

The University of Texas at Dallas

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**Esports Cyberathlete Development (ECD): The Initiative to Enhance the Esports Player
Cognitive Performance & Wellbeing**

Annotated Bibliography (Version 1):

The Emergence of Esports

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ARTSCILAB



SCHOOL OF ARTS, TECHNOLOGY, AND EMERGING COMMUNICATION
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Introduction

This Esports Cyberathlete Development (ECD) project launched by the University of Texas at Dallas' ArtSciLab aims to contribute to design one of the first new sports of the 21st century. The ArtSciLab exists within UT Dallas' School of Arts, Technology, & Emerging Communication. Our goals within the lab are to change the history of ideas & to accelerate the careers of all who research in our lab. With our team of transdisciplinary minds, we introduce a project that is just as multifaceted. Our efforts aim to:

(1) Promote positive values obtained from participating on an Esports team;

- a. Investigate the enhanced cognitive abilities through the strategically-complex gameplay of Esports
- b. Investigate the positive social developments that occur in and out of the Esports environment

(2) Focus on relieving the stigmatized universe of Esports concerning gender stereotypes and effects on intellectual performance;

- a. Our research aims to increase overall inclusivity among various demographics and how its benefits are not discriminatory towards any gender

(3) Help to integrate the skills learned by the Esports players into their lives during and after their Esports careers;

- a. Analysis of cognitive skills acquired by gamers during their gameplay, how such skills can generally transfer to real-world application, and to increase their executive longevity

Background

For the past couple of years, media platforms have broadcasted controversial topics surrounding Esports and neglects the cognitive enhancements that such a strategic sport instills

in its players. Our Esports Cyberathlete Development project will recognize positive and negative variables associated with Esports (i.e., camaraderie and addiction) to better understand the Esports culture on a global level. While data analytics have been applied to Esports, practices implemented to improve the cognitive performance and mental wellbeing of the players is not quite established.

Collaborations

As of now, our Esports Cyberathlete Development project will be collaborating with Esport organizations providing different approaches based on resources available. Through these collaborations, we will gain insight into the psyche of an Esports player, bring an academic element to a local Esports team, and use state-of-the-art medical sciences through the to help prevent Esports players from a spectrum of injuries (i.e., physically, mentally, and/or emotionally) or other negative consequences:

(1) Mark Cuban’s NBA2K team, Mavs Gaming, and The Center for BrainHealth

(2) UT Dallas Esports Team and Center for Vital Longevity

Microprojects

Esports Cyberathlete Development seeks to redesign the electronic gaming environment by increasing engagement in positively impactful games, particularly among those in lower socioeconomic groups. We seek to integrate our sources of community outreach into this collaboration with Mavs Gaming to create an all-inclusive atmosphere. Some of our existing collaborations involve Students Advocating for Mental Health Education (SAMHE) as well as the Dallas Youth Chess League.

The ArtSciLab’s *Creative Disturbance* podcast directed by UTD graduate, Yvan Tina, is working to designate a channel between African Esports Gamecamp organizer, Kofi Sika

Latzoo, and Mavs Gaming. The potential tangible outcomes: explore streaming games as an experimental publishing media; an African LASER (Leonardo Art Science Evening Rdv) on Brain Sciences and Gaming in Dakar; and, through the Mark Cuban Companies Foundation, a Summer/Boot Camp on artificial intelligence held in Dakar (or any other African city).

Publications

Our Esports Cyberathlete Development Team is writing this annotated bibliography to include a compilation of research domains interested in Esports and its emerging enterprise. Our sources vary from academic journals to online publications. Support from these publications allow for further areas of investigation to be explored. While Esports is becoming a great area of interest in psychological, physiological, and academic research, we are eager to embark on this journey with Mavs Gaming and the Center for BrainHealth. As we continue our research, our annotated bibliography will expand its chapters and subchapters.

Our Methodology

Our Esports Cyberathlete Development team is practicing transdisciplinary methods which involve a team of people from diverse disciplines creating team science. Accompanying our extensive research on the topic of Esports, we implemented the theory of co-design (originally “co-operative design”, aka participatory design). In the process of co-design, the approach to design which expresses the need for collaboration between designer and who they are designing for.

We first approach this theory by involving our lead authors, Lauren Bernal and Kristen Deupree, in a series of “Esports Gaming Sessions” to gain an understanding of the Esports player psyche. Through this process, we have created documents where progress and performance can be analyzed in the long-term. These documents (snapshots featured in Appendix) include and

Excel Spreadsheet which indicates the date and time session began, name of attendee, level of gamer you consider yourself to be, Esport played, character selected, time gaming session ended, and a link to the “Esport Reflection Report” (created by Lauren Bernal). The Esport Reflection Report gives Bernal and Deupree the ability to document their experience through their gameplay. It is sectioned into 6 parts: 1) name and date, 2) game played and champion selected, 3) purpose of the sheet, 4) instructions, 5) personal reflection, and 6) rate overall experience per session (ranging from poor to great).

Secondly, we are applying the co-design theory by organizing a focus group of avid Esports players around our UT Dallas campus; involving players who focus on different genres. Through the focus group, our facilitator will issue a series of questions to gather anecdotes of the players’ experiences while playing Esports and how it has impacted their lives. Our measure of success will be determined by the number of qualitative evidences collected per session. Subsequently, we will feature their anecdotes into *Chapter 7. Case Studies*.

Within our project, we have developed a small, executive, team entitled “Persistence”. The name is a play on words from The French Resistance (La Résistance) that was a collection of movements who resisted the Nazi German occupancies in France during World War II (Wikipedia). By changing the first half of “resistance” with “persist-“, we unite to challenge the stigmas surrounding Esports with persistence. The purpose of this formation is to keep executive decision making within the leaders of the Esports Cyberathlete Development Team that is internal to the ArtSciLab. The Persistence consists of this annotated bibliography’s lead authors, Lauren Bernal and Kristen Deupree, co-author, Thouseef Syed, and Esports Cyberathlete Development participant, Alex Garcia-Topete.

Esports Cyberathlete Development Team

Lead Authors

Lauren Bernal, Project Manager of Esports Cyberathlete Development, has experience with an array of research domains branching from transdisciplinary curriculum, music perception and cognition, and interpersonal conflict through UTD's BBS and ATEC. She has a B.S. of Psychology degree from UTD's class of 2019. We anticipate 100% of her time will be designated towards this project by coordinating the efforts of each entity involved along with the research and publications produced by the Esports Cyberathlete Development Team.

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Kristen Deupree, Cognition and Neuroscience Researcher at ArtSciLab, is a researcher and musician, with experience conducting research in music cognition, auditory and visual cognitive neuroscience, applications of information mapped to auditory dimensions, and usability. She has her Master of Science in Applied Cognition and Neuroscience and her Bachelor of Science in Neuroscience with a minor in Performing Arts from the University of Texas at Dallas.

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Thouseef Syed, Machine Learning Researcher & AI/ML Lead of ArtSciLab, is pursuing his Masters in Applied Cognition and Neuroscience majoring in Computational Modeling/Intelligent Systems. He is the creator and developer of Besso, which is a virtual interactive lab assistant tailored for the ArtSciLab. It provides academic, research and technical support to the distinguished members of the lab. As far as **Esports Cyberathlete Development** is concerned he would contribute in enhancing the cognitive well-being of esports players through his expertise in Machine Learning and Data analytics.

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João Silveira, entrepreneur, artist and researcher with a background in Pharmacy and Ph.D. in Education, Management and Science Communication. Currently, João is a guest researcher at the University of Texas at Dallas, and Fiocruz (Brazil) the founder of the Arteciência, a startup that connects art and science to promote creativity and innovation within the school environment.

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Chapter 1: What are Esports?

The following annotations explain the phenomenon of Esports and how its culture has become an international sensation. Beginning with a defining article of Esports, this chapter introduces the genres of Esports (Appendix, Table 1), Esports streaming platforms (Appendix, Table 2), and the influences Esports projects to its players and social domains.

1. Hamari, J., & Sjöblom, M. (2017). **What is Esports and why do people watch it?**. *Internet research*, 27(2), 211-232.

Annotation:

In this article, Hamari & Sjöblom demystify the phenomenon of Esports. First, they **define Esports** as a form of video gaming that is mediated by human-computer interfaces. Acknowledging that electronic gaming is on the rise, Hamari & Sjöblom conducted a study to measure the motivation of Esports and what predicts Esports spectating frequency. Their study utilized the adapted 7-point Likert **motivation scale for sports consumption (MSSC) scale** (Trail & James, 2001) for qualitative measures (i.e., media consumption motivation) which allowed comparisons to traditional sports. They **hypothesized motivational factors would predict frequency of views**. Of the motivational factors, Hamari & Sjöblom found positive and statistical significance between acquiring knowledge from Esports, and enjoyment of aggression with viewer frequency. However, they also found that the enjoyment of aesthetic aspects of Esports was negatively associated with viewer frequency.

2. Jang, W. W., Byon, K. K., & Zhang, J. C. **Genre as a Moderator of the Effects of Determinants Associated with eSports Playing Intention.**

Annotation:

This article is based on an online survey study that investigated the determinants of Esports consumption into six predictors (i.e., hedonic motivation (HM), habit (HB), price value (PV), effort expectancy (EE), social influence (SI), and flow (FL)) of **playing intention** (Jang & Byon, 2018). Addressing their research question “Can eSports **genre moderate eSports consumers’ motivations** to play eSports games?”, they adopted a typology of Esports genres (a) Imagination (IM), (b) Physical Enactment (PE), and (c) Sport Simulation Video Games (SSVG) (Lucas & Sherry, 2004). Their results imply the IM and PE groups shared 5 predictors (HM, HB, PV, EE, and FL), but with the IM group prioritizing FL. On the other hand, the SSVG group showed only 3 predictors related to the survey (HM, HB, & PV).

3. Pluss, M., Bennett, K. J. M., Novak, A. R., Panchuk, D., Coutts, A., & Fransen, J. (2019).

Esports: The Chess of the 21st Century. *Frontiers in Psychology, 10*, 156.

Annotation:

Authors of this article, Pluss, Bennett, Novak, Panchuk, Coutts, & Fransen (2019), **tie the bridges of expertise from Esports to chess players**. In the 1970s, chess players’ complex thoughts and processes were studied (Chase and Simon, 1973). Pluss, Bennett, Novak, et al. (2019) extended this notion by analyzing the expertise of an Esports player. They state there are three factors of Esports performance which delineate **expertise development: (1) objective and systematic tracking of the player that is logged online, (2) constraints of representative tasks from electronic gaming that correspond with the real world, and (3) expertise emergence by lack of systematic and influential training environments**. The developmental spectrum of expertise is best followed by the automatic online logs that track the Esports player’s quantity and quality of performance.

4. Zak, R. (2019, March 18). **How to start watching Esports**. Retrieved August 7, 2019, from <https://www.techradar.com/how-to/how-to-start-watching-Esports>

Annotation:

The author simplifies the process of how to watch and understand the realm of Esports.

Steps: 1. Find the game(s) for you, 2. Learn the lingo, 3. Embrace the culture, and 4. Stay informed.

