Shot Quality Scoring System

A Contextual Expected Value Framework for Comprehensive Basketball Evaluation and Decision-Making

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Introduction

In mid-June of 2025, James Long, Head Coach of the University of Charleston Men's Basketball, came into the offices talking about how he started tracking the quality of shots taken during the NBA Finals. Despite these conversations being nothing more than passerby thoughts or throw-it-in-the-air ideas, my curiosity about how he was going to go about it was like an itch in my brain that I couldn't scratch.

James showed me how he would go about doing it. Natural to his style, it was completely handwritten on paper and with multitudes of colors of various numbers written down. He would basically track every shot that a player would take and give it a value between 1 to 5 depending on how he felt the value of the shot should be represented with 1 being the worst shot and 5 being the best. He then would aggregate all of the shots taken by each team and come up with a shot quality score for each team at the end of the game.

My initial generic curiosity towards what he was doing sparked an opportunity for a project that could potentially be a meaningful, applicable, data-driven system. My initial takeaway from James's methods were on his values that he was choosing as they seemed arbitrary, bounded with scorer error and bias. Sure, he could figure out a way to be slightly consistent the more he did it, but what is the difference between a shot worth 2 and a shot worth 3 in his head? In his process, he had not defined a specific criterion for what a given shot was worth. To add to that, was the number he was choosing the actual value that shot was worth and was it to scale to what all the other shots are worth? What if the best shots (shots with value of 5) were actually worth double what the next best shot (shots with value of 4) was worth? This scale that he is using would then be far from explaining the truth of what was going on.

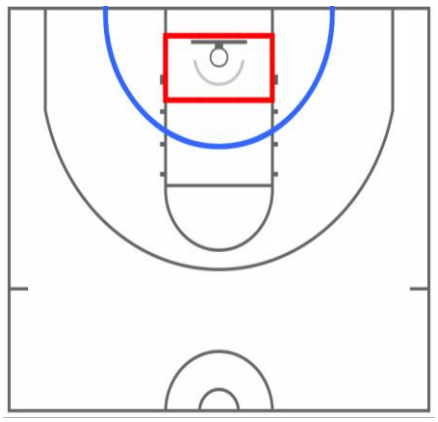
Procedure

Data Collection

What really piqued my interest about this was the idea of gathering an aggregate value for quality of shots to determine which team played the better game. Before determining whether this concept would be helpful, the two flaws in James's system had to be addressed. Lacking any readily available and usable data of any kind, my first thought was to simply watch every shot taken, but from where - all games ever?

Because I worked in Division II Men's Basketball and specifically the Mountain East Conference (MEC), I figured watching all the games from the 2024-25 MEC season (conference games only) would be the best place to start. All the MEC tournament games were included in this study. In addition to that, while Salem International University at the time was an Independent school, it played an MEC schedule by playing each MEC opponent two times so Salem's games against MEC opponents are also included. A season's worth of shots and games seemed like enough data, but not too much work as obtaining this data would be extremely cumbersome. It was also beneficial to use these specific games as the scope of the findings would match the scope of the environment that we would play in at UC.

To begin the data collection process, every shot was broken down into four categories. The first category is shot location: the rim, paint 2's, midrange 2's, and 3's. Since there is some arbitrariness to differentiating between rim and a paint 2 shot as well as between a paint 2 and a midrange, I'll try to outline as simply as I can what the difference I used as a scorer. I like to use what we call the "box" in our program vocabulary, which is a square on the court, bounded by the lane lines, the backboard/baseline and just outside the edge of the restricted area marked by the red square in the Figure below. Paint 2's are shots within approximately 10 feet of the basket (marked by the blue half circle in the Figure below), as long as the shot is not inside the previously mentioned red square. One slight gray area would be if the shooter is moving towards the basket with no defender on them (or a minimal contest) and jumps from the "Paint 2" location, I would give the shooter a rim 2. The midrange location is considered any shot taken inside the 3 but outside of 10 feet/the blue-marked half-circle in the Figure. Finally, 3's would obviously be anything outside of the 3-point line.



The second category is the level of contest by the defense on the shot taken, of which there were 3 levels. The first level would be if the shooter was open or an extremely minimal contest. The third layer of contest would be if the shot was blocked, if the shooter was double teamed or if the shooter was heavily guarded by even if the shot was not blocked. The second level would be somewhere in between those two levels - not wide open and not heavily contested. In addition to these contests, fouls needed to be marked as a possibility and it was decided that this would be represented as a fourth level for the types of contests.

The third category is determined by if the shooter was moving at or immediately before the time of the shot. If the shooter is standing still or moving minimally at the time of the shot this would be the first category. The other category would be if the shooter is moving at all in any horizontal direction. This is not as straight-forward category to assess as I made it seem as it is impossible to do anything basketball related without moving to some capacity. What helps as a scorer of this category is to think about if the player is “on-balance” for rim or paint 2 shots - if the player is on-balance, then it is considered not moving. For catch and shoot jump shots, to not be moving is simply if the shot is a stand still shot. For off the dribble shots, the shooter is required to “pop” their feet in place in situations like an under 3 off a ball screen, side dribble 3, etc. In that sense, step-backs and “hesi-3’s” of any kind are thus considered moving.

The fourth category is the most straight-forward category of dribble versus catch-and-shoot. If the player at any point before his shot upon obtaining the ball dribbled, it was considered a dribble and catch-and-shoot otherwise. There is no grey area in scoring this category.

There are certainly edge cases to discuss that were also factored in. The first being if there was no shot taken on a possession - a turnover. This was simply marked as “the zeroth” level in the first category of shot location since it didn’t exist. The other shot category is Bonus Foul and Technical Foul situations. For both, the shot location was marked as the fifth level.

With these criteria for the four categories, every shot by every team was marked. Shot location is marked with possible values 0 to 5, level of contest is marked with possible values 0 to 3, shot movement is marked 0 or 1, and dribble is marked 0 or 1. Each shot would be marked in a row with the points scored on that given “shot” (shot is in quotes because to 99% of basketball people, a shot would not be said when describing a turnover or shooting foul) in a separate column. The summary of the category breakdown as well as a snapshot of what data entry for these categories would look like are in the Table below.

Location	Contest	Moving	Dribble
0: Turnover	**0**: Wide Open	**0**: Stand Still	**0**: Catch and Shoot
1: Rim Shot	**1**: Light Contest	**1**: Moving	**1**: Off the Dribble
2: Paint 2	**2**: Heavy Contest		
3: Midrange	**3:** Fouled		
4: 3-Pointer			
5: Bonus/Tech			

Regarding entering the data into the sheet, each shot is recorded based on the categories that shot falls under. The date of the game as well as the team that took the shot are marked in their given columns. Most importantly, the points resulting from that shot are also recorded for each shot so further analysis can be completed. Every shot taken in the game is recorded in sequential order. The culmination of this process is exemplified in the Table below.

It should be noted that every shot was watched through Synergy video. In the case of missing footage, the play-by-play sheet provided by one of the team’s box scores is used to give a best guess as to what occurred on the shot. The sanity check used for each game was simply to check that the final score on Synergy matches the final score tallied from the study.

Date	Team	Location	Contest	Moving	Dribble	Points
3/7/2025	Glenville	3	1	1	1	0
3/7/2025	Glenville	4	1	1	1	0
3/7/2025	Charleston	2	1	1	1	2
3/7/2025	Glenville	0	0	0	0	0
3/7/2025	Charleston	2	1	1	1	0
3/7/2025	Glenville	4	0	0	0	0

Preliminary Analysis

Once this process was completed, preliminary analysis was done to assess each combination of shot location, contest, movement, and dribble by looking at the points per shot (PPS) to occur. There are 64 different combinations of the four categories for a given shot. With the additional possibility of a turnover and the bonus/technical free throws, there are a total of 66 possible combinations. The given total points scored, number of shots, and PPS are then carried out for each of these combinations in the tables below.

Location	Contest	Moving	Dribble	Points	Shots	PPS
0	0	0	0	0	3522	0.00
1	0	0	0	1090	641	1.70
1	0	0	1	150	85	1.76
1	0	1	0	824	501	1.64
1	0	1	1	1369	813	1.68
1	1	0	0	806	612	1.32
1	1	0	1	324	243	1.33
1	1	1	0	457	363	1.26
1	1	1	1	2080	1803	1.15
1	2	0	0	36	219	0.16
1	2	0	1	28	109	0.26
1	2	1	0	12	89	0.13
1	2	1	1	176	731	0.24
1	3	0	0	575	352	1.63
1	3	0	1	199	123	1.62
1	3	1	0	359	207	1.73
1	3	1	1	1736	1025	1.69
2	0	0	0	44	41	1.07
2	0	0	1	64	51	1.25
2	0	1	0	30	26	1.15
2	0	1	1	190	210	0.90
2	1	0	0	83	95	0.87
2	1	0	1	330	324	1.02
2	1	1	0	92	111	0.83
2	1	1	1	1081	1350	0.80
2	2	0	0	6	24	0.25
2	2	0	1	18	58	0.31
2	2	1	0	4	19	0.21
2	2	1	1	113	466	0.24
2	3	0	0	36	25	1.44
2	3	0	1	104	67	1.55
2	3	1	0	30	16	1.88
2	3	1	1	623	375	1.66

Location	Contest	Moving	Dribble	Points	Shots	PPS
3	0	0	0	44	70	0.63
3	0	0	1	72	82	0.88
3	0	1	0	32	36	0.89
3	0	1	1	174	210	0.83
3	1	0	0	88	102	0.86
3	1	0	1	120	156	0.77
3	1	1	0	54	79	0.68
3	1	1	1	669	927	0.72
3	2	0	0	0	3	0.00
3	2	0	1	0	8	0.00
3	2	1	0	0	2	0.00
3	2	1	1	16	97	0.16
3	3	0	0	5	3	1.67
3	3	0	1	16	9	1.78
3	3	1	0	9	5	1.80
3	3	1	1	77	43	1.79
4	0	0	0	1694	1477	1.15
4	0	0	1	183	183	1.00
4	0	1	0	104	95	1.09
4	0	1	1	102	76	1.34
4	1	0	0	3394	3234	1.05
4	1	0	1	618	634	0.97
4	1	1	0	659	660	1.00
4	1	1	1	477	603	0.79
4	2	0	0	12	91	0.13
4	2	0	1	3	30	0.10
4	2	1	0	6	27	0.22
4	2	1	1	17	86	0.20
4	3	0	0	145	51	2.84
4	3	0	1	43	14	3.07
4	3	1	0	54	20	2.70
4	3	1	1	70	27	2.59
5	0	0	0	1286	926	1.39

As expected and based on traditional statistical knowledge, there appears to be higher expected points per shot on rim shots (shot location of 1) and starts to trend down moving from paint 2 (shot location of 2) and even more so moving to midrange (shot location of 3) based on a level of contest being wide open or lightly contested (contest of 0 or 1). Another observation that is easily noticed due to conventional basketball analytic wisdom is that for each shot

location, whenever there is a foul on a shot (level of contest of 3), the PPS jumps up higher than most of the other combinations within the other combinations of each shot location group.

Beyond this initial observation, other preliminary observations were carried out by grouping the shots for each category. The first way was simply looking at the PPS by shot location. As seen in the Table below, shots at the rim held the highest PPS at 1.29, followed by 3's at 1.04, paint 2's at 0.87, and midrange at 0.75 (obviously ignoring Bonus/Techs).

Shot Quality by Location			
Shot	**Points**	**Shots**	**PPS**
Rim	10221	7916	1.29
Paint 2	2848	3258	0.87
Midrange	1376	1832	0.75
3s	7581	7308	1.04
Turnovers	0	3522	0.00
Bonus/Techs	1286	926	1.39

This trend continues even if you take out any shot that results in a foul. Rim shots, followed by 3's, paint 2's, and midrange. Although it should be pointed out that paint 2's PPS are now only slightly above midrange (only a rounded 0.01 PPS difference), perhaps a negligible difference. It should also be noted that the PPS drops whenever fouls are removed for each location which is consistent with conventional wisdom that foul shots are the highest expected shot in basketball. All of this is displayed in the table below.

Foul Independent Shot Quality by Location			
Shot	**Points**	**Shots**	**PPS**
Rim	4702	3830	1.23
Paint 2	1416	1956	0.72
Midrange	711	1003	0.71
3s	4719	4697	1.00

Looking at the PPS based on the level of contest, regardless of the other 3 categories provides additional perspective. Open or marginally contested shots (level of contest of 0) is 0.34 PPS higher than lightly contested shots (level of contest of 1). The level of contest of 2 was given the name of "smothered" (like in the video game "2K" - when a heavily contested shot occurs, the display will show in bright red letters "smothered" at the top of the screen) at this

point considering its PPS is the whole way down to 0.22. Then to continue the discussion of the effect that fouls on shots has, the PPS is 1.73 which is significantly higher than the average open shot taken. All the findings for each of these levels of contest can be found in the Table below.

Shot Quality by Contest (All Shots)			
Shot	**Points**	**Shots**	**PPS**
Open	6166	4597	1.34
Contested	11332	11296	1.00
Smothered	447	2059	0.22
Fouled	4081	2362	1.73

Isolating shot movement and dribble states can be seen in the Tables below where once again, expected results turn up. Stand still shots (movement of 0) have a PPS of 1.12 which is greater than moving shots (movement of 1) with a PPS of 1.05. Likewise, catch and shoot (dribble of 0) have a PPS of 1.16 which is greater than off the dribble (dribble of 1).

