"I'll say I'm an introvert, not because of esports, but I've always been like that. So, when I even go out, I don't really communicate with people. I prefer playing the games that make me happy. I'm not social." (R1).

Some other responses are expressed below"

"... there are some games you just play randomly with strangers online and the way they talk affects you. For me I'm kind of reserved and I don't curse, but because they curse, sometimes, I curse as well." (R3)

"It has improved how I socialise positively because it always involves playing with people, playing with a partner, playing online games with people involves meeting people you've not met for the first time, and it always involves communication to figure out how to bypass every task. It has helped me in real life because I now communicate with people efficiently, even when I'm meeting them for the first time." (R4)

Theme 3: Impact of age, gender and social background on the cognitive and psychological development of gamers

Respondents also had various opinions on their observations of how multiple factors like age, gender and social background influence the cognitive and psychological development of gamers. This thematic analysis explores how the engagements, motivations and community interactions of esports gamers differ across age, gender and social status, if at all there are any notable changes and how this comes about.

For the age factor, they all seem to agree on the same opinions. R1 was more emphatic in their response which summarises the opinion from others by explaining that age is an advantage in the cognitive and psychological development of esports gamers, citing that young gamers will be more flexible, think and process information faster than the older generation. R1 also highlighted that the older generations have a higher psychological development, expressed in how they handle losses to games. The older generations tend to handle losses better because they have other significant responsibilities that take their attention and time, compared to younger generations who may spend all day playing games with no real sense of responsibilities aside from academics and winning opponents.

For gender, while R1, R2, and R5 think that gender has no real impact on how esports influence cognitive and psychological skills (possibly because the game is predominantly male according to R1, hence no much empirical evidence to compare the outcomes), R4 thinks the female gender cannot handle the long hours of gaming and the stress that comes with it, in the way their male counterparts will. R3, however, in agreeing with R1, R2 and R5 that gender has no influence on cognitive and psychological development of esports gamers, also emphasised that such impact is based on personality, as some human beings (not gender) have more emotional, psychological and mental tolerance threshold than others.

For the social background, R3 has this to say, "*Social status is another thing for we Africans because not everyone has that access to the Internet or to any other infrastructure that is required to participate in esports.*". Their response suggests that societal backgrounds can influence access to esports, which also hinders cognitive and psychological development that should have been otherwise developed via gaming in such areas. R3 also believed that as Africans, being faced with numerous challenges has given them resilience to handle stress, which can be a transferable skill in the gaming world and speaks to psychological and cognitive development. Therefore, while access to esports is not easily available in Africa, there will be little to no difference in cognitive or psychological development via gaming when compared to others.

Theme 4: Coping mechanisms developed by gamers during esports activities

One of the key objectives of this study is to assess how to balance out the pros and cons of esports participation on gamers, to minimise risks and maximise the positive effects on cognitive and psychological development. The goal of this theme is to uncover the coping mechanisms respondents have employed to ensure that the adverse effects of gaming are kept under control. To answer the question of coping mechanisms, most respondents highlighted that they had to convince themselves that it is all a game, and not anything real or having significant real consequences that may affect the outcomes of their lives, which is a form of emotional strategy based on internal motivation. This conviction or mental prompting helps them recover from a loss, try again next time, and to improve. A summary of this coping strategy is expressed below:

"Sometimes I remind myself that it is just a game. It's just a game, so it doesn't really take out something from me. We just need you to be better and practise better." (R5).

"Sometimes when you lose a game, it's frustrating. You know, you feel frustrated. But because I still believe it's just a game. You know that reminds me that it is always in my head when I'm like, oh, it's just to give it time and I will be fine." (R3). This respondent also highlighted the possibility of being violently reactive to losing a game, however, they take out their frustration on objects by smashing things to cope with losing a game. This points to a more concerning psychological impact of esports on gamers, although it contextually serves as a tolerable excuse for a coping mechanism.

Other respondents mention that they rest or relax as a form of scoping strategy. However, although their forms of rest or relaxation are physical, they are manifested in various forms. Some of them include:

"... sometimes I take break in between games to reset. Talking to myself or a friend and analysing the outcomes of the game can also help me relax." (R2)

"... control your breath, you know, take a deep breath. You know, all those exercises you do just to control your breath and relax. … you just must take a break between the games and if it's games like Call of Duty when you play with your teams, you know, you just get to communicate, laugh and ease the stress." (R1)

"Maybe I can do some little exercise like walking or make some phone calls to try to distract myself from it." (R5).

Theme 5: Risks associated with esports on gamers

All respondents encourage the promotion of esports based on its cognitive benefits. Of course, there is the risk of addiction, which was also highlighted, but they all believe that the benefits, in a controlled environment, outweighs the risks. The responses below summarise their takes:

"Just like every other thing in life when it's too much, you know, when you can't control it, it will have its negative impact. I don't think esports is the problem, rather the way we manage it… it can really help in other aspects of life as well. It just must be properly managed to achieve maximum benefit." (R3)

"... neutral because it will be based on if it is being taken at the professional level. If you're taking esports at a professional level, it can be managed because you can go through training on how to put a balance in which it won't be addictive to that level. But if it's just for fun then it gets to be addictive and should be monitored." (R5).

Findings from the survey questionnaire

The survey came back with 180 responses. The questions were designed to assess measurable variables which are either consistent or negate some of the common themes of the interview. The findings from the survey are outlined below:

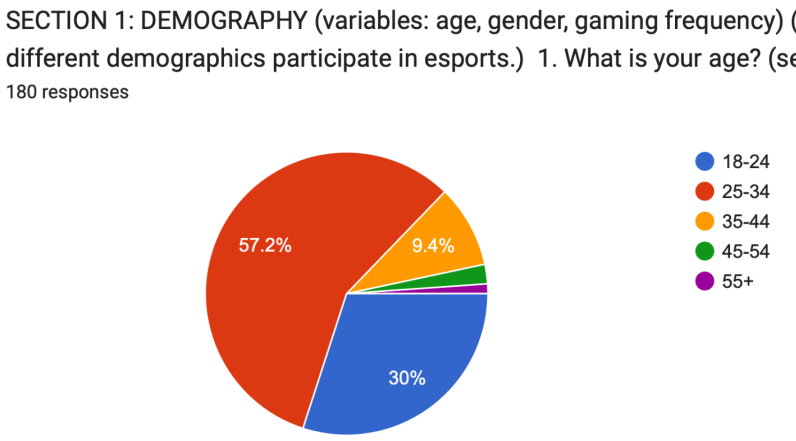

Figure 1: Distribution of age groups.

