Team Performance Management: An International Journal

Taking aim at research on esports teams: a systematic literature review and cross-disciplinary future agenda

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Received 30 September 2024
Revised 17 February 2025
29 April 2025
Accepted 8 May 2025

Abstract

Purpose – This paper aims to systematically review and integrate the fast-growing literature on esports teams. Esports have evolved into hyper-competitive and professionalized settings with particular challenges, which need to be understood to develop and support sustainable esports teams. Likewise, esports teams share similarities with teams from professional sports and beyond, thus having the potential to inform team research in general.

Design/methodology/approach – The authors leveraged a systematic literature review approach and conducted a structured keyword search in Web of Science. The results were extended by a journal-driven search and forward-backward citation tracking, resulting in a final sample of 92 articles, which were analyzed via qualitative content analysis.

Findings – First, the authors find that research predominantly leverages quantitative study designs and samples of nonprofessional MOBA players. Second, four main themes that shape effectiveness in esports teams emerged: team compositional and structural features, leadership and external resources, team emergent states and team action processes. Third, the authors discuss blind spots within the literature that need more attention (e.g. psychological safety and stress management mechanisms) and how scholars can leverage the rich, multifaceted and high-resolution data existing in this context (e.g. game logs, audio and video recordings) to generate important insights on team dynamics valuable far beyond the esports domain. Finally, the authors discuss practical implications for players and teams to build and maintain sustainable esports teams.

Originality/value – To the best of the authors' knowledge, the authors provide the first systematic review on esports team effectiveness based on the Input-Mediator-Output-Input model and a critical evaluation of how it can fertilize esports research and practitioners.

Keywords Team management, Group behavior, Esports, Digital trace data

Paper type Literature review

Team Performance Management: An International Journal
Emerald Publishing Limited
1352-7592
DOI 10.1108/TPM-09-2024-0109

Introduction

Video games have experienced a steady rise in players over the past decades, becoming an integral part of modern society (Wijman, 2021). Within this domain, esports have emerged as a structured, professional and competitive form of video gaming (Mendoza *et al.*, 2023; Scholz, 2019). Esports is defined as "a form of sports where the primary aspects of the activity are facilitated by electronic systems" (Hamari and Sjöblom, 2017, p. 211). Players compete through electronic platforms with competitive systems governed by professional or amateur leagues (Pedraza-Ramirez *et al.*, 2020). Elite players train extensively and participate in tournaments with prize pools reaching millions of US dollars (Esports Earnings, 2025). As a result, esports have grown into a global industry with substantial social, media and economic impact (Rosell Llorens, 2017). Thus, unsurprisingly, esports and gaming have also become the objective of intensive cross-disciplinary research efforts in recent years (Reitman *et al.*, 2020). For instance, there is a well-established tradition of research in clinical psychology and related health sciences that focuses on the potential negative consequences of gaming, such as addiction and physical impairment (Kuss, 2013). Similarly, studies using esports data have gained prominence within computer science, often concentrating on predicting match outcomes using advanced analytical methods (Hodge *et al.*, 2019). In addition, the increasing professionalization of esports has attracted growing interest from scholars in applied psychology and management. Some of this research examines the broader esports ecosystem, including marketing studies on esports spectatorship (Rietz and Hallmann, 2022), while an expanding body of work is beginning to focus more directly on the individuals performing within esports. Although research in this area has grown, it has predominantly investigated individual-level factors related to health and performance (Leis and Lautenbach, 2020; Pedraza-Ramirez *et al.*, 2020; Poulus *et al.*, 2024). This strong focus on the individual level is somewhat surprising, given that many of the most popular esports titles – such as League of Legends, Counter-Strike, Valorant and DOTA2 – are performed in teams (Esports Charts, 2025).

From team research, we know that team effectiveness – the extent to which a team successfully achieves its goals while maintaining member satisfaction and long-term performance sustainability (Hackman, 1987) – is influenced by factors beyond individual player attributes (Mathieu *et al.*, 2008). Effective teams require a composition of knowledge, skills, abilities and characteristics that align with team needs, supported by structural features that facilitate collective goal achievement (Ployhart and Moliterno, 2011; Mathieu *et al.*, 2019). In addition, over time, teams develop shared cognitive, affective and motivational states, along with process routines that enable them to become more than just the sum of their parts (LePine *et al.*, 2008; Rapp *et al.*, 2021). Acknowledging these dynamics, esports research has recently begun to explore team-related phenomena (Tang, 2018). However, this fast-growing field integrates diverse interdisciplinary perspectives, theoretical frameworks and methodological approaches (see details on study characteristics below), raising concerns about fragmentation and inconsistent practical recommendations.

In response, our paper provides a systematic, comprehensive and integrative review of research on esports teams. Our objectives are fourfold. First, we map the intellectual structure of the field. Following Hiebl (2023), we performed a systematic literature search and selection process, yielding 92 empirical studies. We analyzed these studies using the Input-Mediator-Output-Input (IMOI) model (Ilgen *et al.*, 2005), a widely applied framework for understanding team effectiveness (Käosaar *et al.*, 2022; Mathieu *et al.*, 2008; Raetze *et al.*, 2021). Based on this analysis, we identify four core research themes:

(1) team compositional and structural features;

(2) leadership and external resources;

(3) team emergent states (TESs); and
(4) team action processes.

Second, we propose an agenda for future research, identifying underexplored yet critical aspects of the IMOI model in esports contexts. Third, we discuss how esports data can advance general team research, emphasizing its rich, multifaceted and high-resolution nature as well as its potential for creating the often-called-for insights into team dynamics (Cronin *et al.*, 2011; Kozlowski, 2015). Finally, we bridge academia and practice by outlining practical implications for esports team managers, coaches and players, ensuring that research findings inform real-world team operations.

Method

To provide a comprehensive and balanced overview of research on esports teams, we conducted a systematic literature review. Systematic reviews "differ from traditional narrative reviews by adopting a replicable, scientific, and transparent process" (Tranfield *et al.*, 2003, p. 209) to answer a specific research question. They leverage structured sample selection and coding procedures to minimize bias and report the authors' decisions and conclusions in a transparent way to enhance rigor and replicability (Cook *et al.*, 1997; Hiebl, 2023; Kunisch *et al.*, 2023).

