

Toward Successful Esports Team: How Does National Diversity Affect Multiplayer Online Battle Arena Video Games

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Abstract

Today, esports teams in multiplayer online battle arena (MOBA) games are often composed of players from around the world. The paper asks whether a greater national heterogeneity of professional esports teams means their higher effectiveness. Desk research data of 13 tournaments of Dota 2 game held in 2011-2018 is used to calculate the teams' win ratio, i.e., the ratio of skirmishes (in all matches) won to the total number of skirmishes (match is a series of skirmishes). Hence, effectiveness is understood not as ranks or matches won, but as the lowest possible number of lost skirmishes. Multinational teams achieved a higher win ratio, compared to nationally homogenous teams and the analysis includes the role of coaches' nationalities. Working groups, cognitive diversity, and similarity/attraction theories are used to signal potential reasons and consequences of diversity on team performance. This exploratory study indicates future research threads on esports teams' national diversity.

Keywords: esports teams, nationality, teams' effectiveness, esports coaches, MOBA games

1. Introduction

This article pertains to the national diversity of professional esports teams and determines the relationship between national heterogeneity and team effectiveness defined in terms of results (win ratio). The professional *Dota 2* teams are being analyzed, thus the focus is on a given multiplayer online battle arena (MOBA) video game developed and published by Valve. Desk research data from the most important *Dota 2* tournaments held in 2011-2018, i.e., The International (TI, 2011-2018) and Major (2015-2017)

tournaments is used to answer the following research question: are more nationally heterogeneous professional esports teams more effective (both players and coaches nationality is being considered)? Seeing esports crews as work groups, and referring to cognitive diversity (e.g. Cox & Blake, 1991), and similarity/attraction theories (e.g. Byrne, 1971) help explain the consequences of diversity on team performance.

1.1. National diversity in MOBA teams

In recent years, the position of esports games based on their popularity and metagame development has crystallized (e.g. Olsen, 2015). Nowadays, the most popular are sports games (e.g. *EA FIFA* series) and real-time strategy (RTS) games with two teams playing against each other (such as *Dota 2* or *League of Legends*). *Dota 2*—being an example of a MOBA game—began in 2011, and was played as a beta test version until 2013 when Valve released it officially. *Dota 2* continues to be a free-to-play video game with two five-member teams competing to win the so-called “map” by destroying enemy’s “Ancient” (the main structure belonging to each team). *Dota 2* is considered an esports game that requires players to master complicated systems, sophisticated mechanics, and rules of joint play while participating in league-based tournaments (e.g. Georgen, 2015).

The dynamic changes that the MOBA esports scene has undergone over the last decade are attributed to social, economic, and technological factors (e.g. Seo & Jung, 2016; Yong Jin, 2021). These resulted in the professionalization of MOBA and the possibilities of forming multinational teams composed of players from around the world (see Kołodziej, 2019)

Dota 2 requires at least basic knowledge of English (see e.g. Hapsari et al., 2018) and this is the language usually used in heterogeneous teams (some exceptions here are Asian squads; see e.g. Ismangil, 2018; hence continuing to be the most mono-national ones). This however is not problematic, as knowing English becomes the basic competency of professional MOBA players.

Similarly, the geographical dispersion of players of different nationalities is also less relevant. The tournaments' high prizes (with the TI 2018 prize pool amounting to \$25,532,177; see Bantilan, 2018) and sponsorship of both teams and individual players enable transfers of players from different parts of the world (see e.g. Marchenko & Suschevskiy, 2018). Teams with financial resources bring players to one place to train together to successfully compete in highly paid professional international tournaments. Additionally, even in the case transfer is not possible or the player is away, the internet opens options for online training and, generally, forming online teams (e.g. Park & Kim, 2015).