1.1 Popular Esports Games & Genres

4. I. (2019, May 14). **Top 10: The Most Popular Esports Games on Twitch**. Retrieved August 5, 2019, from <https://www.ispo.com/en/trends/top-10-most-popular-Esports-games-twitch>

Annotation:

This article lists the Top 10 most streamed games on Twitch.tv from around the world as of April 2019. **1st place: Fortnite** (Battle-Royal-Genre with over 106 million hours of streams over the course of a month. The goal is to be the last player alive), **2nd place: League of Legends aka LoL** (Multiplayer Online Battle Arena [MOBA] with over 95 million hours of streams), **3rd place: Defense of the Ancients (Dota) 2** (MOBA with over 39 million hours of streams), **4th place: Overwatch** (First-Person-Shooter [FPS] with over 30 million hours of streams), **5th place: Hearthstone** (online card trading game with over 29 million hours streamed), **6th place: Counter-Strike: Global Offensive** (two-team shooter game with over 28 million hours streamed), **7th place: Players Unknown Battleground** (multiplayer shooter game with over 23 million hours streamed), **8th place: World of Warcraft aka Wow** (Massively Multiplayer Online Role-Playing Game [MMORPG] with over 20 million hours streamed), **9th**

place: Apex Legends (Battle-Royal-Genre with over 17 million hours streamed), and **10th place: Mortal Kombat 11** (over 9 million hours streamed).

1.2 Esports Broadcasting Platforms

5. Burroughs, B., & Rama, P. (2015). **The Esports Trojan horse: Twitch and streaming futures.** *Journal of Virtual Worlds Research*, 8(2).

Annotation:

This article discusses the dominate broadcasting platform for Esports, **Twitch.tv**. The Twitch.tv platform allows reality and the virtual world to come together on a global level. By performing and spectating on Esports games, Twitch.tv is serving as a cable-streaming service in the gaming culture that allows **greater accessibility to diverse demographics**. Twitch.tv is helping to bring a **concomitant cultural shift in gaming that blurs the line between being a consumer or a producer of streaming content**.

1.3 Team Dynamics

6. Mora-Cantallops, M., & Sicilia, M. Á. (2018). **Player-centric networks in League of Legends.** *Social Networks*, 55, 149-159.

Annotation:

This article investigates the **ego-networks** formed by Esports players **when playing massive multiplayer online games (MMOG)**, particularly **League of Legends (LoL)**. The authors emphasize how Esports is a significant turf for research exploration given the facets involved; psychology, sociology, economics, and computer science; which all produce unique data per ego (Esports player). The present study clustered egos into either of the four groups: **C1 (the “team player”, frequently plays with the same players at the same time)**, **C2 (the “group player”, regularly plays with 2-3 friends and occasionally plays with other groups or alone)**, **C3**

(the “cell or duo players”, join the game with a random 2-3 members and play solo more often than C1 and C2), C4 (the “solo” player, no strong links between other players and is the least social of all clusters).

Regarding the LoL ranking system, C1 players were notably less highly ranked than the other clusters whereas **C3 and C4 were higher ranked** as platinum plus diamond players. Possible social influences of ego achievement: (1) **the higher the rank of the player**, the less convenience they have to play with players on their level resulting in **solitary play** and (2) the **competitions that are crucial to the players rank** lead the ego to be more selective in their gameplay, less likely to play with their real-life friends to avoid conflicts, and conscious/behavioral **professionalism** is eminent.

1.31 Gamer Communication

7. Wagner, M. G. (2006, June). **On the Scientific Relevance of Esports**. In *International Conference on Internet Computing* (pp. 437-442).

Annotation:

This article focuses on the **dynamics of communication and high-speed strategic decision making** that occur within Esports teams. The authors emphasize strong communications skills and their crucial role in a “high-performance” team when **executing collaborative tasks** when making quick-critical decisions. Additionally, youth-culture is increasing its competencies through such practiced behaviors, creating a wider social-technological gap between cohorts. In conclusion, the authors suggest such the communicative and quick decision-making skills acquired through Esports can be reframed as **team management skills** and **predict the team’s overall success**.

8. Tang, W. (2018). **Understanding Esports from the Perspective of Team Dynamics.** *The Sport Journal*, 21.

Annotation:

This article dissects the differences in becoming a professional or casual Esports team. In addition to the rigor of being a professional Esports player, the enjoyment of playing is heavily dependent on the **cohesion of communication, motivation, and support** from their teammates. Considering each player has an important role, their **cognitive capacities are correlated with high-performance teams**. Diversity within each team is unavoidable given that Esports is an international activity. With this, exposure and coordination with **diverse ethnic and racial backgrounds is conducive to each player's cognitive development**. The **social dynamics** of playing Esports teaches the players **resiliency and emotional support, online and offline**. Similar to traditional sports, the collaboration among the Esports players emphasizes a sense of community among teams and spectators.

9. Mora-Cantallos, M., & Sicilia, M. Á. (2019). **Team efficiency and network structure: The case of professional League of Legends.** *Social Networks*, 58, 105-115.

Annotation:

The authors approached this study to understand how League of Legends (LoL) professional **players assist each other** during a competitive match and to **link their computer mediated behavior and social interactions to their team's performance**. Interpersonally, the team's network coordination is closely stitched as the teams are comprised of 5 players. LoL is one of the most popular MOBA games and enforced adaptability for its players; every two weeks, a new "patch" updates preexisting Champions (game characters) and abilities. This study examines the **network intensity between players and the detriments of player centralization**

(**individual performance**) and find network intensity to be predictive of high team performance and player centralization to be the latter.

1.4 Gender Differences

10. Ruvalcaba, O., Shulze, J., Kim, A., Berzenski, S. R., & Otten, M. P. (2018). **Women's experiences in Esports: Gendered differences in peer and spectator feedback during competitive video game play.** *Journal of Sport and Social Issues*, 42(4), 295-311.

Annotation:

This article encapsulates a total of two studies that focuses on the **female gamer experience** with **sexual harassment and feedback (positive and negative)** in the male dominated Esports. In Study 1, gender differences were analyzed in online gamers' experience with feedback from other players and spectators during online play. In Study 2, gender differences were analyzed in observations of real gameplay that focused on the types of comments spectators directed toward female and male gamers on Twitch (a popular video game streaming website). The findings indicate female gamers experienced a significant amount of sexually harassing comments in comparison to the male gamers.

11. Dargonaki, S. (2018). **Performing gender on Twitch. tv: Gendered playbour through Butlerian theory.** *International Journal of Media & Cultural Politics*, 14(1), 103-110.

Annotation:

This article is centralized on the ethnographic study of the hegemonic masculinity within the culture of Esports production and consumption. From philosopher and feminist, Judith Butler, gender is a construct developed by traits that imitate dominating norms. With this philosophy, Dargonaki observed her data by participating in Twitch.tv, websites, forums, blogs, and social media pages. Additionally, she collected data from streamers using semi-structured

interviews. She states the identity of a professional gamer is **most respected** when the **gamer demonstrates the following masculine traits: rational resource management, competitive demonstration of skill, technical mastery, and great temporal investment**. The female streamers Dargonaki observed either exaggerated or polarized their typical feminine personality traits for the entertainment of their spectators. She further concludes that in the realm of streaming, a **streamer's personality becomes the commodity of their channel and shapes their value** in the eyes of their spectators.

12. Cole, H., & Griffiths, M. D. (2007). **Social interactions in massively multiplayer online role-playing gamers**. *Cyberpsychology & behavior*, 10(4), 575-583.

Annotation:

This article explores the **social interactions that occur inside and outside of massive multiplayer online role-playing games (MMORPGs)**. Previous findings suggest the MMORPG world allows variants of self-expression and liberation through this form of escapism. Additionally, collaborative performance through teamwork provides players with encouragement, comradery, and creates a fun experience. Through this study, the researchers concluded several gender differences when it comes to the ins-and-outs of MMORPG. Of their sample, they gathered a total of 447 male and 246 female players. On average, the male players played slightly more hours than females ($m = 23.3 h > f = 21.7 h$) per week.

Further, the **social components** of this study concluded **several gender differences**. Female players were more likely to physically meet with an online friend ($f = 55.4\% > m = 37.6\%$), more likely to date other players ($f = 15.3\% > m = 7.7\%$), more likely to play with family members and real-life friends ($f = 33.2\% > m = 23.6\%$), more likely to self-disclose with online MMORPG friends ($f = 46.7\% > m = 36.2\%$), more likely to report their motivations for

playing MMORPG as a “therapeutic refreshment” ($f = 21\% > m = 13.4\%$) and males reported their motivations as “curiosity, astonishment, and interest” ($m = 20\% > f = 15.9\%$).

However, there were no gender differences for the effects of MMORPGs online friendships in how either gender perceived their virtual friend’s trustworthiness. Across both genders, their reports suggest a high social activation from by playing MMORPGs with two thirds of the players (67.4%) stating MMORPGs having a **positive effect on their relationships**.

13. Wood, R. T., Griffiths, M. D., Chappell, D., & Davies, M. N. (2004). **The structural characteristics of video games: A psycho-structural analysis**. *CyberPsychology & behavior*, 7(1), 1-10.

Annotation:

In this article, the authors examine the **structural characteristics of video games** that induce initial or continued use. They found across **both genders that a high degree of realism in sound, graphics, and setting were important characteristics**, as well as character **development, customizability, and multi-player**. The study also revealed many major gender differences regarding these structural characteristics. While four-fifths of participants overall responded that high-quality, realistic graphics were important, there were **gender differences regarding the style of graphics**, which may be related to the type of games that males and females preferred. Male respondents showed an overall preference for full motion video, violent actions, and controlling vehicles, as well as games that are based on factual events, such as sports or battles, and it is possible their preference for fast-paced style of graphics may be related to a higher level of performance on visuo-spatial tasks. Female respondents were more likely to prefer non-violent, less competitive games with cartoon style graphics, as well as games that are

based on a higher degree of fantasy, and they favored games that focus on solving puzzles, avoiding danger, and finding and collecting things.

14. Kim, S. J. (2017). *Gender inequality in Esports participation: examining League of Legends* (Doctoral dissertation).

Annotation:

This article uniquely discussed **gender portrayal in eGames** (electronic games) and **gender and aggression**. The difference of gender portrayal in eGames is mainly the lower frequency and high sexual objectification of female characters equaling less respectable figures of discussion. To further investigate, the author looks into *League of Legends (LoL)*, the most popular Multiplayer Online Battle Arena (MOBA) game, which was created by Riot Games. The author found in their study that the **concentration of female to male ratio per game differs**, but the **skills do not**. If they do, the females are a slightly more advanced. The positive windows in Esports are that it is available for all to play and there is **great opportunity to reframe the preexisting stereotypes of male gaming superiority**.

15. Fogel, S. (2018, November 01). **Esports Is Getting Bigger Every Year - So Where Are All The Women?** Retrieved August 5, 2019, from <https://variety.com/2018/gaming/features/women-in-Esports-1203016379/>

Annotation:

Author, Stefanie Fogel, reports the change in Esports spectator demographics. Originally, the Esports fanbase consisted predominantly of male millennials but is now **stretching to a broader demographic of 13-40-year-olds and a 25% female fanbase (in the U.S.)**. Besides the growth of the Esports fanbase, there is still a distinct lack of female professional players in the broader scope. The existing **female pro-players are currently on the rise**. For instance:

Shanghai Dragons signed the Overwatch League's first woman player, Se-yeon "Geguri" Kim, Sasha "Scarlett" Hostyn, Team Dignitas all women's "Counter-Strike: Global Offensive", and Gen. G's (large Esports company) all-female U.S. "Fortnite" team. In terms of business, **the first female streamer to transition into an Esports business role** was hired by Gen. G, Kristen Valnicek. Founder and CFO of Women in Games nonprofit states a **greater need for gender inclusivity** in order for Esports to increase its business profitability.

Aside from gender, toxicity is an issue among some Esports players (I.e., anti-gay and racial slurs). **Immortals and Gen. G** (both large Esports companies) believe media training over various social issues will help reduce such toxicity. Given the powerful influence of these companies, their interest of training **inclusive/sympathetic thinking to Esports players and organizing a female gaming community** is promising.

