META (Most Effective Tactics Available) and Factors Affecting the Result of a Match in an Esports Game

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Abstract This study aims to identify the factors within the "meta" (Most Effective Tactics Available) that have the greatest impact on the likelihood of winning an esports match. The meta encompasses all actions and strategies that allow players to achieve optimal results and gain an advantage over competitors, including equipment choice, tactical preparation, and game knowledge. A survey was conducted among 204 experienced esports players to gather their opinions on various factors influencing match outcomes, both dependent and independent of the player. Seven hypotheses were tested using Structural Equation Modeling (SEM) to analyze the relationships between factors such as random elements, equipment preparation, tactical preparation, strength of the opposing team, fairness of the match, prior preparation, and knowledge about the game. The results indicated that random factors do not significantly affect match outcomes, while tactical preparation, appropriate equipment, prior preparation, strength of the opposing team, fairness of the match, and game knowledge have a significant positive impact on the chances of winning. Notably, tactical preparation and the strength of the opposing team were among the strongest predictors of match results. The findings suggest that in esports, player skills, knowledge, and adherence to the game's meta are crucial determinants of success, whereas random factors play a negligible role. This study contributes to a deeper understanding of the elements that influence competitive performance in esports and underscores the importance of strategic preparation and knowledge acquisition.

Keywords Esports · Meta · Tactical preparation · Match outcomes · Player skills · Game knowledge · Structural Equation Modeling

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1 Introduction

The meta concept really is not the abbreviation to the acronym "Most effective tactics available", when it really comes from the Greek prefix "meta". However, the current urban meaning refers to the most effective tactics available. The concept of "meta" was popularized by the computer gaming community alongside the rise of esports in video games [1]. Over the past decade, as esports gained popularity and attracted an increasing number of enthusiasts, online games have transitioned from platforms for relaxation and pastime to arenas of intense competition [2]. In the esports world, players observe and analyze professional matches, drawing conclusions and consistently striving to emulate professionals. This analysis extends beyond in-game tactics to include preparation for gameplay, computer hardware, in-game settings, and even communication methods with teammates.

Initially, players independently observed and analyzed the behaviors of professionals [3]. Now, all the most popular esports games feature websites—created by the community or sometimes by the game developers themselves—dedicated to analyzing esports matches and the tactics used in specific tournaments, collectively referred to as the "meta." For instance, overbuff.com examines statistics such as the usage rates of specific heroes by players of different ranks in the game Overwatch. Overwatch is a team-based first-person shooter (FPS) offering a choice of 36 unique characters, each with distinct abilities and playstyles. Some heroes inflict more damage but are slower and less agile, while others are highly mobile but deal less damage. This diversity makes selecting the optimal hero challenging. Websites like overbuff.com assist players by providing comprehensive match statistics and esports event data, including hero pick rates at various skill levels and win rates. This information reveals which heroes are favored or avoided by top-division players, influencing the current meta to include only those with the highest win rates and frequent usage among elite players and professionals.

Another example is prosettings.net, which collects information on in-game settings and the computer and peripheral equipment used by professional esports players. Decision-makers can search for any player from popular esports teams to discover details such as their mouse model and sensitivity settings. The site aggregates data to reveal trends, such as the fact that 100% of professional esports players use monitors with a refresh rate of 144 Hz or higher. Monitor refresh rate indicates how many times per second the display can generate a new image; thus, a 144 Hz monitor refreshes 144 times per second. Standard monitors and televisions typically have a refresh rate of only 60 Hz, making them less than half as smooth as the displays used by esports professionals.

It is important to note that the meta is highly variable across all fields, largely due to technological advancements. As better computer equipment becomes available and personalization programs are continually updated, the meta evolves. Gaining experience in a particular field also leads to changes and evolution in tactics. In esports, this variability is further amplified by constant game updates, as developers strive to balance each game optimally [4]. They aim for all available characters or weapons to be on a similar level of effectiveness. While achieving perfect balance is often impossible, developers attempt to minimize the advantage that the meta provides to players.

The term “meta” encompasses all actions that allow a player to achieve the best possible results in a given area and gain an advantage over competitors. To explain what meta is in esports, one only needs to present the elements that increase the chance of winning in computer games—that is, the factors influencing match outcomes in esports.

