# THE EFFECT OF VIDEO GAME MASTERY TO EARNING POTENTIALS OF E-SPORT PLAYERS

## Course: Stats 3380(Non- Parametric Statistic)

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**Abstract**

*Games have been a part of the society for centuries. In order to understand why games have been a part of the recreational activity of man or why it is so wildly used as entertainment. Humanity has decorated individuals who hunted large aggressive beast such as elks, moose, tigers, lion, whales, rhinos and much more violent terrifying creatures. The bigger the hunt, the greater the accolade and bragging rights to the participating party of 1 or more. This tradition dates to Assyrian carvings from 650 B.C that showed lions slaughter by Chariot riders for the king's entertainment (Nat Geo). Technological advances have made it possible for video games to become very challenging but easy enough to learn by repeating actions on assigned keys and constant stimulation of responsive images from the video game, education or experience is not required to play unlike the way, society has championed unique individuals with extraordinary physical prowess who participate in popular games such as the Olympics, NBA(Basketball Association), UFC(Ultimate fighting), WBA(World boxing association) , NBL (baseball league) , Mr. Universe (Body building) with challenges that involve mental or physical stimulation and more often both. Games are very broad to cover, so we will be focusing on video games being played on the platform Personal Computer (PC). It is one of the largest platforms for gaming worldwide and it has attracted developers and gamers of all kinds to embrace its beauty. Many genres exist within this category and we will be exploring the most competitive one amongst them, multiplayer online battle arena (MOBA). We will study the effect of mastery amongst competitive e-sports players in this genre. E-sports players have variable earnings based on the complexity of the game. We will be reviewing the two most played games in the MOBA gaming industries, DOTA 2(Defense of the Ancients) and LOL (League of legend). Both games have a total player base of over 10 million users monthly (unrankedsmurf). The games are vastly popular to pc players, it requires patience and practice to truly master the game.*

*We will further investigate how playing MOBA games professionally brings a large sum of income to the players and observe the correlation to their overall performance at major events. Furthermore, In major events, e-sports earnings are heavily related to the prize pool. An e-sports player limited to the peak of the prize pool.*

## Introduction

MOBA (multiplayer online battle arena) games are the heart of the pc gaming community and created to be one of the most competitive e-sports games in video game history. The most popular question asked about being an e-sports player is "how stable is this source of income?". First of all, what is a MOBA? it is a video game genre that pits two teams of five in a closed map, with the first team to demolish the enemy's base declared the winner. In MOBA, players control a "champion": a character with a unique skill set. There is a huge variety of champions to choose ranging from 50 to 150 in MOBA games, each with distinct abilities and weakness that can be exploited during gameplay. Success incredibly depend on balanced array of skills on the opposing team. Most MOBA games have a single map, with three "lanes" leading a from your base to the enemy base camp. Each is defended by turrets and "minions" computer controlled enemy characters. There are also wild monsters, not affiliated with either side. Defeating these creatures empowers your champions. MOBA games greatly encourage teamwork, with champions assigned different roles such:

- Tank (high defense and absorbs damage for teammates)
- Support (heals and enhances teammates abilities)
- Carry (high damaging and have low defense)
- Jungler (high mobility, assist the team in lanes to reach max potential)

Sometimes the champions are mix of all traits and completely played based on preference by the player. Video games can very enjoyable for a lot of people, similarly for any sport we engage in. However, when it come to E-sports, players must engage in daily training that requires hundreds of hours of playtime to fully grasp the concept of the game. We have chosen to eliminate the following factors and only focus on their accolades while playing the game over a period of 5 years.

- How a champion is built (each champion has 8 slots for armour, damage and utilities which has combination of 180C8= $2.334233778 \times 10^{13}$ ways to be suited for the match up)

- Total amount of playtime (players may play the game longer than pros but will not able to display the reaction and discipline to execute actions in team fights when needed)
- Strategies to gameplay (how fast a player reaches max power, map awareness and control, empowerment of wild monsters)

With this established we can proceed the discuss the potential earnings of e-sports players to their performance at major league events.

## Method

The study was conducted to evaluate the effect of mastery amongst competitive e-sports players in this genre. E-sports players have variable earnings based on the complexity of the game. We will be reviewing the two most played games in the MOBA gaming industries, DOTA 2 (Defense of the Ancients) and LOL (League of legend). Both games have a total player base of over 10 million users monthly (unrankedsmurf,2019), so we will be looking at 10 e-sports players between the 2 MOBA games.

We collected data from the official e-sports database of players who have been competitively playing MOBA games over a period of 5 years from 2015 to 2019. E-sports are made of multiple tournaments with varying prize pools from 10 thousand to 30 million dollars in which players contest to be on top and win a large sum of money. The highest paying tournaments of each year will be chosen to evaluate their earning potentials which are The International for DOTA 2 and League of Legends World Championship for LOL. Data collected is a total of 20 players consisting of 10 e-sports players from each of the MOBA games (DOTA 2 and LOL), the performance from e-sports players during tournaments has determined their total earnings each year.