In summary, the technological advancements along with increasing sponsorship make geographical restrictions less important. Nevertheless, there are some restrictions in the case of online gaming as the players need to use the same server to compete. Valve servers that are located on different continents implicitly support players from a given region. Therefore, if two or more players in a skirmish play from different locations it will cause the so-called high ping, causing a delay while others experience smooth gameplay. In the presented study this factor does not interfere with the overall assessment of team effectiveness, since all data analyzed relate to offline/LAN tournaments organized at the given location.

1.2. Previous research on teams' effectiveness

The data on official tournaments and matches is freely available (e.g. Schubert et al., 2016), hence the researchers try to predict factors contributing to winning a single match in a multiplayer game (e.g. Hodge et al., 2017; Nascimento Junior et al., 2017; Semenov et al., 2017; Xia et al., 2019; Yang et al., 2016). Contrary to this, the presented study discusses individual features of professional players and coaches, to explain general teams' effectiveness. The data being analyzed is not the data from one match of a single team, but many matches of the same team. Correspondingly, the study focuses on the longer-term effectiveness, and not the effects of the team's temporary composition in a particular match, as some

other studies did (Eaton & Mendonça, 2019; Mora-Cantalops & Sicilia, 2019; Sapienza et al., 2017).

Some analyses (Parshakov et al., 2018; Parshakov & Zavertiaeva, 2015; Pobiedina, Neidhardt, Calatrava Moreno, Grad-Gyenge, et al., 2013) confirm that there is a relationship between the degree of homogeneity of the esports team and its effectiveness and show that the diversity of team members nationalities may be beneficial in the long-term perspective. However, the researchers study amateur teams and point to difficulties in verifying the data on players' country of origin (Pobiedina, Neidhardt, Calatrava Moreno, Grad-Gyenge, et al., 2013; Pobiedina, Neidhardt, Calatrava Moreno, & Werthner, 2013). While situating their research outside of the professional MOBA scene, they indicate the need for further research in this area.

1.3. Internal diversity of work groups

Teams in MOBA games can be seen as groups of people working on a particular task (work groups). Esports teams playing *Dota 2* have five players who interact virtually or face-to-face, have a common goal (winning a game), perform organizational tasks through different roles, and have different responsibilities in a given work environment (Kozlowski & Bell, 2003; Mathieu et al., 2000; McGrath & Argote, 2001). Kim et al. (2016) and Freeman & Wohn (2019) underline that esports teams are self-organized, time-pressured, and need intense collaboration.

In general, work groups may be internally diverse in terms of the abilities and backgrounds of their members (Horwitz, 2005). Personal characteristics such as gender, race, and ethnicity, play an important role here, as these are usually easily perceived by co-workers and may significantly affect the team's processes. Harrison et al. (1998) proposed a distinction between diversity indicators related to easily observable bio-demographic features (the first-level) and "deeper" (second-level) features that are "hidden", such as the personality of members, their attitudes, beliefs, values, etc. Horwitz (2005) assumes that the team's results are influenced by both first-level and second-level features and that the easily visible ones can result in considerable differences on the second level (see also the typology of task-related and relationship-oriented attributes by Jackson et al., 1995). While the article considers the first-level national diversity, this does not mean that it could not be a starting point for some future studies on the impact of nationality on the second-level features (this is elaborated on in the Discussion).

It is also important that in the management of heterogeneous work groups the emphasis is on specific organizational strategies and the training of group work skills, and systematic monitoring of teams' effectiveness (e.g. Horwitz, 2005; Larkey, 1996). Managing diversity has become a challenge for both practitioners and researchers, as not paying enough attention to communication processes may prevent achieving organizational goals. Miscommunication may cause serious conflicts and, consequently, a decrease in mutual trust among team members (e.g. Jehn, 1997; Pelled, 1996). Thus, diversity may lead to a decrease in group cohesion, and—in extreme cases—some discriminatory behavior may occur.