Essentially, “meta” in gaming terminology refers to community-accepted strategies considered the most optimal ways to win or achieve the best performance in specific tasks [5]. The meta has shaped how players approach both traditional and contemporary online games, exerting a significant impact on the industry, especially in esports. It can encompass everything from selecting a specific character to employing certain playstyles, guiding and shaping the way games are played [6]. It is also worth noting that, as mentioned earlier, the meta includes the equipment a player uses, which greatly influences performance during gameplay.

The phenomenon of the meta can be encountered in virtually every online game where players compete against others. The primary difference lies in how the meta manifests in each game. Focusing on League of Legends, where players must choose one of over a hundred characters—each with unique abilities—the meta involves character selection, a fundamental aspect of tactics and efficiency [7]. Players strive to select the best possible hero. In contrast, in Call of Duty, a first-person shooter (FPS), the crucial aspect is choosing the appropriate weapons and their attachments, such as sights, magazines, and stocks [8]. Here, players aim to select the most effective weapons with optimally matched accessories. In this context, the meta includes weapon and attachment selection. These examples illustrate that the meta varies widely, as each online game has unique mechanics despite superficial similarities.

The meta is constantly changing in direct proportion to changes in the game itself. This evolution is most noticeable following game updates that implement new balance changes to characters or weapons or introduce elements that can disrupt the current meta. Players can also adopt specific tactics for matches in esports games. Some emphasize offensive strategies, deliberately seeking out and confronting other players to acquire potentially better equipment. Alternative strategies include camping (hiding in one place and waiting for other players to appear) and avoidance (steering clear of conflicts to survive until the final phase of the game) [9]. Another crucial aspect of the meta in esports is the computer and peripheral equipment used by professional players. Selecting appropriate hardware for a specific game is considered a tactical decision. Although this choice occurs outside the game environment, it significantly impacts player performance during gameplay.

The aim of this work is to try to discover which factors belonging to the meta have the greatest impact on the chance of winning an esports match.

2 Methods

The research focused on gathering opinions from users who participated in a survey about the meta in esports and the factors influencing match outcomes in esports games, based on their knowledge and experience. The survey included questions regarding the impact of factors independent of the player, such as the strength of the opposing team, as well as factors dependent on the player, such as prior preparation and knowledge about the game.

To develop a reliable model, several steps were undertaken. A carefully designed model was created to describe the aforementioned phenomena comprehensively. A survey was then developed to fully reflect this model, and opinions were collected from individuals who actively follow esports players and match results, as well as those who are active players themselves. The collected survey results were analyzed using this model with the assistance of the SmartPLS4 software.

The research method involved compiling a database of user opinions obtained through a questionnaire conducted from January 23, 2023, to March 5, 2023, via the Google Forms platform. The survey was distributed exclusively in thematic groups on Facebook and the Discord application to ensure the collected data and the compiled database were as reliable as possible. This approach required respondents to be familiar with the topic.

2.1 Hypotheses Development

Random Factors. Random factors refer to elements not dependent on the player or their opponents but are generated by the game's algorithm. In some games, players have no influence over the equipment they receive. The map on which the match takes place is also chosen randomly, meaning players cannot control the arena they compete in. In battle royale games, the map area may shrink or move unpredictably, independent of player actions. Such random factors can provide an advantage to certain players who, for example, are more familiar with specific maps.

"PlayerUnknown's Battlegrounds" exemplifies the battle royale genre. Each player begins by parachuting into the game area without essential equipment, except for their chosen attire, which does not affect gameplay. To confront opponents, players must find necessary equipment scattered throughout the map; only then do they have a chance to defeat adversaries [10]. Failure to find a weapon in the initial minutes can result in imminent defeat. These items are randomly distributed at the start, with high-risk areas offering better gear. Eliminated players can also be looted for their equipment [11, 12].

Hypothesis 1 (H1): Random factors have an impact on match outcomes.

Preparation of Appropriate Equipment. Esports games require suitable hardware and peripheral devices. Unlike console games, the performance of computer games—including loading times and display quality—is entirely dependent on the player's hardware configuration, which can vary significantly. These games also require an internet connection, so gameplay speed and display lag depend on the player's internet bandwidth. Selecting appropriate peripherals is crucial; for instance, a mouse is vital for aiming in first-person shooters like "Counter-Strike: Global Offensive." Players need reliable equipment to prevent issues like performance drops or connection losses during competitive play. Equipment should be tailored to the specific game; an optimal setup for FPS games differs from one suited for racing games. This aspect is directly related to prior preparation.