Literature search and screening process

To ensure broad coverage of relevant literature, we followed recent recommendations for sample selection in systematic reviews by Hiebl (2023) and combined multiple search approaches. We started by conducting a *database-driven search* in *Web of Science (WOS)*, combining keywords displaying our team-level focus (e.g. team* and clan*) with keywords addressing our interest in gaming or esports contexts (e.g. esport*, cybersport* and "League of Legends"). The final search, conducted in January 2025, resulted in 791 potentially relevant articles. Titles, abstracts and keywords were manually screened in an iterative process based on three inclusion criteria. First, we only included full-text, peer-reviewed empirical studies in English and, thus, excluded conceptual papers, meta-analyses and literature reviews, though we consulted these works when relevant. Second, studies had to contribute to research on team effectiveness and align with the IMOI model. This, for example, led to the exclusion of studies focused on algorithm development for game outcome predictions (Do *et al.*, 2021) and educational applications of games (Park *et al.*, 2023). Third, studies had to investigate team-based settings. While we prioritized professional esports, we also included studies examining semiprofessional, amateur and recreational gamer teams if they provided relevant insights into team effectiveness, because of the fluid boundaries between these categories and the inconsistent reporting of player status in existing research. As esports research is still in its infancy and conference proceedings are key outlets for research in computer science – an area where intensive research on esports teams is conducted – we included both journal articles and conference proceedings. Two independent coders (the first and second author) conducted the screening, resolving discrepancies through discussion. This process resulted in 61 articles. To complement the database-driven search, we conducted a *journal-driven search.* Using the *Electronic Journals Library* hosted by the *University Library of Regensburg*, we identified four specialized esports journals not indexed in WOS: *International Journal of Esports*, *International Journal of eSports Multidisciplinary Research*, *International Journal of eSports Research* and *Journal of Electronic Gaming and Esports*. Screening all articles published in these journals yielded nine additional studies. Finally, we conducted *forward-backward citation tracking* based on the 70 articles identified through database- and journal-driven searches. We manually screened reference sections (backward) and used WOS to identify studies that cited

these articles (forward), leading to the inclusion of 22 more articles. This resulted in a final sample of 92 articles, with the complete selection process summarized in Figure 1.

Literature analysis

We systematically analyzed and coded all 92 articles using predefined categories. The first set of categories included descriptive elements such as *research methods*, *sample characteristics*, *journal subject areas* and *applied theoretical frameworks*. This coding process identified, for instance, whether studies used qualitative, quantitative or mixed methods, the types of teams analyzed (e.g. game type and level of professionalism) and the classification of publication outlets. The second set of categories focused on analytical dimensions, capturing *research topics*, *empirical findings* and *future research directions*. To organize empirical findings, we relied on the IMOI model of team effectiveness (Mathieu *et al.*, 2008) and broader team research. Within this framework, inputs refer to preexisting characteristics of individuals, teams, organizations and environmental contexts that shape performance. Mediators encompass team processes, which reflect dynamic interactions among members, and emergent states, which include shared cognitive, motivational and affective conditions that develop over time (Marks *et al.*, 2001). Outcomes represent the "results and by-products of team activities that are valued by one or more constituencies" (Mathieu *et al.*, 2008, p. 412). During the coding process, additional sub-categories emerged inductively when findings did not fit within the predefined framework. Following principles of qualitative data analysis (Miles *et al.*, 2018), the first two authors coded each study, engaging in multiple rounds of discussion to refine categorization. This iterative approach resulted in the identification of the four key themes presented in the results section.

Results

Study characteristics

We present the characteristics of the final sample in Table 1, and additional information is provided in the Online Supplementary Material. Analyzing the characteristics of our sample revealed that research on esports teams is still in an early state but evolving quickly. All

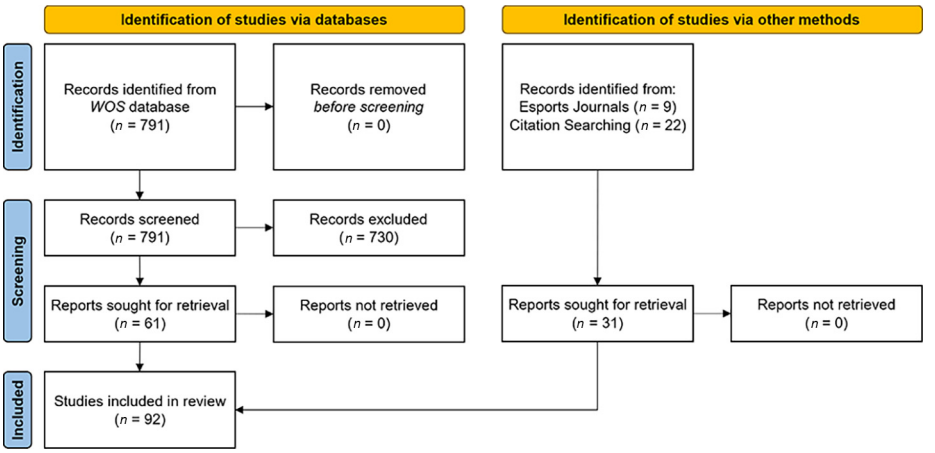

Figure 1. Flow diagram
Source: Figure by authors

Table 1. Sample characteristics

Categories	No. of studies	% of studies
*Input-mediator-outcome distribution**		
Inputs	63	68.5
Outcomes	63	68.5
Mediators	53	57.6
Discipline		
Computer sciences	35	38.0
Business, management, psychology and other social sciences	32	34.8
Esports, gaming and sports sciences	16	17.4
Others	9	9.8
*Type of games**		
MOBA	52	56.5
FPS	21	22.8
MMOG and MMORPG	18	19.6
Others	9	9.8
Not specified	4	4.4
*Level of professionalism**		
Recreational gamer	49	53.3
Esports athletes	36	39.1
Not specified	10	10.9
Research design		
Quantitative	52	56.5
Qualitative	24	26.1
Mixed methods	16	17.4
*Data environment**		
Non-competitive	57	62.0
Competitive	33	35.9
Not specified	14	15.2
Publication type		
Journal article	74	80.4
Conference proceeding	18	19.6
Publication time		
2009–2014	14	15.2
2015–2019	30	32.6
2020–2024	48	52.2