In their seminal article on workforce diversity, Cox & Blake emphasize that a “core of similarity among group members is desirable (...) the need for heterogeneity, to promote problem-solving and innovation, must be balanced with the need for organizational coherence and unity of action” (1991, p. 51). Practitioners and researchers underline that creating diverse teams may increase creativity and strengthens their innovation (e.g. Roberge & van Dick, 2010), although they find it quite difficult to determine the relationship between internal diversity and team performance (e.g. Horwitz & Horwitz, 2007; Roberge & van Dick, 2010). It is claimed that improving or worsening the effectiveness of diverse work groups depends on many contextual factors. Although work groups are often diverse in terms of demographics and cognitive abilities, it is unclear whether heterogeneous groups are more efficient than homogeneous ones (e.g. Horwitz & Horwitz, 2007).

Two approaches—cognitive diversity (e.g. Chow, 2018; Cox & Blake, 1991; Mello & Rentsch, 2015) and the attraction of similarities (e.g. Byrne, 1971; Tziner, 1985)—explain the consequences of diversity on team performance. The latter assumes that the homogeneity of the team, especially in terms of demographics (gender, age, ethnicity), promotes mutual attractiveness. Differences in this area usually harm team effectiveness and social integration. Conversely, the theory of cognitive diversity indicates the positive impact of diversity on team performance, since it means unique cognitive resources—a condition necessary for supporting creativity, innovativeness, and problem-solving (Horwitz & Horwitz, 2007). Both approaches will be addressed and related to the national diversity of *Dota 2* teams in the Discussion.

2. Methods

The analyzed data covers seven years, during which, the formula of TIs and Majors did not change

significantly. Each year more teams wanted to participate in the tournaments, and this could have resulted from the previously mentioned growing interest in esports and raising incentives (the winner of TI 2018—the OG team—received 44% of the total pool, which is more than \$11 million; Bantilan, 2018). The presented analyses refer to 13 tournaments (9 Internationals and 5 Majors) held in 2011-2018, in which 212 teams took part and played 3,329 matches. Only pre-COVID-19 events are considered, as the ones organized during lockdowns were canceled altogether or took place without the fans attending. The specificity of COVID-19 era tournaments could have influenced the variables considered in this study, hence these are not included, especially since obtaining data on how and why the composition of teams during lockdowns differed exceeded the scope of this article.

Assessing the national diversity of a given MOBA team was based on assigning specific nationalities to individual players. In this study, the player's nationality is taken directly from the available data and it is defined using objective factors of formal and legal nature (Barwiński, 2004). Considering gamers' nationalities, the teams were classified as multinational or mononational, and the country of origin and formal status of a given esports team as a professional business entity is not examined here. Also, teams appearing in subsequent tournaments are treated as separate cases, regardless of participating under the same name in other tournaments. This approach is used because teams' composition changes frequently between tournaments and this could influence the style of playing the game, communication, general team functioning, and—consequently—the results achieved.

The database used to carry out the analyses included official data provided by teams and organizations and data posted on the official websites of *Dota 2*. While numerous, such websites vary substantially in reliability. The criteria used for website selection were: (1) open access, (2) the most comprehensive scope, (3) transparent data structure (e.g. regarding matches' or players' statistics), (4) popularity among professionals (e.g. use of statistical data to run tournaments) and (5) community participation in content creation and control of the data. The following websites were used:

- <https://www.dotabuff.com>: The site is owned and run by Elo Entertainment, a company that provides statistical support to professional players. This dataset is often used by players and

teams to develop more effective game strategies and improve skills.

- <https://www.opendota.com>:
The work of volunteers who provide access to extensive statistics on players, teams, and rankings. Allows developers to create applications that use this data.
- <http://www.datdota.com>:
Database of players' and teams' statistics
- <https://dota2.gamepedia.com>:
A public database created by users who improve existing data and create new content.

Being open access, the data from these websites is free to use in esports and business analytics, and research projects. Third parties can use the data, as it is public and not protected by intellectual property law. Also, it is important to notice that these websites are constantly monitored by the fan community, professional players themselves, and the organizations representing them. This control system is focused on delivering reliable and high-quality data, as it can influence the tournaments, professional players, and teams, hence it could result in considerable financial gains. However, if there were any inconsistencies between data available on these websites, this was verified with other web sources (e.g. official profiles of players on social media, tournament histories posted on streaming services, and press articles on individual players and tournaments).