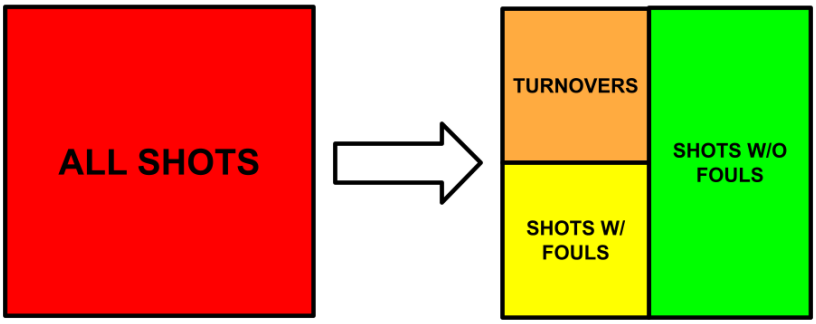
Shot Quality by Movement			
Shot	**Points**	**Shots**	**PPS**
Stand Still	10330	9216	1.12
Moving	11696	11098	1.05

Shot Quality by Dribble			
Shot	**Points**	**Shots**	**PPS**
C&S	10784	9296	1.16
Off the Dribble	11242	11018	1.02

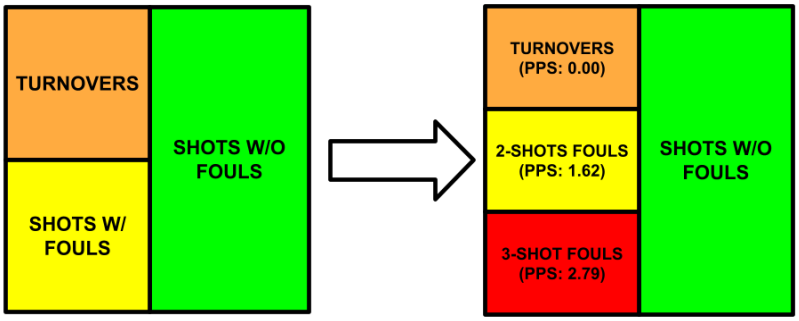
Within the preliminary analysis, there are not really any findings that are too novel. It is conventional that from inside the 3, the further away you get from the basket, the lower the resulting PPS, and 3-pointers PPS being only lower than rim shots. Extending from this, fouls demonstrate a heavy weight on PPS as removing shots that include fouls from the sample drops each location's respective PPS (the one unique finding does occur with this process of paint 2 and midrange having similar PPS after this process) and simply having the highest PPS when looking at shot quality by contest. Furthermore, the more contested a shot is, the lower the PPS. Finally, stand still and catch and shoot shots demonstrate a higher PPS than moving and off the dribble shots, respectively. Again, none of these concepts are too eye opening, but perhaps digging deeper can create something of use.

Development

The next phase of looking at this data was to try and sift through what is important (and what is not) to hopefully obtain some useful insights. The simplest way to approach this is to strip away some edge cases and make them instances that stand on their own. To start, the most obvious edge case is turnovers - turnovers stand on their own as they are expected to result in a 0 PPS no matter what else occurs. The next (and still apparent) edge case to look at are the bonus and technical free throws. These are their own occurrences as it is but we can also extend this logic to *all shots with fouls*. With the separation of shots with fouls and shots without fouls occurring we have created two distinct shot types (three including turnovers) shown in the Figure below.

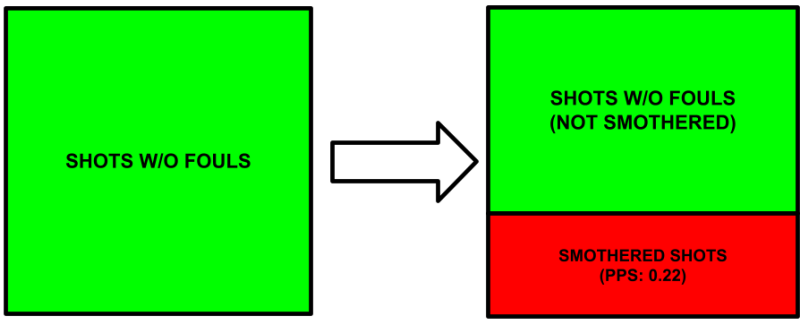


With the shots with fouls for now being grouped together, the occurrences for these are broken down into 3 subgroups. The first, already established, bonus/technical fouls has a resulting PPS of 1.39. The second group includes fouls on any two-point shots (rim 2, paint 2, or midrange) and has a resulting PPS of 1.72. The final group includes fouls on any three-point shots and has a resulting PPS of 2.79. It is clear that fouls on three-point shots are nearly 1.00 PPS higher than bonus/technical fouls and two-point shot fouls so it is best to view them as a separate subgroup. While 1.39 for bonus/technical fouls and 1.72 for two-point shot fouls are also dissimilar, since the tendency of bonus/technical fouls are two shots, these two categories are grouped together as “two free throw fouls” with a PPS of 1.62. This leads to the next stage of breakdown seen in the Figure below.



Now that the edge cases of turnovers and fouls are handled, shots without fouls can be discussed. After going back through the preliminary analysis breakdown tables for shot quality, it seemed that each of the categories needed to be considered. Whether looking at location, level of contest, moving, or dribble, there appears to be a difference between the levels of each indicating that perhaps their interactions are what should be considered next.

Before doing so, when looking at the shot quality by level of contest, the smothered shots stood out as being different from other shots. For the sake of curiosity, the shots without fouls are divided on whether the level of contest is considered smothered. As seen in the preliminary analysis, smothered shots have a PPS of 0.22. It is common sense based on the definition we gave to the smothered level of contest that not only does a 0.22 PPS make sense, but this is a shot that we would like to entirely avoid offensively (of course defensively, we would love it). From here, (looking only at shots without fouls) we are left with the two scenarios - smothered shots and everything else as seen in the Figure below.



There are 32 different categorical combinations for the shots tracked demonstrated in the table below. Each combination of location, movement, and dribble are separated by the remaining level of contest - 0 (wide open) and 1 (light/minimal contest). For most of the location -movement-dribble combinations, the wide-open shots have higher PPS than light/minimal contest shots. The only combination that did not follow this pattern is shots with location of 3 (midrange), movement of 0 (stand still), and dribble of 0 (catch and shoot). This combination indicates a stand still catch and shoot midrange jump shot (which intuitively occurs very rarely) which oftentimes occurs against zone defenses from a middle flasher. Another unique finding is the combination of location of 4 (3-pointer), movement of 1 (moving), and dribble of 1 (off the dribble, which presumably indicates a step-back shot, has the largest disparity between wide open and light/minimal contest. This is potentially due to the “better” players being more likely to gain separation on a step-back and thus more likely to have a level of contest of 0 and having a better chance of making the shot since they are better players! On the contrary, while better players may have shot some step-backs with level of contest of 1, it is probable that there is a

higher proportion of lesser players shooting these, dragging the PPS down and causing this disparity.

Shot Category			Level of Contest of 0			Level of Contest of 1		
Location	**Movement**	**Dribble**	**Points**	**Poss.**	**PPS**	**Points**	**Poss.**	**PPS**
1	**0**	**0**	1090	641	1.70	806	612	1.32
1	**0**	**1**	150	85	1.76	324	243	1.33
1	**1**	**0**	824	501	1.64	457	363	1.26
1	**1**	**1**	1369	813	1.68	2080	1803	1.15
2	**0**	**0**	44	41	1.07	83	95	0.87
2	**0**	**1**	64	51	1.25	330	324	1.02
2	**1**	**0**	30	26	1.15	92	111	0.83
2	**1**	**1**	190	210	0.90	1081	1350	0.80
3	**0**	**0**	44	70	0.63	88	102	0.86
3	**0**	**1**	72	82	0.88	120	156	0.77
3	**1**	**0**	32	36	0.89	54	79	0.68
3	**1**	**1**	174	210	0.83	669	927	0.72
4	**0**	**0**	1694	1477	1.15	3394	3234	1.05
4	**0**	**1**	183	183	1.00	618	634	0.97
4	**1**	**0**	104	95	1.09	659	660	1.00
4	**1**	**1**	102	76	1.34	477	603	0.79

While the observations regarding PPS being higher for level of contest of 0 than level of contest of 1 are true, there is not enough consistency and disparity (for all cases) to continue stripping away the edge cases. While there are some cases that have larger disparities thus calling for more edge cases to be assessed, there is a stronger case for there not being enough data. For more than 10 of the overall combinations, there are less than 100 data points to consider which is not strong enough of a sample size to make strong conclusions. Beyond that, there are some categories that have close differences with one case being a reversed difference as explained previously. With a lack of uniformity and low sample size in mind, the next phase is to combine these combinations regardless of level of contest being 0 or 1 which can be seen ordered by PPS in the table below.

Shot Category			Level of Contest of 0/1 Combined		
Location	Movement	Dribble	Points	Possessions	PPS
1	0	0	1896	1253	1.51
1	1	0	1281	864	1.48
1	0	1	474	328	1.45
1	1	1	3449	2616	1.32
4	0	0	5088	4711	1.08
2	0	1	394	375	1.05
4	1	0	763	755	1.01
4	0	1	801	817	0.98
2	0	0	127	136	0.93
2	1	0	122	137	0.89
4	1	1	579	679	0.85
2	1	1	1271	1560	0.81
3	0	1	192	238	0.81
3	0	0	132	172	0.77
3	1	0	86	115	0.75
3	1	1	843	1137	0.74

There are three distinct categories that cluster after sorting the shots by PPS. Starting from the bottom (in orange) are the lowest value shots including all combinations of shot location of 3 (midranges), the two shots combinations with shot location of 2 and movement of 1 (moving paint 2's), and the shot combination of location of 4, movement of 1, and dribble of 1 (moving, off the dribble 3's). These shots when combined have a PPS value of 0.80.

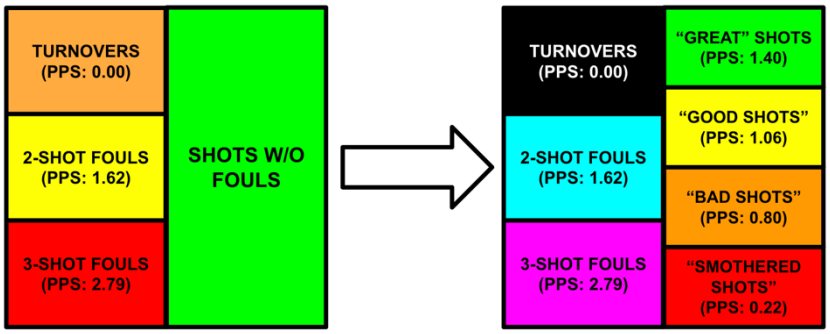
The second highest ranking shot range is marked in yellow. It includes the remaining combinations of shot location of 4 (stand still catch and shoot 3's, movement catch and shoot 3's, and stand still off the dribble 3's) and remaining combinations of shot location of 2 (stand still off the dribble and catch and shoot paint 2's). These shots when combined give a PPS value of 1.06.

The final, highest ranking shot range is marked in green. It includes all the combinations of shot location 1 - any shot at the rim. These shots when combined have a PPS value of 1.40.

The summary of these findings can be seen in the table below. In it, the three expected values (plus the expected values of smothered shots) are given with a rounded expected value (to the nearest 0.25). The actions associated with each shot category combinations are also given.

	Shot Category			PPS Value	
Action	Location	Movement	Dribble	Grouped PPS	Rounded PPS
Dump Offs, Put-Backs	1	0	0	1.40	1.50
Cuts, Lobs, Pick and Rolls	1	1	0		
Balanced Post at Rim/Play Off 2 at Rim on Drive	1	0	1		
Drives	1	1	1		
Stand Still C&S 3's	4	0	0	1.06	1.00
Balanced Post-Up, Play Off 2 Touch Shot (Come to a Stop)	2	0	1		
Movement C&S 3's	4	1	0		
Sit Behind Ball Screen, Walk In 3, Fly-By 3	4	0	1		
C&S Short Roll, Dump Off Pushed Out Far Away	2	0	0		
Wide Cuts, Far-Out Dump Offs	2	1	0	0.80	0.75
Iso 3's	4	1	1		
Wide Drives, Driving Floater, Off-Balanced Post-Ups, Fading Rondos	2	1	1		
Iso Midrange (Pause Before Shooting), Far-Out Balanced Post-Ups	3	0	1		
Stand Still C&S Midrange	3	0	0		
Moving C&S Midrange (Usually on BLOB)	3	1	0		
Iso Midrange, Shot Fake One Dribble, Pull-Up Off BS	3	1	1		
Blocked Shot, Guarded by 2 People, Or Smothered by 1 Person	ALL COMBINATIONS WITH CONTEST = 2			0.22	0.25

Now that shots without fouls have been defined, the figure below shows a summary of all possible cases. Each block has been recolored to correlate with the size of the associated expected value.