16. Wasserman, J. A., & Rittenour, C. E. (2019). **Who wants to play? Cueing perceived sex-based stereotypes of games.** *Computers in Human Behavior, 91*, 252-262.

Annotation:

Social group identification, gaming stereotypes, gaming platforms, and gamer perceptions are powerful influences for gamer affinity among genders. The authors of this article investigate these **potential barriers for female participation and success in recreational gaming, competitive Esports, and gamification.** The authors found an equal amount of skill in advancing through games among males and females, but the males were perceived to have a greater affinity for the game (which aligned with the stereotype) than the females - regardless of the gaming platform (tabletop, tablet, or desktop). On the other hand, **the more a player identified as a gamer**, it served as a **superordinate identity that subsumed their gender identity**; protecting the females from performance-threat-effects. Regardless of gamer identity,

sex-based stereotypes can skew female gaming performance (across gaming contexts). The authors recommend gaming to diversify its content to mitigate such stereotypes.

1.5 Impacts in Education

17. Hawkins, L. (2019, July 12). Esports Meets Education: **UIL Considers Proposal to Sanction Competitive Gaming in Texas High Schools** » Dallas Innovates. Retrieved July 26, 2019, from <https://dallasinnovates.com/Esports-joameets-education-uil-considers-proposal-to-sanction-competitive-gaming-in-texas-high-schools/>

Annotation:

In North Texas, Esports has been declared as a **University Scholastic League (UIL)** of Texas activity. In turn, competitions will be held in Texan high schools as well as other academic arenas. On the forefront, Texas' Grapevine-Colleyville Independent School District (GCISD) 75 official Esports members and expects to have 250 total next year. According to **Complexity's** chief marketing officer, Cam Kelly, claims mental and physical health of Esports players has not been attended to. Consequently, **preventative measures** have not been researched or applied to the Esports community. However, the UIL adoption of Esports is believed to help **foster professionalism and scholarship opportunities** for high school Esports players.

18. Funk, D. C., Pizzo, A. D., & Baker, B. J. (2018). **eSport management: Embracing eSport education and research opportunities.** *Sport Management Review*, 21(1), 7-13.

Annotation:

This article argues the academic territory of Esports management is linear to traditional sport management and should be embraced as such. The authors imply the **emergence of Esports is an evolution within the sports community and examining its industry will**

provide grounds for education and research. Recognizing this potential, the authors urge the attention of Esports to sport practitioners and management academics.

Chapter 2: Esports and the Brain

A cognitive Olympics – Esports exercises multiple modalities of the human brain with ongoing stimulation. With training exercises comes precision, behavioral modifications, and experience.

This chapter looks into the affects Esports has on the facets of psychology, cognition and learning, and social behaviors.

2.1 Psychology

1. Bányai, F., Griffiths, M. D., Király, O., & Demetrovics, Z. (2019). **The psychology of Esports: A systematic literature review.** *Journal of Gambling Studies*, 35(2), 351-365.

Annotation:

This literature review consists of 30 articles that have previously published. The domains Bányai, Griffiths, and Demetrovics (2019) reviewed were **(1) the development of becoming an Esports player, (2) the psychological characteristics of Esports players such as mental skills and motivations, and (3) what motivates Esports fans to spectate the games others are playing.** For the present review, the domains of mental skills and motivations (2 above) are most relevant. The author’s conclusions were that the mental skills observed from the players are what determines the “make or break” success of their performance. Heavy emphasis on game knowledge, quick strategic planning and execution, motivation, adaptability (to their opponents’ strengths and the overall pressure of playing) and warming up before the competition are factors that breed success. In the player’s alone time, it is crucial they are acknowledging their performances as well as setting short and long-term goals for themselves and their team. For

motivation, the competition, challenge, and escapism motivations were identified as the need gratifications obtained through Esports using the gratification theory by (Katz et al., 1973).

2. Collins, T. J. (2017). **Psychological skills training manual for eSports athletes.**

Annotation:

This publication serves as a **training manual** based on theoretical and empirically researched **sports psychology** methods for Esports players and coaches to boost their psychological skills. These skills are focused on **goal setting, imagery, and positive self-talk**. With this triad of skills, the manual aims to **reduce possible self-deprecating cognitions and behaviors** of the players which typically lead to depression, anxiety, and difficulties with socializing. In turn, goal setting (either task or ego-involved) influences quality of performance, imagery training increases the chances of adapting to external stimuli, and positive self-talk (instructional, motivational, or negative thought stoppage) reduce performance anxiety as well as intrusive thoughts.

3. Puerta-Cortés, D. X., Panova, T., Carbonell, X., & Chamarro, A. (2017). **How passion and impulsivity influence a player's choice of videogame, intensity of playing and time spent playing.** *Computers in Human Behavior*, 66, 122-128.

Annotation:

This article explores the possible relationship between gaming addiction research and video game consumption/spectatorship by examining the **influence of passion (the Passion scale) and impulsivity (Inventory of Impulsivity)**. These measures of passion and impulsivity were examined in terms of three variables: **intensity of play, playing time, and choice of Massive Multiplayer Online Role Play Game (MMORPG) vs. non-MMORPG**. The predictor variables for Intensity of Play were: playing MMORPG games, harmonious and

obsessive passion, and dysfunctional impulsivity. The predictor variables for Hours of Play were: age, harmonious passion, and dysfunctional impulsivity. **Age, both passions, and functional impulsivity predicted preference for MMORPGs.**

4. Carbonie, A., Guo, Z., & Cahalane, M. (2018). **Positive Personal Development through Esports.** In *PACIS* (p. 125).

Annotation:

Carbonie, Guo, & Cahalane (2018) collected **qualitative data on Esports player values** as to why they believe Esports enriches **positive personal development** such as increased self-esteem and self-efficacy (particularly youth). The Esports players agreed on key benefits to playing: **commitment, cooperation, initiative, tangible rewards, emotional self-regulation, personal growth, self-esteem, and communication.** The value to these benefits involved **hedonism, power, purpose of life, and sense of achievement.** It was also found that the values of the players appear to be associated with their levels of intrinsic motivation.

5. Peter, S. C., Li, Q., Pfund, R. A., Whelan, J. P., & Meyers, A. W. (2019). **Public stigma across addictive behaviors: casino gambling, Esports gambling, and internet gaming.** *Journal of gambling studies, 35(1), 247-259.*

Annotation:

The present study of this article explored the **stigma associated with behavioral addictions** involving the **intersection of casino gambling and internet gaming addiction** to produce the new form, **Esports gambling.** The data for this study was collected online through the Amazon Mechanical Turk (mTurk) work marketplace. The study casted 4 degrees of addiction severity for each form of addiction with a fictional character, Michael, in a given circumstance in comparison to Michael experiencing a financial crisis. The participants were

asked to indicate their desired distance from Michael and which attributes they would use to describe his mental illness. The study found internet gaming attracted significantly less public stigma than casino gambling as well as less desire for social distance, and was seen as less dangerous. The authors propose the **stereotypic attitudes of casino gamblers may not carry over to a different form of addiction, internet gaming or Esports gambling.**

2.2 Cognition, Neuroscience, & Learning

6. Renshaw I., Davids K., Araújo D., Lucas A., Roberts W.M., Newcombe D.J., & Franks B. (2019) **Evaluating Weaknesses of “Perceptual-Cognitive Training” and “Brain Training” Methods in Sport: An Ecological Dynamics Critique.** *Frontiers in Psychology*, 9(2468).

Annotation:

In response to rising popularity of brain training in performance-enhancing industries, the authors present a critical evaluation of **perceptual-cognitive process training** methods proposed to improve isolated cognitive and perceptual functions, such as vision, attention, memory, and decision-making, and their effectiveness in generalizing transfer to sport performance. They evaluate supporting evidence, review limitations of mechanisms, and conclude that these approaches may offer some general transfer, however lack specific transfer to contextualize in sport performance. They argue in favor of an **ecological dynamic's** perspective to training, which supports the concept that performance environment is functionally integrated in training programs with performer interactions and constraints of the sport task.

7. Canning, S., & Betrus, A. (2017). **The Culture of Deep Learning in Esports: An Insider's Perspective.** *Educational Technology*, 65-69.

Annotation:

This article takes a glimpse into the eye of **part-time gamer, Steven Canning, who is also an instructor of educational technology** at State University of New York (SUNY) at Potsdam. Authors, Canning and Beatrus, report the on viewership of 2015 major sport championships – stating that the famous Esports game, League of Legends (LoL) had 27 million viewers (11 million more viewers than the NBA Finals). Next, they proceed to describe the **skill development advances and mastery of strategy enhanced by playing Esports**, making analogies to playing an instrument or physical sport. Skills such as multitasking are a blend of intricately-exercised muscle memory and dynamic improvisation which is constantly utilized during an Esports performance. Interestingly, Canning explains the “**transferrable core competencies**” - such as precise communication among team members and a keen interpretation of manipulation by others – are acquired by **learning the mechanics through emulation**. Canning emphasizes the key points needed for successful emulation: (1) identify the mechanics involved in the manipulation and (2) repeat mechanics until they are part of your muscle memory.

8. Bonny, J. W., & Castaneda, L. M. (2017). **Number processing ability is connected to longitudinal changes in multiplayer online battle arena skill**. *Computers in Human Behavior*, 66, 377-387.

Annotation:

Authors, Bonny & Castaneda (2017), gathered research on multiplayer online battle arena (MOBA) games and how it **enhances cognitive abilities within MOBA settings (i.e., visuospatial attention, working memory capacity) as well as numerical attention in external settings (i.e., chess)**. The sample involved advanced players, not novices. This particular study hypothesized that MOBA frequency gameplays would improve numerical and working memory

abilities after a five-month period, which was confirmed in this study. Their findings aligned with their hypothesis.

9. Kowal, M., Toth, A. J., Exton, C., & Campbell, M. J. (2018). **Different cognitive abilities displayed by action video gamers and non-gamers.** *Computers in Human Behavior*, 88, 255-262.

Annotation:

This study in this article investigated the **cognitive advantages** developed from two types of games **(1) first person shooter (FPS) and (2) massive online battle arena (MOBA)** and the differences between two levels of gaming experience **(1) experienced video game players (AVGPs) and (2) gaming novices (NVGPs)**. To measure the cognitive abilities, the participants completed a **Stroop test and a Trail-Making test (TMT A&B)**. The study found that the AVGPs had significantly faster reaction times than the NVGPs but made more errors on the cognitive assessment tests. However, the AVGPs error rates were the same as the NVGPs while having faster reaction times on the TMT tests. In conclusion, the findings implied **AVGPs have enhanced processing speed and task-switching abilities** (reflected by the error rates). This pattern of **favoring speed over accuracy** on tasks is one successful strategy in inhibiting distracting stimuli in normal cognitive performance and appears to correlate with successful AVGPs.

9. Maymin, P. (2018). **An open-sourced optical tracking and advanced Esports analytics platform for League of Legends.** In *2018 MIT Sloan Sports Analytics Conference* (Vol. 18).