Based on the data available the study considers the following variables: team name, participation in subsequent tournaments, number of matches, and games played (where a game/skirmish is a single map being played; a match is understood here as a series of games, the exact number of which depends on a phase of the tournament), number of wins, the nationality of team members and team coaches. Based on these, two additional variables were introduced—the national diversity of the team (based on the nationality of its members; e.g. teams with one nationality or two, or three nationalities) and the win ratio (based on the number of skirmishes played and won).

2.1. Win Ratio

The win ratio was calculated to illustrate how effectively teams compete with one another during the tournaments. Effectiveness cannot be measured solely by the number of events won or ranks. Both TIs and Majors are multistage competitions and group stage or main stage (playoffs) failures make it necessary to play more skirmishes/games, but the teams still retain the chance of taking top places or even winning the entire tournament.

In the group stage top teams from each group advance to the upper bracket of the main event. However, all other teams go to the lower bracket, hence being defeated does not eliminate a given squad. It is the playoffs that are crucial with the lower bracket teams going out of the tournament after losing the first match, and the upper bracket ones still playing further games after the initial defeat. This complex system rewards teams that manage to achieve high efficacy in the group stage. For successful teams, the path to the final is significantly shorter and lower efficacy means playing more games.

Ultimately, teams with the same number of matches won could play a completely different number of skirmishes. In the Majors, the most effective team, i.e., the one that would win each subsequent match without losing a single game, would have won the tournament after playing a total of six matches and 13 games. This perfect result is the shortest way to victory. Opposite, the least effective way of winning a trophy is playing 10 matches and 28 games. For comparison, the fastest way out of the tournament is being defeated in three matches with five games. In TI series, consecutive 12 matches (25 games) won guarantee a final success, and the longest path to winning the entire event means 15 matches and as many as 37 games. The team that is the first one to be out of the tournament plays eight matches and 16 games.

These numbers show the importance of winning matches with the lowest possible number of lost skirmishes. Each team struggles to avoid losing games, as this is the shortest way to top places and a way to avoid fatigue. This shows the importance of the win ratio, calculated as the ratio of games/skirmishes won to the total number of games/skirmishes and usually given as a percentage thus ranging from 0 to 100. In the presented analyses, the ratio is given in decimal values from 0 to 1 and used to measure teams' effectiveness. In this approach, effectiveness is not only about ranks in the given tournament (matches won) but rather about teams' efficacy. In a long run, a team that maintains a high win ratio achieves good results and at the same time minimizes the required effort (it is worth remembering that the paper does not evaluate the long-term efficacy of every single team as teams from subsequent tournaments are treated as separate cases).

In Table 1 the teams are divided into four groups concerning their win ratio and connected with places in the tournaments—e.g. only 4.7% of the teams managed to win more than three-quarters of their games, and these highly effective teams usually took the highest places in the tournaments. Although it cannot be unequivocally stated that a high win ratio

means winning the tournament, teams with the highest win ratio were indeed the top-ranked teams (see Table 1). It is possible that the squad with a high win ratio in the group stage suddenly loses all games in playoffs and drops out, or that a crew that barely struggles in group skirmishes, then wins the entire tournament. However, as mentioned above, this does not mean that the win ratio cannot be used to assess the team's effectiveness, especially since the rules of both the TIs and Majors highly reduce the possibility of achieving a high win ratio by a team eliminated at the beginning. Therefore, the win ratio was used to analyze whether and to what extent the players' nationality may affect the teams' effectiveness.