Hypothesis 2 (H2): The preparation of appropriate equipment affects match outcomes and player effectiveness.

Tactical Preparation. Tactical preparation involves theoretical knowledge about the game. Factors such as studying professional players and their strategies enhance a player's understanding and readiness. Keeping up with the game's meta and applying it in personal gameplay is also crucial. Team-based tactical preparation is essential since esports are generally team-oriented rather than individual. This preparation relies entirely on the player and their team and does not require mechanical skill but focuses on strategic knowledge [13]. By observing professionals and following the meta, players gain theoretical insights rather than hands-on skills. This concept is closely linked to prior preparation.

Hypothesis 3 (H3): Tactical preparation affects match outcomes.

Strength of the Opposing Team. Assessing the opposing team's strength and teamwork is a significant factor influencing match results. This factor is entirely beyond the player's control; they cannot influence their opponents' capabilities. Rankings or divisions provide theoretical assessments of skill levels but may not accurately reflect actual performance [14]. Understanding the overall strength of the opposing team, based on metrics like average team rank, can identify theoretical favorites. Individual skills of opposing players and the presence of exceptionally skilled individuals can also impact the match outcome.

Hypothesis 4 (H4): The strength of the opposing team affects match outcomes.

Fairness of the Match. Fairness pertains to the integrity of gameplay [15]. Since esports are played on computers, there's potential for illegal software and cheats that give unfair advantages, such as "aim-bots" that automatically target opponents. Facing a cheater can make winning extremely difficult or impossible. Other cheats include "wallhacks," allowing players to see through walls, eliminating the element of surprise. Such software grants significant advantages and undermines fair competition. In some cases, bots might even take full control of a character to execute optimal moves.

Hypothesis 5 (H5): Fairness of the match and the presence of cheaters affect match outcomes.

Prior Preparation for the Game. Prior preparation encompasses all player-dependent activities before the match. Investing time in practice and training enhances effectiveness in esports games. To maximize winning chances, players should engage frequently with the game to maintain peak performance, continually acquire new skills, and deepen their understanding of gameplay. Consistent experience and ongoing training lead to increased comfort and knowledge during matches [16]. This concept directly relates to the esports meta phenomenon and includes all elements dependent on the player, prepared before actual gameplay. During matches, players utilize these pre-prepared elements. This aspect is directly connected to game knowledge and tactical preparation.

Hypothesis 6 (H6): Prior preparation affects match outcomes and player effectiveness.

Knowledge About the Game. Knowledge about the game refers to understanding the game's mechanics and intricacies. Esports games are set in virtual arenas with varying layouts; familiarity with these environments can influence match results [17]. In games featuring diverse characters and weapons, comprehensive knowledge of these elements can enhance player effectiveness. Since maps and weapons are frequently updated, players must stay informed about the latest changes and additions. This encompasses both theoretical and practical knowledge, including mechanics like aiming and shooting in FPS games. This concept is closely tied to prior preparation.

Hypothesis 7 (H7): Knowledge about the game affects match outcomes.

Chances of Winning. Chances of winning represent the theoretical advantage of a team, considering factors like overall rank or division. A higher rank may suggest an advantage over lower-ranked players. Team cohesion, tactical preparation, and familiarity with game mechanics also contribute. While individual preparation influences outcomes and effectiveness, winning chances are a combination of personal preparation and factors beyond the player's control, such as the opposing team's strength [18]. Since esports are typically team-based, teamwork and collective tactical preparation are crucial. This concept aggregates all previously mentioned factors. Similar to conventional sports, outcomes are not guaranteed for favorites; underdogs can prevail despite lower expectations. Other unaccounted factors include variables like current team form, previous match results, and external influences such as stress.

2.2 Model

A model was developed during this study, comprising eight constructs and 24 variables. These constructs and their associated hypotheses have been previously presented and explained; now, the variables used in the model will be introduced.