Note(s): The sum of the percentages for categories with an asterisk is greater than 100 as single studies sometimes belong to multiple sub-categories
Source(s): Table by authors

identified studies were published between 2009 and 2024, with the majority over the past five years (52.2%). Research is interdisciplinary: Over one-third (34.8%) of the studies were published in journals from business, management, psychology and other social sciences, encompassing a variety of sub-disciplines. Additional important fields include computer sciences (38.0%) and (e)sports-related sciences (17.4%). In line with the nascent state of theorizing (Edmondson and McManus, 2007), almost half of the studies leveraged qualitative or mixed-methods designs to create initial but in-depth insights, often based on interviews. Quantitative designs have been similarly important. Most of these works relied

on archival or game data, which are often publicly available data sets or accessed via application programming interfaces. Experimental and survey-based designs are also common. Increasingly, scholars have started to leverage high-resolution log data (Mora-Cantallops and Sicilia, 2019; Wax *et al.*, 2017). Data has been collected on several types of esports games and teams with different levels of professionalism, but predominantly from MOBA games (56.5%) and recreational gamers (53.3%). Almost two-thirds of the studies collected data in a noncompetitive environment (at least partly), such as unranked matches and interviews outside competition. In several studies, the level of professionalism (n = 10) and the type of data environment (n = 14) could not be determined because of a lack of information. Finally, the majority of studies in our sample were published in academic journals, and only 19.6% came from conference proceedings.

Synthesis of empirical findings

This section synthesizes key research findings on esports teams. Following the IMOI model, we categorize the findings into four main clusters:

(1) team compositional and structural features;
(2) leadership and external resources;
(3) TESs; and
(4) team action processes.

These clusters capture critical factors that influence performance, success, viability, as well as member well-being, satisfaction and commitment in esports teams. Given that several empirical studies within our sample investigated multiple input factors at the same time and/or considered more complex mediation and moderation relationships, there are some overlaps in the reporting between the four themes (e.g. team structure indirectly impacting performance via enhanced team cognitions).

Theme 1. Team compositional and structural features. The most prominent theme in our sample (n = 37) concerns the role of compositional and structural features in esports teams, which represent partly overlapping input variables in the IMOI model (Mathieu *et al.*, 2019). Team composition research examines how individual attributes and their combination affect processes, emergent states and outcomes (Mathieu *et al.*, 2008). In contrast, structural features pertain to how teams divide complex tasks into manageable components (Mathieu *et al.*, 2017). Several studies investigated how different approaches to *team formation* influence dynamics and performance in recreational settings. For instance, Kahn and Williams (2016) found that self-selected teams in MOBA demonstrated higher performance because of enhanced transactive memory systems and social presence (these mediating variables account for TESs, which are discussed in more detail in Theme 3). Further research highlighted the positive impact of forming teams based on friendships or loyalty, which fostered player experience (Mora-Cantallops and Sicilia, 2018) and effort (Zeng *et al.*, 2021), as well as team learning (Landfried *et al.*, 2019) and performance (Pobiedina *et al.*, 2013; Wax *et al.*, 2017) across game genres. However, Zeng *et al.* (2021) noted that for high-skill players, playing with friends had diminishing returns and could even hinder performance. In contrast, professional teams appear to prioritize factors beyond friendship, as indicated by Freeman and Wohn's (2019) qualitative study, which found that some teams used scouting, interviews and trial periods for recruitment.

Beyond selection processes, other studies examined the impact of *knowledge, skills, abilities and other characteristics (KSAOs)* on esports teams, particularly in MOBA games. Interview-based studies identified technical-tactical skills, psychological traits, healthy

habits, experience, game sense and teamwork as essential for optimal performance (Bonilla *et al.*, 2022; Fanfarelli, 2018; Kaye, 2016). However, empirical evidence primarily supports the performance-enhancing effects of gaming experience (Bonny *et al.*, 2020; Sapienza *et al.*, 2018), self-regulation skills (Wang *et al.*, 2022) and specific thinking styles (Wang *et al.*, 2015). Finally, Lai *et al.*'s (2021) work showed the importance of social competencies, as they found them to be linked to improved social behaviors in recreational MOBA teams.

Additionally, research explored the impact of *team stability* on team dynamics and performance, though findings varied. Algesheimer *et al.* (2011) reported that team tenure (time spent playing together) positively affected cohesion in esports teams ($\beta = 0.106$ and $p < 0.01$) but had no significant impact on intrateam communication. Mukherjee *et al.* (2019) found that prior shared success predicted victory in MOBA teams. Other studies examined more nuanced effects, such as Ahmed *et al.* (2019), who identified different performance trajectories based on team persistence (number of times a team played together). Their study suggested that closed Massively Multiplayer Online Game (MMOG) teams exhibited a quadratic relationship between persistence and performance, whereas open teams showed a linear relationship. Yet open teams sustained effectiveness longer than closed teams because of member variability. Ching *et al.* (2021) found that social familiarity (from repeated interactions) and functional familiarity (from performing similar roles independently) particularly benefited specialist MOBA teams. Furthermore, their second study showed that competitive familiarity – frequent competition followed by collaboration – was more valuable for exogenously assigned MOBA teams than prior cooperative experience, as it enhanced team learning, coordination and performance (Ching *et al.*, 2024). Other studies suggested that team experience does not directly influence performance but instead moderates the impact of trust, behavioral interdependence and collaboration on team success (Carrasco-Farré and Hakobjanyan, 2024; Lee and Chang, 2013).