Table 1. Teams' win ratio and places in tournaments (%)

Win ratio	N	%	Places 1-4	Places 5-11	Places 12-18
0.0-0.25	32	15.1	0.0	18.8	81.3
0.251-0.5	91	42.9	1.1	56.0	42.9
0.51-0.75	79	37.3	53.2	43.0	3.8
0.751-1.0	10	4.7	90.0	0.0	10.0

p 0.706, $p < 0.001$, $N = 212$

3. Results

3.1. National diversity

As mentioned earlier, each team consists of five players, hence the representation of one to five different nationalities is possible. Multinational teams are becoming increasingly common at tournaments. In the presented study teams with at least three nationalities accounted for almost 36% of all teams participating in TIs and Majors and teams with two or more nationalities for almost 68%. Figure 1 shows a decline in one-nationally teams and an increase in multinational ones.

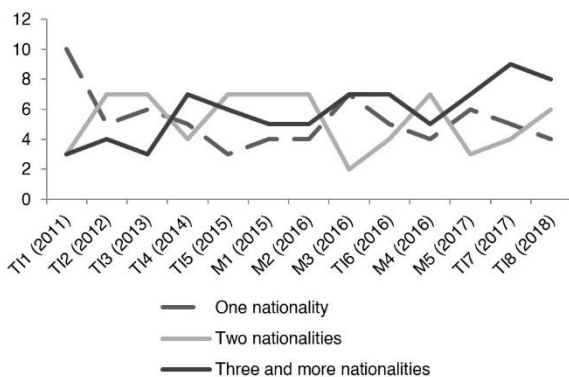


Figure 1. The national composition of the teams in subsequent tournaments (N)

The number of teams that participated in the analyzed tournaments and hired a coach increased (see Figure 2) and the nationality of the coaches is another factor diversifying the squads (see Figure 3). The coaches were usually of different nationalities than any of the players on the team. The second most common situation was the maximum homogeneity of the team, including the coach who had a similar nationality as any other member of the squad. Thus, with these polarized results, it is worth considering how effective were those homogeneous and heterogeneous groups.

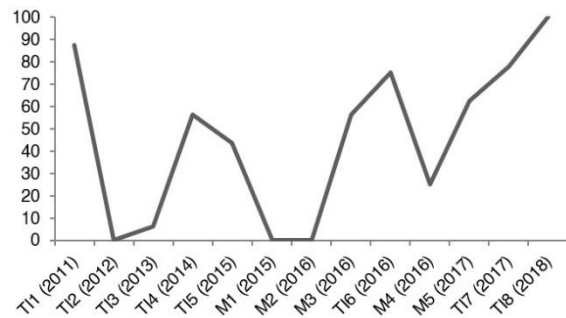


Figure 2. The percentage of teams having a coach during a tournament (%)

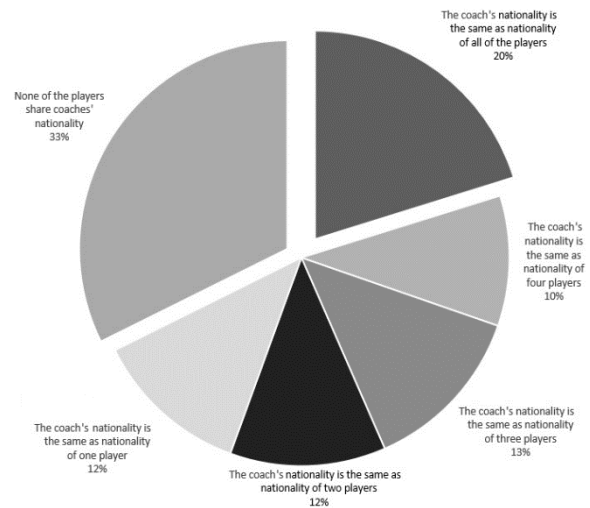


Figure 3. Homogeneity of the nationality of the coach with the team members (%)

3.2. Teams' effectiveness (win ratio)

As mentioned previously, the presented article answers whether the effectiveness of the team increases along with the national diversity of the team. This can be assessed using the win ratio especially since other socio-demographic features of the team members (like age, gender, etc.) are similar (although

it was not possible to consider other potentially viable variables—an issue elaborated on in the Discussion).