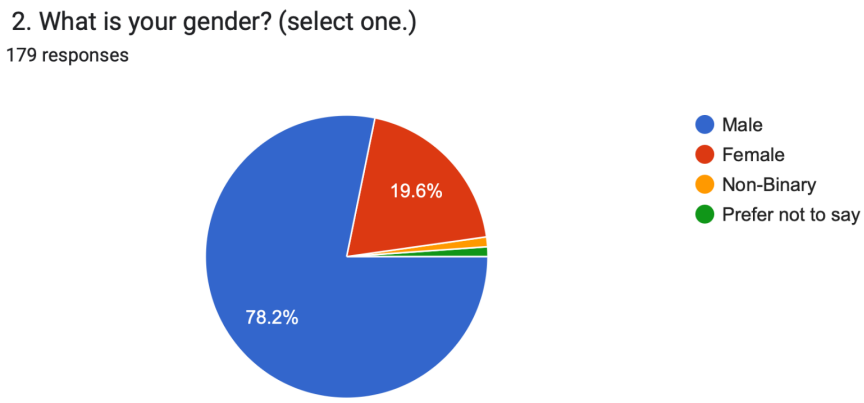

Figure 2: Distribution of gender

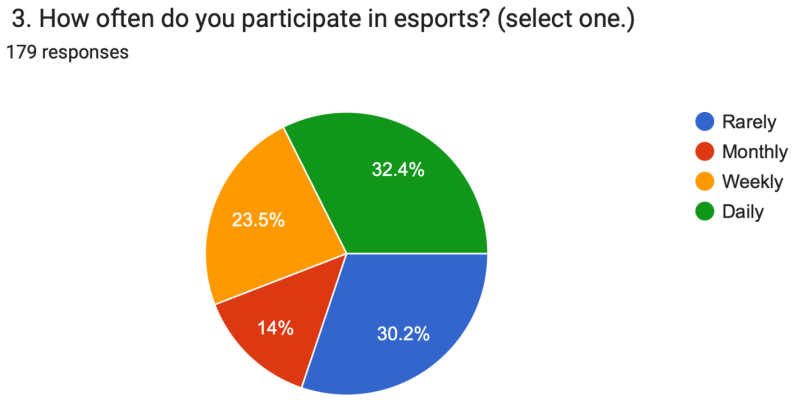

Figure 3: Gaming Frequency

The responses from this survey were obtained from a mixture of professional and casual student gamers, and are summarised in percentages below:

On psychological impacts, using Likert scale yes, no, maybe. The following summarises the responses from the survey:

- On feeling more stressed when playing competitively over casual gaming, 52.8% don't, 31.1% do and the rest are uncertain.
- 52.4% have experienced anxiety during esports match, 38.2% have not, and others are unsure
- 53.1% agrees that esports have enhanced their ability to handle pressure, 26.3 have not experienced any improvement in this regard, the rest are not sure.
- 48.3% have experienced burnouts in esports gaming, 42.7% have not
- 42.5% showed that their mood, interaction with people is influenced by the outcome of a game, 40.8% showed they are not affected, and the rest are unsure.

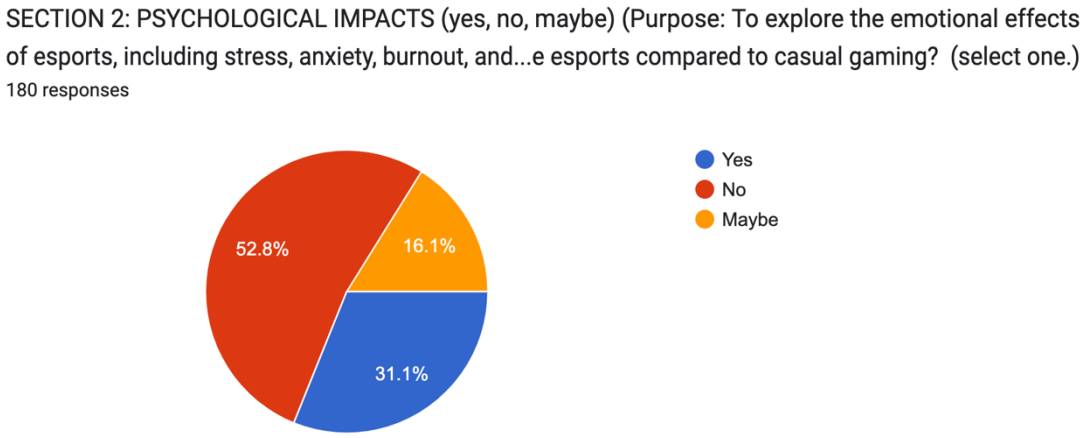

Figure 4: Prevalence of stress when playing competitive esports compared to casual gaming