Annotation:

In this article, the author has developed a new method of data collection for **League of Legends (LoL), the most popularly played multiplayer online battle arena (MOBA) game,**

to address the limitations of current methods of data collection by utilizing the much greater potential data which is available to capture. Currently, the only forms of data are **boxscore-equivalent statistics** provided by the game's publisher, Riot Games, through their free **application programming interface (API)**, which includes data points such as **when a champion dies, gets a kill or an assist, etc.** This database of limited information forms the basis of all current LoL analytics, however **these standard metrics do not well predict team performance.**

The author has developed a unique method using **open-sourced optical tracking** for capturing more abundant and useful underlying data which includes: **tracking each champion's location multiple times per second, as well as every ability cast, attack made, damages caused and avoided, actual vision granted and denied, and player's health, mana, and cooldowns.**

With this comprehensive data, the author has developed an **advanced Esports analytics platform** which can **define situations critical to gameplay which could not be revealed by the API data alone.** These analytics are able to elucidate scenarios such as, when a champion died, how many allies and enemies were around? Why did a champion die: lack of vision, health or gold deficiency, outnumbered, ganked, or mechanically outplayed? What was the value of a champion death or enemy kill to the team? Was a player's time spent productively or wasted? Were team fights executed with the correct formations? Did players engage and disengage effectively? Were their actions used offensively or defensively? This level of analysis allows for a **systematic way to answer these types of questions which players actually ask themselves when reviewing game film.**

10. Santarnecchi, E., Feurra, M., Galli, G., Rossi, A., & Rossi, S. (2013). **Overclock your brain for gaming? Ethical, social and health care risks.** *Brain stimulation*, 6(5), 713.

Annotation:

The authors wrote this article to address the **risks** that may be associated with the **uncontrolled use of a device** developed by Focus Labs which claims to **enhance performance on video games by self-administrated transcranial Direct Current Stimulation (tDCS)** to increase brain plasticity and neuronal firing rate. tDCS is a type of non-invasive brain stimulation (NIBS) neuromodulatory technique used in research, with growing clinical applications for treating pathological neuropsychiatric conditions. Applied to the prefrontal cortex, tDCS modifies cortical excitability inducing lasting improvements in cognitive abilities with a dose-response effect of applied current strength. Focus Labs suggests targeting the prefrontal cortex with the self-administrated tDCS,

However, the authors of this article caution that this may be unsafely tampering with the subtle boundaries between addiction and video game use, given the association of **reduced inhibitory control in the prefrontal cortex** to pathological gambling as well as evidence of a relationship between tDCS on the prefrontal cortex and problems with **impulse control and risk-taking behaviors**. It is also pertinent to note that studies with animal models have documented brain damage following the use of transcranial electrical stimulation. Ultimately, no official safely guidelines have been established for prolonged, self-administered use of tDCS, and furthermore, the foc.us gamer headset is not regulated by the FDA as a medical device; it is therefore the user as an unsupervised lay person who assumes full risk of the health effects.

11. Basak, C., Boot, W. R., Voss, M. W., & Kramer, A. F. (2008). **Can training in a real-time strategy video game attenuate cognitive decline in older adults?.** *Psychology and aging*, 23(4), 765.

Annotation:

The study in this article investigated the cognitive declines – primarily **executive functions (I.e., attention switching, working memory, visual short-term memory, and reasoning)** – of **older adults ($n = 69$ years of age)** and how **23.5 hours of strategy-based real-time video game (Rise of Nations, RON) training** can attenuate the natural decline and improve its state of functioning. The battery of cognitive tasks was administered pre-, during, and post the 7-8-week span of the study and was divided into two categories: **executive control tasks and visuospatial attentional** (visual perception of space between different objects in relation to one another) tasks. The authors found that the experimental group, which received the strategic video game training, showed a **significant increase in executive functioning** subsequent to the training period **in comparison to the control group that did not receive training**. Consequently, the cognitive skills acquired by during the RON training period were **transferrable** to real-world application - yielding similar results for younger demographics and game training.

12. Bavelier, D., Green, C. S., Pouget, A., & Schrater, P. (2012). **Brain plasticity through the life span: learning to learn and action video games.** *Annual review of neuroscience*, 35, 391-416.

Annotation:

This article reviews how complex training, such as **action video game play**, can foster **brain plasticity and learning**. The article is written with the consideration that **video game**

training instills a shorter timeframe for learning to perform new tasks; “learning to learn”.

The article’s chapter, *Benefits of Action Video Game Experience*, is divided into 6 sections with concluding evidence per sector. Section (1) ***Vision***: Enhances spatial and temporal resolution as well as sensitivity to activated stimuli. Section (2) ***Cognitive Functions***: Improves visual short-term memory, spatial cognition, multitasking, and some executive functions. Section (3) ***Decision Making***: Increased ability to extract and synthesize accumulated information from the environment to make an executive decision. Section (4) ***Reaction Time and Speed Accuracy Trade-Off***: Improved ability to make quick and accurate decisions including when the environment is changed. Section (5) ***Attention***: Enhancements found in top-down attentional control (I.e., selective attention, divided attention, and sustained attention). Section (6) ***Causality***: The key of this article is on learning, so establishing if action video gameplay is the source of these improvements are crucial. Hence, the authors discussed the elaborative process of control used during each experiment. From the control comparisons with the experimental groups, **action video gameplay is proven causal for the brain plasticity capabilities in learning.**

13. Blacker, K. J., Curby, K. M., Klobusicky, E., & Chein, J. M. (2014). **Effects of action video game training on visual working memory.** *Journal of Experimental Psychology: Human Perception and Performance*, 40(5), 1992.

Annotation:

In this article, the authors conducted a study to investigate the potential improvements in visual working memory by training with an action video game. **Visual working memory (VWM)** is the ability to maintain and utilize visual information for a period of time after the input stimulus has been removed from direct perception. VWM is a critical process involved in

learning and problem solving, however it is fundamentally **limited in capacity**. In the present study, the authors found an **increase in the quantity of information stored in VWM (capacity)**, as measured by a change detection task, after training with action video games compared to a control game. However, they did not find an improvement in the quality of information stored, as indicated by a complex span measure of VWM, which is associated with higher-order executive functions.

14. Blacker, K. J., & Curby, K. M. (2013). **Enhanced visual short-term memory in action video game players**. *Attention, Perception, & Psychophysics*, 75(6), 1128-1136.

Annotation:

The authors of this article conducted 2 experiments to test the **visual short-term memory (VSTM)** (i.e., visual attention and speed of processing) of video game players compared to non-gamers. Experiment 1 was the simpler of the 2 by using simple colored stimuli and VSTM. The gamers showed **enhanced processing speed** in comparison to the non-gamers regardless of either time constraint (limited or unlimited time) for **encoding the items to memory**. Experiment 2 was more complex by **increasing the demand for level of processing** with using intricate shapes of stimuli. The results were reflected from Experiment 1. The authors conclude that their findings restate that the inherent capacity-limited system of VSTM processing can be **malleable in the case of video game acquired skills**.

2.3 Social Behaviors

16. Hughes, C. M. (2015). **A measure of social behavior in team-based, multiplayer online Games: The Sociality in Multiplayer Online Games Scale (SMOG)**. *Computers in Human Behavior*, 69, 386-395.

Annotation:

This article introduces the **Sociality in Multiplayer Online Games (SMOG) Scale** which measures social behaviors in team-based MOBAs. The scale consists of two statistically independent factors, **anti-social (destructive) behaviors and pro-social (constructive) behaviors**, portrayed in the gaming environment. To assess the construct validity of SMOG, three studies were conducted. In addition to measuring anti-social and pro-social behaviors, **interpersonal orientations (dominance or affiliation)** were also assessed. The findings concluded (1) anti-social behaviors was predicted positively by dominance and negatively by affiliation and (2) pro-social behaviors was predicted positively by both dominant and affiliation.

17. Campbell, M. J., Toth, A. J., Moran, A. P., Kowal, M., & Exton, C. (2018). **Esports: A new window on neurocognitive expertise?**. *Progress in Brain Research*, 240, 161-174.

Annotation:

This chapter reviews the current progress and future potential for research in Esports with an emphasis on the **effects of gaming on neurocognition**. The authors consider Esports to be an environment particularly well-suited for scientific research which examines the neurocognitive changes that take place with the **development of expertise**, due to the massive scale of participation, controlled environments, structured skill ratings, and large repositories of data. Many studies have identified **health and social benefits** of gaming, as it encourages social interactions between individuals of different demographics as well as reducing social anxiety in an environment based on fair play, sportsmanship, and skill development. Research has also shown that video games are capable of incurring substantial changes in the brain and behavior, as players consistently demonstrate **superior performance on a wide range of visuo-spatial and attentional tasks**. It is important to recognize these studies measure skills specific to the video game environment, and it is not known whether this cognitive proficiency extends to any

generalized benefit beyond the gaming situation. Researchers have also conducted EEG and fMRI **brain-imaging studies investigating the underlying mechanisms** of these cognitive benefits, and have identified changes in prefrontal cortex activity, associated with higher level cognitive functions such as working memory, executive attention, decision making, fluid intelligence, and emotion processing, as well as regions such as the posterior parietal cortex which is associated with visual processing.

18. Molloy, D. (2019, August 30). **How playing video games could get you a better job.**

Retrieved from <https://www.bbc.com/news/business-49317440>

Annotation:

This article introduces David Barrie, founder of *Game Academy*, a startup business that concentrates on the **thinking skills acquired by playing Esports**. Barrie is a firm believer that Esports **fosters creativity, leadership, organization, and conflict resolution skills** that are transferrable into the business world. The author shares an interview with **radiotherapy physicist**, Mark Long, who claims gaming **enhances his ability to solve work challenges and stay disciplined with his attention** when completing tasks.

Chapter 3: Esports and Sports

The following annotations explore the relevant fields related to sports as they apply to professional Esports players. These fields include sports psychology and motor skills (Chapter 3.1), such as mental skills training, embodiment, and fundamental motor skills, followed by the applications of sports therapy (Chapter 3.2) to issues such as shared stressors and communal coping strategies among members of a team.

3.1 Sport Psychology & Motor Skills

1. Cottrell, C., McMillen, N., Harris, B.S. (2019) **Sport psychology in a virtual world: Considerations for practitioners working in Esports.** *Journal of Sport Psychology in Action*, 10(2), 73-81.

Annotation:

This article reviews the overlapping applications of **sports psychology** theory in **Esports**, in addition to unique considerations demanded by a technology-mediated performance environment. The authors provide information and best practice suggestions for sports psychology practitioners who can offer **mental skills training** to address the needs of this area as the platform grows in popularity.

2. Hilvoorde, I. V., & Pot, N. (2016). **Embodiment and fundamental motor skills in Esports.** *Sport, Ethics and Philosophy*, 10(1), 14-27. DOI: 10.1080/17511321.2016.1159246

Annotation:

This article argues the motor skills utilized during Esports gaming performances are **fundamental to sports** as well as the **intrinsic gamer involvement** with general sport education. The combination of the 2 factors creates embodiment that is practiced in the learning of traditional sports. This **creation of virtual embodiment** allows the active player to **enter different realities**. Addressing the debate on if Esports can be legitimized as a regular sport, the authors rebuttal indicates the **lack of “physical activity” is not substantial**. Further, the authors emphasize the **similarities of Esports culture and regular sport culture** along with room for investigation on the similar motor skills with **digital literacy**, hence **gamification**.

3.2 Sport Therapy & Applications

2. Leprince C., D'Arripe-Longueville F. and Doron J. (2018) **Coping in Teams: Exploring Athletes' Communal Coping Strategies to Deal With Shared Stressors**. *Frontiers in Psychology*. 9:1908.

Annotation:

While the majority of research in sports psychology has focused on the individual, French researchers conducted a qualitative study on an interpersonal level of analysis to explore **shared stressors and communal coping strategies in the context of a team sports environment**. The authors describe cognitive, behavioral, and emotional self-regulation skills and emphasize coping as a critical process necessary for successful adaptation in a team sports environment. Their thematic analysis revealed four types of issues which contribute as **shared sources of stress**: 1) social pressure issues regarding interactions with coach, referee, and opponent as well as expectations from media, spectators, leaders, and family, 2) teammate relationship issues include negative behaviors and social interactions between team members, both verbal and non-verbal, 3) team performance issues such as low controllability of the situation and score, domination of opponents, and decreased perception of team efficacy, 4) logistical and organizational aspects of competition such as travel and equipment.