Now that every possible shot has been bucketed, this provides an opportunity to convert the values into something usable as seen by multiplying these new values by 4 in the table below. The only value that is not rounded to the nearest 0.25 is the 2-shot fouls, instead it is rounded up to 1.75. This is due to the PPS having a value clearly greater than “Great Shots” and if it is also rounded to the nearest 0.25, then this pattern would not be appropriately representative as it would be equal to the “Great Shots” instead. Furthermore, the table shows possible summarized action types for each of the shot combinations giving opportunity to have translatable execution of teaching. This will be discussed at length in a later portion.

Tier	True PPS	Rounded PPS	System Score	Action
Great Shot	1.40	1.50	6	Rim Shots
Good Shot	1.06	1.00	4	"All Other Shots"
Bad Shot	0.80	0.75	3	Midrange, Iso 3's, Moving Paint 2's
Smothered Shot	0.22	0.25	1	Any Blocked or Smothered Shot
2-Shot Fouls	1.62	1.75	7	Any 2-pt Shot Foul, Tech, Bonus
3-Shot Fouls	2.79	2.75	11	3-pt Shot Foul
Turnovers	0.00	0.00	0	Live or Dead Ball

Finalizing the System

This is the basis of the shot quality study findings - bucketing or tiering each possible outcome of a single possession. By having an accurately expected and scaled value ("System Score") on a possession-level, this allows for an aggregate to be made by simply adding each possession's system score from tallying all of the shots. The "Tier" name is replaced by the "System Score" name when discussing the quality of shots. The general formula for System Score is given below:

$$System\ Score\ (1.0)\ =\ \sum_{i=1}^{n} System\ Score_i \qquad where\ i =\ the\ ith\ shot\ taken$$

Based on the 2024-25 data, there are some interesting findings that encourage further pursuit of this system. First, there is an estimated 72% accuracy of the winner of the aggregate System Score, which will just be called "System Score" going further, being the winner of the actual game. On top of this, the table below has the records, projected record, expected points per shot difference between offense and defense, and shot differential for all the teams in the MEC schedule. The projected and actual records for each team are decently close with all teams being within three games (other than Frostburg St. of five games). The more encouraging and enticing finding is looking at the expected point per shot differential and shot margin. The teams that generally shoot higher expected value shots tend to perform better. Just because you take higher, league-wide average quality shots, does not mean you can get away with not having players who can make these shots at an expected rate (Davis & Elkins). On top of this, the shot margin is also an eye-opening indicator with West Liberty being a consistent league winner and dominating the shot margin with their turnover-inducing press defense. The shot margin also might be an indicator of success because of this, and it could be why Frostburg is anticipated to have projected a much higher record. It should be noted here that shot margin is the number of shots (fouls and true shots) taken subtracted by the number of shots given up.

Team	Record	Proj. Record	Exp. PPS Diff.	Shot Margin
West Liberty	22-3	21-4	+0.034	+10.2
Fairmont St.	22-3	17-8	+0.027	+2.0
Charleston	16-7	17-6	+0.102	+0.5
Concord	16-8	13-11	+0.022	-3.8
WVSU	13-10	15-8	+0.026	-1.4
Glenville	13-11	10-14	+0.000	+0.4
Frostburg St.	10-13	15-8	-0.039	+6.8
Davis & Elkins	9-15	11-13	+0.038	-2.4
Wheeling	7-16	9-14	-0.050	-0.3
Point Park	6-18	8-16	-0.040	-1.5
Wesleyan	4-18	1-21	-0.096	-5.1
Salem	3-19	4-18	-0.039	-6.6

While the objective framework gave sufficient validity to pursue this as viable to implement with the team, some additional subjective measures were added by the coaching staff. First, since shot differential was noticed as a desired trait for the team, each offensive rebound is given as an additional point to the system score. Next, to avoid encouraging behavior of forcing the ball on the rim and potentially increasing turnovers, open stand still 3's as well as paint touch stand still 3's was considered to be "Great Shots". It should be noted here that the "Tier" name is replaced by the "System Score" name when discussing the quality of shots (i.e. "Great Shots" are referred to as "6's"). On top of this, to encourage quality contests on perimeter shots (and approximately backed by the study itself), the term "downgradeable contest" was used for any 3-point attempt that is a 4 by bumping the quality of the shot from a 4 to a 3 on loosely defined good contests on perimeter shooters. This process is also done for paint touch 3's changing them from 6's to 4's. In addition to this, only the *last* shot of a possession was added to the System Score to encourage high quality shots once the possession is retained from an offensive rebound. Since the data was not collected with these subjective measures in mind, there is no way to validate them at this point in the process. Regardless of this fact, the findings described are used as the structure of the system implemented for the 2025-26 season.

Implementation

With the system structure established, the implementation process will be discussed in detail next. The first step was to present to the team the fundamental findings so that they are informed yet not overwhelmed with too much of the details. The team did zoom meetings twice per week over the summertime and so this made for a natural opportunity for a presentation to occur (and not be something out of the blue for the team to be caught off-guard by). The basics of data collection, procedure to find values, associated action plays, and the trends of successful teams were discussed through a slide deck and video.

Initiation

The specificity of the research was never mentioned again but taught through timely dialogue and scoring of drills. For the first one to two months once the players got on campus, there were no live-play segments that were scored based on true basketball scoring (2's and 3's), but through exclusively using the system score established. It did not matter whether the ball went in or not, the only thing that mattered was the quality of the shot taken. This process (in conjunction with a wins and system leaderboard hanging in the locker room) created an inherent desire for the players to pursue the high-quality shots. There was simply no need to say, "no midrange shots" or "that shot was heavily contested - bad shot". All that had to be done was to look up at the scoreboard and see if the player and their team had taken (or prevented) better shots than the other.

One conundrum that came up was that late in the drill, there seemed to be a flaw in keeping a competitive situation, so an alternative scoring structure was also introduced. In some drills (or late in other drills), system *makes* were counted. This kept the incentivization of taking good shots as players and teams can only max out their possible possession by taking those high-quality shots. Albeit the fundamental expectation of shots are slightly altered, but all that matters at this point is the relative motivation for the player and team to take the desired shots. A feature added in this "system makes" version of drill was by making free throws worth four - after all if both free throws are made that gives 8 system points and divided by 4 is 2 actual points, so this works out mathematically.

Beyond these drills, consistent dialogue and team-wide vocabulary was used to create an ownership of the system. The biggest vocabulary term is "Hunt 6's" meaning exhaust all possible options to get a 6 via a rim shot or kick out 3. This was coached in nearly every huddle, throughout the ball being live, and in film sessions the question being asked "Did you hunt a 6?" Throughout the year, this discussion was adjusted to encourage hunting 6's for the first 20

seconds of the shot clock to also accepting 4's for the last 10 to incentivize not getting a 3, 1, or 0. "Hunt 6's" was the pinnacle of dialogue and its simplicity brilliantly eliminated any unnecessary over explanation.

Some other dialogue that came up was when players had confusion on the difference between 4's and 3's on drives and post-ups. Simplicity once again was in the forefront of discussion and players were told to "get on balance". If a player is off-balance, they are considered moving in the study. Since paint 2's are only a 3 if the player is moving and a 4 if the player is not moving, then the being on balance solves this distinction. Being on balance is a fundamental skill development term that the players were already familiar with to assist in making sure their shots were a tier higher quality whenever possible. On post-ups this is straightforward, while on drives, the preferred shot encouraged is a "touch shot" which is generally known as a two-foot floater. Since touch shots are a hallmark to the player's skill development, the focus can be eased from the player away from "4 quality shots versus 3 quality shots" and instead emphasizes even further the importance of the skill work that is done as a team.

Terminology and Formulas

As time went on, the system naturally developed its own brand of terminology for tracking both player stats and team stats. The first three are attributed to the overall description of the player's and team's process which are Shot Quality, Stint Quality, and Result Quality. Shot Quality is simply the weighted average of all the shots (remember shots are everything but a turnover including a shot attempt that a player is fouled on) taken with the formula given below:

$$Shot\ Quality = \frac{6 * 6's + 4 * 4's + 3 * 3's + 1's + 7 * 7's + 11 * 11's}{6's + 4's + 3's + 1's + 7's + 11's}$$

The Stint Quality formula is the same as shot quality but includes turnovers (no mention of count of turnover is in the numerator since it has a weight of 0) and is given below:

$$Stint\ Quality = \frac{6 * 6's + 4 * 4's + 3 * 3's + 1's + 7 * 7's + 11 * 11's}{6's + 4's + 3's + 1's + 7's + 11's + 0's}$$

The Shot Quality and Stint Quality formulas are the same for both the player and the team, but the Result Quality formula does not follow the same pattern. The Result Quality formula for a player is the same as the Stint Quality formula except adding all of the players offensive rebounds given below:

$$Result\ Quality_{Player} = \frac{6 * 6's + 4 * 4's + 3 * 3's + 1's + 7 * 7's + 11 * 11's + OREB}{6's + 4's + 3's + 1's + 7's + 11's + 0's}$$

The distinction for the team-based Result Quality is that the only counts of shots that are considered are the *last* shot of a given possession. Otherwise, the formula is the same as the player-based Result Quality formula given below with LS describing *last shot*:

$$Result\ Quality_{Team} = \frac{6 * LS\ 6's + 4 * LS\ 4's + 3 * LS\ 3's + 1 * LS\ 1's + 7 * LS\ 7's + 11 * LS\ 11's + OREB}{LS\ 6's + LS\ 4's + LS\ 3's + LS\ 1's + LS\ 7's + LS\ 11's\ +\ 0's}$$

Simply put, the Shot Quality describes the expected value any time a player or team takes a shot while the Stint Quality describes the expected value any time a player or team does any event (or stint). The team-based Result Quality is basically describing the per-possession expected value and can be used in comparison of team's PPP. The player-based Result Quality

is not a great formula for explicit comparison purposes but does offer an answer to “what overall offensive value does a player provide?”

The next layer of terminology involves assessing the breakdown and execution within the scoring framework. The first being the described rate for each possible system scoring. For example, “6%” pronounced “six percentage” describes the percent of all stints (shots plus turnovers) that are 6’s given in the formula below:

$$6\% = \frac{6\ Count}{6\ Count + 4\ Count + 3\ Count + 1\ Count + 7\ Count + 11\ Count + 0\ Count}\ x\ 100$$

This formula can be replicated for 4’s, 3’s, 1’s, 7’s, 11’s, and 0’s and their associated percentages. The next terminology is the execution within each possible system scoring. For example, “six execution” is the actual point per shot for all sixes that are attempted given in the formula below:

$$6\ Execution = \frac{Total\ Points\ off\ of\ 6's}{6's}$$

The previously described Shot Margin is a key statistic in the system. The term is brought back up and the formula explicitly given below because of its importance.

$$Shot\ Margin\ =\ Shots\ Taken\ -\ Shots\ Allowed$$

where:

$$Shots\ Taken\ =\ 6's_{offense} + 4's_{offense} + 3's_{offense} + 1's_{offense} + 7's_{offense} + 11's_{offense}$$

$$Shots\ Allowed\ =\ 6's_{defense} + 4's_{defense} + 3's_{defense} + 1's_{defense} + 7's_{defense} + 11's_{defense}$$

Lastly, and perhaps most importantly, the System Score is given by the sum of all the last shot system score values and then that is summed with the count of offensive rebounds as described in the updated scoring criteria which is given below:

$$System\ Score\ =\ \sum_{i=1}^{n}(LS\ System\ Score_i) + OREB$$

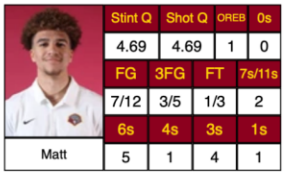
where:
$i\ is\ the\ ith\ possession$

Integration

It is one thing to have the capabilities of formulating this research and implementing the findings, but it is critical to have feedback loops in the workflow. These feedback loops came in the format of post-game and post-practice reports using Sportscode, in-game tracking through Google Sheets, as well as having full season data stored in Google Sheets as well.

The post-game report is created through a Sportscode Output Window in which three distinct sections are shown. The player section involves the four rows and three columns on the left side describing individual contributions. The team system score section is on the top right which shows how each team did in comparison to the other in a given event. Finally, lineup data is presented in the bottom right to see what players contributed when they were on the floor. A sample of a postgame report is given below.