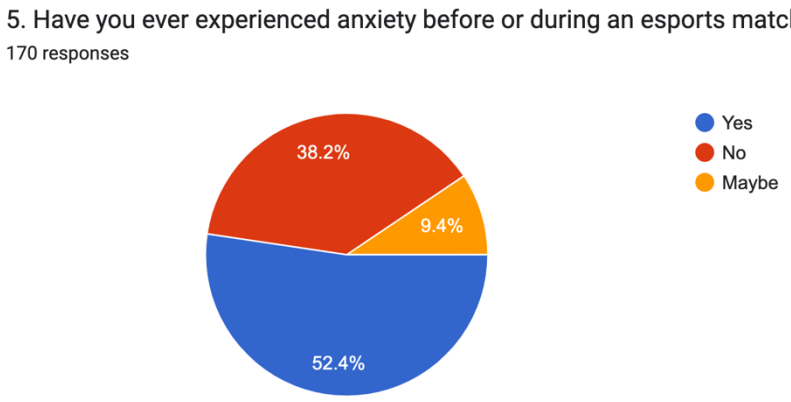

Figure 5: Prevalence of Anxiety Experienced Before or During an Esports Match

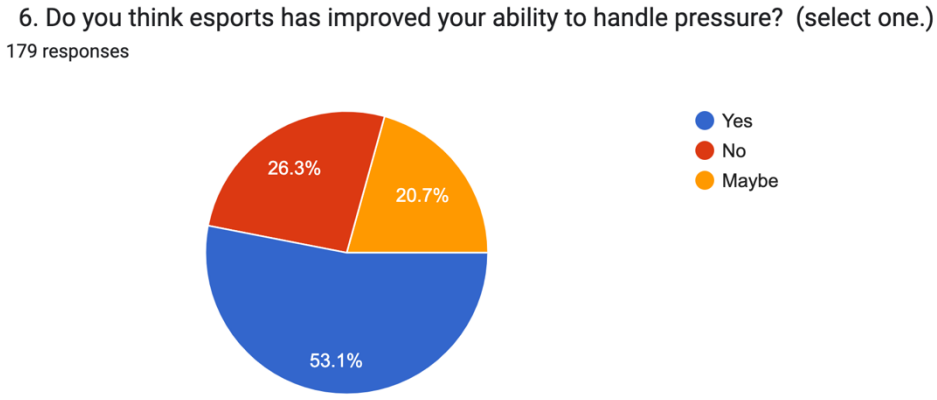

Figure 6: Impact of Esports on Ability to Handle Pressure

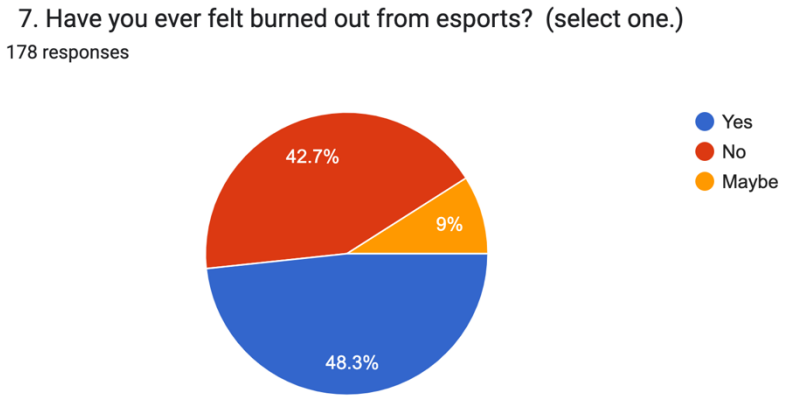

Figure 7: Self-Reported Burnout Among Esports Participants

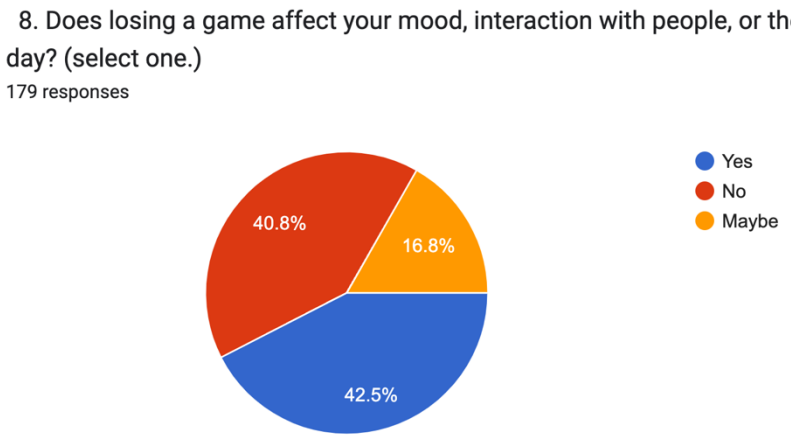

Figure 8: Emotional and Social Impact of Losing a Game

On cognitive impacts, using Likert scale from 5 to 1, (5- strongly agree, 4 -agree, 3- neutral, 2-disagree, and 1-strongly disagree), the following summarises the responses from the survey:

- 16.7% strongly agree that esports have increased their reaction time and reflexes in real situations, 27.8% agree. 36.7% are neutral, 11.7% disagree, and 7.2% strongly disagree.
- 15.1% strongly agree that they find it easier to multitask because of esports, 27.4% agree, 28.5% were neutral. 16.2% disagree that esports have improved their ability to multitask and 12.8% strongly disagrees.
- 36.1% strongly disagree that participating in esports has negatively affected their attention span in non-gaming situations, 34.4% disagrees. 15% remained neutral and only 11.1% agree that esports negatively affect their attention span in non-gaming situations.
- 17.8% of respondents strongly agree that esports participation has helped them develop better problem-solving skills, 30.6% agree. 33.3% were neutral meanwhile 14.4% disagree.
- 7.2% of respondents strongly agree that they struggle with sleep after long gaming sessions, 20% agree and 18.3% remained neutral. However, 33.3% strongly disagree that the struggle with sleep after long gaming sessions and 21.1% disagree.