The issues that must be considered here are: 1) the national diversity of the team members and 2) the presence and nationality of the coach as a potential factor that may affect the team's effectiveness. Table 2 shows that in the case of the former, the more diverse the team was, the better its results were, with teams with players of at least three nationalities usually registering the two top win ratios. Importantly, 51% of these teams were able to win more than half of the games, compared to 37% of other squads. Moreover, this dependence was also visible in highly homogenous teams (one nationality)—e.g. 20,6% of these teams were not able to win more than 25% of the games. These findings are confirmed by the correlation coefficient between the analyzed variables (win ratio and team heterogeneity) being ρ 0.155 ($p < 0.05$), which means a weak but statistically significant positive relationship.

As mentioned before, the tournament's ranks cannot be seen as a perfect indication of a team's effectiveness. Nevertheless, it is worth noticing, that the squads with players of at least three nationalities were the top-ranked ones the most often as shown in Table 2. The relation is also noticeable in case of the worst places occupied usually by homogeneous and two nationalities teams.

Table 2. National diversity plus having a coach and win ratio and places in tournaments (%)

		Win ratio				
		N	0.751-1	0.51-0.75	0.251-0.5	0-0.25
Team heterogeneity						
One nationality	68	1.5	35.3	42.6	20.6	
Two nationalities	68	2.9	33.8	50	13.2	
Three and more	76	9.2	42.1	36.8	11.8	
ρ 0.155, $p=0.024$, $N=212$						
Coach						
Team with a coach	98	6.1	39.8	41.8	12.2	
No coach	114	3.5	35.1	43.9	17.5	
ρ -0.93, $p=0.176$, $N=212$						
		Places taken in tournament				
		N	Places 1-4	Places 5-11	Places 12-18	
Team heterogeneity						
One nationality	68	22.1	42.6	35.3		
Two nationalities	68	14.7	45.6	39.7		
Three and more	76	35.3	40.8	23.9		
ρ 0.143, $p=0.037$, $N=212$						
Coach						
Team with a coach	98	31.7	41.8	26.5		
No coach	114	18.4	43.9	37.7		
ρ 0.161, $p=0.019$, $N=212$						

Teams that hired a coach achieved a win ratio over 0.5 more often than those that resigned from coaches (for win ratio higher than 0.7 this is even more visible; however there is insufficient statistical evidence that

the correlation between these two variables is significant). The same can be said about places in the tournaments (Table 2), thus having a coach seems to be associated with the squads' effectiveness. However, the data used does not allow one to clearly explain the coach's role in improving effectiveness, with many potential variables being important here. For example, a coach's personality or style of work, medical resources, etc. could influence the players' performance—a topic elaborated on in the Discussion.

When it comes to coaches' nationality, on the one hand, highly homogeneous crews with all players having the same nationality were more successful when trained by a coach of the same nationality (Table 3). On the other hand, strongly heterogeneous teams with players of at least three different nationalities achieved better results with the coach having different nationalities than the members (Table 3). These results show that the relation between coaches' nationality and effectiveness is not that clear in the case of the presented study, contrary to the influence of national homogeneity/heterogeneity of players and having or not having a coach at all.

Table 3. National diversity plus coaches' nationality and win ratio and places in tournaments (%)

		Win ratio			
		0.751-1	0.51-0.75	0.251-0.5	0-0.25
Mononational teams					
Coach's nationality is the same as players' nationality		0.0	45.0	35.0	20.0
Coach's nationality is different from that of all players		0.0	28.6	57.1	14.3
Multinational teams					
Coach's nationality is shared with one player		8.5	36.2	46.8	8.5
Coach's nationality is shared with two players		5.7	34.3	48.6	11.4
Coach's nationality is shared with three players		4.3	43.5	43.5	8.7
Coach's nationality is shared with four players		0	50	50	0
ρ 0.112, $p=105$, $N=212$					
		Places taken in tournament			
		Places 1-4	Places 5-11	Places 12-18	
Mononational teams					
Coach's nationality is the same as players' nationality		40.0	40.0	20.0	
Coach's nationality is different from that of all players		0.0	42.9	57.1	
Multinational teams					
Coach's nationality is shared with one player		31.9	38.3	29.8	
Coach's nationality is shared with two players		31.4	37.1	31.4	
Coach's nationality is shared with three players		39.1	34.8	26.1	
Coach's nationality is shared with four players		30	50	50	
ρ -0.048, $p=490$, $N=212$					