Their analysis also revealed four overarching dimensions of **communal coping strategies**: 1) problem-focused communal efforts are strategies aimed at managing and solving and include analysis and action planning, information sharing, refocusing, going back to basics, and mobilizing effort expenditure, 2) relationship-focused coping includes motivational support, compensation, and social joining, 3) communal management of emotions including interpersonal emotional regulation, reassurance, de-dramatization, 4) communal goal withdrawal which includes task-disengagement and venting emotions.

Chapter 4: Esports and Health

The mental and physical health of an Esports player are critical to their wellbeing as well as their gaming performance. The embodiment between their mind and motor functioning produces the quality of work they can contribute to their teams as well as their quality of life outside of their gameplay. The following annotations address articles that discuss the proclivity for gaming addiction (as mentioned by the DSM-5) and if such diagnosis is valid in terms of Esports, and the behavioral and physical outcomes from playing Esports.

4.1 Mental Health

1. Choi, C., Hums, M., & Bum, C. H. (2018). **Impact of the family environment on juvenile mental health: Esports online game addiction and delinquency.** *International journal of Environmental Research and Public Health*, 15(12), 2850.

Annotation:

This study examined Asian multicultural families with **dual-incomes and adolescent** (ages 12 – 18) and the relationship to **online gaming addiction, delinquency, and motivation to participate in Esports**. The participants were divided into one of four groups: (a) monocultural, single-income families, (b) monocultural, dual-income families, (c) multicultural, single-income families, or (d) multicultural, dual-income families. With these groups, Choi et al. (2018) posed two research questions based on the adolescent's family type: (1) What online game addiction factors drive juvenile delinquency? and (2) What are the differences in online game addiction, juvenile delinquency, and Esports participation.

From their study, they found **adolescents who were in monocultural, single-income families had statistically significant propensities to form online gaming addictions** and this was associated with having lower “self-regulation” and “social avoidance tendencies”. However,

adolescents from dual-income families (regardless of culture in the home) **scored statistically higher with delinquent behaviors** (i.e., drugs, school absences). Lastly, **adolescents from dual-income families were more motivated to play/spectate Esports to “pass time” rather than for “social interaction”** and those from multicultural families participated to engage in “social interaction”.

Thus, there were **positive correlations between online gaming addiction and delinquent behavior**. To solve this issue, the authors state that afterschool/educational programs need to educate adolescents, monitor their time spent playing online games, and ensure they stay accountable for their online game playing by using their actual names.

2. Nielsen, R. K. L., & Karhulahti, V. M. (2017, August). **The problematic coexistence of internet gaming disorder and Esports**. *In Proceedings of the 12th International Conference on the Foundations of Digital Games* (p. 52). ACM.

Annotation:

This article addresses The American Psychiatric Association’s (APA) proposal of adding **“Internet gaming disorder” to the future Diagnostic Statistical Manual (DSM-6)** and suggests **Esports may conceptualize the proposal’s validity** of the proposed mental disorder. The prolific cultural practice of Esports serves as an area of investigation given only a handful of consumers become professional Esports players. Approximately, there are 1.5B players of Esports, but only a percentage become professionals. This percentage continuously trains at an estimate of six hours a day, not including direct methods of practice, for consecutive years. Like most diagnoses in the DSM, the disorder is cause for significant impairment in daily activity for a >12-month period. The authors elaborate on each of the nine indicators of the criteria followed by critiques. They conclude the **APA’s proposal is guided by speculation and lacks**

distinguishability from competitive game play (dedication to profession) and addiction (a mental disorder) by its inability to keep up with the fast-paced gaming culture.

3. King, D.L., Delfabbro, P. H., and Griffiths, M.D. (2010). **Cognitive Behavioral Therapy for Problematic Video Game Players: Conceptual Considerations and Practice Issues.** *Journal of CyberTherapy & Rehabilitation.* 3(3), 261-273.

Annotation:

In this article, the authors propose the application of Cognitive Behavioral Therapy methods in the treatment of problematic video game playing, and discuss conceptual considerations and practice issues. **Cognitive Behavioral Therapy (CBT)** is a well-established method of psychotherapy, or talk therapy, which aims to replace or redirect maladaptive cognitions or thought processes which may play a role in developing and maintaining problematic behavior. Video game playing may cross the line from excessive use to be considered **problematic video game playing** when it can cause an individual to jeopardize work or education, social relationships, and personal health and well-being. CBT has been used with some success in treating gambling addiction, and, given the various structural similarities of slot machines to video games, may be appropriately extended to address the issues of problematic video game playing.

The authors present a basic foundation for treating problematic video game playing with CBT, which includes monitoring use, goal-setting, and dealing with problem cognitions.

Monitoring use directs the players to become more aware of the problems and negative consequences of excessive use, with the desired outcomes to motivate change as these issues become more tangible and to provide greater insight to the self-perpetuating cycle of trying to escape these problems with further video game use.

The authors encourage players to keep track of the number of hours spent playing video games, including time spent waiting for loading screens, and also to record the number of failures, mistakes, and wasted opportunities made while otherwise occupied with video games. **Goal-setting** involves reaching the objective to reduce time spent playing video games to levels that are no longer problematic or interfering with the player's well-being and functioning in life. This may involve total avoidance from video games, avoiding specific games, or playing in a controlled manner. Massively multiplayer online role-playing games (MMORPGs) may present the greatest difficulty in controlling the time spent playing due to the social obligations from having players rely on each other to play together. Players may find it emotionally very challenging to disconnect from the sense of identity to their character and belonging to a social network. A therapist may help rehearse ways to inform other players of the need to reduce time spent playing and to avoid social pressure.

One of the primary objectives of CBT is **dealing with problem cognitions** and replacing them with more adaptive thoughts that will lead to healthier behavior. A CBT exercise may involve having the player to record their motivations for playing video games and then evaluate whether the game regularly satisfied these motivations. Players may be motivated to gain rewards, experience, or skill points in a game, but this may require performing simple, repetitive actions or "grinding" which they do not consider enjoyable. Psycho-education may also be beneficial for the players to have an awareness of the operant conditioning paradigm and understand that video games are designed to provide short-term rewards in the early stages of the game while gradually reducing the reward payoff as the game progresses.

4. Triberti, S. et al. (2018). **What Matters Is When You Play: Investigating the Relationship Between Online Video Games Addiction and Time Spent Playing over Specific Day Phases.** *Addictive Behaviors Reports.* 8 (2018): 185–188.

Annotation:

In this article, the authors investigate factors which contribute to **Internet Gaming Disorder (IGD)**, with an emphasis on time spent playing over specific day phases (morning, afternoon, night; weekday, weekend). The diagnosis of IGD is now included in both the DSM-5 and ICD-11, but there is still debate about specific features of the disorder. Many research studies have investigated **time spent playing (TSP)**, but it is not clear whether increasing TSP should be considered a symptom of online gaming addiction and thus included in the list of diagnostic criteria. Early studies considered TSP to be a fundamental measurement of problematic use and addiction, while the ensuing debate has identified reasons why TSP may be a confounding variable and not reliable as an indicator of addiction. Despite the continued debate, most studies still regard TSP as an important measurement to determine problematic use of video games. The authors make the important distinction that a high level of engagement in gameplay is not the same as addiction, and contexts such as professional Esports may require a lot of playing without developing IGD.

One reason for the diversity of opinion is that TSP is a self-reported measurement which can vary in structure. Research authors often combine different measure based on **Likert scales**, for example days of playing over the week and hours played during a typical day. In the present study, the authors found a **positive association between IGD score and TSP** on weekend mornings, which can be considered problematic as it may interfere with other activities. They also found that TSP during the afternoon was negatively associated with age, corresponding to

younger participants' free time, and TSP at night was related to a preference for game genres which require multi-player organization.

4.12 Player Burnout

5. Lajka, A. (2018, December 21). **Esports players burn out young as the grind takes mental, physical toll.** Retrieved from <https://www.cbsnews.com/news/esports-burnout-in-video-gaming-cbsn-originals/>

Annotation:

This article reports the **strenuous training** of professional Esports players which consists of **12-14 hours per 6 days a week**. The mental and physical demands of practice are accelerating the player burnout rates for the professionals whose competitive **careers peak until their mid-20s**. According to Esports reporter, Richard Lewis, players are pressured to invest all of their time to practice; repeating the same routines and expecting different results. the consequence for such rigor is **burnout** which affects their mental and physical states. Resulting in **exhaustion, emaciation, postural problems, and wrist injuries** (i.e., carpal tunnel syndrome).

6. Fawcett, S. (2019, June 12). **Why do some esports stars burn out so young?** Retrieved from <https://www.esports.net/news/industry/esports-stars-burn-out-young/>

Annotation:

This article describes the buildup of professional Esports player burnouts. The tedious ritual of game practice lasting ongoing hours per day, the levels of professional gaming requires **sacrifice for lasting relationships to achieve success**. Most professional gamers are situated in team-housing where they **cohabit with their teammates**, leading to more practice time and higher expectations. In addition to this pressure, they also experience **scrutiny from media**

platforms such as Twitter and Reddit resulting in **panic attacks and acute anxiety**. The insecure and intensive lifestyle **prohibits** the players from a sufficient amount of time for **recuperation to refrain burnouts**.

7. Cooney, B. (2018, December 28). **xQc doesn't think it's burnout that makes professional esports players quit**. Retrieved from <https://www.dexerto.com/esports/xqc-doesnt-think-its-burnout-that-makes-professional-players-quit-267432>

Annotation:

This article reports a disagreement between **former Dallas Fuel player, Felix 'xQc' or 'xQcOW' Lengyel**, Mark Cuban (owner of Mavs Gaming), Nate Nanzer (Commissioner of Overwatch League), and Kevein Hitt (Esport reporter) over player burnout. xQc claims that burnout is not the cause of performance decline, but the **failure to adapt to changes in the game**. He is also one of Twitch's most profuse streamers, streaming Overwatch plays.

8. Erzberger, T. (2018, August 20). **Mental health issues remain pervasive problem in esports scene**. Retrieved from https://www.espn.com/esports/story/_/id/24427802/mental-health-issues-esports-remain-silent-very-real-threat-players

Annotation:

The author begins this article with a disconcerting event that occurred in August 2018 at the Smash Bros. Melee event at Evolution Championship Series. Professional Esports player, Justin "Plup" McGrath, experienced a **panic attack after losing** the competition. Following, Plup posted on Twitter his concern for the attack **jeopardizing his career** and his immediate turn to medication as a preventative measure. Triggering such a terrifying experience are the **levels of stress, toxic scrutinization from online forums, and lack of decompression time to self-reflect or build meaningful relationships outside** of their gaming careers.

9. Chiu, S. (2018, December 30). **Why Burnout is Higher in Franchised Esports**. Retrieved from <https://www.vpesports.com/overwatch/why-burnout-is-higher-in-franchised-esports/>

Annotation:

This article lists the explanations as to **why burnout is infamous** in the profession of Esports. While the two most popular Esports in the franchise, League of Legends (LoL) and Overwatch (OW), are continuously **patching (updating)** to entertain the casual Esports player, it causes mental strain on the professionals with increased practice time. This is due to the **franchise league model** and involvement of **Korean Esports**. Provided, Korean culture favors a **hard work ethic, resulting in longer practice hours**. A lively example of a surprisingly-successful Esports player who dedicates lengthy practice hours is French pro, **Paul “sOaz” Boyer**, who deliver top performances at splits (playoffs, Mid-Season Invitational, and World Championships).