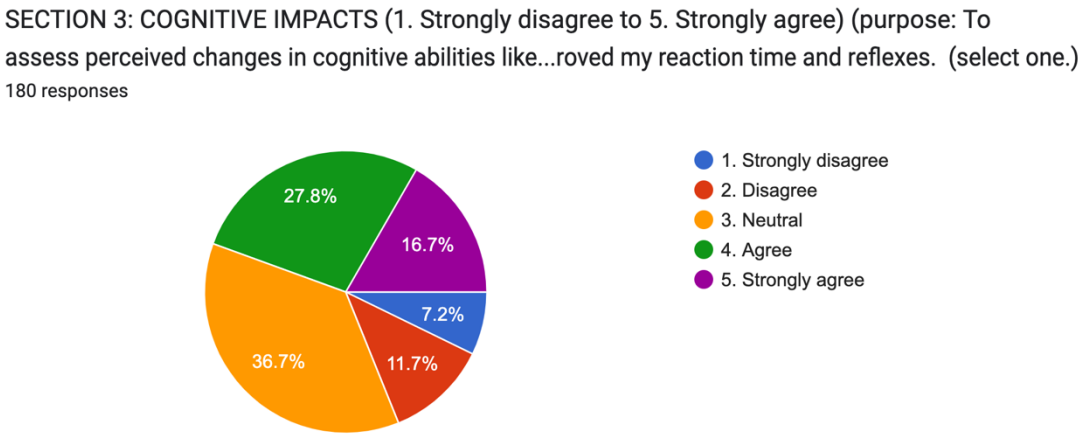

Figure 9: Perceived Improvement in Reaction Time and Reflexes from Esports

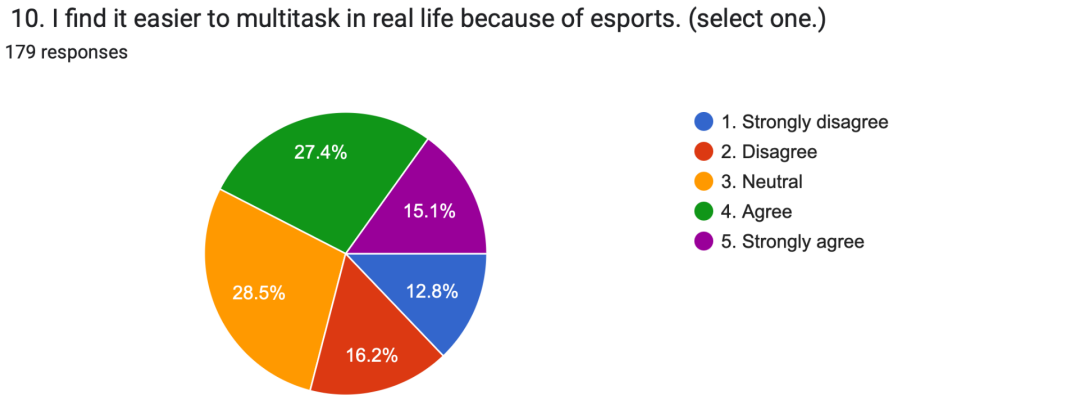

Figure 10: Perceived Impact of Esports on Multitasking Ability

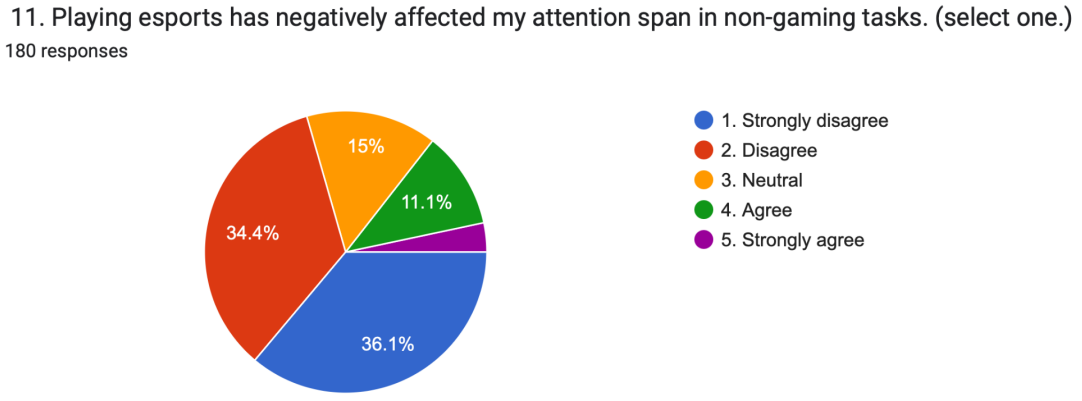

Figure 11: Perceived Negative Impact of Esports on Attention Span Non-Gaming Task

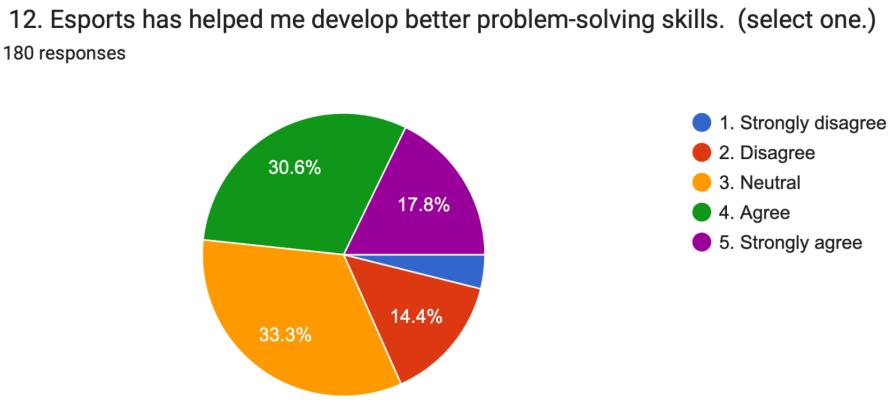

Figure 12: Perceived Development of Problem-Solving Skills Through Esports participation

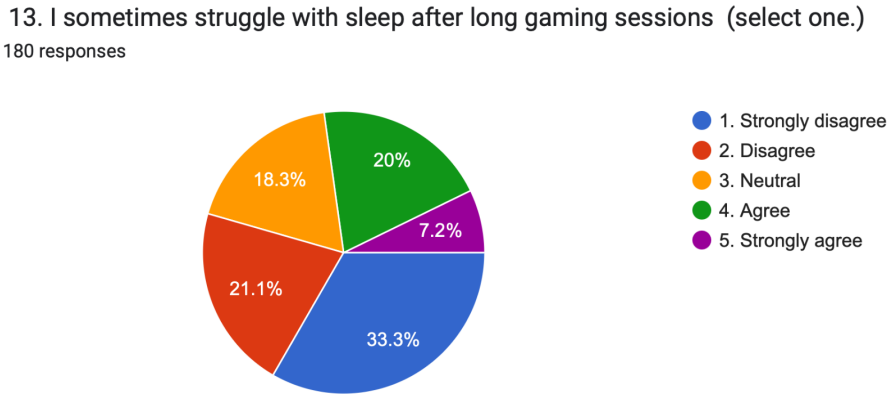

Figure 13: Reported Sleep Difficulties Following Extended Gaming Sessions

For social and behavioural impacts.

- 52.8% of participants believe that participation in esports has improved their teamwork abilities, while 24.8% disagree, and the rest are unsure.
- 58.3% believe that esports have affected their academic work/ performance, 27.2% disagree, and the rest are unsure.
- 66.1% recommend esports for mental and cognitive benefits, 12.8% do not, and 21.1% are unsure.