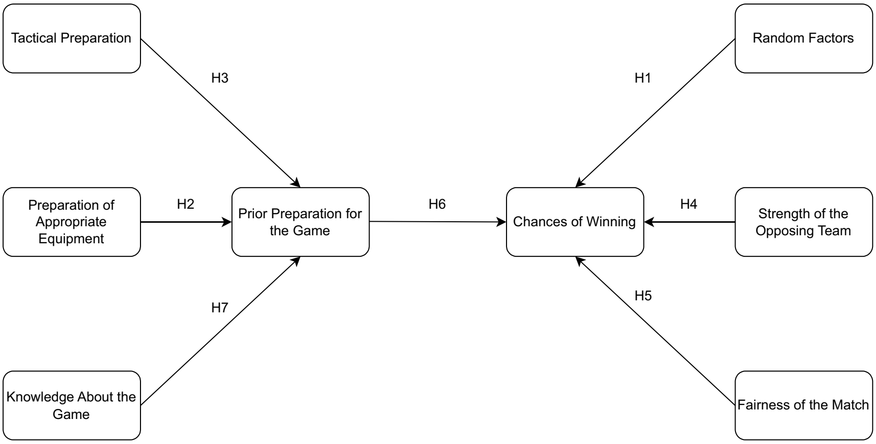

Fig. 1 The developed SEM model

The theoretical framework aims to support the analysis of factors that may influence the chances of winning a match in an esports game (see Fig. 1).

Table 1 provides information on the constructs and the abbreviations of the variables used in the model. The "Question" column refers to the survey items to which respondents provided answers on a 7-point Likert scale (where 1 indicates "strongly disagree with the statement," and 7 indicates "strongly agree with the statement").

In this model, each construct is represented by three variables, corresponding to specific survey items. The constructs are designed to capture various factors that may influence esports match outcomes, including tactical preparation, equipment readiness, game knowledge, prior preparation, random factors, the strength of the opposing team, fairness of the match, and overall chances of winning. The survey responses provide quantitative data to assess the impact of these factors on performance in esports competitions.

2.3 *Sample Characteristics*

During the study, 210 responses were collected via a questionnaire distributed on Facebook and Discord among users familiar with esports games and the concept of the meta. The survey was published exclusively in thematic groups to ensure that participants had a thorough understanding of the subject matter. After analyzing the responses using variance as a statistical measure, six responses were deemed unsuitable because they provided identical answers to all questions, resulting in zero variance. These responses were removed from the dataset and were not included in further analysis.

Table 1 Constructs, variables, and survey items used in the questionnaire

Abbreviation	Construct	Survey item
TP1	Tactical preparation	Following the actions of esports players affects our game results
TP2		Following and understanding the current meta affects game results
TP3		Tactical preparation of the entire team affects game results
PAE1	Preparation of appropriate equipment	Internet connection speed affects in-game performance
PAE 2		Computer components and frames per second (FPS) affect in-game performance
PAE 3		Selecting appropriate peripherals (monitor, mouse, keyboard, headphones, etc.) affects in-game performance
KAG1	Knowledge about the game	Knowledge of maps in a given game affects match results
KAG2		Knowledge of character abilities affects match results
KAG3		Knowledge of weaponry affects match results
PPG1	Prior preparation for the game	The number of hours spent in a game reflects skill level
PPG2		Practicing and mastering game mechanics improves our in-game skills
PPG3		Developing and acquiring information about the game improves our in-game skills
RF1	Random factors	Randomly obtained weaponry affects match results
RF2		Randomly selected maps affect match results
RF3		The location where the circle closes (in battle royale games) affects match outcomes
SOT1	Strength of the opposing team	The average rank (division) of the opposing team affects match results
SOT2		The opposing team's preparation affects match results
SOT3		Individual skills of players in the opposing team affect match results
FM1	Fairness of the match	Cheating occurs in online esports games
FM2		The presence of a cheater in the game affects the result

(continued)

Table 1 (continued)

Abbreviation	Construct	Survey item
FM3		Playing against a cheater in esports games makes winning impossible
CW1	Chances of winning	The average rank (division) of our team affects match results
CW2		Teamwork affects match results
CW3		Skills and knowledge of game mechanics affect match results

According to Hair et al. [19], a widely accepted guideline for determining sample size in Partial Least Squares Structural Equation Modeling (PLS-SEM) is the "10-times rule," which states that the minimum sample size should be at least 10 times the largest number of structural paths directed at any construct in the model. For example, the most complex construct in the model has four predictors, the required sample size would be 40, making a sample of 204 more than adequate. Additionally, Kock [20] propose a method based on the minimum R^2 value in the model, suggesting that for typical effect sizes ($R^2 >= 0.10$) and a desired statistical power of 80% at a 5% significance level, a sample size of approximately 150–200 is sufficient. Thus, a sample size of 204 not only meets but exceeds these criteria, ensuring robust and reliable results in PLS-SEM analyses.