In contrast, a game with less patching, like Counter-Strike: Global Offensive (CS:GO), inflicts less strain as there is less stress for the pros to **adapt** as the game was predominantly engineered for casual players, not pros. However, another highly-patching Esport, Dota2, differs from LoL and OW by its less strenuous pro player demands; allowing them to have more **autonomy** with the strength exerted into training and breaks.

4.2 Physical Health

10. DiFrancisco-Donoghue J., Balentine J., Schmidt G., et al. (2019). **Managing the health of the eSport athlete: an integrated health management model**. *BMJ Open Sport & Exercise Medicine*. 5:e000467. doi:10.1136/bmjsem-2018-000467

Annotation:

The authors aim to establish a health management model to address the **physical health of Esports athletes**. They conducted an online survey inquiring to the gaming and lifestyle habits as well as musculoskeletal issues developed by Esports athlete. Their findings were that players practiced between 3 and 10 hours per day with the most common complaint of **eye fatigue (56%), followed by neck and back (42%), wrist (36%), and hand (32%) pain**. Less than 2% of those with complaints sought medical attention. In addition, they report that 40% did not participate in any physical activity. Following the results of their physical health survey, the authors proposed an **integrated health management model** that focuses on **health and injury prevention**.

They suggest that **sport physical examinations performed by the primary care sports medicine physician** should include questions **beyond the traditional examination** to include **physical activity and nutrition, social behavior, addictive behaviors, academic performance, musculoskeletal complaints, and vision**. They concluded that the **primary care physician** plays a vital role in identifying needs and recommending treatment and thus should have a working knowledge of **what gaming entails and specific demands of the game**. **Coaches** should also have a working knowledge of **health guidelines and signs of these common overuse issues as well as signs of gaming addiction**.

11. Simon, F. (2014). **ESport and the Human Body: Foundations for a Popular Aesthetics**.

Proceedings of the 2013 DiGRA International Conference: DeFragging Game Studies.

Volume: 7. ISBN / ISSN: ISSN 2342-9666

Annotation:

In this article, the author argues for the consideration of physical engagement of the human body in Esports players through the review of work in cognitive science and sociology in

addition to **issues of aesthetics**. Concepts of **embodied and distributed cognition** hold that mental activity is fundamentally derived from bodily activities and relies on interactions between the video game media and environment. Furthermore, **Esports require a high level of dexterity and physical endurance from these types of cognitive processing**. Developing the necessary skills to perform in Esports demands a great deal of practice and drilling that requires physical exertion. Performance output of these players also produces actions of aesthetic value. The human player interacts skillfully with the controllers to carefully execute plays with precise timing.

4.3 Drugs and Ethics

6. Graham, R. (2016, March 10). **Does Esports Have a Drug Problem?** Retrieved June 25, 2019, from <https://killscreen.com/articles/does-esports-have-a-drug-problem/>

Annotation:

Esports player, Kory Friesen, also known as "Semphis", reveals the story of his **frequent use of the stimulant drug, Adderall**. He openly admitted that at one point, his whole team was using the **performance-enhancing** drug. While it this medication is most commonly used for Attention Deficit Hyperactivity Disorder (ADHD), it can be abused for various nonmedical reasons – especially when one is under **strenuous pressure to excel with their performance**. Friesen claimed the drug **quickened their response times and improved their reflexes** while playing. The Electronic Sports League (ESL) strictly prohibits such use of drugs or alcohol during any sort of match.

7. Graham, B. A. (2015, July 23). **Anti-doping in Esports: World's largest gaming organization will test for PEDs**. Retrieved June 25, 2019, from

<https://www.theguardian.com/technology/2015/jul/23/anti-doping-in-Esports-worlds-largest-gaming-organization-will-test-for-peds>

Annotation:

This article was written subsequent to the previous article – extending on **The Electronic Sports League’s (ESL) partnership with Germanys anti-doping agency, Nationale Anti-Doping Agentur (NADA)**. Together, they collaborated with the **World Anti-Doping Agency (WADA)** to enforce drug and substance policy in the U.S., Asia, and Australia. Recognizing drug-enhanced-performance granted by stimulating drugs, such as Adderall, are a resort for Esports players, the ESL and its collaborators have enforced drug tests and rules stating, **“to play a match, be it online or offline, under the influence of any drugs, alcohol, or other performance enhancers is strictly prohibited, and may be punished with exclusion”**.

8. Baldwin, A. (2019, April 17). **Targeted tests having an impact in Esports, says Verroken**. Retrieved June 26, 2019, from <https://www.reuters.com/article/us-sport-doping/targeted-tests-having-an-impact-in-Esports-says-verroken-idUSKCN1RT2D4>

Annotation:

This article was an interview with Michele Verroke, founding director of Sporting Integrity, a consulting agency that anti-dope tests Esports players for the Esports Integrity Coalition (ESIC). Players have indicated that **Adderall (helps with concentration)** is not the only stimulant being used to **enhance their game performance**, but also **marijuana (for helping to relieve stress)**. Verroken carries out oral fluid tests (sampling saliva) to test the players sobriety to target the stimulants. In addition to the drug-intake concerns of the players, there **other physiological concerns as well** such as excessive blue-light exposure from their computer screens.

9. Holden, J. T., Rodenberg, R. M., & Kaburakis, A. (2017). **Esports corruption: Gambling, doping, and global governance.** *Md. J. Int'l L.*, 32, 236.

Annotation:

This article examines the threats to Esports' evolving growth and its integrity. Such threats are internally and externally targeting the players, tournament organizers, gamblers, sponsors, politicians, and fans. Internal threats include using **performance-enhancing drugs and match-fixing** (often motivated by gambler payoff). External threats include **pressure from a regulated and irregulated gambling markets.**

10. Ghoshal, A. (2019). **Ethics in esports.** *Gaming Law Review*, 23(5), 338-343.

Annotation:

This article begins with distinguishing Esports from “off-line” sports (traditional sports). A primary difference is that Esports are trickier to regulate because **the copyrights over the game content is intellectual property** to the developer. The **Esports Integrity Coalition (ESIC)** serves as the regulatory body for Esports classifies ethical issues within Esports into two broad areas: **cheating to win** (i.e., software cheats, online attacks, and doping with performance-enhancing drugs) and **cheating to lose** (i.e., match-fixing or other fraudulent betting and structural tournament manipulation). While there are ongoing regulations being applied to savor Esports' integrity, the authors make suggestions for reform. Considering Esports is in the sports industry, **jurisdictions and establishing a uniform code of ethics** will mitigate threats.

11. Brickell, A. (2017). **Addressing integrity and regulatory risks in esports: The responsibility of the whole esports community.** *Gaming Law Review*, 21(8), 603-609.

Annotation:

This article emphasizes the need for **Esports stakeholders** to be concerned with **sport integrity** as Esports is emerging into the sports industry. Common scandals in traditional sports involve **doping problems, match-fixing, institutional corruption**, and other similar threats. The **Esports Integrity Coalition (ESIC)** seeks to protect the industry's integrity by assessing its potential threats (i.e., cheating to win or cheating to lose) and implementing regulation. Furthermore, the nature of Esports being electronic, the risks for gambling regulation are prone to occur as well as endangered environments for player protection. The authors conclude this article with a breakdown of how Esports stakeholders' roles of influence in the jeopardy of the industry's integrity.

Chapter 5: Esports and Technology

The technological advances of Esports carry vast knowledge from education to Artificial Intelligence. Currently, such devices are recording gamer productivity and making predictions for their future performances. The following annotations investigate the impacts Esports has made and will make in the progression of technology. To begin this chapter, it is best to understand the possible impacts of the Esports in education by making a brief analysis in the interaction between Gamification and Learning (a list of 10 examples of gamification EdTech, see Table 3, Appendix).

5.1 Serious Games, Gamification, & EdTech

1. Carlier, S., Van der Paelt, S., Ongenaes, F., De Backere, F., De Turk, F. (2019). **Using a Serious Game to Reduce Stress and Anxiety in Children with Autism Spectrum Disorder.** *Proceedings of the 13th International Conference on Pervasive Computing Technologies for Healthcare, Trento, Italy, May 20-23, 2019 (PervasiveHealth'19)*, 10 pages.

Annotation:

The authors conducted a study to evaluate the effectiveness of a serious game in **reducing levels of stress and anxiety in children with Autism Spectrum Disorder (ASD)**. The authors worked with specialized therapists to develop New Horizons, a mobile game which integrates elements of cognitive behavioral therapy and relaxation techniques.

2. Rice, J. W. (2012). **The gamification of learning and instruction: Game-based methods and strategies for training and education**. *International Journal of Gaming and Computer-Mediated Simulations*, 4(4).

Annotation:

This book tries to answer questions such as "How to use games and gamification to teach **professional knowledge and behavior**", "What types of game dynamics are most **motivational and edifying**" and "How to **manage the development of gamified instruction**".

3. Gee, J. P. (2003). **What video games have to teach us about learning and literacy**. *Computers in Entertainment (CIE)*, 1(1), 20-20.

Annotation:

Author, James Paul Gee, looks at the good that can come from playing video games. In this book, games are evaluated, and theories of cognitive development are expanded. The author looks at **major cognitive activities** including how individuals develop a sense of identity, how we grasp meaning, how we evaluate and follow a command, pick a role model, and perceive the world. Gee, J. P. (2003). What **video games** have to teach us about **learning and literacy**.

4. Farber, M. (2017). *Gamify your classroom: A field guide to game-based learning*. Peter Lang.

Annotation:

This article is a field guide on how to implement game-based learning and «gamification» techniques to everyday teaching. It is a **survey** of best practices aggregated from interviews with experts in the field.

5. Core, C., & Prep, S. T. **Education Research: Conducting Research and Education Research on the Web.**

Annotation:

Author, Ashmeet Singh, wrote this article to explain that many **startup companies** are **creating games for the school environment**. The scope of EdTech solutions has evolved so much so that you can find an app to learn pretty much anything. To understand the complex landscape of the EdTechs, including the many gamification possibilities, Singh discusses the EdTech landscapes: (1) **Immersive Tech** – apps based on VR, AR, and MR, (2) **Early Childhood Learning** – Apps that assist the development of 3-5 year olds, (3) **Coding & Technology** – apps teaching coding and robotics to kids and adults, (4) **STEM** – science, technology, engineering, and mathematics learning apps, (5) **Learning Management Systems** – LMS administer, document, track, report and deliver educational courses, (6) **Social Emotional Learning** – apps that support wellbeing and positive mental health, (7) **Language Learning** – tools and apps, and (8) **Online Courses** – free or paid online educational courses.

5.2 Artificial Intelligence

6. G.W. Salicki. (2019, January 10) **How Machine Learning and AI are changing Esports and Knowledge itself.** from <https://medium.com/swlh/how-machine-learning-and-ai-are-changing-Esports-and-knowledge-itself-b4d977473cc1>

Annotation:

In this article, the author highlights the emergence of **machine learning and statistical analysis** that have given rise to new strategies to broaden the horizon of Esports. He mentions about Elon Musk's startup, popularly known as *Open AI* who have been involved in data analytics along with SAP tools to comprehend different aspects of a game. To our knowledge of gaming, many distinct or familiar strategic patterns are iterated throughout. He supports his theory by giving an example of the game Dota and how several situations can be approached by expanding human knowledge, which is only possible by **embracing simulations**. These simulations would aid the Esports players in recording rich data and making executive decisions in pressure situations. Finally, he concludes that the world we dwell in has turned a blind eye to biases and that we are limited by human constraints of temporality and mortality to alternative views of assessing situations.