	Stint Q	Shot Q	OREB	0s
	2.75	3.66	0	1
	FG	3FG	FT	7s/11s
	0/3	0/2	0/0	0
	6s	4s	3s	1s
Trevor	0	2	1	0

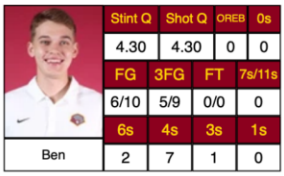


	Stint Q	Shot Q	OREB	0s
	4.69	4.69	1	0
	FG	3FG	FT	7s/11s
	7/12	3/5	1/3	2
	6s	4s	3s	1s
Matt	5	1	4	1

	Stint Q	Shot Q	OREB	0s
	5.25	5.25	0	0
	FG	3FG	FT	7s/11s
	7/11	4/8	7/10	5
	6s	4s	3s	1s
Braden	4	4	3	0

Charleston		WVSU	
System Score	301	System Score	231
Shot Margin	+15	Shot Margin	-15
OREB/TO	15/5	OREB/TO	8/12

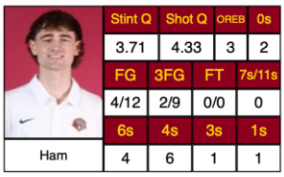
Result Quality	Stint Quality	Shot Quality	Result Quality	Stint Quality	Shot Quality
4.63	4.50	4.81	3.60	3.54	4.23
6s	4s	7s/11s	6s	4s	7s/11s
20.0%	35.3%	18.4%	9.3%	23.4%	17.1%
3s	1s	0s	3s	1s	0s
15.3%	3.0%	7.6%	23.4%	7.8%	18.7%
Real Score	Real PPP		Real Score	Real PPP	
84	1.29		64	1.00	



	Stint Q	Shot Q	OREB	0s
	4.30	4.30	0	0
	FG	3FG	FT	7s/11s
	6/10	5/9	0/0	0
	6s	4s	3s	1s
Ben	2	7	1	0

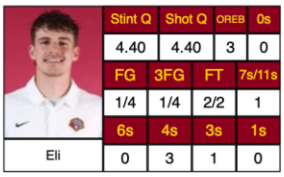
	Stint Q	Shot Q	OREB	0s
	4.83	5.80	5	2
	FG	3FG	FT	7s/11s
	4/7	0/0	3/6	3
	6s	4s	3s	1s
Thomas	5	1	1	0

	Stint Q	Shot Q	OREB	0s
	4.50	4.50	1	0
	FG	3FG	FT	7s/11s
	0/3	0/3	1/2	1
	6s	4s	3s	1s
Kaden	0	2	1	0



	Stint Q	Shot Q	OREB	0s
	3.71	4.33	3	2
	FG	3FG	FT	7s/11s
	4/12	2/9	0/0	0
	6s	4s	3s	1s
Ham	4	6	1	1

	Stint Q	Shot Q	OREB	0s
	2.00	4.00	0	1
	FG	3FG	FT	7s/11s
	0/1	0/1	0/0	0
	6s	4s	3s	1s
Jalen	0	1	0	0



	Stint Q	Shot Q	OREB	0s
	4.40	4.40	3	0
	FG	3FG	FT	7s/11s
	1/4	1/4	2/2	1
	6s	4s	3s	1s
Eli	0	3	1	0

Lineup Data				
Player	System +/-	Real +/-	Result Q O	Result Q D
Ham	+60	22	4.71 (49)	3.56 (48)
Braden	+57	14	4.86 (46)	3.79 (44)
Matt	+59	14	4.84 (33)	3.15 (32)
Ben	+54	24	4.57 (52)	3.53 (52)
Thomas	+69	14	4.66 (54)	3.51 (52)
Eli	+15	-1	4.08 (23)	3.59 (22)
Kaden	+13	2	4.87 (24)	4.33 (24)
Jalen	+12	7	4.11 (17)	3.22 (18)
Scoot	+1	6	4.45 (11)	4.00 (12)
Trevor	+10	-2	4.37 (16)	3.75 (16)
Levon	0	0	0.00 (0)	0.00 (0)

	Stint Q	Shot Q	OREB	0s
	0.00	0.00	0	0
	FG	3FG	FT	7s/11s
	0/0	0/0	0/0	0
	6s	4s	3s	1s
Levon	0	0	0	0

	Stint Q	Shot Q	OREB	0s
	0.00	0.00	1	0
	FG	3FG	FT	7s/11s
	0/0	0/0	0/0	0
	6s	4s	3s	1s
Scoot	0	0	0	0

	Stint Q	Shot Q	OREB	0s
	3.54	4.27	8	12
	FG	3FG	FT	7s/11s
	20/49	9/28	12/18	11
	6s	4s	3s	1s
WVSU	8	18	15	6

The first section involves the player section with each of the 11 potential rotation players having a template. In the first row, the Stint Quality and Shot Quality are given as key features to highlight the player's system efficiency along with their offensive rebounds and turnovers (OREB and 0's) to highlight the player's impact on shot margin. The next row of the player template includes basic box score data including their field goals (FG), 3-point field goals (3FG), and free throws (FT) to show comparison of their actual output. At the end of this row is the

count of any time a player was sent to the free line in any capacity through the system terminology (7's/11's). This, along with the count of 6's, 4's, 3's, 1's shows the breakdown of the players shots.

This player section allows for within-player and cross-player comparison for their efficiency when obtaining a system statistic. For example, when looking at a close-up of Ham and Braden's player templates below, Ham went 4/12 from the field while Braden went 7/11. Ham's struggles can be attributed to his Shot Quality of 4.33 (average) while Braden's success that night can be attributed to his Shot Quality of 5.25 (elite). Sure, Braden's is raised because of his 7's obtained from his trips to the foul line, but even without them, he still would have had a Shot Quality of 4.73. Now conversation to each individual player of either their shortcomings or their successes as well as a team-wide message can be given. If you take better shots, you will (on average) have better outcomes.

Ham	Stint Q	Shot Q	OREB	0s
	3.71	4.33	3	2
	FG	3FG	FT	7s/11s
	4/12	2/9	0/0	0
	6s	4s	3s	1s
	4	6	1	1

Braden	Stint Q	Shot Q	OREB	0s
	5.25	5.25	0	0
	FG	3FG	FT	7s/11s
	7/11	4/8	7/10	5
	6s	4s	3s	1s
	4	4	3	0

The next section we can look at is the team system score section which includes the opponent's system score as well (after all it is the defensive system score). The System Score and Shot Margin (and its offensive rebound plus turnover breakdown) are given at the top due to its importance. This section can initiate discussion starting with answering questions of "Should we have won?" or "Did we do enough systematically to win?". A "More + Better" mantra spread throughout the program and this section highlights whether this was achieved. The breakdown begins right below it with the trio of Result Quality, Stint Quality and Shot Quality which can help answer the question, "Did the 'More' component or the 'Better' component hold us back?". For example, if there was a decently high Shot Quality, say 5.10, but a low Stint Quality, say 4.05, then that means the shot selection is phenomenal, but the team did not take care of the ball. Below that is the system shot selection breakdown to see what led to the associated scores above it to finalize any specific issues that may have occurred. For example, getting a 6% of 20.0% is extremely low which begs the question, "Are opponents playing our team a certain way or are we not 'hunting 6's' as much as we should?" Finally, the Real Score and Real PPP is given at the bottom for comparison. A close-up of this section is given below.

Charleston			WVSU		
System Score	301		System Score	231	
Shot Margin	+15		Shot Margin	-15	
OREB/TO	15/5		OREB/TO	8/12	
Result Quality	Stint Quality	Shot Quality	Result Quality	Stint Quality	Shot Quality
4.63	4.50	4.81	3.60	3.54	4.23
6s	4s	7s/11s	6s	4s	7s/11s
20.0%	35.3%	18.4%	9.3%	23.4%	17.1%
3s	1s	0s	3s	1s	0s
15.3%	3.0%	7.6%	23.4%	7.8%	18.7%
Real Score	Real PPP		Real Score	Real PPP	
84	1.29		64	1.00	

Lineup Data				
Player	System +/-	Real +/-	Result Q O	Result Q D
Ham	+60	22	4.71 (49)	3.56 (48)
Braden	+57	14	4.86 (46)	3.79 (44)
Matt	+59	14	4.84 (33)	3.15 (32)
Ben	+54	24	4.57 (52)	3.53 (52)
Thomas	+69	14	4.66 (54)	3.51 (52)
Eli	+15	-1	4.08 (23)	3.59 (22)
Kaden	+13	2	4.87 (24)	4.33 (24)
Jalen	+12	7	4.11 (17)	3.22 (18)
Scoot	+1	6	4.45 (11)	4.00 (12)
Trevor	+10	-2	4.37 (16)	3.75 (16)
Levon	0	0	0.00 (0)	0.00 (0)

Finally, the lineup data section highlights some basics if a particular player was on the floor to any capacity. The “System +/-” and the “Real +/-” are analogous to each other - what is the system score differential and what is the real score differential when each player is on the floor? A breakdown of this through Result Quality Offense and Result Quality Defense when each player is on the floor is given as well. The number in parenthesis is the number of last shot possessions that player was on the floor for each side of the ball. This section is designed to show any potential player that might not have gotten as many shots to stand out and vice versa. For example, Jalen in this game only took one shot and missed it but he was a +12 System +/- and +7 Real +/- on 17 offensive and 18 defensive possessions with the second-best Result Quality Defense score on the team this game - this information can help lead to future roster changes when necessary. The close-up of the lineup data section is given above to the right.

The next implementation method is through in-game tracking. Since bench personnel are allowed an iPad or tablet to keep track of statistics during the game, we took full advantage. The left hand-side has the full arrangement of system information with conditional formatting on each cell to determine if the criteria is being met. In addition to the system features, the possession count is also given on the top left which can help in determining if the pace of the game is where it needs to be at. On the right-hand side, is the system score broken down by individual media timeout whenever a dead ball occurred to allow discussion of why a team may have gone on a run or not. This is all given in the Tables below.

Possessions: 74	Charleston	Frostburg
Score	325	292
Shots (OREB/TO)	66 - (6/14)	65 - (8/17)
Result Quality	4.39	3.95
Shot Quality	5.21	4.75
Stint Quality	4.30	3.77
6s	27 - 33.8%	18 - 22.0%
4s	21 - 26.3%	16 - 19.5%
3s	4 - 5.0%	15 - 18.3%
1s	2 - 2.5%	4 - 4.9%
0s	14 - 17.5%	17 - 20.7%
7s	12 - 15.0%	11 - 13.4%
11s	0 - 0.0%	1 - 1.2%

1st Half	Charleston	Frostburg
14:50	35	28
9:15	40	25
4:37	26	34
HT	30	30
11:57	63	63
9:50	20	18
5:47	30	32
1:19	53	41
Since	28	21

It is worth noting that all of this output is automatically updated in Google Sheets with only the user's/coach's entry of each shot. In the table below, a snapshot of the running possession-level data is shown. To avoid confusion, the right-most number of a given shot (either a 0 or 1) can be ignored with the preceding one (or two for 11's) digits are the ones to look at for the quality of a given shot - in the first possession from Charleston a 61 is marked, only refer to the 6 in the tens digit (a 6 was taken). Possessions marked with a "/" in between the numbers indicates an offensive rebound. For example, in the 11th possession from Charleston there is a "31/11/70" means a 3 was taken, followed by an offensive rebound by that team, a 1 was taken, followed by another offensive rebound by that team, and the last shot was a 7 (got fouled and sent to the line). Technical or intentional foul shots as well as events after a free throw rebound are considered unique possessions in the system, so the scoring for these would occur in the next cell down and the tracking of the opponent would continue adjacent to it. Since offensive rebound counts were still desired for free throw offensive rebounds, a unique work around of putting a "/" to start followed by the scoring shot in the new line was done. In the right most column, the time is marked for media timeouts to assist in the calculator of the right most table output from above. This simple entry automatically converted to informative output allowed for live discussion in terms of the system - "not taking great shots", "turnovers are hurting us", "fouling on shots too much", "pace of play is too fast", etc.

By mid-season the sheet also had conditional formatting in place to highlight when our team or opponents were going on runs outside of the norm. Using methods similar to a CUSUM chart, whenever opponents would go on system scoring runs and whenever we would go on system scoring droughts, the tracking would calculate when the streaks would be outside of the

desired cumulative deviation. Color indicators would highlight would things were starting to trend in a poor direction (orange) and when something would need changed immediately (red).

Charleston	Glenville	
40/31	40	
41	41/31/31	9:17
60	11/61	
70	31	
40/41	31	
11	0	
0	0	
0	41	
41	61	
70	41	4:24

The beauty of data projects and data in sports is that results are never final as there is no equilibrium. There are not any level waters that indicate that you are optimal *and* can remain the state that your program is in, your play style is in, the players you recruit, or the metrics you use for eternity. If you get lucky enough to even sniff an “optimal” solution, environment changes, coaches adjusting to your style, and more are bound to happen. In discussing the findings and adjustments made within the study is staged as it occurred in the past with an understanding that change is coming, however we will save the future work section to dive into handling this change.

Mid-Season Report

After every game, I tracked our (Charleston) system scores for the games and scrimmages through the automated post-game reports. By the time the scrimmage and the non-conference schedule was completed, I found that I could track a game in a little under 30 minutes not including any additional Sportscode work that I did to prepare film for the players in my group. I was able to do this so quickly as I used the same method of tracking that I did in the live game tracking for all the games.

This encouraged me to do this for any conference game (including MEC games played against Salem) as I needed a way to validate if the system was correct and operating as expected. This validation also served a useful purpose of creating a system scouting report for our opponents. The revelation that this could be used in this way did not occur until the break (in Division II there is a required week off in late December into early January) in our season through the “Mid-Season System Report”.

The Mid-Season System Report included several key items along with each of their associated insights including a league-wide summary, a team-wide summary, league-wide breakdowns, overall system evaluation, and a curious question of the true value of 4’s. The first breakdown is the Overall Team Summary outlined in the table below. It consists of each team’s record, expected PPS offense, expected PPS defense, and shot margin along with their rank in the conference and is given in the table below.