The study targeted esports players who regularly engage in popular esports games. The first key question asked how long, on average, each player spends playing esports games per day. Over half of the respondents (55.4%) reported playing "2–4 h per day" or "More than 4 h per day," indicating that the sample primarily consisted of experienced players. Only 11.3% selected "Less than 1 h per day." The second and final screening question inquired about which esports games the respondents regularly play. Thirteen esports games were listed, and respondents could select more than one. More than half reported regularly playing *Counter-Strike: Global Offensive* (*CS: GO*) and *League of Legends*. The least selected games, with 24.5% of players each, were *Rainbow Six Siege* and *Hearthstone*.

Respondents were then asked about their gender. The majority—141 individuals (69.1%)—identified as male, while 63 individuals (30.9%) identified as female. The largest age group among respondents was 20–22 years old (71 individuals, 34.8%), followed by 22–26 years old (59 individuals, 28.9%) and 18–20 years old (41 individuals, 20.1%). Smaller groups included those over 26 years old (19 individuals, 9.3%) and under 18 years old (14 individuals, 6.9%). Regarding educational attainment, most respondents had secondary education (139 individuals, 68.1%), followed by higher education (34 individuals, 16.7%). Smaller groups included those with primary education (26 individuals, 12.7%) and basic vocational education (5 individuals, 2.5%). In terms of employment status, the largest group consisted of pupils and students not working (113 individuals, 55.4%). This was followed by full-time workers (35 individuals, 17.2%), pupils and students working part-time (32 individuals, 15.7%), and part-time workers (11 individuals, 5.4%). The remaining respondents included those not working (7 individuals, 3.4%) and pupils/students working full-time (6 individuals, 2.9%). Regarding place of residence, the largest group lived in cities with populations between 100,000 and 200,000 inhabitants (51 individuals, 25%). Close behind were those living in cities with more than 200,000 inhabitants (49 individuals, 24%). Respondents from towns with 25,000–50,000 inhabitants comprised 45 individuals (22.1%), while those from cities with 50,000 to 100,000 inhabitants accounted for 39 individuals (19.1%). The smallest group lived in towns with fewer than 25,000 inhabitants (20 individuals, 9.8%).

3 Results

In the initial phase of our research using SmartPLS4 software, we analyzed the validity of the variables [21]. The reflective variable FM3 was removed from the model as it did not meet the quality criteria; its loading value was below the optimal threshold of 0.7. All remaining constructs and their associated variables achieved satisfactory loadings exceeding 0.7, indicating optimal results and no need for further variable removal.

Next, we assessed the internal reliability of the constructs using Cronbach's alpha, indicator reliability (Rho_A), composite reliability (Rho_C), and average variance extracted (AVE). The results are presented in Table 2.

All constructs demonstrated satisfactory internal consistency and composite reliability, with values above the minimum threshold of 0.7 and below the upper limit of 0.95. Additionally, the AVE values for each construct exceeded 0.5, indicating high indicator reliability [22]. According to the Fornell-Larcker criterion—which requires that a construct's square root of AVE (represented on the diagonal) be greater than its correlation with other constructs (values below the diagonal)—all constructs exhibited acceptable discriminant validity. The results are presented in Table 3.

Table 2 Reliability analysis of reflective variables

Construct	Cronbach's alpha	Indicator reliability (Rho_A)	Composite reliability (Rho_C)	Average Variance Extracted (AVE)
RF	0.871	0.886	0.921	0.795
PAE	0.852	0.859	0.911	0.773
TP	0.772	0.774	0.868	0.687
SOT	0.792	0.802	0.878	0.707
CW	0.710	0.713	0.840	0.638
PPG	0.797	0.799	0.881	0.712
KAG	0.902	0.902	0.939	0.837

Table 3 Fornell-Larcker matrix

Construct	RF	PAE	TP	SOT	CW	PPG	KAG
RF	0.892						
PAE	0.569	0.879					
TP	0.787	0.688	0.829				
SOT	0.575	0.769	0.695	0.841			
CW	0.532	0.663	0.672	0.736	0.798		
WPG	0.595	0.657	0.742	0.719	0.724	0.844	
KAG	0.618	0.565	0.654	0.621	0.680	0.609	0.915

Based on these results, we developed a structural equation model (SEM) using SmartPLS4, estimating factor loadings, path coefficients, and R^2 statistics for each construct. The strongest relationship in the model is between *Tactical Preparation* and *Prior Preparation for the Game*, while the weakest is between *Random Factors* and *Chance of Winning*. Table 4 presents the bootstrapping results, including path coefficients, means, standard deviations, t-statistics, and p-values. Each path was evaluated to determine whether the associated hypothesis was confirmed or rejected.