7. Cami Rosso (2018, June 29) **The Convergence of Artificial Intelligence and Esports**

From: <https://www.psychologytoday.com/us/blog/the-future-brain/201806/the-convergence-artificial-intelligence-and-Esports>

Annotation:

This article describes the **economic impact of Esports** as a result of convergence of Artificial Intelligence and Esports. It emphasizes on different facts outlining potential startups that have played a major role in **global monetization, enhancement of user and audience experience, training of Esports players and competing with AI bots**. It also focuses on startups that specialize in predictive analysis to improve the performance of the Esports players. As the field of virtual assistants is blooming, many startups have incorporated assistive assistants to help the players win on all occasions. Another notable point mentioned in the article would be, with the increase of corporate sponsors, live streaming, and immense funding of Esports leagues

there would be a point in the near future that **Esports would be recognized as an Olympic Sport.**

8. Yilmazcoban, O. (2018, December 12). **AI is Esports' newest weapon.** Retrieved from <https://venturebeat.com/2018/12/11/ai-is-Esports-newest-weapon/>

Annotation:

This article emphasizes on how the rise and development of Artificial Intelligence has led to becoming Esports's newest weapon. As far as Esports coaches are concerned, they have been incompetent when compared to the skills of **AI based coaches**. The advantage an AI coach possesses is access to **detailed statistics and vital insights** of the players whereas a human coach does not. The tools used to assess different players have predominantly assisted them in learning from their mistakes committed during the game. It outlines different potentials startups who are focused on enhancing the skills of players by providing an online platform that would **aid the players**. The author concludes that the future of AI is bright as the size of the audience, gamers and the revenue is increasing at an exponential rate.

5.3 Biofeedback

9. Jon Irwin, (2016, January 8) **The Biofeedback games made to Improve Our Well-Being**

From: <https://killscreen.com/articles/the-biofeedback-games-made-to-improve-our-well-being/>

Annotation:

This article highlights on how biofeedback games help in the cognitive well-being of the players. Earlier, games influenced the players through **biorhythms**. However, the current scenario is more focused towards pulling **physiological reactions**. The author discusses that there were attempts in the past at incorporating biofeedback, however they merely trifled with it.

Biofeedback was implemented not only to measure a player's physiological parameters but also to gather data. This data could be used to learn about players mental health and cognitive abilities. The author concludes that the results of the research would help the players **overcome challenges at home, school, or work.**

10. Dean Takahashi, (2018, November 8). **Humm's headset turns your brain into overdrive for better gaming** From: <https://venturebeat.com/2018/11/08/humms-headset-turns-your-brain-into-overdrive-for-better-gaming/>

Annotation:

The article is entirely focused on a startup called **Humm technologies**. It has invented a **headset that would enhance a person's cognitive abilities**. They achieve this by stimulating certain regions of the brain that are responsible for learning and memory. The company claims that the headset would **help players concentrate and acquire skills on a regular basis**. Also, as far as the safety is concerned, it is a non-invasive brain stimulation. The headset has been successfully tested on players and has achieved positive results. It also provides information on **user's cognitive state and monitors on their stress, fatigue and stress** over a period of time.

11. M. Abdullah Zafar, Beena Ahmed, Rami Al Rihawi, and Ricardo Gutierrez-Osuna. (2018, March 19) **Gaming away stress: Using biofeedback games to learn paced breathing** from: <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8319498>

Annotation:

The paper speaks about the implementation of biofeedback in order to **learn paced breathing**. The experimenters conducted a test on 100 male participants by making them play biofeedback and audio pacing versions of the game. The games were essentially played between breathing and a cognitive performance. They arrived at **significant results** which proved that the

utilization of **biofeedback led to better breathing during the play**. This eventually led to players performing well in cognitively stressful task. Therefore, it is concluded that **respiratory biofeedback** in the video game proves to be highly effective.

5.4 Virtual Reality

12. Hamilton, L. (2016, Aug 25). **Sliver.tv raises \$6.2 million in funding as it hitches virtual reality and Esports together**. CED, Retrieved from <http://libproxy.utdallas.edu/login?url=https://search-proquest-com.libproxy.utdallas.edu/docview/1814016965?accountid=7120>

Annotation:

In this news article, the author covers Silver.tv's announcement of funding to launch an open beta platform for Esports entertainment. Silver.tv offers an **immersive 360 degree and VR experience** to their fanbase of Esports spectators. Their focus is on the **perspective of the audience**, rather than the player's point-of-view. Silver.tv's "Auto Content" generation technology crawls, indexes, and records more than a dozen live professional tournaments and players at a time, and is constructing a database of matches, players, and tournaments, along with game metadata. "Hot Spot" and "Special Effects" algorithms identify highlight moments and create reels of top plays, applying slow motion, zoom-in effects, and dynamic placement of virtual cameras to capture the optimal viewing angle. Silver.tv currently generates and publishes 360-degree highlights within 12-24 hours following the completion of a match.

Chapter 6: Esports and Business

The Esports enterprise is mounting with ample opportunity for financial gain. The following annotations touch on the consumer experience of Esports and the increase of supply and demand.

1. Schoettle, A. "**Esports explode: Video-game competitions becoming global sensation; businesses, teams, schools race to get in on action.**" Indianapolis Business Journal 4 Dec. 2017: 1A+. Business Insights: Essentials. Web. 31 July 2019.

Annotation:

In this article, the author reviews the **growing business opportunities** in the Esports market. With the participation of a **global audience of 500 million**, businesses, Major League professional sports teams, and collegiate sports teams are all becoming involved in this growing economy which, according to Newzoo gaming and mobile communications research firm in San Francisco, will amount to a **\$1.5 billion-dollar industry** by the year 2020.

2. Weiss, T., and Schiele, S. (2013). **Virtual worlds in competitive contexts: Analyzing Esports consumer needs.** *Electronic Markets*, 23(4), 307-316.
doi:<http://dx.doi.org.libproxy.utdallas.edu/10.1007/s12525-013-0127-5>

Annotation:

The authors conducted a behavioral study to evaluate the needs of Esports consumers, using a theoretical background of a **Uses and Gratifications** approach. They conducted semi-structured expert interviews and a qualitative analysis of both **competitive** (competition, achievement, challenge, reputation, rewards) and **hedonic** (social relationship, escapism, self-fulfillment, fun, virtual identity) needs and gratifications which supply the motivational drive of Esports consumers.

3. Bayliss, H. A. (2016). **Not Just a Game: the Employment Status and Collective Bargaining Rights of Professional Esports Players.** *Wash. & Lee J. Civ. Rts. & Soc. Just.*, 22, 359.

Annotation:

This article analyzes the roles of Esports players from the largest Esports program, Riot Games' League of Legends (LoL), and how there is limited opportunity for **collective bargaining** based on if the players are employees or independent from LoL. The authors pose the topic on the rights of the Esports players as the industry of Esports expands. The breakdown of the professional LoL consists of sponsors, Riot Games, LoL Championship Series (LCS), the team organizations, professional players, and the serviced streaming platforms. Out of the 6 entities, 3 specifically **deal with the players: the team organizations, the streaming platforms, and the LCS**. Riot Games is a California based industry, so the **legalities concerning the compensation for participation, regulations of the professional players, and team publicity** renders under such constitutes in accordance with the LCS.

Unlike with traditional pro-sports, the LCS **player mobility is restricted**. The LCS limits the ability for other teams to bargain for players. Any propositions to modify the LCS' regulations must be submitted for review by the LCS. Thus, **potential for risk of arbitrary of unfair decisions** is less attenuated than a more regulated system (i.e., the National Basketball Players Association's (NBPA) Collective Bargaining Agreement (CBA)). The authors state that if the LCS does not wisely apply their funds or address the issue of minority representation, the **players will be put in jeopardy** from either loss of compensation or loss of venue to perform.

The authors conclude that as the LCS exerts sufficient control over the LoL players, the **players have yet attempted to form a system of collective bargaining** and the National Labor Relations Board (**NLRB**) **has not asserted such jurisdiction over the Esports industry**. If at some point these notions were to be pursued, the Esports professional players and game makers would reach a higher level of professionalism with greater employment security.

4. Borowy, M. (2013). **Pioneering eSport: the experience economy and the marketing of early 1980s arcade gaming contests.** *International Journal of Communication*, 7, 21.

Annotation:

The authors of this article identify **Esports as a product of gamer culture, a successful outcome of “experience economy”, and an enterprise established by event marketing.** In combination of sports, marketing, and technology, Esports promotes **competitive cyberathleticism.** The article expands on the business development and rise of Esports from the **1980s arcade phenomena into a cybernetic outlet** we now know as Esports.

5. Jenny, S. E., Keiper, M. C., Taylor, B. J., Williams, D. P., Gawrysiak, J., Manning, R. D., & Tutka, P. M. (2018). **Esports Venues: A New Sport Business Opportunity.** *Journal of Applied Sport Management*, 10(1).

Annotation:

This article announces the **financial opportunity for venues when hosting Esports competitions.** Over the last decade, Esports have attracted over 25 million viewers and high-profile sponsorships such as Coca-Cola, Red Bull, Intel, and Nissan. The venues where Esports competitions are mostly held are in entertainment facilities within U.S., Western Europe, China and South Korea that were initially designed for traditional sports. Thus, **new and conducive facilities** are being constructed to cater to the Esports gaming environment.

This subject is expanded through the lenses of “**open systems theory**” which states the **success and long-term growth** of an organization are **heavily influenced by their surrounding environment.** While the entertainment facilities (e.g., the Staples Center in Los Angeles, CA) are generating substantial revenue from Esports competitions, greater accommodations must take place to create an Esports atmosphere (i.e., technologically with scoreboards, comfort for the

audience). While some Esports entertainment facilities already exist, the **demand for more is rising**.

3. Lee Igel, (2019, March 14) **Arlington, Texas Announces Plans to Build largest Esports Stadium in United States**

from: <https://www.forbes.com/sites/leeigel/2018/03/14/arlington-texas-announces-plans-to-build-largest-esports-stadium-in-u-s/#251de7054131>

Annotation:

This is a news article that features the state of Texas is scheduled to build the largest eSports stadium in the United States later this year. The cost of this state-of-the-art facility is estimated to be about **\$10 million** dollars and **100,000** sq. ft. in size. It will be a home for the video gamers and enthusiasts. The venue will be open 24/7, with modern amenities. It will host tournaments and eventually championship for not just the players but also the fans to spectate them. It will accommodate about **1000** gamers and will be involved in matches that will last 8 hours or even longer. As eSports industry is exploding with opportunities for gamers around the world, many deep-pocketed tech giants are looking to invest and expand their technologies and services.

Chapter 7: Case Studies (coming in Version 2)

This chapter is dedicated to avid Esports players who consider Esports to be an influence on their daily lives. The evidence below was collected during our focus group sessions. With their consent, we share their anecdotes collected from semi-structured interviews to illuminate the significance Esports has on individual lives.

Chapter 8: Esports Resources

Through our research of Esports, we came across several resources that provided a wealth of information. Each section below lists those resources beginning with common terminology that was mentioned throughout several articles.