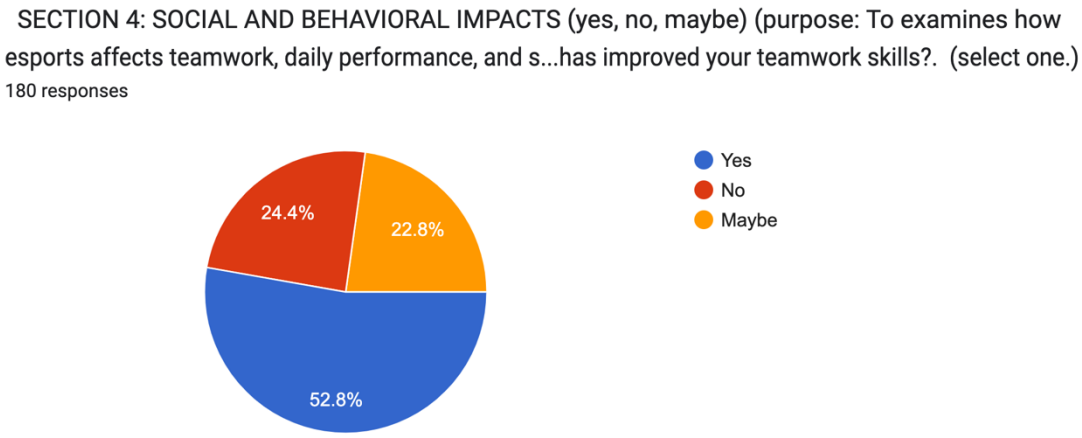

Figure 14: Perceived Improvement in Teamwork Skills Through Esports Participation

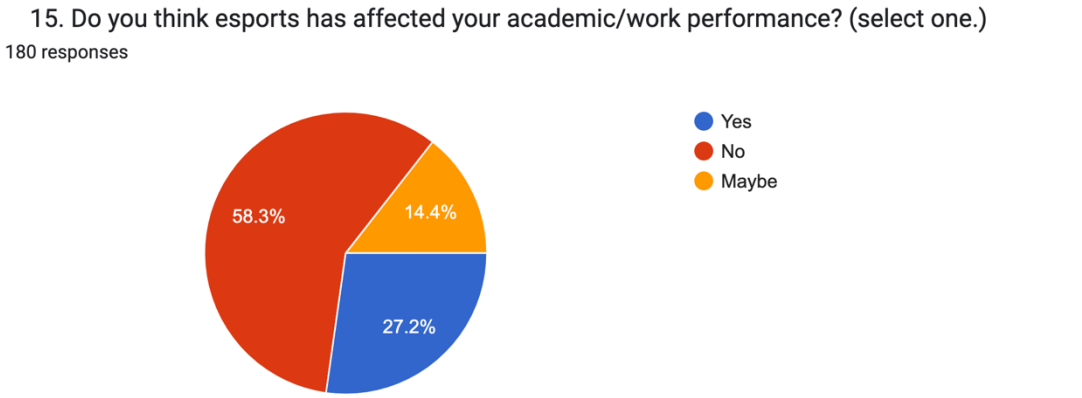

Figure 15: Perceived Impact of Esports on Academic/Work Performance

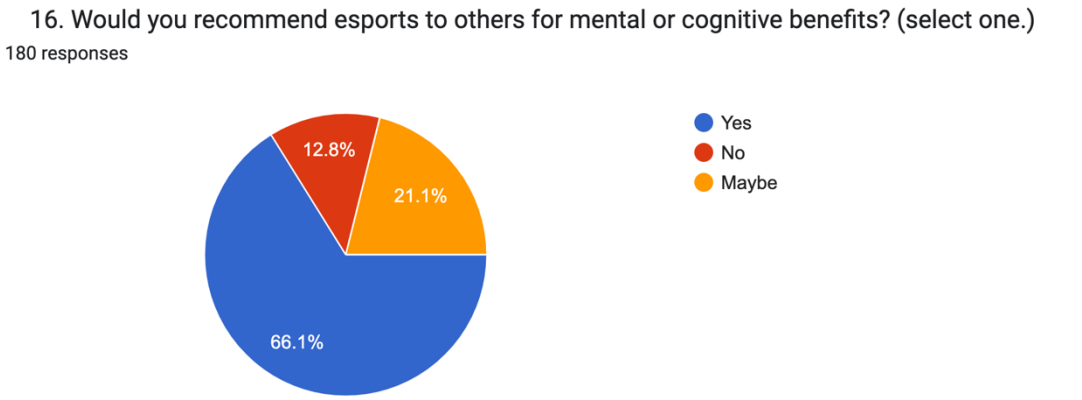

Figure 16: Willingness to Recommend Esports for Mental or Cognitive Benefits

4.1 Discussion of Findings

In this part, the researcher will be making inferences and informed conclusions by comparing the results of the interview and survey with findings from available literature. This is done to assess the psychological and cognitive impact of esports on student gamers of which the majority are from the Kajaani University of Applied Sciences. This discussion serves as the interpretation of the findings, such that it suggests answers to the research questions and meets the relevant study objectives.

From the findings of the study, it is obvious that there are beneficial psychological and cognitive impacts of esports participation on student gamers, which are also presented with varying negative outcomes. Participants from the interview all agree that esports participation has enabled them to harness and hone not just gaming skills, but transferable skills that have become lifestyle skills (Cheng and Bayasgalan, 2024; and Sousa et al.,2020). Some of the cognitive skills groomed include quicker reaction time, ability to multitask, improve decision making through pattern recognition, which then translates to enhanced problem-solving skills (Bediou et al., 2018, p.77-110; Palaus et al., 2017; Tindall-Ford et al., 2020). These skills honed does not come without disadvantages, as some of them have highlighted its impact on their attention span, either due to sleep disruption, or inability to pay attention to long forms of texts like reading, or activities without some form of gaming element in it, which agrees with the findings of Wilmer et al. (2017).

Adversely, participants also reported how their psychological development has had both negative impacts like anxiety, burnouts, mood dysregulation, and even violent tendencies which according to the World Health Organization (2018a, 2018b), are classified as mental health orders called gaming disorders and hazardous gaming; and positive impacts, including improved teamwork ability, enhanced self-esteem, and enhanced communication skills (Lobel et al., 2017). This explains the importance of esports on the social life of gamers. However, findings from the interview suggests that there is no serious psychological damage, just temporal adjustments like having a bad day or making poor decisions because of it which mostly stems from losing a game (Granic et al., 2014). While this is relevant in assessing impact, it only relates to the short-term behaviour of gamers, which is conditional, and cannot be attributed to lifetime psychological impact, especially for older gamers; also, because participants have similar but varying methods of coping with the loss and their reactions to it (Reyes, 2022).

Participants suggested that reacting negatively to losing a game can have a long-term impact on the younger generation of gamers with no real responsibility aside from academics and gaming, although impacts may vary based on individuals, intensity of gaming and coping strategies, and this is consistent with the findings of Reyes (2022). They explained that during their younger years, spending long hours on the screen can disrupt their sleeping schedule which affects their productivity, cause them to have poor time management skills where gaming replaces other crucial responsibilities like doing their assignments, or even cause them to perform poorly in academics due to long term neglect and replacement of academic hours for gaming (Tindall-Ford *et. al*., 2020).