Team	Record	Exp. PPS Off.	Exp. PPS Def.	Shot Margin
Charleston	1-4 (9)	1.22 (1)	1.09 (4)	-8.8 (11)
Glenville	2-3 (7)	1.04 (10)	1.14 (7)	+6.4 (3)
Fairmont	4-1 (3)	1.17 (3)	1.07 (3)	+8.2 (2)
West Liberty	4-0 (2)	1.18 (2)	1.13 (6)	+15.8 (1)
D&E	3-2 (5)	1.17 (4)	1.12 (5)	+2.0 (6)
Concord	5-0 (1)	1.17 (5)	1.06 (1)	+4.2 (4)
Salem	1-4 (9)	1.15 (6)	1.06 (2)	-9.4 (12)
WVSU	1-3 (8)	1.09 (9)	1.16 (8)	-7.3 (10)
Wesleyan	0-5 (12)	1.04 (12)	1.19 (12)	-6.2 (9)
Frostburg	3-2 (5)	1.13 (8)	1.16 (9)	-3.2 (7)
Point Park	1-4 (9)	1.04 (11)	1.17 (10)	-4.0 (8)
Wheeling	4-1 (3)	1.14 (7)	1.18 (11)	+4.0 (5)

At the break, we had a 1-4 league record in the Mountain East (currently in 9th position) and an overall record of 4-6, were 1st in expected PPS offense, 4th in expected PPS defense,

but 11th in shot margin. Concord led the league at the time in expected point per shot defense at 1.06 PPS while West Liberty blitzed teams away in the shot margin category at +15.8 shots per game.

I think early in the season there was a heavy emphasis of the *better* component in the "more plus better" mantra that the team carried out in its dialogue, but the mid-season results tell us that *more* components needed much more attention. We emphasized drills and talked about *more* with shot quality but paid limited attention to the *more* components and rarely had drills that could accomplish the players subconsciously learning *more* like they did with *better*. As a staff we have proven to ourselves the capability of utilizing a scoring system and associated drills impacting on-court success with the highest expected value points per shot, we just had to do it with shot margin.

It is always known that West Liberty's press has carried them year-in and year-out because they forced turnovers, but this report became eye-popping as to how much statistical advantage it creates. It quickly became obvious that creating turnovers is fundamental to winning in the MEC and perhaps even in Division II. From this table alone, we can gather that shot quality only matters if you're getting the *same* number of shots. If you get more, it can matter less, but the inverse is not necessarily true - just because you get more shots, does not mean you can take as many bad ones as you like. This was the flashing sign that to win at this level and turn our season around, we needed to create turnovers.

The next observation was looking at the breakdowns of each team's % of possessions (i.e. 6%) and their associated actual PPS (i.e. 6 execution) for both offense and defense. The charts can be seen below from the time the midseason report was created in the order of "High Quality Offense", "Low Quality Offense", "High Quality Defense", and "Low Quality Defense".

	6's (Exp. PPS: 1.50)			4's (Exp. PPS: 1.00)			7's (Exp. PPS: 1.75)			
Team	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**Total % of Poss.**
Charleston	34.3%	1.38	-0.12	12.9%	1.17	0.17	13.6%	1.74	-0.01	60.7%
West Liberty	33.5%	1.42	-0.08	19.3%	1.21	0.21	11.2%	1.64	-0.11	64.0%
Fairmont	28.8%	1.54	0.04	17.8%	1.25	0.25	13.3%	1.46	-0.29	59.8%
Concord	34.4%	1.58	0.08	13.9%	1.27	0.27	12.5%	1.75	0.00	60.8%
Glenville	22.8%	1.58	0.08	17.5%	1.29	0.29	9.4%	1.78	0.03	49.7%
D&E	32.8%	1.55	0.05	11.1%	1.02	0.02	11.8%	1.67	-0.08	55.7%
Wheeling	24.2%	1.45	-0.05	18.6%	1.19	0.19	14.0%	1.57	-0.18	56.7%
WVSU	20.8%	1.45	-0.05	13.5%	1.24	0.24	12.9%	1.55	-0.20	47.1%
Frostburg	25.6%	1.55	0.05	11.8%	1.19	0.19	15.9%	1.57	-0.18	53.3%
Point Park	21.2%	1.43	-0.07	18.3%	1.18	0.18	7.2%	1.57	-0.18	46.7%
Wesleyan	23.1%	1.37	-0.13	10.1%	1.00	0.00	8.4%	1.38	-0.38	41.5%
Salem	25.1%	1.28	-0.22	9.8%	0.93	-0.07	15.1%	1.37	-0.38	50.0%

	3's (Exp. PPS: 0.75)			1's (Exp. PPS: 0.25)			0's (Exp. PPS: 0.00)			
Team	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**Total % of Poss.**
Charleston	8.8%	0.73	-0.02	9.5%	0.05	-0.20	21.0%	0.00	0.00	39.3%
West Liberty	14.0%	0.71	-0.04	7.9%	0.26	0.01	14.2%	0.00	0.00	36.0%
Fairmont	20.0%	0.76	0.01	7.6%	0.06	-0.19	11.7%	0.00	0.00	39.3%
Concord	14.6%	0.66	-0.09	11.8%	0.08	-0.17	12.3%	0.00	0.00	38.7%
Glenville	27.8%	0.98	0.23	10.6%	0.09	-0.16	11.7%	0.00	0.00	50.1%
D&E	19.9%	0.77	0.02	8.3%	0.11	-0.14	15.9%	0.00	0.00	44.1%
Wheeling	23.3%	0.85	0.10	7.7%	0.12	-0.13	11.6%	0.00	0.00	42.6%
WVSU	28.1%	0.89	0.14	9.1%	0.39	0.14	14.6%	0.00	0.00	51.8%
Frostburg	23.1%	0.89	0.14	10.9%	0.42	0.17	12.5%	0.00	0.00	46.5%
Point Park	25.3%	0.81	0.06	8.4%	0.17	-0.08	19.5%	0.00	0.00	53.3%
Wesleyan	26.8%	0.63	-0.12	11.7%	0.25	0.00	19.5%	0.00	0.00	58.1%
Salem	21.8%	0.74	-0.01	8.7%	0.05	-0.20	19.3%	0.00	0.00	49.8%

	6's (Exp. PPS: 1.50)			4's (Exp. PPS: 1.00)			7's (Exp. PPS: 1.75)			
Team	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**Total % of Poss.**
Charleston	25.3%	1.49	-0.01	10.7%	1.13	0.13	16.2%	1.65	-0.10	52.3%
West Liberty	23.3%	1.42	-0.08	10.0%	1.00	0.00	10.8%	1.40	-0.35	44.1%
Fairmont	21.9%	1.47	-0.03	13.3%	1.20	0.20	11.6%	1.49	-0.26	46.8%
Concord	24.0%	1.47	-0.03	14.6%	1.32	0.32	10.1%	1.66	-0.09	48.8%
Glenville	23.9%	1.44	-0.06	13.5%	1.32	0.32	13.7%	1.74	-0.01	51.1%
D&E	23.3%	1.61	0.11	16.6%	1.08	0.08	12.4%	1.46	-0.29	52.3%
Wheeling	29.6%	1.50	0.00	11.1%	0.96	-0.04	14.8%	1.45	-0.30	55.6%
WVSU	33.2%	1.44	-0.06	16.8%	1.12	0.12	10.6%	1.74	-0.01	60.6%
Frostburg	31.8%	1.41	-0.09	12.4%	1.21	0.21	13.7%	1.64	-0.11	57.9%
Point Park	34.1%	1.51	0.01	15.4%	1.40	0.40	8.1%	1.62	-0.13	57.6%
Wesleyan	32.1%	1.48	-0.02	17.2%	1.01	0.01	12.8%	1.46	-0.29	62.1%
Salem	24.0%	1.39	-0.11	21.0%	1.28	0.28	9.6%	1.71	-0.04	54.6%

	3's (Exp. PPS: 0.75)			1's (Exp. PPS: 0.25)			0's (Exp. PPS: 0.00)			
Team	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**% of Poss.**	**Actual PPS**	**Diff.**	**Total**
Charleston	22.0%	0.84	0.09	15.3%	0.13	-0.13	10.3%	0.00	0.00	47.5%
West Liberty	17.7%	0.51	-0.24	8.5%	0.12	-0.13	29.5%	0.00	0.00	55.6%
Fairmont	26.4%	0.75	0.00	10.0%	0.29	0.04	16.4%	0.00	0.00	52.7%
Concord	26.7%	0.80	0.05	11.1%	0.18	-0.07	13.1%	0.00	0.00	51.0%
Glenville	24.8%	1.03	0.28	8.0%	0.24	-0.01	15.2%	0.00	0.00	48.0%
D&E	21.0%	0.63	-0.12	8.1%	0.29	0.04	18.4%	0.00	0.00	47.5%
Wheeling	19.9%	0.91	0.16	7.9%	0.06	-0.19	16.7%	0.00	0.00	44.4%
WVSU	21.2%	0.79	0.04	7.3%	0.08	-0.17	10.3%	0.00	0.00	38.8%
Frostburg	17.6%	0.83	0.08	10.5%	0.16	-0.09	13.7%	0.00	0.00	41.8%
Point Park	20.1%	0.68	-0.07	5.7%	0.17	-0.08	16.1%	0.00	0.00	41.9%
Wesleyan	17.2%	0.83	0.08	7.3%	0.23	-0.02	13.0%	0.00	0.00	37.5%
Salem	20.1%	0.89	0.14	12.6%	0.14	-0.11	12.2%	0.00	0.00	45.0%

The takeaway from these charts starts with us having the highest expected PPS due to having the 2nd highest 6%, but we had the lowest 6 execution. Offensively, top teams *usually* have the most possessions with the best shots and opposite on defense (Concord, Fairmont, West Liberty in this report so far). There was some solace in this space that maybe we are not as far off as we think we are and we just need to make some layups (by working on some finishing).

In looking at the defensive side of things, the already mentioned shot margin war through turnovers becomes prevalent again. Even though we had one of the highest “High Quality Offense” and a decently low “High Quality Defense” (offense against), 0’s are the thing that has derailed us offensively and a lack-there-of defensively. As a side comedic note, as a scorer of the system and hopeful dreamer that there were good findings from it, if I knew that a team was losing the system score (and sometimes the real score), but I know they were the true winner of the game, I LITERALLY FOUND MYSELF PRAYING FOR 0’s to occur! And this would routinely happen; turnovers have become a staple to swinging games in the system *and* in the real game!

One extra comment on this turnover feature is that even if a team protects the ball, if they have a high percentage of possessions of “Low Quality Offense”, this can hurt you even if you shoot well on these low-quality shots. The case and point of this is Glenville having a 3% of 21.8% at a 0.98 3 execution which is nearly a full system point above what is expected. While Glenville makes these low expected value shots at a high rate, they had the 10th overall expected PPS and were sitting at a 2-3 record at that point in the season.

The next phase of this report is to take the entire discussion just made and ask if it is still worth following through on it. At that point in the season the system scores correctly picked 28 winners out of the 29 games played. This made for a 96.6% accuracy and only incorrectly picked Glenville at Frostburg on 12/13/2025. This game was absolute mayhem and not a lot of good ball being played which potentially caused some noise in the system of this particular game.

Beyond this picking of winner accuracy, the accuracy of the individual values also was assessed. As seen in the table below, 6’s have a pretty good accuracy having a league-wide execution of 1.47 PPS, just 0.03 below what is expected. 3’s having an execution rate of 0.80 PPS is also pretty close with a difference of 0.05. The 1’s isn’t as close as these other two but is still close enough considering that a 1 is a shot taken where the player is smothered and as long as it clearly is more than 0, it can be identified as not a turnover (a shot is better than no shot). The 7’s and 11’s are a little further away from their expected values but are direct reflections of

free throw percentage, and so there does not need to be an overreaction to a disparity between actual and expected outcomes.

With all of the validity that the system had gained, the 4's appeared to have a different value than expected, causing some deeper reasoning why this could be the case. As a staff, we *subjectively* assigned paint touch or open stand still 3's to 6's and "downgradeable" contests on any 3's could shift the score down a tier, so in essence the 4 was the most "subjectively" impacted bucket. By adding in these concepts, we also essentially removed lower expected shots from the 4 category which has (thus far) boosted it to its new expected value. Sure, by removing paint touch or open stand still 3's should drag the PPS back down for the 4 category, but there are far more 3's that are downgradeable than those shots. This explanation was deemed the most likely reason that the expected PPS was where it was at this point in the season.

Scoring	Actual	Expected	Difference
6	1.47	1.50	-0.03
4	1.18	1.00	0.18
3	0.80	0.75	0.05
1	0.17	0.25	-0.08
7	1.58	1.75	-0.17
11	2.58	2.75	-0.17
0	0.00	0.00	0.00

From here, the temptation is that the 1.18 PPS indicates that a 4 might really be a 5, but it is definitely too early to call. The data this mid-season report is based on is from 29 total games so that is not enough to completely change the system structure for the rest of the way. The low sample size is also something to consider for everything mentioned in the mid-system report. Sure, there are some behaviors like turnover and shot margin that have become red flags for things that need changed, but everything learned so far needed to be (and was) taken with a statistically rigorous grain of salt.