Also, Table 3 shows that one cannot indicate a correlation between a simple distinction that the team is either mononational or multinational and the win ratio and places taken in the tournament. This means that what matters here is not only the fact that a given team is mono or multinational but also the degree of national diversity, as indicated above.

4. Discussion

During the past decade, multiplayer online battle arenas (MOBAs) have become one of the most played game genres, and their market is growing at an extremely dynamic pace (Hamari & Sjöblom, 2017). Therefore, one should expect not only progressive professionalization using metagaming sources to manage teams (see Mora-Cantalops & Sicilia, 2018), but also making strategic decisions based on scientific inquiries. Considering the development and availability of pre-game, in-game, and post-game data, the analysis of tournaments, games, and matches could provide new insights into the performance and the effectiveness of professional esports teams (and this is true not only for *Dota 2* but also other similar titles like *League of Legends*, *Heroes of Newerth*, *Heroes of the Storm*, *Dead Island: Epidemic*, *Dawngate*). The presented research is an example of such analysis, using win ratio data and combining it with the nationality of members (players).

As indicated in the Introduction, previous studies on characteristics diversifying people in work groups indicate that these characteristics may improve or worsen teams' effectiveness (depending on various contextual conditions). Considering the aim of the article, one may thus assume that national diversity could trigger problems and prevent teams from achieving their goals. These problems could impede proper communication, causing players of different nationalities not to be able to function effectively as a team, cause conflicts, and potentially lead to teams' disintegration—all this in line with the attraction of similarities approach. This article shows that it is the opposite—the multinational teams are the most effective ones and highly differentiated squads achieve a higher win ratio. What is important is that these teams are similar in terms of basic characteristics of their members, such as gender or age, hence the connection between national heterogeneity and effectiveness becomes clearer.

Moreover, it seems that having a coach is more important nowadays, as it could be another factor influencing the teams' win ratio. Squads with a coach generally achieved higher win ratio and held top positions more often than teams without a coach. However, the link between the coach's nationality and

the team's effectiveness is less clear. It could be that in the case of homogeneous teams trained by a coach of the same nationality this cohesion helps eliminate communication barriers and adjust the training methods to the expectations of all team members (thus the similarity/attraction theory applies). Such teams whose members communicate in one national language may not respond well to a foreign-speaking coach. Opposite, multinational teams achieved the best results while working with a coach whose nationality was completely different from that of the players—this could mean greater cognitive diversity. A strongly differentiated squad may respond better to new solutions and methods brought by a “stranger” and “innovative” coach. A coach's nationality could be important for matching the right coach to a given team. Additionally, in any future analyses, one could consider the specific role of a coach in a team, i.e., proposing a strategy and recognizing the strengths and weaknesses of the opponent (see e.g. Sabtan et al., 2022). Connecting this role with a win ratio and teams' national diversity is worth further exploration.

As mentioned before, the results presented confirm that of Pobiedina's et al. (2013; 2013) who found national diversity to be related to the teams' results. However, the researchers pointed to difficulties in verifying the players' country of origin as they studied amateur teams only, a problem not relevant to the presented study. Amateur players are unable to verify the characteristics of other members of their current team, a situation not occurring in professional esports. The analyses of pro-teams are the only ones that may go beyond the problem of ephemeral amateur teams. Only by analyzing data on perfectly-controlled tournaments, it is possible to test assumptions on different variables influencing effectiveness, including measuring the impact of nationality.