However, the results from the survey seem to suggest differently, with about 78.2% being male, and 87.2% between the ages of 18 to 34, whose responses show strong differences on the psychological impacts, while the cognitive impacts seem to tally with interview responses. For instance, about 36.7% of participants are unsure if their reaction time was improved by participating in esports. This is significant compared to the 44.5% combined participants that agree and strongly agree, which shows that the impact of esports on gamers cognitive skills relative to reaction time, can be positive, but not noticeable, and hence cannot be generalisable.

The statistics from the survey responses on the impacts on cognitive and psychological wellbeing of gamers are closely polarised, proving that it has almost the same negative impacts as the positive ones, although the positive impacts have a tad higher statistic. This agrees with the interview responses that if appropriate training and management is put in place, esports can be recommended to enhance cognitive and psychological development of participants and is supported by the findings from Thillier et al., (2023). The 12.8% statistics from the survey of people that do not recommend esports for this purpose proves the argument that the benefits, in a controlled environment such as motivational self-talks, taking walks, talking to a friend to ease off the frustration of losing, having mental and physical breaks, outweighs the negative impacts of esports participation, which is also supported by Poulus *et. al*., (2022).

5 Conclusion

This study was aimed at assessing the psychological and cognitive effects of esports participation on gamers to provide evidence-based advice on how to maximize its positive impact on gamers, while significantly mitigating the negative impacts equally. The latter can be said to be achieved when the objectives of the research have been met, and the questions posed by the research have been successfully answered, in addition to adding a balanced view on the cognitive and psychological effects of esports participation on gamers to the academic literature which justifies the research. This section will summarise the key findings of the research into themes that answer the research questions and meet the objectives.

1. Psychological impacts of esports on gamers: some of the positive effects on psychological development of gamers are improved self-esteem which enhances communication, and by extension, teamwork ability, especially in cross-cultural collaboration. On the negative side, there is a possibility to be reactionary when a game is lost, which can affect mood, cause poor social interaction with the people around, lead to bad decision making, sometimes even the tendency to be violent by *smashing things.* There is also a potential for addiction if screen time and intensity of gaming is not controlled.

2. Cognitive impacts of esports on gamers: the impacts are both negative and positive, although the positive impact outweighs the negative ones. There is evidence of enhanced problem-solving skills, multitasking effort, focus, concentration, rapid decision-making under pressure, and improved memory, which underscore the positive impacts of esports on cognitive development of gamers. Conversely, poor time management and low attention span especially to non-gaming activities, are key negative impacts on the cognitive welfare of gamers.

Both the first and second themes have highlighted the cognitive and psychological skills gained by esports participation on gamers, including the benefits and disadvantages that comes with it. This answers the first and second questions of the research, and satisfies the first, second and third objectives of the study.

For the fourth objective, the tendency of violence and lack of attention to spousal duties recorded by R3, are possible unhealthy gaming habits. Furthermore, addiction and time mismanagement are crucial poor gaming habits. The healthy gaming habits can be attributed to the enhanced communication skills in teamwork, and the pattern recognition in identifying weaknesses and solving problems, which are the psychological skills gained.

3. ***Age, Gender, and Social Background as Drivers of Psychological and Cognitive development of esports gamers:*** The statistics from the survey show that most esports gamers are male, which agrees with the response from R1. Although most interview participants are indifferent on how gender influences cognitive and psychological development of esports gamers, R4 thinks that the male gender are more likely to handle pressure and stress than their female counterparts. While evidence from the other respondents disagree, it also suggests that gender has no influence, rather it depends on personality and individual differences.

Furthermore, R3 suggests that people from poor economic backgrounds will not benefit from the cognitive and psychological benefits of esports because they lack access to the infrastructure that makes esports available to them, although they highlighted that the resilience they have gained in surviving such conditions can harness some of their psychological skills and development.
Results from both interviews and surveys show that although the younger generation may benefit from an enhanced cognitive wellbeing due to lesser responsibilities and more time invested in gaming, they are more likely to be addicted, have emotional dysregulation, and poor time management due to reduced attention span and focus relative to completing non-gaming tasks.

This theme also fulfils the third objective of the study and lends answers to the third/last research question.

5.1 Recommendations of the study

This is the final objective of the research with the goal of suggesting strategies that promote healthy gaming habits and enhance the positive benefits of the cognitive and psychological wellbeing of esports gamers. The following recommendations are synthesised from the coping strategies of the interview respondents of this research:

- Students that are seeking to participate in esports professionally should take professional training to help them benefit from its positive effects and minimise risks.
- Non-professional gamers should pace themselves by taking breaks which can be relaxation exercises, taking long walks, talking to a friend and staying away from the screen.
- Gamers can engage screen time monitors to enable them to manage their time appropriately and still get relevant non-gaming tasks done.
- Institutions of learning can partner with psychologists and cognitive scientists to develop practical applications of gaming in other academic contexts to improve learning outcomes.
- Gamers should constantly reflect on themselves or engage accountability partners who are not gamers to enable them to monitor their behaviour and lifestyle changes through specific personality assessments to ensure that they are neither becoming addicts or emulating poor behaviours and communication patterns from their teammates or online opponents.
- Finally, further research should be conducted to ascertain how gender and social backgrounds, including different genres of esports, can uniquely influence the cognitive and psychological development of esports gamers.

This study has shown that the effects of esports participation on the psychological and cognitive development of gamers are polarised. While the positive benefits are more than the negatives, it is only so if relevant coping strategies are employed to enable gamers manage adverse cognitive and psychological effects. These coping strategies are simple and have been proven to be effective, especially for older demographics because they can bounce off their reaction to losing games by engaging in other non-gaming activities that underpins their responsibilities. However, younger generations have a higher tendency to be addicted, even though they equally have a higher tendency to develop and hone cognitive skills such as faster reaction times, manage pressure, multitask, retentive memory, learn new things, solve complex problems by breaking them down. It is therefore imperative that more attention is paid to the younger generation, and that they are introduced to more coping strategies to enable them to optimize the benefits of esports on their psychological and cognitive development.

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Appendix 1.