One big help from the mid-season report, which was utilized for the rest of the year, is the four charts from the high/low quality team-by-team breakdowns. Because it contains the distribution of the opponent's shots, it was used as a tool for scouting reports. This can be accomplished not only by looking at the distribution of the other team's system shots, but their efficiencies in each case as well. For example, looking at Glenville as an example once again, we can see that they shoot a high 3% of 27.8 (2nd highest) with a PPS of 0.98 (highest). In our

film presentation, we can coach the players on Glenville's willingness to shoot system 3's which are mostly midrange jumpers. This can lead to the conversation that since this is a heavy part of their game and they execute higher than what other teams do at it, our contests need to be great when they do shoot it. Looking at Fairmont from the defensive perspective, we can see that they have the lowest 6% defense at 21.9%, but they do allow a 4 execution of 1.20. This can lead to conversation of discussing their length that prevents teams they play from getting to the rim, but if we can get some 6's off of paint-touch 3's, and perhaps even collapse the defense on non-paint 3's (gap 3's) to take and make 4's at a high rate. By looking at the percentage of shots in each shot quality category as well as the execution within each of them, this demonstrates a scouting report applicability which was a big moment in this stage of the season.

Second Half Adjustments

As mentioned previously, turnovers became a key focal point for the team after the evidence of their importance from the mid-season report. In response to this new information, intentional teaching of turnover creation (and other concepts) and scheme adjustments were done in practice for the remaining part of the season. This teaching of turnover emphasis was used not only to create turnovers on defense, but for mitigating them on offense as well.

To create turnovers, we would have segments called “Pick 6” stations which would be drills where we had targeted ways that we practiced understanding and executing reads that could result in turnover creation, usually at the point of the turnover. In a quick sidebar, the term “Pick 6” is a commonly used one in basketball for getting a live-ball steal and scoring on the other end much like in football when a team intercepts a pass and returns it for a touchdown. With tongue in cheek, we think our usage of it is more profound because it is a steal into a scoring system 6. Returning back to the topic at hand, the majority of these “Pick 6” drills focused on gap steals - on reversals, drive “stings” (we termed sting as whenever a ball handler drives past your gap and you swipe at the ball to hope for the ball handler to pick it up or get a deflection), and reading the drive getting out and getting a hand in the passing lane.

On top of these turnover-specific drills, other drills were implemented with discussion and intention of the scoring system in mind. The first example includes wall-up stations which involve help defenders jumping up with legal verticality as a ball handler goes up to shoot a lay-up at the rim. This concept is taking a potential 6 and turning it into a 1 as the ball handler would be smothered if the wall-up is timed and executed correctly.

Another drill involves closeouts and discussing “getting into contests” whenever a perimeter shooter goes into their shot. As a reminder, perimeter 3-point shots that are “downgradeable” become a 3 while the ones that are not remain a 4. Since it was found that 4’s (at that moment) were approximately 1.25. PPS and 3’s were approximately 0.75 PPS, this means that 3-point shooters are effectively going from 42% to 25% when “downgradeable” contests occur. This led to intentional closeout drills and specifically closeout drills working on getting into the contest. To coach these drills properly, a definition for “downgradeable” was made which had risen through watching the 29 games of the study - the defender needs to arrive with a hand, alter the shooting speed and pocket on the shot, and after the shot having a slight extension of the contest meeting the shooter’s follow through. Post game 29 of Mountain East Conference play, the gray area of a downgradeable contest was significantly trimmed down making not only coaching contests simpler but scoring potential downgradeable contests in future MEC games.

Beyond stations, scheme change also was done to help increase turnovers including trapping on ball screens and post-ups. This required breaking down how to properly execute these traps whether it was properly corralling the ball handler at the point of the ball screen or closing the trap on post-ups. Included with discussing the point of the action of these traps is drilling how to read where the ball might be thrown out of the trap and properly zoning, rotating, and ultimately making a play on the ball. While teaching technique and reads were critical for executing these new schemes, having the players understand the "why" of doing this new way of basketball was simple because of the system scoring knowledge the players had. Because the system created a way of life for the team throughout the pre-season, these new findings and the changes needed with them maximized buy-in and minimized the time to do so.

The mid-season report also initiated drill implementation and scheme change for the offense as well. While playing off two feet had always been a part of the team's concepts, the importance of it from the lens of the system scoring and the need to take care of the ball made us revisit these fundamentals more consistently. On top of this working on shots within the 4 category also became a prevalent part of player skill development in the new year. The staff felt that part of the reason offensive turnovers were a problem was because the team was *only* looking for 6's and so was forcing it on the rim when it just was not there or there was not a willingness to take a good shot (a 4) because of the overemphasis on "hunting 6's". In response to this, the dialogue shifted from "hunt 6's" to "hunt 6's for the first 20 seconds of the shot clock, then 4's are okay in the last 10 seconds if we need to". Because the reality of more 4's being taken was about to happen, the skill development focus of these shots naturally made sense.

The offensive scheme drastically changed as well. In the first half of the season, it consisted entirely of conceptual offense with random ball screens, ghosts, slips, etc. which would eventually lead to advantage creation (size, speed, numbers, etc.). While we had good guard play, the ball would oftentimes get stuck in their hands for far too long causing overdribbling as well as a wearing effect on their abilities throughout the course of a game. To counter this, the scheme switched to a more Princeton-style offense with the ball being entered to our big (we called it a "trigger" or "catalyst") and playing off of three-man actions after that. The idea was that if we could steal lay-ups or cause confusion that would be great, but in a worst case scenario we could put the ball back into our guards hands like we wanted in the conceptual offense except now they still had not used their dribble yet, giving the guards less issues than before. Again, the dialogue and coaching surrounding the skill work and player development as well as the new scheme were important, but what was even more powerful was that the dialogue would always revolve back to the "why". "Why do we need to play off two

feet?" "Because we need to reduce turnovers so that we can win the shot margin." "Why are we shooting 4's in our workouts whenever the coaches told me to 'hunt 6's?" "Because while we are hunting 6's in the first 20 seconds of the shot clock, with the new offensive scheme 4's will be a prevalent part of what we do and also if we cannot get a 6 in the first 20 seconds, 4's are significantly better than forcing it on the rim and getting a turnover." "Why are we doing the 'trigger' actions?" "To eliminate overdribbling and thus reduce turnovers." It all comes back to the system scoring and its findings.

In addition to this, there were special teams adjustments made through baseline out of bounds defense as well as free throw rebounding when on offense. For baseline out of bounds, while some teams just want to mitigate any immediate scoring threat, our entire outlook was to cause turnovers in these situations - never give a team a break. For free throw rebounding, there was a strategy implemented to have the two guys in the lane basically cross with one of the guys running into the low box out to help free his teammate. The strategy may seem a little abstract, but it worked significantly in getting the offensive rebound off of missed free throws which we will discuss later. In the system, getting a free throw offensive rebound starts a new possession and thus contributes to shot margin!

End of Season Team Results

With the system scoring inspiring new drills, skill development, and scheme in all three phases of offense, defense, and special teams, it completely turned the season around. After sitting at 4-6 at the midway point, we finished the regular season 19-8 with a 13-2 for the second part of our season. This occurs with two of those losses being defeats on the road against top 25 nationally ranked opponents (West Liberty and Fairmont). Not only did our season flip, but we also clinched an outright bid in the Atlantic Region for the NCAA National Tournament as the #8 seed. This is a remarkable feat considering the poor outlook heading into our week-long break, and who knows if a clear, objective image of what needed to be fixed would have occurred without the scoring system.

While the overall team success was impacted by the scoring system, the offense finished top 5 in the country in several key metrics (according to CBB Analytics). The team ranked 1st overall in effective field goal percentage at 59.7% which was 1.7 percentage points better than the 2nd best team in Division II. This was led behind finishing 1st in 2-point field goal percentage at 59.5% and 3rd in 3-point field goal percentage at 39.9% with an overall field goal percentage of 50.4% which was second in the nation.

These overall results are attributed to the defensive and offensive skill and schematic changes that were made after the mid-season report. On the offensive end the changes included skill work of ball security, decision making and adjustment to the Princeton-style offense while on the defensive end the changes included skill work of gap steals, drive reads, and wall-up drills as well as adjustment to trapping at point actions like ball screens and post-ups. In special teams situations (base-line-out-bounds), the adjustment of intentionality on creating turnovers rather than scoring prevention also improved with the team finishing first in turnover percentage on baseline out of bounds in the MEC at 17.7%. These adjustments led to major changes in the targeted area of growth (shot margin) while maintaining the expected efficiencies on both sides of the floor. The target change of shot margin per game completely shifted going from -8.8 to +5.7 finishing second in shot margin during this stretch. The expected offensive PPS remained the best in the league by a wide margin and actually improved from 1.21 to 1.23 PPS. Defensively, with the increased turnover production there comes a certain risk of being exposed to better shots, yet the expected defensive points per shot remained the same at 1.09 PPS and was 2nd in the league during this stretch. The dynamic of where the team was pre-midseason report, post-midseason report, as well as the overall finish within the league is outlined in the table below.

Games	Record	Shot Margin	Exp. PPS Offensive	Exp. PPS Defense
Pre-Report	1-4 (9)	-8.8 (11)	1.21 (1)	1.09 (4)
Post-Report	15-3 (3)	+5.7 (2)	1.23 (1)	1.09 (2)
Overall	16-7 (3)	+2.6 (4)	1.23 (1)	1.09 (2)

In addition to looking at how the improvements were made in the shot margin and holding steady in both expected points per shot offense and defense, winning the possession battle also became an area of growth. Shot margin is not the same as possession margin, but having more possessions does contribute to obtaining more shots. As mentioned, a free throw offensive rebounding scheme was put in to free up one of the players on the lane line and while seems a little out-of-the-box, it worked. Looking at the table below, University of Charleston gained on average 1.22 possessions per game simply off free throw rebounds in the second half, and bringing the average up to 1.13 additional possessions per game for the season. This is half of a possession more than the next closest team. This speaks to the results of the strategy stemming from the emphasis of finding creative ways to get more possessions.

Team	FT REB/G (Second Half)	FT REB/G (Season)
Charleston	1.22	1.13
Fairmont	0.76	0.80
West Liberty	0.60	0.64
Frostburg	0.47	0.58
Salem	0.47	0.55
Concord	0.42	0.46
Wheeling	0.39	0.39
D&E	0.32	0.33
Glenville	0.24	0.29
WVSU	0.21	0.26
Wesleyan	0.21	0.18
Point Park	0.11	0.13

End of Season Player Results

These feats are remarkable especially considering the roster that the team had coming into the season. It should be noted here that what is being mentioned regarding the players listed has little to do with the belief that we had in the players and the reality of their experience heading into the 2024-2025 season which is outlined in the table below.

Player Name	Year	Previous Experience Notes
Braden Chapman	Jr.	21 PPG, limited to 13 GP due to injury at WVU Tech (NAIA) in 2024-25
Thomas Hailey	Gr.	16 PPG in 26 GP at WVU Tech (NAIA) in 2024-25, 74 GS in 101 GP with 12 PPG for career (2020-25)
Matthew Shelton	So.	11 PPG, 24 GS in 28 GP in 2024-2025 (Returner)
Hamilton Campbell	RS-Jr.	6 PPG, 2.7 APG in at Hampden Sydney (DIII) in 2024-25, 28 total GP at Lenoir-Rhyne (DII) from 2022-24
Ben Nicol	RS-So.	7 GP, 31 MIN at Ohio (DI) in 2024-25, Red Shirted year prior
Kaden Davis	Fr.	Tallmadge High School (OH)
Eli Robertson	Jr.	7 GP, 18 FGA in 2024-25 (Returner), 75 MIN combined in 1st two seasons (2023-25)
Trevor Barrett	So.	28 GS in 28 GP, 8.6 PPG in 2024-25 (Returner)
Scoot Taylor	Sr.	5 PPG in 23 GP in 2024-25 (Returner), played at Louisburg College (JUCO) in 2022-24
Jalen Rivens	Jr.	2 PPG in 24 GP in 2024-25 (Returner), 10 MIN in 2023-24, JV player in 2022-23 at Belmont Abbey (DII)
Levon Jacobs	Fr.	Davidson Day School (NC)
Jayallen Turner	RS-Fr.	Charleston Catholic (WV), Red Shirted year prior (Returner)

The table lists the player's class for the 2025-26 season with their given experience, and they are put in the order by the number of field goal attempts taken during the year. Out of the players in contention for playing time coming into the fall, 5 of the 12 players had been a part of high-volume usage or relied upon scoring-wise (Chapman, Hailey, Shelton, Campbell, and Barrett). Players including Nicol, Davis, Robertson, Jacobs, and Turner, all had limited to 0 minutes coming in - in fact the plan for Davis was to have him not play and red shirt this season and Turner had a season-ending injury before any games could be played. This leaves Taylor and Rivens as the only two remaining that have had some impact. For Taylor’s case he certainly made impacts on the 2024-25 season, but just three years prior Rivens was a JV player at

Belmont Abbey despite getting some time in 2024-25. This is all just to set a stage that the roster “on paper” has a wide range of usage - some with experience and (many) others that have had limited playing time.

