Madness of NBA Talent in March

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ABSTRACT

A successful run in March Madness, the National Collegiate Athletic Association men's college basketball tournament, leads to an increase in revenue, university name recognition, and fan base support. With each additional round won, the university benefits even more. This has prompted university athletic departments to look for tools to effectively further their teams' progression in the tournament. This paper utilizes a two-step cluster analysis to determine if having future National Basketball Association players is likely to further a team's progression in the tournament. The two-step cluster analysis produced promising results. This model is useful to coaches and athletic departments that are aiming to have the best chance at winning the tournament.

I. INTRODUCTION

Since 1896, college basketball has captured the nation's heart. (First College Basketball Game 1). Year after year, collegiate athletes showcase their talents in hopes of making it big. The lucky few make it to the National Basketball Association (NBA), while the rest reminisce on their glory days. The stands, filled to their capacity, start to shake as hopeful fans cheer their team on to victory.
For junior guard Paxson Wojcik of the Brown University Bears, the goal of every season is to make it to March Madness (Zelkowitz and Poeckes 1). March Madness refers to the National Collegiate Athletic Association men's college basketball tournament. It is a single-elimination tournament with the goal of crowning a national champion (NCAA.com 1). 64 teams make it to the tournament, with 4 additional teams playing a play-in game right before the tournament starts. All rounds are televised on national television, allowing for NBA hopeful players to showcase their talents to the broadest audience possible.

March Madness is for the best of the best college basketball programs to come together and compete for a national title for themselves, their team, and their schools. With the best college basketball teams in the country, you are also going to have the best college basketball players in the country. These players are excellent assets for their teams, and by proving themselves throughout the season and in the tournament, many have a chance of becoming professionals in the future.

This project analyzes whether a future NBA player on a roster will influence how far that team will advance in the March Madness tournament. There are a plethora of reasons why this question is being asked. First, there is a vast amount of money that a program receives if their team wins. While the exact figures are unknown, it is estimated that for each game won, a program will receive $264,859 to split however their conference deems fit (Johnson 1). Second, history shows that in the years following a successful March Madness run, universities with teams in the tournament see a large increase in applicants. When Butler University made it to the championship game in 2010, the next year they recognized a 40% jump in applicants (Coudriet 1). Lastly, the increase in viewership allows for players to increase their chance of being drafted. Before Ja Morant became the NBA All-Star he is today, he played for Murray State University. Murray State, which had a 16-17 record before Ja Morant played for the school, jumped to a 28-5 record with a conference championship and a March Madness win (Murray State University Athletics 1). This jump to a winning record, along with individual statistics

accumulated by Ja Morant in his March Madness run, allowed him to skyrocket from being an undrafted prospect before college to the number two pick in the NBA Draft of 2019 (NBA.com Staff 1).

The goal of this research is for the results to be useful to coaches. This research will be useful to coaches in the decision-making process of recruiting future prospective athletes to their program. It is assumed that many high-profile high school recruits will eventually play in the NBA. When college coaches look at whom to recruit to their team, they can prioritize these likely future NBA players. This is because these players will ultimately aid the coach in doing their job, by making it to March Madness, advancing, and winning it all.

II. LITERATURE REVIEW

The literature surrounding the March Madness tournament, the National Collegiate Athletic Association, and the National Basketball Association is significant. There have not, however, been many studies and publications that examine the linkage between the three.

Some of the most helpful information comes from the National Collegiate Athletic Association. It is estimated by the NCAA that out of 18,816 NCAA Participants, only 1.2% reach the NBA (NCAA 1). From that small pool, only the lucky and most talented few can maintain their spot on a team's roster.

In a 2015 article by Kerry Miller of Bleacher Report, titled *Ranking the Most Talented Rosters in College Basketball History*, Miller analyzes the performance of college basketball teams with multiple future professional basketball players. Unlike previous studies, Miller discusses how the pairing of these future professionals helps further a team's overall record in the tournament. As opposed to looking at the NCAA history overall and every possible correlation between future NBA player and tournament success, this article examines a specific set of teams that were successful in the tournament and had players who continued their basketball career in the NBA. The criteria to make this Miller's list is difficult to match. "[T]eams were required to have at least two players who were either named to an All-NBA team or taken as a top-five pick in an NBA draft" (Miller 1). The players on these teams were the best of the best in their professional careers, and their talent was evident in their collegiate careers due to the success many of their teams had in the NCAA tournament.