Survey Questions

Section 1: Demographics

1. What is your age group?

- 18–24
- 25–34
- 35–44
- 45–54
- -55+

2. What is your gender?

- Male
- Female
- Non-binary/Other
- Prefer not to say

3. How often do you participate in esports?

- Rarely
- Monthly
- Weekly
- Daily

Section 2: Psychological Impact (Yes/No/Maybe)

4. Do you feel more stressed when playing competitive esports compared to casual gaming?

- Yes

- No

- Maybe

5. Have you ever experienced anxiety before or during an esports match?

- Yes

- No

- Maybe

6. Do you think esports has improved your ability to handle pressure?

- Yes

- No

- Maybe

7. Have you ever felt burned out from esports?

- Yes

- No

- Maybe

8. Does winning/losing a game affect your mood, interaction with people or the outcomes of your day?

- Yes
- No
- Maybe

Section 3: Cognitive Impact (Likert Scale: 1-Strongly Disagree to 5-Strongly Agree)

9. Esports has improved my reaction time and reflexes.

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

10. I find it easier to multitask in real life because of esports.

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

11. Playing esports has negatively affected my attention span in non-gaming tasks.

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly Agree

12. Esports has helped me develop better problem-solving skills.

(1) Strongly Disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly Agree

13. I sometimes struggle with sleep after long gaming sessions.

(1) Strongly disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly agree

Section 4: Social & Behavioural Impact

14. Do you think esports has improved your teamwork skills?

- Yes

- No

- Maybe

15. Have esports affected your academic/work performance?

- Yes

- No

- Maybe

16. Would you recommend esports to others for mental or cognitive benefits?

- Yes

- No

- Maybe

Appendix 2.

Interview questions

1. How do you feel emotionally after a competitive esports' session (e.g., stressed, motivated, frustrated, anxiety)?
2. Can you describe a time when esports positively or negatively affected your focus, time management or decision-making in real life?
3. Do you think esports has changed the way you interact with others socially or in your relationships? If so, how?
4. Can you describe any specific cognitive skills you believe you've improved through gaming?
5. Do you think esports has had any negative effects on your concentration or attention span? If so, how?
6. How has esports affected your ability to multitask and make quick decisions under pressure?
7. What coping strategies do you use when facing high-pressure situations in esports?
8. Do you believe esports should be promoted for cognitive benefits, or are the risks (e.g., addiction, stress) too significant? Why?

9. Do you think age, gender, or social background has influenced how esports affect you psychologically or cognitively? If so, in what ways?

Interview 1

1) How do you feel emotionally after a competitive esports' session (e.g., stressed, motivated, frustrated, anxiety)?

it all depends on the outcome of the game, how the session was, you get. Well, sometimes I might feel stressed or anxious depending on who I'm playing with. if I'm playing a tougher opponent, you know, sometimes trying to find a way to be able to beat your opponents might make you feel stressed.

2) Can you describe a time when esports positively or negatively affected your focus, time management or decision-making in real life?

Esports has affected me negatively I'm not going to lie, you know, there are periods when you will be so involved in an online tournament. Like you know, you're trying to finish it up. But you have something else to do. And then unfortunately, you'll be carried away.

3) Do you think esports has changed the way you interact with others socially or in your relationships? If so, how?

I'll say I'm an introvert, not because of esports, but I've always been like that.

4) Can you describe any specific cognitive skills you believe you've improved through gaming?

Yes, I noticed that my reaction time has really improved.

5) Do you think esports has had any negative effects on your concentration or attention span? If so, how?

No, I don`t think so

6) How has esports affected your ability to multitask and make quick decisions under pressure?

My multitasking abilities and making quick decisions under pressure has greatly been enhanced. I find it easier to switch between tasks, stay organised and make fast decisions without feeling overwhelmed.

7) What coping strategies do you use when facing high-pressure situations in esports?

I use breathe control, and some other exercises.

8) Do you believe esports should be promoted for cognitive benefits, or are the risks (e.g., addiction, stress) too significant? Why?

Well, I think it should be promoted for its cognitive benefits. Cognitive functions like your reaction time, multitasking. They're not only valuable in gaming but can also transfer in academic. So, I think it should be promoted

9) Do you think age, gender, or social background has influenced how esports affect you psychologically or cognitively? If so, in what ways?

Feel like the older you get, the smarter you are, you know, the better decisions you're able to make. I believe my age. I'm at an ideal point where I can process and adapt to fast peace strategy games.

Interview 2

1) How do you feel emotionally after a competitive esports' session (e.g., stressed, motivated, frustrated, anxiety)?

when I'm playing any sports game, esports inclusive it depends on outcome. Sometimes I get frustrated if I lose a lot. if I win more then I'm happier.

2) Can you describe a time when esports positively or negatively affected your focus, time management or decision-making in real life?

Yes, when I spend a lot of time playing and then the next day, I will have to focus on my schoolwork, it might take a while to switch back into school mood.

3) Do you think esports has changed the way you interact with others socially or in your relationships? If so, how?

No, not really.

4) Can you describe any specific cognitive skills you believe you've improved through gaming?

Yes, I will say gaming has improved my reaction time especially in non-gaming situations, even my ability to solve real life complex problems has improved.

5) Do you think esports has had any negative effects on your concentration or attention span? If so, how?

No, it has not.

6) How has esports affected your ability to multitask and make quick decisions under pressure?

I find it challenging to multitask while gaming since I use my personal computer for gaming however, my decision making has improved.

7) What coping strategies do you use when facing high-pressure situations in esports?

Deep breathes helps me during intense gaming situations.

8) Do you believe esports should be promoted for cognitive benefits, or are the risks (e.g., addiction, stress) too significant? Why?

Yeah, in my own opinion, yes, it should be promoted, but moderated because it can be addictive.

9) Do you think age, gender, or social background has influenced how esports affect you psychologically or cognitively? If so, in what ways?

I will say yes. As an adult, I find it easier to handle stress. But much more younger people might be vulnerable to intense gaming or high-pressure situations.

Interview 3

1) How do you feel emotionally after a competitive esports' session (e.g., stressed, motivated, frustrated, anxiety)?

Look, I think most times for everything we do the outcomes determines our reaction or how we feel about what we do

2) Can you describe a time when esports positively or negatively affected your focus, time management or decision-making in real life?

Yes, it has a negative effect on my sleep. It affects me negatively when you I lose a game, and you know, you begin to make bad decisions because it affects how you feel, and sometimes even how you react to your partner

3) Do you think esports has changed the way you interact with others socially or in your relationships? If so, how?