Starting with the guys that have played with some significance, they each had their own career highs. Both Campbell and Shelton had career highs in field goal percentage and three-point field goal percentage and improved their career average in both categories as well. Chapman had a career high three-point field goal percentage and improved on his career average in both field goal and three-point field goal percentage. Hailey improved his career average in field goal percentage while Barrett had no improvements in any of the four categories. For the two players that had limited impact coming into the season, Rivens improved in all four categories while Taylor improved in none. However, Taylor did have a career high in Division II play in three-point field goal percentage. Robertson and Nicol both played miniscule collegiate level minutes yet improved in all four categories as well with each shooting above 43% from three-point range. In regard to the incoming freshmen, Jacobs shot above 50% from the field and Davis remarkably achieved this and shot above 40% from three-point range.

Overall, C players (not including Jacobs and Davis) had improvements in all four categories of career highs and career averages in field goal and three-point field goal percentage. 7 of the 9 potential improvers did so in career field goal percentage with 6 of the 9 improving in both career average and career highs in three-point field goal percentage. All of these improvements are outlined in the table below with the green cells indicating improvement in those categories.

Player	2025-26 FG%	Career FG%	Career High FG%	2025-26 3PFG%	Career 3PFG%	Career High 3%
Braden	47.0%	45.3%	48.6%	43.2%	40.2%	42.0%
Thomas	66.7%	60.5%	68.3%	0.0%	33.0%	33.0%
Matt	52.7%	52.1%	52.1%	34.0%	32.4%	32.4%
Ham	47.1%	33.7%	34.1%	37.1%	28.7%	29.2%
Trevor	38.9%	43.5%	43.5%	35.9%	37.0%	37.0%
Scoot	36.4%	50.3%	58.8%	30.8%	33.7%	38.2%
Jalen	52.4%	26.9%	28.3%	45.0%	24.4%	25.0%
Ben	44.2%	33.0%	33.0%	43.0%	28.6%	28.6%
Eli	47.9%	25.8%	27.8%	45.8%	11.1%	16.7%
Kaden	53.2%	---	---	42.3%	---	---
Levon	55.6%	---	---	33.0%	---	---

While looking at the end results of the player's season, things can start to make more sense when looking back at the process results in conjunction with them. The player summary can be seen in the table below outlining the overall contributions to the team with % of Stints (percent of the whole team's stints), Stint Quality, % of Shots (percent of the whole team's shots), and Shot Quality while also giving a snapshot of a comparison of each player's expected points per shot to what they actually accomplished for all shots and foul independent shots (shots that are not 7's or 11's).

	Overall				All Shots			Foul Independent Shots		
Player	**% of Poss.**	**Stint Q**	**% of Shots**	**Shot Q**	**Exp. PPS**	**Act. PPS**	**Diff.**	**Exp. PPS**	**Act. PPS**	**Diff.**
Braden	18.2%	4.24	18.2%	4.94	1.23	1.27	+0.04	1.13	1.17	+0.04
Thomas	15.9%	4.84	16.4%	5.46	1.37	1.29	-0.08	1.26	1.31	+0.05
Matt	11.9%	4.75	13.0%	5.07	1.27	1.21	-0.06	1.18	1.14	-0.05
Ham	12.4%	3.73	11.1%	4.75	1.19	1.27	+0.09	1.10	1.20	+0.10
Ben	11.1%	3.97	10.6%	4.74	1.19	1.27	+0.09	1.10	1.21	+0.10
Kaden	9.4%	4.45	10.1%	4.84	1.21	1.27	+0.06	1.12	1.25	+0.13
Eli	5.3%	4.13	5.7%	4.54	1.13	1.35	+0.22	1.11	1.32	+0.22
Trevor	6.0%	3.52	5.6%	4.42	1.11	0.96	-0.15	1.05	0.90	-0.15
Scoot	4.5%	4.07	4.4%	4.82	1.20	1.06	-0.15	1.05	0.87	-0.17
Jalen	3.3%	3.68	2.9%	4.85	1.21	1.13	-0.09	1.13	1.05	-0.09
Levon	1.3%	3.92	1.2%	4.90	1.23	1.00	-0.23	1.05	0.67	-0.38
Rico	0.5%	3.56	0.5%	4.00	1.00	0.50	-0.50	1.00	0.50	-0.50
Logan	0.2%	5.50	0.2%	5.50	1.38	0.00	-1.38	1.38	0.00	-1.38
Mike	0.0%	---	0.0%	---	---	---	---	---	---	---
Total	**100.0%**	**4.21**	**100.0%**	**4.90**	**1.23**	**1.23**	**0.00**	**1.14**	**1.17**	**+0.03**

When looking at this table, the results that occurred seem to make a little more sense with the process information available. The "plus" players (players with a differential greater than 0) for all shots are Braden, Ham, Ben, Kaden, and Eli. These guys and Thomas were "plus" players for foul independent shots as well. What this indicates is that these players are above league average in the distribution of shots that they shoot as this is similar to the calculation of the Wins Above Replacement (WAR) statistic used in baseball. These players all had

remarkable seasons and were amongst the group that had many career shooting improvements in the previous table.

Diving into the “minus” players (players with a differential less than 0) for all shots is Matt, Trevor, Scoot, Jalen, and Levon. In the case of Matt, the probable reason that he was still able to achieve as many career improvements as he did was due to his expected point per shot being the second highest on the team at 1.27. Even with a slight drop off from the league average, this is such a high value that it makes sense that he achieved career improvements across the board. In regard to Scoot, Jalen, and Levon, these players operated on low volume but a certain level of execution dictates what kind of player you are. Scoot and Levon had 1.20 and 1.23 expected points per shot, respectively, but had 1.06 and 1.00 actual points per shot, respectively, while Jalen’s drop off was only from 1.23 PPS to 1.13 PPS. Scoot and Levon’s lack of efforts (and Jalen’s improvements) could be indicative of their true abilities, but it also could be from noise from their low usage not showing their true abilities. Either way, the scoring system reaped benefits for Jalen where Scoot and Levon’s output simply did not match the expectation. The final player, Trevor Barrett, had a low expected point per shot at 1.11 (lowest amongst rotation guys) and an actual point per shot at 0.96. This indicates that it makes plenty of sense as to why he had fall offs in all areas of shooting percentages. He simply did not take great shots and even the ones that he shot, he was not efficient enough of a player to come close to matching what is expected.

Without unboxing too much of theory in this section, it is best to quickly mention the logic that arose into assessing expected versus actual point per shot. First, in examining the expected point per shot, while this value is the “average” of all the shots, this does not necessarily imply that these are shots that the “average” player would shoot on these shots. In reality, this number is skewed towards players that take the majority of the shots (starters and scorers off the bench). This is a similar bias of the WAR statistic in baseball, but regardless is one that best represents “what you would expect to happen on a particular shot”. This dynamic just needs to be in the back of the mind when evaluating or comparing players and teams.

With this dynamic in mind, when looking at the actual value in comparison to the expected value, deeper assessments can be made. The “plus” value players can now be looked at not only as above average players, but even above average starters, scorers, etc. in the league. In contrast, “minus” player assessment can be broken into two parts. The first being “minus” players that are within 0.05 of the expected value. These players are not necessarily “bad” players, rather they are most likely a low value starter or a secondary player off the bench. As this gap between actual and expected points per shot grows for “minus” players, this is when

the trend starts to move toward the player not being a fit for the role that they are in or are not high-quality Division II or MEC players. Based on the discussion of the players above, it becomes obvious where each of them lie in this range.

Breaking down the players overall expected values by each type of shot can also give additional insight to their results. Most of the “plus” players achieved this status by not only matching the expected values of 6’s, but dominating the 4 category by a large margin. Players like Eli and Kaden not only did this, but they did as well if not better on 4’s than 6’s. Part joke, part “dialogue” was calling Eli a “Walking 6” and he literally was just that, having an exact actual points per shot of 1.50 (equivalent to a 6 exactly). Then, the low “minus” players like Matt, for example, simply did not excel in the 4 category. Other “minus” players like Trevor and Scoot are this because even though they shot well on 4’s, they shot poorly on 6’s (1.11 and 1.04 PPS, respectively). These low values on shots that should almost guarantee points on the board drag down their overall expected values and are also a large reason these players did not achieve career improvements. When looking at a “minus” player like Jalen, his actual points per shot on 4’s were not too impressive (0.60 PPS), but he scored relatively well on 6’s (1.43 PPS), but because he shot mostly 6’s (44.7% of shots), this is likely why he did see career improvements across the board. Having this high 6 percentage was also a reason why Matt had career improvements as well (48.1% of shots). It should also be noted separately that nearly no one had any success shooting 3’s with the highest 3 execution being Ben at 0.88 - it is simply too hard of a shot grouping to shoot well in throughout an entire season. In summary, shooting poorly on 6’s is going to almost guarantee a “minus” player, shooting well on 4’s is what can separate and create a “plus” player, but when not dominating in any area, the player must have a high 6 percentage in order to optimize a player’s real shooting percentages.

End of Season Scoring System Impacts

Not much more is to be said about the individual and team-wide end of season results but revisiting the state of the system itself is critical. Out of the 141 games played, 118 of the games were correctly picked by the system score while 23 were incorrectly picked. This makes for a prediction accuracy of 83.7% which would translate to a 23-5 actual record if your team won the system score every time. When adding in University of Charleston’s non-conference games and National Tournament game into the prediction, this results in 148 games played with 125 games being predicted for an accuracy of 84.5% which would result in a 24-4 regular season record. These extra games and the data from them were not included in any of the

tables or explanations mentioned previously but were just used for additional insight on this matter.

In a worst-case scenario accounting for an error when scoring the game, all of the wins that were within 5 system points were changed to losses. This would lead to 109 out of the 141 games being predicted correctly which would make for a 21-7 record. In the worst-case scenario of utilizing the system score, the prediction accuracy would be 77.3% which would still be a better win percentage than 36 out of the 64 teams that made the National Tournament and 52 out of the 80 teams considered in the Regional Rankings. This means you would have a better win percentage than all 24 than of the 8, 9 and 10 seeds which guarantees you a spot in the National Tournament. You would also have a better record than all but one of each of the 5-seeds, 6-seeds, and 7-seeds. Again, this is in the *worst*-case scenario.

In a best-case scenario accounting for the same error, all of the losses that were within 5 system points (used a lower value for conservative purposes) were also flipped. This would lead to 121 out of the 141 games being predicted correctly which would make for a prediction accuracy of 85.8% and an expected record of 24-4. This would put you at a better win percentage than all teams that were a 4-seed or lower, better than seven out of the eight 3-seeds, five out of the eight 2-seeds, and better than the Midwest Regional 1-seed of Michigan Tech.

Looking at other breakdowns can also be intriguing as alternate, underlying factors could impact the effects of winning the system score. For example, home teams (just looking at the regular season) had a record of 75 wins and 57 losses for a win percentage of 56.8% where the system predicted a record of 71 wins and 61 losses for a win percentage of 53.8%. In addition to this, home teams out score their opponents on average by 2.17 points per game while the system score margin is 5.20 for home teams which is an expected value of 1.30. This just speaks to the power of the known home court advantage.

Not only are the outcomes (expected and actual) favoring the home team, but the process also does as well. Teams have a higher shot margin (+0.86 shots per game) attributed to a lower turnover margin (-0.77 turnovers per game), and more offensive rebounds per game (+0.25 offensive rebounds per game) which indicates an increased effort level when at home. On top of this, the shot quality is slightly better for home teams (4.53) than for away teams (4.49). With a better shot quality and shot margin for home teams, this accounts for most of the actual increased win percentage for home teams.

There is also a little luck that is involved that is attributed to this increased home win percentage. The 4-win gap between the actual and predicted records for home teams could be

deemed marginal, perhaps these extra four wins came about due to something that cannot be explained. Regardless of this, home teams play a better process and have better results, so when playing on the road, there simply needs to be an understanding that simply winning the scoring system might not be enough.

Breaking down how the system scoring is held up for the league can be seen in the table below. When looking at expected records, Wheeling and Point Park outperformed their expected records by 7 games and 4 games, respectively, and Salem underperformed their record by 3 games. In the case of Wheeling, the players on these teams were extremely talented and while the findings did not include a player breakdown for opponents, the underwhelming process that they played with is overcome by this talent and perhaps a little luck with seven wins by a margin of six points or less and 11 wins by a margin of 10 points or less. The remaining nine teams are within two games of their expected record, with 6 teams being within one game, and Fairmont's record being a perfect match. That's not to say that this is the number of games the system got wrong, with the "Games Matched" column showing how many games each team had a match of outcome between system score and real score with the "Games Contradicted" column showing any games with a contradiction. It would make sense that Charleston, the team that played the game of the system score, would have the least games contradicting (and it happened the last game within the study).