Several quantitative studies also explored the role of *team diversity*, defined as variation in attributes such as demographics, education and personality among team members (van Knippenberg and Mell, 2016), mainly by focusing on MOBA and First-Person Shooter (FPS) games. Most research focused on cultural and national diversity, yielding mixed results. Pobiedina *et al.* (2013) found that low-national-diversity teams performed better in competition, whereas other studies reported the opposite effect. Cultural diversity was positively associated with intrateam communication ($\beta = 0.284$ and $p < 0.001$) and cohesion ($\beta = 0.169$ and $p < 0.01$) (Algesheimer *et al.*, 2011), as well as team performance (Kołodziej, 2019; Parshakov *et al.*, 2018). Lin *et al.* (2023) further demonstrated that cultural diversity enhanced strategy quality in teams, particularly when gamer identity was salient. Studies on other diversity dimensions are scarce. Findings indicated that language and experience diversity negatively impacted team performance (Parshakov *et al.*, 2018), ability disparity improved team outcomes (Yuan *et al.*, 2018) and gender diversity influenced cohesion, satisfaction and strategy selection (Martin and Good, 2015).

Finally, some research focused o*n structural input factors* such as network features and reward systems. Yuan *et al.* (2018) examined incentives in recreational FPS teams, showing that competitive rewards enhanced performance in teams with high ability disparity but had no effect in more balanced teams. Other studies investigated network structures, but findings were inconsistent. For instance, Benefield *et al.* (2016) found that moderate network density optimized team performance in Massively Multiplayer Online Role-Playing Games (MMORPGs), whereas Lee *et al.* (2013) reported that communication network density had no significant effect on the performance of FPS teams.

Theme 2. Leadership and external resources. A second theme in the esports team literature ($n = 18$) explores how leadership and external resources influence team

effectiveness, aligning with input variables in the IMOI model. Leadership in the team context is defined as "process of team need satisfaction in the service of enhancing team effectiveness" (Morgeson *et al.*, 2010, p. 8). External resources, on the other hand, refer to all positive sources of influence that either emerge from within or outside the organizational system within which they are nested (Mathieu *et al.*, 2008). First, several studies examined *leader(ship) characteristics, styles and behaviors*, primarily through quantitative research on recreational gamers. Mysirlaki and Paraskeva (2019, 2020) found that leader emotional intelligence positively influenced MMOG team performance, viability and member satisfaction, with effects partly mediated by transformational leadership and team cohesion. Interviewees in Falkenthal and Byrne's (2021) study described distributed leadership, where leadership roles shift dynamically based on situational demands, as a key success factor. Two quantitative studies on MMORPG teams supported this claim, linking distributed leadership to enhanced team performance (Robinson, 2016; Van Dijk and Broekens, 2010). Additionally, a longitudinal study by Goh and Wasko (2012) found that leader–member relationships influenced the development and allocation of team resources, which in turn improved performance.

Second, a variety of mainly qualitative studies emphasized the role of *external support* in esports, highlighting key stakeholders such as the teams' organizations, coaches and family members. Coaches were described as mentors who provide guidance beyond gameplay, including life advice (Poulus *et al.*, 2022a). Social support from family and teammates was linked to improved performance and success (Hong and Connelly, 2022), while educational, psychological and financial support from the broader gaming community helped players develop into high-performing team members (Hong, 2022). However, some studies critically examined external support structures. Coates *et al.* (2020) found that hiring a manager did not significantly improve performance in FPS teams. Similarly, qualitative research revealed deficiencies in esports coaching, with many coaches lacking essential leadership, communication, game knowledge and planning skills (Poulus *et al.*, 2022a; Sabtan *et al.*, 2022). To address these gaps, Sabtan *et al.* (2022) suggested teams use multiple specialized coaches.

A final subset of studies examined *interventions* aimed at enhancing esports team effectiveness. Research on current training approaches found that professional teams are increasingly adopting structured methods, incorporating strategies like replay analysis and game footage reviews alongside traditional gameplay (Brea Castro, 2021; Poulus *et al.*, 2022a). However, esports athletes often criticize a lack of professionalism in training, which they perceive as limiting its effectiveness (Abbott *et al.*, 2022). Other studies developed and tested new training programs. Baker-Bates *et al.* (2024) trialed an online-delivered 5R program with an FPS team, reporting tentative improvements in social identification, collective efficacy, resilience, intrateam communication, belonging and commitment. Maier (2024) tested a communication-focused intervention in the same setting, improving team communication effectiveness and performance. Finally, in professional MOBA settings, a performance psychology workshop was perceived as enhancing team cohesion (Swettenham and Whitehead, 2022), and combined physical and mental training resulted in enhanced player performance and team interactions (Pereira *et al.*, 2016). Yet, despite these promising findings, research on team-focused training interventions remains scarce.

Theme 3. Team emergent states. The third core theme in our sample (n = 22) examines TESs and their impact on team effectiveness. TESs are dynamic team properties that develop over time through team member interactions (Marks *et al.*, 2001; Rapp *et al.*, 2021). Research in this area primarily explores shared cognitive states (i.e. members' collective beliefs) and shared affective states (i.e. members' emotions, attitudes and feelings). The majority of studies in this area focused on *team cohesion*, an affective state defined as the

"shared bond/attraction that drives team members to stay together and work together" (Salas *et al.*, 2015, p. 365). Quantitative research across all game genres highlights its positive effects on shared goal development ($\beta = 0.153$ and $p < 0.01$; Algesheimer *et al.*, 2011), team cooperation ($\beta = 0.759$ and $p < 0.001$; Lin and Ni, 2014), team performance, viability and member satisfaction (Mysirlaki and Paraskeva, 2019; Tan *et al.*, 2022). Poulus *et al.* (2022a) found that esports teams actively develop strategies to strengthen cohesion. Such strategies include both individual-level approaches (e.g. increased self-awareness) and team-level practices (e.g. creating a visual identity and using positive communication patterns) (Macedo and Falcão, 2019, 2020; Swettenham and Whitehead, 2022).

Other studies explored *relationship strength* through different TES concepts. Team identification (i.e. a shared sense of belonging; Carmeli and Shteigman, 2010) and team trust (i.e. a belief in teammates' reliability; Tsai *et al.*, 2012) both correlated positively with team commitment, cooperation and prosocial behavior, contributing to overall teamwork and performance, especially in MMORPG settings (Lee and Chang, 2013; Liao *et al.*, 2020; Lin and Ni, 2014). Qualitative studies further emphasized that strong social bonds improve communication, coordination and performance in esports teams (Poulus *et al.*, 2022a; Falkenthal and Byrne, 2021). To build these bonds, teams engage in team-building activities, both in-person and online (Freeman and Wohn, 2019; Macedo and Falcão, 2020). However, Goh and Wasko (2012) found that trust did not significantly impact performance in MMOG teams, thus highlighting inconsistencies in previous findings.