There are some games you just play randomly with strangers online and the way they talk affects you. For me I'm kind of reserved and I don't curse, but because they curse, sometimes, I get negatively influenced and I curse as well

4) Can you describe any specific cognitive skills you believe you've improved through gaming?

I think it has improved my problem-solving skills because you know when you are playing you need to find a way to get the better of your opposition and you also get to react quicker to things. This learned skill has improved in real life situations.

5) Do you think esports has had any negative effects on your concentration or attention span? If so, how?

Yes, it does. Especially when you lose a game. You might be in the middle of a completely different task and situation and suddenly you start thinking of what you could have done different during the game and how you could have avoided the loss.

6) How has esports affected your ability to multitask and make quick decisions under pressure?

Yes, because you know when you when video gaming, especially FIFA 25, you are doing so many things simultaneously like, defending, and attacking and with very little time to make these decisions. So, in everyday situations, it does not take me too much time to decide on things.

7) What coping strategies do you use when facing high-pressure situations in esports?

Sometimes when you lose a game, it's frustrating. You know, you feel frustrated. But because I still believe it's just a game. You know that reminds me that it is always in my head when I'm like, oh, it's just to give it time and I will be fine

8) Do you believe esports should be promoted for cognitive benefits, or are the risks (e.g., addiction, stress) too significant? Why?

Yes, I think I should be promoted but Just like every other thing in life when it's too much, you know, when you can't control it, it will have its negative impact. I don't think esports is the problem, rather the way we manage it. it can really help in other aspects of life as well. It just must be properly managed to achieve maximum benefits

9) Do you think age, gender, or social background has influenced how esports affect you psychologically or cognitively? If so, in what ways?

Social status is another thing for we Africans because not everyone has that access to the Internet or to any other infrastructure that is required to participate in esports. Luckily for me, I can, and it is something I enjoy. I play consistently for a while and sometimes I take long breaks from gaming, I don’t think age or gender has any influence on how gaming affects people.

Interview 4

1) How do you feel emotionally after a competitive esports' session (e.g., stressed, motivated, frustrated, anxiety)?

It depends on the competition, because esports normally involve competition, so it depends on the outcome of the competition. If i win or lose will usually influence how I feel afterwards.

2) Can you describe a time when esports positively or negatively affected your focus, time management or decision-making in real life?

I will say last semester, I had a course on athlete development, I was tasked to focus on a game and record my routine, I realised afterwards that I was able to improve my decision-making ability. However, it negatively affected my time management ability because sometimes I game all night and end up sleeping late.

3) Do you think esports has changed the way you interact with others socially or in your relationships? If so, how?

It has improved how I socialise positively because it always involves playing with people, playing with a partner, playing online games with people involves meeting people you've not met for the first time, and it always involves communication to figure out how to bypass every task. It has helped me in real life because I now communicate with people efficiently, even when I'm meeting them for the first time.

4) Can you describe any specific cognitive skills you believe you've improved through gaming?

I will say it has improved my problem-solving skills. I did play this game called `` a way out`` consistently for two months where I had to bypass hurdles and figure out things for myself. This improvement was obvious when solving my everyday problems.

5) Do you think esports has had any negative effects on your concentration or attention span? If so, how?

I think I find it a bit harder to concentrate on reading, especially lengthy text.

6) How has esports affected your ability to multitask and make quick decisions under pressure?

It has affected me positively, especially in making quick decisions. Just like in gaming situations when you must make decisions in record time. As for multitasking, I am unsure if it has any effect.

7) What coping strategies do you use when facing high-pressure situations in esports?

The coping mechanism I use is to take a break, if I feel pressure, I take a short break and reset.

8) Do you believe esports should be promoted for cognitive benefits, or are the risks (e.g., addiction, stress) too significant? Why?

Yes, it should be promoted but participating in esports can be addictive too, so it must be moderated.

9) Do you think age, gender, or social background has influenced how esports affect you psychologically or cognitively? If so, in what ways?

I think age has an effect psychologically on different age group. Older people can deal with pressure better especially in competitive gaming meanwhile younger people might easily get stressed by the demands of the game.

Interview 5

1) How do you feel emotionally after a competitive esports' session (e.g., stressed, motivated, frustrated, anxiety)?

I can say it all depends on the outcome of the competition or the gameplay of the day. I can get frustrated after losing a game or eve stressed because I love to win. But when I win, I am motivated so, it depends on outcome.

2) Can you describe a time when esports positively or negatively affected your focus, time management or decision-making in real life?

Yes, one time it did affect my relationship. There was a time I took two months of my time playing/practicing intensely so I could improve before a competition, and my partner was not really comfortable with it because I was not giving much attention and time to her, and maybe when she wants to watch her own programme or go for cinema with me and I'm unavailable because I want to play and improve my skills. So, it did affect my focus in maintaining real life relationship.

3) Do you think esports has changed the way you interact with others socially or in your relationships? If so, how?

Yes, like I explained for the last question.

4) Can you describe any specific cognitive skills you believe you've improved through gaming?

I will say my reaction time. Especially when I play at a competitive level. Usually when I play, I tend to figure out my opponents' weakness and react to their gaming strategy. I am also an athlete, so this has also helped me in my other sport to react quickly and solve problems quicker.

5) Do you think esports has had any negative effects on your concentration or attention span? If so, how?

I won't say it has negatively affected me. Maybe it affects how I interact with other people socially but on a personal level it has had no negative effect on me.

6) How has esports affected your ability to multitask and make quick decisions under pressure?

It has affected me positively. Especially when I play competitively online and in some situation my partner brings a serious discussion during peak gaming time to distract me from winning, but I still manage to focus on that and focus on the game and still be successful.

7) What coping strategies do you use when facing high-pressure situations in esports?

Maybe I can do some little exercise like walking or make some phone calls to try to distract myself from it Sometimes I remind myself that it is just a game. It's just a game, so it doesn't really take out something from me. We just need you to be better and practise better

8) Do you believe esports should be promoted for cognitive benefits, or are the risks (e.g., addiction, stress) too significant? Why?

I am neutral, because it will be based on if it is being taken at the professional level. If you're taking esports at a professional level, it can be managed because you can go through training on how to put a balance in which it won't be addictive to that level. But if it's just for fun then it gets to be addictive and should be monitored.

9) Do you think age, gender, or social background has influenced how esports affect you psychologically or cognitively? If so, in what ways?

No, I don't think age or social background has had any influence on how participating in esports affects me.