This does not mean that the presented study is not without limitations, as the relation between win ratio and national heterogeneity/homogeneity is rather a one-dimensional one. Many variables that could influence both national differences in teams' composition and win ratio are not considered due to the limitations of data used. For example, there is no assessment of individual players' skills here. Also, the teams' finances could be important, as only the richest organizations could afford to hire the best players of different nationalities and/or coaches. What is more, these teams might be the ones with enough resources to support members from different parts of the world to stay and train together, locally (and also these teams may have other important resources, e.g. medical ones). Also, nationality is not differentiated in any way, hence any future studies could try to further the

presented analysis by including the parts of the world the players come from—e.g. are European teams (composing of players coming solely from Europe) more effective than the ones that have a wider mix of nationalities (e.g. Europeans, Asians, etc.).

The study does not consider the meaning ascribed to nationalities, i.e. perception/feeling of difference and how it might influence effectiveness, and also some other variables that could be connected with nationalities, such as e.g. religious beliefs, organizational culture, collective values (see e.g. Harrison et al., 1998; van Knippenberg et al., 2004). It is not about the aforementioned second-level differences but the first-level ones. Nevertheless, it is worth remembering that the former may affect the latter and affect the way resources and/or support are used. In the longer term, these could influence the knowledge and skills of players necessary to complete tasks, and determine roles and positions in the team, hence influencing the whole team's functioning (see e.g. Jackson et al., 1995).

Considering this, the article does not aim to answer why are the nationally heterogeneous teams more effective or how are differences in nationality not problematic. However, looking at the theoretical background introduced earlier one could indicate some leads in this regard. For example, the similarity of esports teams' members in terms of their basic socio-demographic characteristics such as gender and age could be psychologically comforting as stressed by the attraction of similarities approach. This, in turn, could help solve basic communication problems resulting from different nationalities. Also, this could increase the chances of achieving success because of favoring innovativeness as stressed by the cognitive diversity approach. The environment which favors the identification of differences and similarities accounts for diversified visions of achieving the team goal hence facilitating different solutions. It is thus possible that nationally diverse teams could gain not only the high skills of players but also processes that promote innovative game strategies. This could be especially important in the case of *Dota 2*, as it requires that the players change and innovate playing strategies as the game parameters change from time to time (every month or so, the so-called "patches" are released aimed at balancing the gameplay by tweaking its mechanics). Hence, the players must work together to identify the weaknesses and strengths of the squad and the causes of failures. Looking at cognitive diversity one could assume that possible initial difficulties in achieving effective results in multinational teams are counteracted with joint training leading to innovative solutions (see e.g. Faust et al., 2013).

Such conclusions are not possible to be stated here with full certainty; similarly, the article does not make any claims on how nationality influences the style of play of individual players or on how specific cultural predispositions might affect skills and as a result determine higher effectiveness. To answer these one would have to propose research mixing quantitative methodologies (e.g. as presented here) with qualitative inquiries, and this could be one of the future research threads worth pursuing. The same with including other important variables (such as the above-mentioned teams' finances, perceptions/feelings of difference, and other second-level features) that might affect the effectiveness and combining these with national diversity. Hence, there is a strong need to continue the analyses on teams' effectiveness in the context of national homogeneity-heterogeneity. Although some studies have examined the consequences of teams' composition for performance and membership stability (see the Introduction), there is still limited research on nationality, including, how it could affect longer-term, task-related consequences, such as performance satisfaction and learning. The presented study wants to intensify the discussion on how the players' nationality might affect teams and it must be seen as a step toward filling this research gap.

This could be important not only for understanding teams' internal processes and performance. Today, both squads and organizations would do well to develop effective long-term management strategies that would consider assessing the players' cooperation within multinational crews. Not only effectiveness could matter here, as understanding the role of nationality in esports might also contribute to a better understanding of the recent changes in the esports scene, i.e., its general expansion and intensive migrations of players. Similar to traditional sports, esports audiences find pleasure in identifying the nationality of players and teams (Ruotsalainen et al., 2022; Ruotsalainen & Välsalo, 2021), hence managing teams in terms of national diversity seems important for both results and marketing and building brands.

5. References

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