Beyond affective states, several studies investigated *shared cognitive states* in esports teams. A study on transactive memory systems – the knowledge of who knows what within a team (Hollingshead *et al.*, 2012) – found positive correlations with performance in MOBA teams (Kahn and Williams, 2016). Additionally, a qualitative study identified a shared team mental model of "jointly hard work for hard fun" as a factor shaping collective work and motivation in MMORPG teams (Chang and Lin, 2014). Two studies examined the role of empowering team climates, showing that they positively predict need satisfaction, motivation, well-being and performance in esports teams (Goh and Wasko, 2012; Lopes Angelo *et al.*, 2022). These findings align with self-determination theory, which posits that individuals reach their full potential when their basic psychological needs for autonomy, competence and relatedness are met (Deci *et al.*, 2017). Additional qualitative research suggests that shared cognitions such as awareness of dynamic game flow, mutual understanding of skills and personality and distributed cognitions of time could benefit esports teams (Musick *et al.*, 2021; Reitman, 2018).

Finally, three studies explored *team conflict states* as factors influencing in-game performance. Shin *et al.* (2021) found that MOBA teams without conflicts had higher win rates and greater member satisfaction than those experiencing in-game disputes. Gallenkamp *et al.* (2010a, 2010b) analyzed how different conflict types affect MMOG team performance, identifying negative effects of relationship conflict, positive effects of task conflict and mixed effects of process conflict. Their findings also suggest that culture and conflict management strategies moderate these relationships.

Theme 4. Team action processes. The fourth and final major theme in our sample ($n = 25$) explores the role of team action processes, defined as "periods of time when teams conduct activities leading directly to goal accomplishment" (Marks *et al.*, 2001, p. 366). Studies in this area examine both in-game actions linked to team performance and the interaction processes that enable successful teamwork. Here, several studies have analyzed which *in-game actions* contribute to team success, particularly in MOBA and FPS games (Ekdahl and Ravn, 2022; Xia *et al.*, 2019). For example, research on FPS championship matches found that teams securing pistol round wins and first kills had a significantly higher likelihood of winning matches (Yalçıner and Kilci, 2023). While these findings help refine strategic

decision-making, they offer limited insight into how teams coordinate and interact to implement these strategies effectively.

Expanding beyond in-game statistics, researchers have used interviews, ethnographic observations, video/audio recordings and surveys to examine *team interactions* in esports. Across methodological approaches, studies consistently highlight coordination and cooperation as crucial for team success. For instance, Lin and Ni (2014) found that *team cooperation*, defined as "the process of two or more team members, by utilizing resources, knowledge, and information technology, to pursue shared goals, tasks, and benefits" (p. 259), had a direct positive effect on performance in MMORPG teams ($\beta = 0.51$ and $p < 0.001$). Fanfarelli (2018) found that better coordination of team endeavors and team-based mechanical synergies improved team performance during FPS tournaments. Another study indicated that the impact of collaboration on performance in MMOG teams may vary based on experience levels: High collaboration benefited experienced teams, whereas lower collaboration was more advantageous for less experienced teams (Carrasco-Farré and Hakobjanyan, 2024).

Most studies on this theme focused on *communication* as a key team process. Research across games and professional levels consistently found that frequent intra-team communication during matches enhances team performance and satisfaction (Abramov *et al.*, 2022; Algesheimer *et al.*, 2011; Tan *et al.*, 2022), with some of those studies attributing these boosts to the development of TESs such as team cohesion and a shared desire to perform. Moreover, research on communication affordances, such as global chat, local chat and no chat conditions, has revealed that while these different communication systems support the emergence of distinct communication patterns, they do not lead to significant differences in task completion time (Khodr *et al.*, 2022). Beyond immediate gameplay, studies have shown that communication and information sharing are essential for fostering shared cognitions, enhancing team cohesion, supporting group flow and promoting team learning and recovery from setbacks (Kaye, 2016; Musick *et al.*, 2021; Reitman, 2018). In fact, within one study, participants described communication as the "very basis from which subjects form and maintain […] community and cultural norms of the team" (Macedo and Falcão, 2020, p. 7). Given its importance, esports teams aim for efficient, selective in-game communication, ensuring that only relevant information is shared while preserving essential team knowledge (Falkenthal and Byrne, 2021; Reitman, 2018).

Discussion

After outlining the key findings of our synthesis, this section takes a step further by discussing their implications for future esports research and broader team research. We also highlight how these insights translate into esports practice and acknowledge the limitations.

Using insights from team research to advance knowledge on esports teams

Our findings indicate that research on esports teams has primarily revolved around four core themes, which can be synthesized into a process-oriented framework based on the IMOI model, as illustrated in Figure 2. In this figure, the line width of boxes and arrows represents the intensity of research conducted on each theme or the strength of connections between them. Within each box, key concepts are displayed, with solid font indicating areas of higher research intensity, while italicized font denotes less explored topics. Overall, existing research has largely focused on analyzing the direct effects of input factors (Themes 1 and 2) and mediating variables (Themes 3 and 4) on team performance indicators, which remain the dominant outcome measures in studies on esports teams. Additionally, several works have examined the relationships between input and mediating variables without explicitly linking them to outcomes, leaving gaps in understanding how these factors interact dynamically over