From the results, six out of seven hypotheses were confirmed. The unconfirmed hypothesis was H1: "Random factors have an impact on match outcomes," suggesting that random factors do not significantly influence esports match outcomes; instead, player skills and team performance are paramount. Notably, hypotheses H3, H4, and H6 exhibited the strongest effects, as indicated by their t-statistics and p-values.

Finally, we assessed the model's predictive relevance using R^2 and Q^2 values obtained through the blindfolding procedure. These values help determine the significance of the constructs within the model. The results are presented in Table 5.

The R^2 values are moderate to high, indicating a reasonable fit between the data and the model. Additionally, the positive Q^2 values suggest good predictive relevance, indicating that the model has acceptable predictive accuracy.

Table 4 Path coefficients and hypothesis testing

Hypothesis	Path	Path coefficient	Mean	Standard deviation	T-Statistic	p-value	Confirmed?
H1	RF → CW	0.007	0.010	0.067	0.101	0.919	No
H2	PAE → PPG	0.242	0.239	0.093	2.592	0.010	Yes
H3	TP → PPG	0.466	0.470	0.077	6.028	0.000	Yes
H4	SOT → CW	0.383	0.381	0.079	4.816	0.000	Yes
H5	UR → CW	0.240	0.236	0.074	3.243	0.001	Yes
H6	PPG → CW	0.307	0.305	0.074	4.130	0.000	Yes
H7	KAG → WPG	0.168	0.164	0.077	2.179	0.029	Yes

Table 5 R^2 and Q^2 Indicators

Construct	R^2	Q^2
Chance of winning (SW)	0.658	0.280
Prior preparation for the game (WPG)	0.607	0.409

4 Discussion and Conclusions

The analysis demonstrates that factors such as tactical preparation, appropriate equipment, prior preparation, strength of the opposing team, fairness of the match, and knowledge about the game significantly impact esports match outcomes. Random factors, however, do not have a substantial effect. The model exhibits good reliability and validity, providing valuable insights into the determinants of success in esports competitions.

The first hypothesis examined whether random factors influence match outcomes in esports. The study did not confirm this hypothesis and showed a low correlation. This suggests that esports are similar to traditional physical sports, where random elements exist but do not significantly impact the outcome [23]. Instead, a player's skills and proper preparation are the primary determinants of match results. Although many random factors are present in esports games, our study indicates that game developers strive to minimize their influence, ensuring that such elements neither favor nor disadvantage any player. Consequently, all participants have equal opportunities on the virtual battlefield.

The remaining hypotheses were confirmed and demonstrated positive relationships. The study showed that, according to the respondents, skills, knowledge, and adherence to the game's meta have the greatest impact on esports match outcomes, rather than random factors beyond the player's control. It is noteworthy that the hypothesis testing the impact of cheaters on match outcomes was also confirmed, indicating that playing against a cheater is extremely difficult, if not impossible, to win. Cheaters are among the most significant issues in esports. Game developers have been grappling with this problem since the inception of esports games, and there have even been instances where professional esports players cheated during official tournaments.

This study has several limitations that should be acknowledged. First, the sample size, while sufficient for PLS-SEM analysis, consisted of a specific demographic of experienced esports players primarily recruited through online platforms like Facebook and Discord. This sampling approach may introduce a selection bias, limiting the generalizability of the findings to broader populations, including casual players or those from less competitive gaming contexts. Second, the study relied on self-reported data, which is susceptible to response biases, such as social desirability or overestimation of personal skills and preparation levels. Third, the study focused on a limited number of factors within the meta and did not account for the dynamic nature of esports games, including frequent updates and evolving player strategies.

Future research could address these limitations by using larger samples, including participants from different regions, skill levels, and gaming platforms. Longitudinal studies could provide insights into how changes in game updates and evolving metas influence the identified factors over time. Additionally, future studies could explore the interplay between individual factors, such as player psychology or team dynamics, and external elements, such as game mechanics and technological advancements, to gain a more holistic understanding of esports performance. Experimental studies could also validate the causal relationships identified in this study, particularly regarding the impact of tactical preparation and equipment on match outcomes.

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