8.1 Terminology

- **Co-design:** the approach to design which expresses the need for collaboration between designer and who they are designing for
- **Focus Group(s):** For the purpose of this project, we operationally define this term as a method of gathering and heterogeneous group of highly motivated Esports players as part of our co-design process (defined above).
- **“Persistence Team”:** small, executive, committee in the Esports Cyberathlete Development project to make executive decisions on incoming information and opportunities.
- **Transdisciplinary:** relating to more than one branch of knowledge; interdisciplinary. (from Oxford)
- **Team Science:** a collaborative effort to address a scientific challenge that leverages the strengths and expertise of professionals trained in different fields. (from NCI)
- **Gamification:** the application of typical elements of game playing (e.g. point scoring, competition with others, rules of play) to other areas of activity, typically as an online marketing technique to encourage engagement with a product or service. (from Oxford)
- **Serious Games:** Electronic games whose main purpose is “serious” and not to simply entertain. The primary “serious” purposes can be to teach or train in areas such as education, health care, advertising, politics, etc. (from IGI Global: Disseminator of Knowledge)

- **Machine Learning:** the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. (from Wikipedia)
- **Player-centric Networks:** coordination, collaboration, and proximity between players (Mora-Cantalops & Sicilia, 2019)
 - **Ego-nets:** the comparative analysis between the “ego” (the individual Esports player) and their “net” (team-network)
- **Cyberathleticism:** a professional player of computer games (Borowy, 2013)

8.2 Academic Journals

1. Frontiers in Psychology
 - a. Performance Science
2. Elsevier
 - a. Computers in Human Behavior
 - b. Journal of Business Research
3. National Center for Biotechnology Information (NCBI)
 - a. PubMed.gov
4. APA PsycNET

8.3 Websites

1. [Esports Observer](#) by Street & Smith’s Sports Business Journal
 - a. Available on site: podcasts, news, stocks, databases, markets, business, games, leagues, & Esports forum
2. [Esports Earnings :: Prize Money / Results / History / Statistics](#)
3. [Daily Esports](#) Available on the site: Esports news & professional Esports player interviews

4. [NerdETF](#) : Roundhill believes that esports and video games are the future of live media, sports and entertainment. That's why we created the first pure-play esports ETF, the Roundhill BITKRAFT Esports & Digital Entertainment ETF.
5. [Gamesindustry.biz](#): Lists international upcoming gaming events
6. [Mobalytics, Analytics for Competitive Gamers](#): “Founded by a group of passionate gamers, Mobalytics is a rapidly growing eSports startup with a big vision: to empower any and all gamers to unlock their potential.”
7. [Events for Gamers](#) : 250+ Events, 1 Calendar – routinely updates site for upcoming events concentrated on Esports

8.4 Conferences (2019-2020)

1. Sports Tech World Series USA
2. UK Sports Tech Cup
3. International Mobile Brain/Body Imaging Conference (MoBI)
4. 2020 EsportsTravel Summit (hosted at Arlington, Texas’ new Esports Stadium)
5. Esports Day – Game Developers Conference
6. Esports Biz Summit 2020
7. Esports – Consumer Technology Association 2020
8. XLIVE Esports Summit
9. ECAC eSports
10. Esports CAR – The World’s Esports Business Arena
11. Gaming Expo: SXSW Conference & Festivals

Appendix

Esports Gaming Sessions Documents

Excel Spreadsheet Snapshot

Record of ET Gaming Sessions

	Date of Session	Time of Session	Name of Attendee	Level of Gamer You Are	eSport Game Played	Champion Selected	Time Gaming Session Ended	Fill Out eSport Reflection Sheet HERE
EXAMPLE:	07/31/19	11:00 AM	Lauren	Beginner	League of Legends (LoL)	Aatrox	1:15 PM	Completed

Esports Reflection Report Snapshot

eSport Gaming Session Reflection

Name:

Date:

Game Played:

Champion Selected:

Purpose of this sheet: Bring the ET team together for a great time! We will also be able to...

1. Gain firsthand experience on what eSports is like (in a recreational sense)
2. Track your experience through our ET Gaming Sessions
3. See if you have experienced any progress (i.e., strategically, communicatively, cognitively, with reaction times, etc.)
4. Report any transferred skills from gaming to your performance outside of the game (ex. Increased awareness of surroundings, faster responses to text message or email notifications)
5. Compare if there are any gender differences between ET members and gaming techniques

Instructions:

1. Save this template as a COPY and Save As in the [ET Gaming Sessions Materials](#) → [ET Reflection Reports Folder](#) with your first name, game played, and date (Example: Lauren_LoL_07-31)
2. Fill out the information above: Name, Date, Game Player, Champion Selected
3. Personal Reflection: write a few sentences on what your experience was like, what did you notice about the eSport gaming environment, how you think you performed, information you would like to share, etc.

Personal Reflection:

Overall Experience (highlight which option you most agree with): Poor (I am not much of a fan of playing), Good (I enjoyed the game, but still need to tinker with it), Great (I can't wait for our next session!)

Table 1. Genres of Esports

<u>Genres of Esports</u>	<u>Popular eSport Titles</u>
Player vs. Player (PvP)	Fighting Games: Super Smash Bros, Mortal Kombat, Street Fighter, Tekken Sports Games: FIFA, Madden, Rocket League
Real-Time Strategy (RTS)	Starcraft, Warcraft, Chess.com
First-Person Shooter (FPS)	Counter-Strike, Battlefield, Call of Duty, Overwatch
Multiplayer Online Battle Arena (MOBA)	League of Legends, Heroes of the Storm, Defense of the Ancients Mobile: Arena of Valor (China’s mobile version of LoL)
Massively Multiplayer Online Role-Playing Game (MMORPG)	World of WarCraft, Guild Wars
Racing	Need for Speed, Mario Kart
Collectible Card Game	Hearthstone, Shadowverse
Puzzle Game	Pac-man, Tetris Ultimate
Battle-Royale-Genre	Apex Legends, Fortnite, Player Unknown Battleground
Third-Person-Shooter (TPS)	Gears of War

Sources: [Discover Esports](#), [Esports Earnings](#)

Table 2. Esports Streaming Platforms

- Twitch 
- YouTube Gaming 
- Mixer 
- Facebook Gaming 
- Stream TV 
- Caffeine 

Chinese Streaming Services:
Huya aka “Twitch of China”

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- Douyu TV 
- NetEase CC 
- ZhanQi 
- Panda TV 

Source: [Esports Observer](#)

Table 3. Examples of Gamification EdTech

Source	Description
1. https://kahoot.com	"We are on a mission to make learning awesome and unlock the deepest potential of each and every learner by making learning fun and engaging through games."
2. https://www.playmyway.com	Play My Way is an app that asks you an educational question by popping up every few minutes then hiding after you answer. After finishing a set of questions in Math, Science, & English, you can also view a detailed report. It is a bond between parents, teachers, and students
3. https://www.tinytap.it/	The TinyTap Market is an online community of millions of kids, teachers and parents that create and share their fun educational games. The games can be published as real apps on the TinyTap Market, AppStore, Google Play and the Web.
4. https://www.ichamp.in	A game to learn math (created in India)
5. https://www.playshifu.com	Playshifu creates engaging and immersive AR experiences for children encouraging early STEAM skills
6. https://byjus.com	BYJU'S offers highly personalized and effective learning programs with games and for classes 1 - 12 (K-12), and aspirants of competitive exams
7. https://www.ageoflearning.com	Age of Learning blend education best practices, innovative technology, and insightful creativity to create engaging and effective educational experiences that bring learning to life. Their flagship program is the ABCmouse.com ®, a digital learning resource for children ages 2–8, designed to help prepare children for kindergarten and ensure third-grade readiness
8. https://www.7generationgames.com	An educational video game company that creates web-based games for elementary and middle school students that combine math, history, language and a little adventure
9. https://www.kikolabs.com	They set out to invent a new type of learning experience. A suite of games targeting behaviors that train executive function and reasoning, skills are chosen for their importance in a child's development and learning capacity. Adaptive algorithms that scale each game's difficulty along multiple vectors to continually challenge a child. Progress reports delivered to parents. It's simple, yet powerful – and based on real science.
10. https://education.minecraft.net	Minecraft helps kids to learn computer science, problem-solving, wilderness conservation, and even introductory chemistry concepts. Students will feel like they are in the original Minecraft world but with far more substance.

Table 4. Esports Organizations at UT Dallas

UTD Esports Team: 4 players per team (launched August 20, 2018) https://utdEsports.com/				
Overwatch A	Overwatch B	League of Legends A	League of Legends B	Coaches & Analysts
UTD Student Organizations (Categorized as “Club Sports”) https://utdallas.presence.io/organizations				
<i>League of Legends UTDallas</i>		<i>Rocket League Club</i>		<i>Tespa at UTDallas</i>
<p>Mission, Purpose, and Organization Description: “Have a love for League? Go to UTD? Want to meet others who share that same passion as you? Then you've come to the right place! Here at LOLUTD we want to bring together all players, new and old, to create a community where everyone can make friends and help each other out. Our mission is not only to set up an official League of Legends community at UTD, but to improve the League of Legends community as a whole.</p> <p>Total Members: 35</p>		<p>Mission, Purpose, and Organization Description: “The mission of the Rocket League Club is to create and build a supportive community around the video game Rocket League. In order to achieve our purpose, our club will focus on providing its members and other Rocket League players with means to discuss and Esports of the game in detail, appropriate coaching for players who wish to improve in the game and to hold tournaments for players to complete in. Also another main objective of the club is to support the growing UTD Esports community by supporting events, player streams, and providing services, such as rides or watch parties for Esport competitions and events.”</p> <p>Total Members: 40</p>		<p>Mission, Purpose, and Organization Description: “The Esports Association (TeSPA) at UTDallas is a competitive gaming organization focused to bring players from all games to unite, play, and compete. TeSPA serves as a support club for any interest for events in any game by providing resources to start an event, (i.e. venue, money, prizes). Our goal is to work with any clubs to successfully host any gaming event as well as encourage students to form new gaming clubs without feeling pressured to create an event on their own.”</p> <p>Total Members: 16</p>

(information gathered September 2019)

Table 5. National & International Esports Organizations

Organizations	Descriptions
1. North America Scholastic Esports Federation (NASEF)	<p>Mission To provide opportunities for ALL students to use esports as a platform to acquire critical communication, collaboration, and problem-solving skills needed to thrive in work and in life.</p> <p>Vision To ensure that ALL students possess the knowledge and skills needed to be society’s game changers: educated, productive, and empathetic individuals.</p> <p>Core Values</p> <ul style="list-style-type: none"> • Learning » We connect learning and play in and out of the classroom so that students, educators and families experience the real-world value of education through interest-driven learning. • Opportunity » We value a safe and engaging space for all students to connect, play, learn, and grow. • Community » We build a strong community of interconnected scholar players who demonstrate leadership, accountability, commitment, and fortitude. • Diversity » We develop strong character and self-identity so that all participants celebrate individuality and differences. • Respect » We honor the human potential for respect of self and others <p>Website: https://www.esportsfed.org/about/research/</p>
2. BITKRAFT	<p>BITKRAFT is the first and most active esports investment fund in the world. We see esports as the future of digital entertainment and work alongside the best founders to build outstanding products and services. We focus our investments in early and growth stage companies - globally.</p> <ul style="list-style-type: none"> • This site mentions NerdETF.com: The Roundhill BITKRAFT Esports & Digital Entertainment ETF (“NERD ETF”) is designed to offer retail and institutional investors exposure to esports & digital entertainment by providing investment results that closely correspond, before fees and expenses, to the performance of the Roundhill BITKRAFT Esports Index (“NERD Index”). <p>Website: https://www.bitkraft.net/</p>
3. eSport.fund	<p>About: This is a public fund with the mission to reveal the true passion of eSports and make it stand alongside with traditional sport. Are you a financially healthy yet a very busy man? You are just few clicks away from being on par with those who make stage arrangements.</p> <p>Funding: The growth and popularity of eSports alone is the reasonable justification for designating competitive games as sports. Do you have spare time to commit yourself, but also struggling to get sponsors engaged? Tell us about your tournament ideas and we might resolve your financial issues.</p> <p>Website: http://esport.fund/</p>