Historically, it was not unheard of for the NBA to draft players immediately after they had graduated high school. To combat the issue of athletes skipping college and going directly into the professional world, the NCAA implemented a rule, "After the 2005 draft, the league implemented a rule that requires North American draftees to be 19-years-old and one year out of high school" (Discussion with Adam Silver 1). This rule led to a new phenomenon in college basketball, the one-and-done athlete. Many extremely talented players, who would likely be drafted immediately out of high school but for this rule, attended university for one year while waiting to be drafted to an NBA team. For certain college programs, this rule has been helpful. "Since the NBA raised its age minimum, Kentucky has reached three Final Fours" (Discussion with Adam Silver 1). Many elite players will go to these elite programs for one year, be an asset to the team, and then enter the draft, leaving available scholarships for the next one and done.

III. DATA DESCRIPTION

In this research, eight individual data sets were compiled. The first four data sets were compiled from Kaggle.com. This data has team information from every division one college basketball team from 2015-2019. The data includes wins/losses, efficiency, seeding for the postseason tournament, how far the team advanced in the tournament, and much more. The data was cleaned to remove the letter "R", which was placed in front of each number in the postseason tab to represent the round eliminated in the tournament. The letters "NA" from the Postseason and Seed columns, which were used to represent that a team had not been selected to compete in the tournament for that year, were also removed. The remaining statistics were utilized to determine what factors contribute to a successful run in the tournament.

The last four data sets were compiled from BasketballReference.com. This data has information on every player drafted in the NBA Draft from 2015-2019, along with their college team name and

statistics from their NBA rookie season. The data was cleaned by changing the values in the college tab from the college's abbreviation to the college's full name to match the Kaggle.com data. All rookie statistics, including professional team name, were deleted as they were not a part of the focus of this study. The total number of athletes drafted for each college per year was then tallied.

Finally, the data sets were linked together by the college name columns.

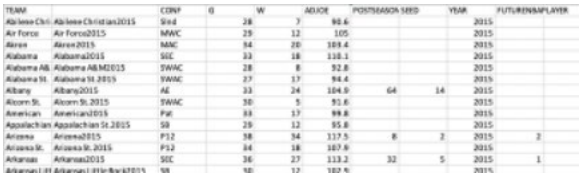

Figure 1: Sample of the dataset created from Kaggle.com and BasketballReference.com

IV. DATA MODELING

Based on the purpose of the study and the structure of the dataset, cluster analysis was the best modeling method. The purpose of a cluster analysis is to sort different data points into groups where the degree of association between two objects is high if they belong to the same group and low if they belong to different groups (Alchemer 1). IBM SPSS Modeler offers the tools necessary to complete a Two-Step Cluster Analysis. A Two-Step Cluster Analysis is an approach which uses a distance measure to separate groups, and then uses a probabilistic approach to choose the optimal subgroup (Benassi 3).

In the model 19/26 columns were used as inputs with the target being the Postseason column. Seed, Year, Team, C2, and CONF were not used as they were qualitative inputs. G (games) was not used as the number of games played was reflected in the W (wins) column.

The results obtained from this method were two clusters with a fair quality around 0.3. The size of Cluster 1 and Cluster 2 respectively is 44 and 90.