All the data presented will include e-sports player earnings in a tournament and the total prize pool at the time of the event. To determine if there is a significant difference between DOTA 2 and LOL players in their total tournament earnings, 10 players are selected from each game and their total earnings will be compared using the chi-square analysis to find the difference. Furthermore, to determine the relationship of the prize pools in MOBA games, the box plot was used to find outliers and find potentials earnings of the top players. Winnings are based on the performance of players at major league tournaments which will be determined by their prize pool between the 2 games.


## Discussion of Results

*Significant Difference in Tournament Earnings Between DOTA 2 Players And LOL Players*

The data will be analyzed quantitatively using a chi square test. The table reported shows a total 20 randomly selected DOTA 2 and LOL players that have earned below 1 million dollars, we chose to use this restriction to show closer variability in the earnings.

|    | DOTA 2 | LOL |
|----|--------|--------|
| 1  | 905747 | 379602 |
| 2  | 728437 | 360201 |
| 3  | 380439 | 374778 |
| 4  | 579467 | 200832 |
| 5  | 813722 | 819683 |
| 6  | 591288 | 572086 |
| 7  | 439242 | 149002 |
| 8  | 974399 | 391322 |
| 9  | 654208 | 246852 |
| 10 | 363710 | 563457 |

In this test, we want to compare DOTA 2 players and LOL players to their total tournament earnings that are within the range of 100,000 to 999,999. We categorized the data of those players on a weak nominal scale using an interval scale to categorize their earnings and make a contingency table. In order to perform a chi-square test to analyze if the frequency of one nominal variable depends on another nominal variable at α=0.05 level of significance.

Looking at our analysis, we have *($X^2$=5.644; df=2, p-value=0.0594)*. Our p-value is greater than our level of significance, therefore we conclude that there is insufficient evidence that there is a significant difference between the between the DOTA 2 and LOL players in their total tournament earnings.

Earning potentials for players are strictly based on their prize pool. The data collected for the prize pool of DOTA2 and LOL over a period of 5 years will be used to show how the prize pool for MOBA games have increased over the years.
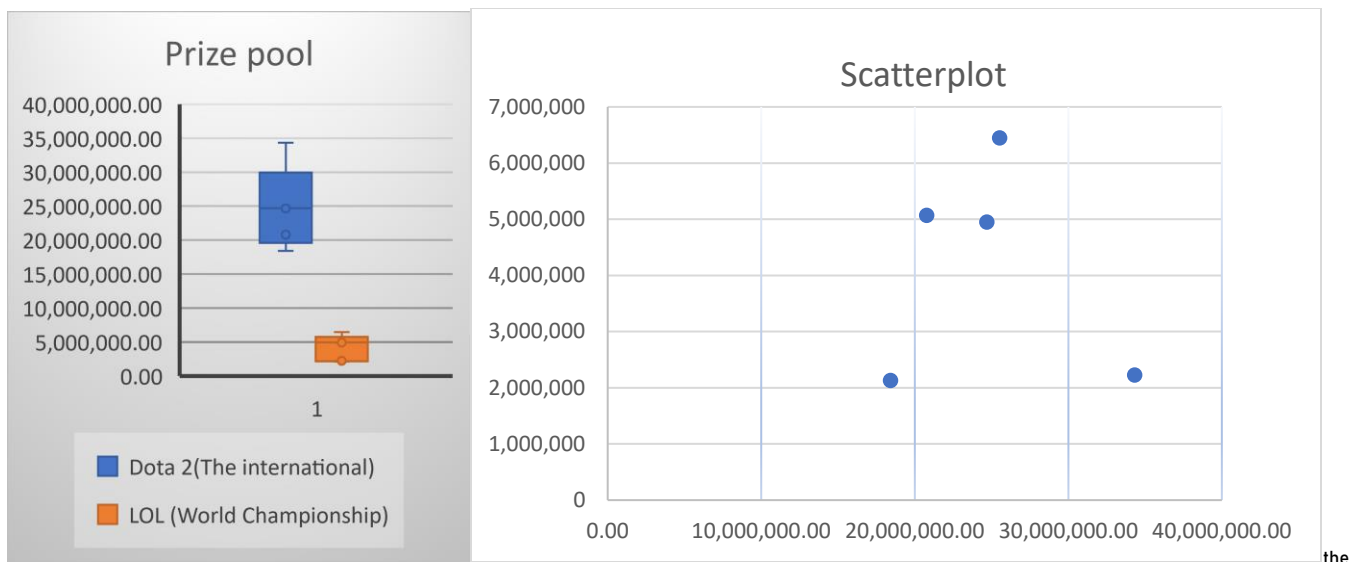