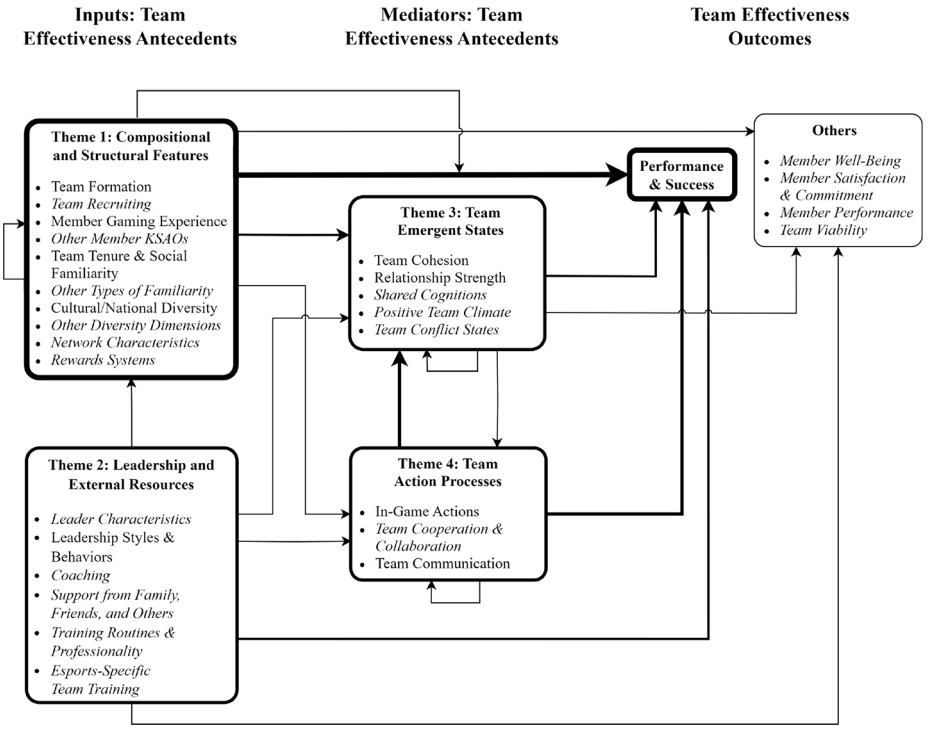

Figure 2. Integrative framework
Source: Figure by authors

time. Given the limited connections between different team-related concepts and the narrow scope of variables explored thus far, significant opportunities exist to expand and deepen esports team research. In the following sections, we outline the most promising future research directions to address these gaps and advance the field.

Esports differ fundamentally from both physical and other mental sports. Unlike traditional sports, esports is played on computers in real-time, with a strong emphasis on cognitive skills, in-game mechanics and team coordination (Hamari and Sjöblom, 2017). Furthermore, esports teams often consist of individuals outside the WEIRD (Western, Educated, Industrialized, Rich and Democratic) demographic (Henrich *et al.*, 2010), raising questions about whether insights from traditional sports and work teams can be directly applied to this setting. Consequently, esports present a unique research domain that warrants a deeper understanding of effective teamwork in this context. To systematically address gaps in esports team research, scholars should leverage established taxonomies for input variables, TESs and team processes from team science (Marks *et al.*, 2001; Mathieu *et al.*, 2008; Rapp *et al.*, 2021), as well as insights from research on teams in traditional sports (for a recent review, see Quigley *et al.*, 2022). However, within our sample, fewer than 15% of studies grounded their research in the broader team research literature (Ahmed *et al.*, 2019; Musick *et al.*, 2021; Wax *et al.*, 2017), making it challenging to integrate and compare cross-disciplinary findings.

Applying established team concepts (see the following examples borrowed from Marks *et al.*, 2001; Mathieu *et al.*, 2008 and Rapp *et al.*, 2021), esports scholars can generate more nuanced insights into how specific input variables (e.g. team member KSAOs and organizational support) influence team states (e.g. psychological safety and team situation awareness), processes (e.g. strategy formulation and conflict management) and outcomes (e.g. team performance and team viability). Competitive esports generate rich, openly available data, which can be used to operationalize various compositional and structural team features. For instance, in MOBA and FPS games, each team member assumes a distinct in-game role, reflected in their character selection. These roles may differentially impact team success and require specialized KSAOs that can be systematically analyzed (Leavitt *et al.*, 2016; Shin *et al.*, 2021). Additionally, detailed archival data from sources such as HLTV (the leading Counter-Strike statistics website), Liquipedia (an esports games wiki) and other online platforms provide extensive statistics on players, teams, matches and more. While some studies in our sample have already leveraged these data sources (Naidenova *et al.*, 2024; Parshakov *et al.*, 2018), they can be further used to model complex input variables. For instance, research on traditional sports teams has investigated factors such as star player presence (Swaab *et al.*, 2014), demographic faultlines (Bezrukova *et al.*, 2016) and pay dispersion (Trevor *et al.*, 2012) in relation to team performance. Esports scholars could explore whether these relationships hold in esports, given the unique team structures and digital nature of the field.

Compared to research on sports teams (Quigley *et al.*, 2022), emergent states and team processes have received greater attention in esports research. However, our knowledge remains limited given the relatively small number of studies within our sample (n = 52) that focused on these more dynamic concepts within esports teams. These studies only considered a few of the various existing states and processes and often did so based on qualitative designs (Macedo and Falcão, 2020; Reitman, 2018; Swettenham and Whitehead, 2022), which do not offer any insights on effect sizes and directions, besides subjective experiences. While some emergent states, such as cohesion, trust and transactive memory, have been explored, the broader landscape of shared team states remains largely unexamined in esports research (Rapp *et al.*, 2021). Esports tournaments are highly competitive, complex performance environments, comparable to high-reliability organizations, emergency response teams and innovation-driven project teams. In such settings, teams rely on specific emergent states – such as team situational awareness (Endsley and Robertson, 2000), collective efficacy (Jex and Bliese, 1999) and psychological safety (Edmondson, 1999) – to successfully navigate unexpected changes. Future research should explore how these states influence esports team effectiveness.