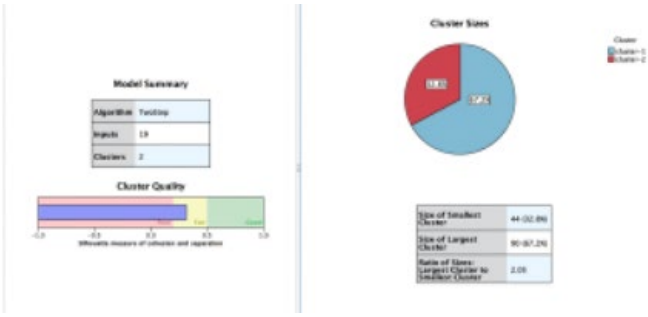

Figure 2: Summary of Two-Step Cluster Analysis Model (IBM SPSS Modeler)

V. RESULTS

The two-step cluster analysis produced two distinct groupings. Teams with multiple future NBA players were placed in Cluster 2, while teams with only one future NBA player were placed in Cluster 1. The model first found distinctions in W (wins) with Cluster 2 averaging 10 more wins than Cluster 1. This same trend of Cluster 2 outperforming Cluster 1 was seen in other relevant success metrics such as Adjusted Offensive Efficiency, Adjusted Defensive Efficiency, and Turnover Rate. With this same order repeated through all these measures, it is clear that Cluster 2 teams have the talent to perform well in the tournament.

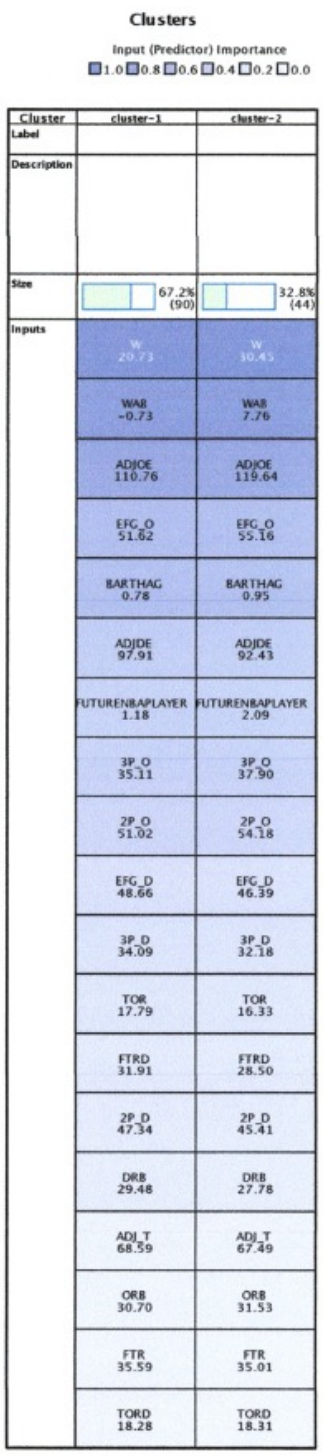

Figure 3: Cluster Predictor Importance

When looking at each individual data row, it is visible that most of the teams that did not make the tournament were not placed in any cluster. The teams that did not make the tournament, did not have a single future NBA player on their team.

Roughly 3/4 schools in Cluster 1 made it to the tournament. These schools did relatively well with most making it between the Round of 64 and the Sweet 16.

In contrast, every school in Cluster 2 made it to the tournament. These schools were the most likely to advance the furthest with every team in the Final 4, except for two, being a member of Cluster 2.

Based on these facts, it is easy to conclude that the model successfully proves that having a future NBA player on a collegiate roster influences how far the team advances in the March Madness tournament.

Coaches can use these results in planning their recruiting efforts to craft the best team possible to advance the furthest in the tournament.

VI. LIMITATIONS AND RECOMMENDATIONS

There are a few key limitations to this research. First, the data used for this study only covers the 2015-2019 seasons. While this covers 1,758 different teams, it would be more beneficial to have data that covers a longer period of time.

Second, the only way to know if a college player will move on to play in the NBA is after they are drafted. The NBA draft does not occur until after the player has finished their college career. Therefore, this can make prediction difficult.

Finally, the data does not factor in the “luck effect” that comes with playing in the tournament. Basketball players are human, and they will not always play to the ability reflected in their statistics. In other words, humans can occasionally have a bad day.

In the future, researchers should analyze whether these clusters are consistent with more years of data, and should look to see if the same trends appear in other sports such as baseball or football.

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