*Relationship Between MOBA Games And Their Prize Pools.*


| Major League Prize Pool | | |
|---|---|---|
| | DOTA 2 (The International) | LOL (LOL: World Championship) |
| **2015** | 18,429,613 | 2,130,000 |
| **2016** | 20,770,460 | 5,070,000 |
| **2017** | 24,687,919 | 4,946,969 |
| **2018** | 25,532,177 | 6,450,000 |
| **2019** | 34,330,069 | 2,225,000 |

We collected the total cash prize pool of DOTA 2 and LOL over a period of 5 years to show the relationship the 2 two games and how it determines the total
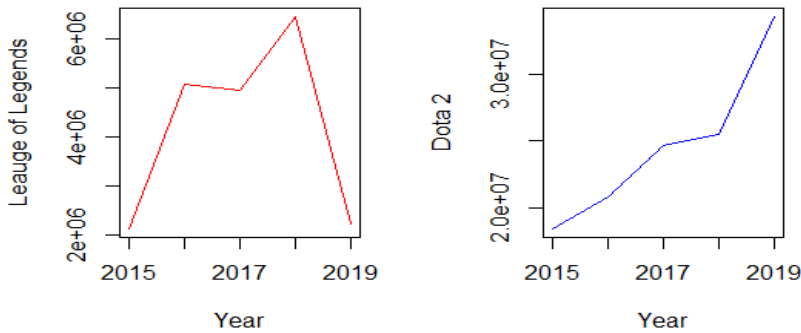


If we look at the graphical data and observe the earnings on a yearly basis, we will see that there is a constant increase the potential earnings for the DOTA 2 e-sports players compared to the LOL e-sports players which fluctuates back and forth. The increase in DOTA 2 yearly increase in prize pool is likely because of increased sponsorship from the developers Valve corporation compared to LOL who already has a large fan base and constants seeks to increase viewership via online stream giants like Twitch and Amazon prime. According to business insider, LOL had over 100 million viewership put its as game as most popular e-sport game (business,2019)

There is no good relationship between the two games in terms of earnings which therefore implies that there is a lot of significant difference between DOTA 2 and LOL top game players earnings, also we checked their correlation and they have a negative correlation= -0.1633 and when we go back to the quantile plot, we will see that the data is so wide spread and DOTA 2 players are on a higher range compared to league of legends players.
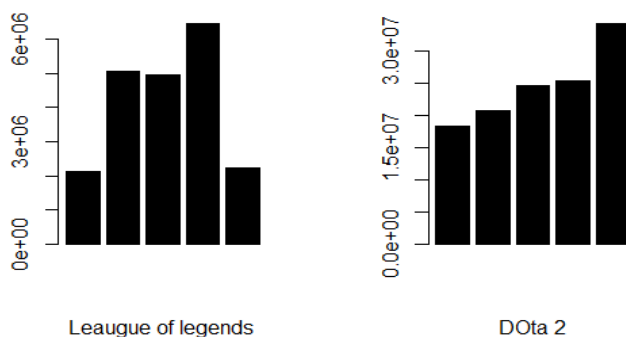


The bar chart for LOL is bell shaped showing that the prize pool had progressively increased then suddenly dropped compared to DOTA 2 having more spread to the right, making skewed to the left. The potential earnings for DOTA 2 players are higher than LOL players

*Winnings Are Based On Overall Performance From Players During Tournaments*

Players are awarded large sums of money for their performance at major league events which varies based on their placement in the competition. It is known that the 1st place in any competition is highly recognized and compensated handsomely for their hardwork and determination to claim the title as the best.

The table below is how the prize pool is shared between each placement on how teams perform at tournaments

| LOL World Championship Division | |
|---|---|
| **Placement** | **Prize Pool division (%)** |
| **1st** | 37.5 |
| **2nd** | 13.5 |
| **3rd-4th** | 7 |
| **5th-8th** | 4 |
| **9th-12th** | 2.25 |
| **13th-16th** | 1.25 |
| **17th-20th** | 0.75 |
| **21st-24th** | 0.5 |

| DOTA 2 (The International) | |
|---|---|
| **Placement** | **Prize Pool division(%)** |
| **1st** | 45.5 |
| **2nd** | 13 |
| **3rd** | 9 |
| **4th** | 6 |
| **5th** | 3.5 |
| **6th-7th** | 2.5 |
| **8th-11th** | 2 |
| **12th-15th** | 1.5 |
| **16th-18th** | 1.33 |

Our analysis has confirmed that there is a negative correlation between the prize pool of DOTA 2 and LOL. We know that the prize pool for DOTA 2 keeps rising each year which means players will earn more on each placement at the tournament they compete in. In 2019, 1st place at the international takes 45.5% of the prize pool which is 15.6 millions dollars compared to 11.6 million dollars in 2018 . For LOL, players had more to potential earning more in 2018 than 2019 because of the difference in price pools. If players earn a higher position in the tournament, then it is likely they will get a bigger bracket to earn more money than if they did not climb the higher bracket. This is where mastery in the MOBA game the player enjoys come into play. The only restriction to the earning potential of an e-sports player is the peak of the prize pool of the major event.

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