Additionally, professional esports teams compete within organized leagues and tournaments – often in multiple matches per day and, in some game genres, in at least two-digit number of rounds. As such, various performance episodes can be observed for a single team during tournaments. Yet large parts of the team interaction unfold outside matches, such as during pauses between rounds, post-game debriefs and extended periods between tournaments. According to Marks *et al.*'s (2001) recurring phase model of team processes, these transition periods facilitate mission analysis, goal specification, strategy formulation and planning – all of which are critical for long-term team success. In other work domains, transition processes have been linked to enhanced effectiveness (Bliese *et al.*, 2017; LePine *et al.*, 2008). Understanding how esports teams develop and adapt their strategy portfolios over time is, thus, a promising research avenue. Interpersonal processes are equally crucial in this setting but have hardly been considered thus far. Prior research suggests that successful esports teams aim to minimize unnecessary communication (Falkenthal and Byrne, 2021; Reitman, 2018). Beyond game-related exchanges, effective teams must also manage

emotions, stress and interpersonal conflict, given the high-stakes, emotionally charged and volatile nature of professional esports (Boldi *et al.*, 2024; Gallenkamp *et al.*, 2010a, 2010b). Negative in-game results can trigger frustration, anger and stress, potentially escalating into conflict, peer pressure and toxic behaviors (Monge and O'Brien, 2022; Poulus *et al.*, 2022b). Investigating how teams develop communal coping strategies and conflict resolution mechanisms could, thus, yield valuable insights (see studies focusing on this concept in traditional sports settings and beyond; Leprince *et al.*, 2018, 2019; Vakilzadeh and Raetze, 2025).

Most studies in our sample focused on objective performance indicators such as match wins/losses, win percentages and in-game statistics as team effectiveness measures (Lee *et al.*, 2013; Mora-Cantallops and Sicilia, 2019; Shin *et al.*, 2021). However, this emphasis has led to a narrow view of team success, overlooking team viability – the ability of a team to sustain long-term performance (Bell and Marentette, 2011) – as well as critical individual-level outcomes like player health, satisfaction and commitment (Mathieu *et al.*, 2008, 2019). For instance, our findings suggest that team tenure, familiarity and emergent states positively impact effectiveness, but low viability, health issues and low commitment can increase turnover intention and player attrition (Heavey *et al.*, 2013; Li and van Knippenberg, 2021). Future research should explore the drivers of team effectiveness beyond performance and success.

Using esports data to advance knowledge on teams across domains

While theories and concepts from team research provide guiding frameworks for a more sophisticated and integrated study of esports teams, we argue that esports samples can also contribute significantly to general team research. Esports environments generate high-resolution team-related data, surpassing even the data richness available in professional sports – a domain frequently used to derive management-related insights into traditional work teams (Quigley *et al.*, 2022). As highlighted earlier, esports provide extensive archival data. Additionally, during tournaments, teams are continuously video- and audio-recorded, capturing footage from player and coach cameras, headset communications and on-stage interactions. Moreover, players, coaches and experts regularly participate in interviews and match analyses, which are publicly shared, contributing to a wealth of behavioral, communication and archival material. Beyond these sources, the games themselves generate digital trace data, which are high-resolution, longitudinal records of routine information with timestamps (Berente *et al.*, 2019; Hüllmann, 2025). The availability of rich secondary data sources can be further enhanced by primary data collection methods. Researchers can use established empirical tools from social sciences, including ethnographic observations, individual and group interviews, subject matter expert inquiries and surveys. Additionally, given that esports teams remain seated during performance episodes and are continuously filmed, the environment enables the use of advanced, minimally invasive technology for data collection. Examples include wearable sensors, physiological stress measures and facial expression recognition software (Chaffin *et al.*, 2017; Daudelin-Peltier *et al.*, 2017). These characteristics make esports an unparalleled environment for collecting fine-grained, non-intrusive data on teams in real-world competitive settings, offering an invaluable opportunity for advancing team research. Yet getting access to these data remains a challenging endeavor. Most process data, such as on-stage video and audio recordings, are created and stored by the esports organizations facilitating major tournaments. Their content rights belong to the players and coaches being recorded, and teams might be reluctant to share them for fear of losing their competitive advantage. Hence, acquiring data access requires consent from multiple parties and must be considered a long-term process of trust-building and negotiation (Cunliffe and Alcadipani, 2016).

Esports data can provide critical insights into nearly all aspects of team phenomena, particularly team dynamics, when triangulated and analyzed using time-sensitive methodologies. These dynamics can be broadly defined as "multilevel processes unfolding over time that involve the intersection of individual, dyadic, team, and/or organizational level actions relevant to short-term and/or long-term changes during the team lifecycle" (Li *et al.*, 2023). This includes changes and dynamics in team composition, structure, emergent states, processes, internal and external networks and organizational environments (Fyhn *et al.*, 2023; Klonek *et al.*, 2019; Wolfson *et al.*, 2022). Collecting high-resolution data to analyze these dynamics is challenging in traditional work settings, prompting long-standing calls for innovative research designs and contexts to advance knowledge of team dynamics (Cronin *et al.*, 2011; Klonek *et al.*, 2019). Esports data directly address this need. For instance, esports statistics from online platforms can be modeled as time series to examine how changes in team structure affect performance outcomes. Video and audio data can be leveraged to investigate patterns across all types of team processes (Marks *et al.*, 2001), including adaptive responses to unexpected changes (Lei *et al.*, 2016). Esports provide a unique setting to study the complex bottom-up and top-down processes of collective emotions and stress, which have predominantly been analyzed in controlled laboratory settings thus far (Raetze *et al.*, 2025; Sassenus *et al.*, 2022; Van Kleef and Côté, 2022). Given recent advancements in automated analysis of team interactions, researchers can analyze large amounts of esports data without relying solely on time-consuming manual coding (Mathieu *et al.*, 2022; Klonek *et al.*, 2020). Automated approaches can process transcribed team interactions and extract meaningful insights on communication patterns, coordination strategies and decision-making behaviors in esports teams.

Finally, digital trace data from esports can be used to operationalize a wide range of "behavioral constructs [at] the individual and team level" (Chaffin *et al.*, 2017, p. 3). As behavioral logs often capture interactions between humans, they are particularly well-suited for analyzing team dynamics (Andersen *et al.*, 2016). Many esports games provide demo replays that record all in-game actions, offering a comprehensive view of player behavior. In multiplayer games, these digital trace data enable the detailed observation of all in-game actions and interactions among both teammates and opponents. For example, the digital trace data from a single Counter-Strike match grant access to millisecond-level records of all players' events, positions, movements and actions. Public data sets of these digital traces are available, such as the Esports Trajectories and Actions (ESTA) data set, which includes 1,558 replays with 41,782 rounds from professional Counter-Strike tournament matches, accounting for 8.6 million game events (Xenopoulos and Silva, 2022). These esports digital trace data offer both empirical and theoretical advantages (Hüllmann, 2025). Empirically, digital trace data are often more objective, accurate and complete than behavioral coding or multimodal tracking. For instance, positional and behavioral data can be sampled at over 100 Hz at a sub-pixel level, ensuring an exceptionally high level of precision (Xenopoulos and Silva, 2022). Unlike traditional methods, which rely on selective coding, digital trace data capture the entire game state and the full duration of a match, providing a more comprehensive data set (Hüllmann, 2025). From a theoretical perspective, the richness of esports data allows for the detection of novel effects, including the measurement of small-scale phenomena that previously remained unnoticed (Xenopoulos *et al.*, 2020). Digital trace data enable researchers to unpack action processes in depth, providing fine-grained insights into how these processes unfold over time. Beyond identifying mediators, these data allow for describing, explaining and predicting team dynamics with unprecedented granularity (Hüllmann, 2025). By triangulating archival data, communication and behavioral recording, digital trace data and other available sources, researchers can conduct rich correlational

analyses to explore complex relationships between team variables and their development over time (Xenopoulos and Silva, 2022; Rothmeier *et al.*, 2020).

Despite its potential, leveraging esports data to generate novel insights into team dynamics presents several methodological and analytical challenges. First, archival and non-obtrusive data must be processed and structured to operationalize relevant team variables and define their temporal logic meaningfully (Klonek *et al.*, 2019). Similarly, the extremely high resolution of digital trace data, along with wearable and sensor-based metrics, increases analytical complexity and requires new approaches to meaningfully abstract and combine data. To navigate these challenges, researchers must iteratively bridge theory and data – testing which theoretical constructs can be meaningfully operationalized using high-resolution esports data (Klonek *et al.*, 2019). Applying insights from highly specialized esports settings to traditional work teams requires careful interpretation, ensuring that findings are contextually relevant and transferable (Quigley *et al.*, 2022). Given these complexities, we encourage future scholars to engage in cross-disciplinary collaborations, integrating expertise from esports, team research and data science. By harnessing the vast potential of esports data, researchers can make significant contributions to both esports-specific and broader team research, ultimately refining our understanding of team dynamics in a way that transcends the boundaries of this domain.

Practical implications

Our results hold practical implications for coaches, professional players and team managers to develop evidence-based practices that support the composition and development of sustainable esports teams. For building a team, managers should find and assemble a team for which cohesive team states can emerge. Knowing players before recruiting them is helpful because trust predicts in-game success. Physical proximity fosters team cohesion, suggesting real-life meetups, team- and gaming houses and joint physical activities for team building (Kahn and Williams, 2016). Much like conventional sports teams, esports teams can establish farm or academy teams to get to know players before rotating them into the main roster. To adequately develop teams, coaches need better training and professionalization to maximize positive impact, like conventional sports coaches who have a stronger educational foundation (e.g. psychology education) (Abbott *et al.*, 2022). Next to coaches, parents are essential as external support, especially given the young age of esports athletes. The stronger involvement of parents and other family members could lead to better well-being and performance. External support may include integrated support teams composed of nutritionists, fitness coaches, psychologists and communication coaches – because it is not only about technical skills but also non-technical skills and creating physical strength (Pereira *et al.*, 2016). For example, developing healthy coping mechanisms for coaches and players can facilitate sustainable high performance and longevity of the team (Mattern *et al.*, 2024). Positive vibes from the gaming community are essential for reducing stress, enhancing motivation and, ultimately, performance. Protecting players from the negative impact of social media (e.g. hateful comments) is paramount. Likewise, it can be beneficial to maintain the "fun in the game" for players to keep up the performance (Chang and Lin, 2014). Allowing time to try out new game mods, community maps and interactions, explore new things in the game or play in a relaxed manner with the community may act as a source of enjoyment for players. Moreover, all players should retrieve leadership training (Tannenbaum *et al.*, 1998), as in-game situations are dynamic and complex. Thus, they must be able to dynamically allocate decision-making authority throughout a match depending on the game state. Furthermore, we argue that more research on context-specific training (similar to health care or emergency response settings) is needed (Eppich *et al.*, 2011;

Weaver *et al.*, 2014). To best serve esports practitioners, such training needs to be developed and tested scientifically, ideally in cooperation with the practitioners.

Limitations

The findings of this systematic review should be interpreted in light of several limitations. First, our review excluded articles that were not written in English or published in peer-reviewed outlets, which may have resulted in an incomplete representation of the field. Additionally, our sample was drawn from a single database (WOS) using a predefined set of keywords, which may have restricted the final pool of studies. However, WOS is a comprehensive database, and we used broad search terms with placeholders to maximize coverage. Moreover, we supplemented the database search with journal-based searches and forward-backward citation tracking to enhance the inclusiveness of our sample. Second, potential biases may arise from variations in study methodologies, such as differences in sample sizes, geographical regions, participant demographics and inconsistent categorizations of individuals as either casual gamers or esports athletes. Also, many studies relied on qualitative methods or self-reporting tools, which can introduce bias and subjectivity, potentially limiting the generalizability of findings. The diverse measurement approaches used across studies not only highlight the complexity of esports team dynamics but also create challenges in comparing results across different research efforts. Third, the interpretation and categorization of studies were conducted by the authors, requiring the translation of terminology between heterogeneous disciplines, which may have influenced the thematic structuring of results. Finally, as this literature search was completed in January 2025, it does not account for newer publications emerging in the rapidly evolving field of esports studies.

Conclusion

This study offers a systematic literature review to integrate the fast-growing research on esports team effectiveness by synthesizing evidence from 92 studies. We structured our findings using the IMOI model (Ilgen *et al.*, 2005) and found that the majority of the literature falls into one of four categories: team compositional and structural features, leadership and external resources, TESs and team action processes. We highlight gaps existing in previous findings and inform how esports team research can enrich a future research agenda on esports teams and beyond. Despite growing interest in the field, there remains a notable lack of empirical studies leveraging the rich, multifaceted and fine-grained data the esports environment provides. This review underscores the need for more research on esports team effectiveness and a more sophisticated use of esports data by using quantitative and mixed-methods approaches capable of processing and analyzing these kinds of data.

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Further reading

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Supplementary material

The supplementary material for this article can be found online.

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