Team	Real Record	System Record	Games Back of System	Games Matched	Games Contradicted
Charleston	16-7	17-6	-1	22	1
West Liberty	23-2	24-1	-1	22	3
Fairmont	21-4	21-4	0	23	2
Glenville	14-10	15-9	-1	19	5
Frostburg	12-12	13-11	-1	21	3
Concord	13-11	15-9	-2	20	4
Wheeling	16-7	9-14	7	16	7
D&E	8-16	9-15	-1	19	5
Wesleyan	2-20	1-21	1	21	1
WVSU	5-18	7-16	-2	19	4
Point Park	7-16	3-20	4	17	6
Salem	4-18	7-15	-3	17	5
Total	**141-141**	**141-141**	**0**	**236**	**46**

The table below displays the outcomes for each shot type throughout the entire study with similar findings from the mid-season report. The expected values for 6's, 3's, and 1's are approximately what is expected. Once again, 7's and 11's serve their purpose with 7's being clearly higher than 6's and 11's falling closer to their expected value than an expected value of a 10. The only clear distinction is the 4 being distinctly greater than a 1 which could be for a number of reasons. The league shot 36.0% from 3-point range in 2025-26 which was better than in 2024-25 where the league shot 34.4% which the study was based off. In addition to this, the league took 486 more 3-points shots than the year prior with 6914 in 2025-26 and 6428 in 2024-25. These are potential, known contributions to the increase in what was expected with 4's, where some current unknowns will be discussed in the future work section.

An additional feature to be discussed is the standard deviation, and more specially the relative standard deviation (RSD). What these values tell us is that for each scoring type, how variable a shot would be from its expected outcome. For RSD, this simply takes the standard deviation and divides it by the expected value itself to get a standard deviation in relative terms to itself, essentially creating a standardization of sorts. The finding in this capacity is that the order of expected value is inversely correlated to the order of the variance you would expect for a given shot. So not only are 6's the best shot (excluding 7's and 11's) from an expectation standpoint, the variability you could get from taking this shot is the lowest and this pattern is

consistent for all of the shots. This gives a basis that while shooting a lot of 3's can lead to a lot of success in spurts (say, having an expected PPS of 1.10) which makes it feel like the shots being taken are good shots, it can also lead to a lot of droughts (say, having an expected PPS of 0.50). So, while it can feel in the moment that 4's are the way to go, the results of 4's could flip while shooting 6's will more consistently hover around its expected outcome of 1.50.

Future Work

It is clear that the system has given strong indications of usability for any coaching staff in various forms whether it be in-game or post-game reporting, player feedback, advanced scouting all while obtaining strong validity one year out from the study. With the already established assertion that “there is no equilibrium” when it comes to any kind of environment, and specifically in the analytics sports world, this not only leaves us with the necessary due diligence to brace for change, but the opportunity for growth to stay ahead and thrive. In this section, further discussion of potential threats and growth opportunities will be had.

Potential Threats

The first threat that needs to be accounted for is the reality that while the scoring system has tremendous accuracy, there are a couple of shortcomings that will need to be addressed and corrected. Looking at the simplest cases of handling fouls - 7s and 11s - was overlooked as all foul situations were grouped into these two categories. The good news is that handling these cases requires simple calculations with the basis of what we already have. In regards to fouls situations where free throws will be shot there are six possibilities - two shot foul (foul on a 2-point shot, double bonus, an intentional foul, or a two shot technical foul), three shot foul when fouled on a 3-point shot, an “and-1” on a two-point shot, an “and-1” on a three-point shot, a “1-and-1” single bonus scenario, and the rare 1-shot technical foul.

Since the equivalence of 1 real point is 4 system points, simple math can paint out each of these scenarios when considering that the league average free throw percentage is 75%. Starting with the simplest case, the 1-shot technical foul would be worth 3 system points considering the league average. Extending this logic for two-shot fouls and three-shot fouls, the two-shot fouls would be worth 6 system points, and the three-shot fouls would be worth 9 system points. When accounting for the “and-1” scenarios, the shots themselves went in, so these shots will be counted plus the remaining expectation of a 1-shot scenario. This means for a two-point “and 1”, the system value would be an 11 and for a three-point “and 1” the system value would be a 15. This leaves the final scenario of a “1-and-1” and in this case, the chance of making 0 free throws, one free throw, or two free throws will have to be mathematically accounted for giving the system value of 5. The outcomes and associated calculations are given for each of the scenarios below.

Scenario	Calculation	System Expectation
One-Shot Technical	4*0.75	3
Two-Shot Fouls	4*0.75 + 4*0.75	6
Three-Shot Fouls	4*0.75 + 4*0.75 + 4*0.75	9
And-1 Two	4*2 + 4*0.75	11
And-1 Three	4*3 + 4*0.75	15
1-and-1	4*0.75*0.25 + 8*0.75*0.75	5

While these outcomes are simple mathematically to derive, it is probably best to distinguish these shots from even if the expectations match. For example, a one-shot technical has a system expectation of 3, but these shots explain something completely different than a midrange jumper. A demarcation for this type of situation from the rest of 3's would then be necessary. An additional idea would be that since all of these situations involve free throws, a way to do this would be to put something trailing or following the 3 values to distinguish the shot's identity ("F3", "5F"). Regardless of the format, it would need to be able to work in conjunction with all of the systems established so that outputs would still be digestible for the coaches and players.

Another situation that needs to be addressed is the 4's dilemma as there is a clear lack of understanding of what this category encompasses. It is the one category that has the most widespread combination of categories from the study itself. After all, it was considered "the everything else" category of shots when initially explaining all the different things that go into it. It was also the category that was most affected by the subjective adjustments with the paint touch stand still 3's and the wide-open stand still 3's being bumped up to being 6's and the heavy contests downgrading the shots down to being 3's. Since the sources are unknown, the breakdown of this category should be pursued in the same way that they were broken down in the original study, and maybe even to a greater depth.

At a minimum, true 3-point shots need to be revisited perhaps not only within the 4 category but in totality. The location may need to be more specifically revisited as corner 3's were not even considered being a separate location despite their known higher efficiency. Also, shots that are far behind the line (which some of the players on losing teams in the 2025-26 teams took) also need to be assessed. While the dribble category is pretty self-explanatory, the movement features of these shots could be slightly improved by cementing any criteria that is in

question. The contest category is perhaps the trickiest one. While throughout the year, it became more apparent what a “downgradeable” contest looks like, there needs to be an increased validity of these assumptions. Finding a better-defined answer for 4’s would go a long way in locking down its true value, but it would also help to teach what these next level of quality shots are worth and how to attack or prevent them (be able to teach contests better).

Another shortcoming is the identity of 0’s. It is known that there is a significant difference between a live ball and a dead ball turnover. Perhaps the true value of the turnover is not fully encapsulated as a 0 does not distinguish between these two possibilities. While play resets with a dead ball turnover, it could be presumed that there is no additional value from them. On the other end though, since when live ball turnovers occur, the team that just turned it over does not have a set defense which could lead to an increased chance of letting up a basket. Not only this, but other considerations like whether the turnover occurred in the backcourt could also play a role in turnovers having non-zero net values. And who knows, maybe only live ball turnovers in the back court have added value while those in the front court do not. Regardless of this thought, the only way to know is through researching this process further.

These added value of live ball concepts can also be used when discussing 1’s as well. Could blocked shots lead to run outs giving an additional efficiency to the next shot that is taken? It would seem to be a possibility without knowing the data behind it since the ball oftentimes will be changing direction once the block occurs. With that in mind, then the real value of a 1’s future impact could be worth more to the team that blocked it and even more detrimental to the team that took that shot.

Another feature that may potentially be misvalued is the offensive rebound, as it was assigned one point arbitrarily. This leaves valuing this particular action into a plethora of possibilities. Could offensive rebounds be impacted by whether it was a live ball rebound or a ball knocked out of bounds? Beyond this, could offensive rebounds be more likely on certain shots and could post-offensive rebound shots have additional value as well? If nothing comes about from trying to answer these questions, perhaps offensive rebounding could be studied as its own entity to find an answer to this such as does shape pre-shot, when the ball hits the rim, and heights of those players impact rebounding more than anything else? A can of worms to find value in the offensive rebounds needs to be answered especially considering the finding of the importance of shot margin to winning at the Division II level.

With all of these factors in mind, this could help solve the disparity between Result Quality and its expected points per possession as seen in the table below. Every team’s actual points per possession was greater than what was expected with only three of the teams being

within 0.09 PPP. The average of the differences between the expected and actual points per possession is right around 0.10. All of this amounts to evidence that there are components that are not only being misvalued but even undervalued when it comes to giving an indication of expected points per possession. If result quality is the basis for tracking of the system score itself then it becomes that much more urgent to make up for this missing value.

Team	Result Quality	Expected PPP	Actual PPP	Difference
Charleston	4.34	1.08	1.20	0.12
Glenville	4.07	1.02	1.17	0.15
Fairmont	4.28	1.07	1.24	0.17
West Liberty	4.32	1.08	1.20	0.12
D&E	3.98	0.99	1.09	0.10
Concord	4.26	1.06	1.16	0.10
Salem	3.94	0.98	0.99	0.01
WVSU	4.01	1.00	1.07	0.07
Wesleyan	3.72	0.93	0.96	0.03
Frostburg	4.17	1.04	1.16	0.12
Point Park	3.76	0.94	1.06	0.12
Wheeling	4.13	1.03	1.14	0.11
Average	**4.08**	**1.02**	**1.12**	**0.10**

When taking a snapshot of the same concept of shot quality compared to the actual points per shot as seen in the table below, it is clear that the valuation of shots does give a trusted accuracy. All of the 12 teams were within 0.07 PPS with nine of them being within 0.05 PPS, and an average absolute difference of 0.04, a far greater representation than result quality is at assessing points per possession.

Team	Shot Quality	Expected PPS	Actual PPS	Absolute Difference
Charleston	4.90	1.23	1.23	0.00
Glenville	4.40	1.10	1.17	0.07
Fairmont	4.69	1.17	1.23	0.06
West Liberty	4.67	1.17	1.20	0.03
D&E	4.50	1.12	1.14	0.02
Concord	4.58	1.14	1.13	0.01
Salem	4.49	1.12	1.05	0.07
WVSU	4.44	1.11	1.10	0.01
Wesleyan	4.24	1.06	1.02	0.04
Frostburg	4.49	1.12	1.17	0.05
Point Park	4.16	1.04	1.09	0.05
Wheeling	4.44	1.11	1.13	0.02
Average	4.50	1.12	1.14	0.04

What this says is that perhaps it is not the valuation of shots that is causing the disparity between result quality and points per possession, so other avenues might need to be explored. One method that was considered was by keeping all of the shots the same and altering the value of an offensive rebound until the average difference between team's expected points per possession and actual points per possession reaches a minimum. It was found that if offensive rebounds are given a value of 3.5 points, then this gives a minimum difference of 0.0, and when they are given a value of 4 points, then this gives a minimum absolute difference of 0.03. This indicates that if using this method to determine the value of offensive rebounds, the new value of offensive rebounds should be within this range for the system score. The issue with simply doing this is the risk of overfitting the data and does this really mean that an offensive rebound would give you an *additional* point for every offensive rebound that you get? This means that if a team gets 4 offensive rebounds on a possession, then they are predicted to get 4 actual points on that possession before even considering the shot attempt that follows it.

While the initial guess work of finding value of offensive rebounds has some flaws, the idea of finding value in the shot margin category seems promising. Expected shot quality seems to be reflective of what actually occurs, so beyond the adjustments mentioned, it seems like a solid indicator and should mostly remain intact. Moving forward, looking at the effects of offensive rebounds and turnovers as discussed will be the driving factor to fix the result quality metric. Once the effects are found, it is paramount that the findings can be integrated and

translated to the system scoring itself. This serves as a heavy challenge to find their added value within its context and mesh it with the preexisting structure the system score entails but can help mitigate any shortcomings that the system score has and propel it to a new level.

Potential Opportunities

While looking into changes into the values of the current system can help solve some of the noise that is involved in the current system, additional research can also help to improve current methods as well. The biggest effort of research comes through defining a stricter way to teach perimeter contests, as right now it is still in the “best guess”. While this previously described “best guess” would seem to be an optimal way, are there others that are better? Research into hand placement, distance from shooter, side of shooter defender is on (front, shooting hand-side, non-shooting hand-side) for both pre- and post-shot are some of the possible features to be explored. Doing this in conjunction with the shot breakdown can also be telling as all of this will help trend towards a more accurate description of the “downgradeable” contest.

Additional improvements for the next iteration come in the form of implementation and coaching the system on the defensive lens. While there was a heavy emphasis on offense with “hunting 6’s” throughout the season and dialogue around turnovers ramped up after the mid-season report, shot quality prevention was discussed rarely. The only time that anything to any degree would be talked about on the defensive end was wall-ups and getting into contests. There was a whole dialogue of doing whatever it takes to get a high-quality shot on the offensive end, but the reciprocal dialogue of “preventing 6’s” never really occurred to a close extreme as that.

Ramping up the intensity for turnovers exposed the opportunity for giving up more 6’s and it might be why the 6% might be higher than desired in comparison to the rest of the league. While this is true, if the dialogue could have been “giving up 6’s are bad, scramble to take these away” or things of that nature, then perhaps this 6% would be lower.

Another area of dialogue that was touched on but not emphasized enough was preventing 7’s through foul habits. While some drills were implemented throughout the season to help with these foul habits, Charleston still led the league in 7% by a large margin. Fouling is not something that can be completely avoided, but if a greater emphasis is spent on these shots, perhaps this area of focus could go down as well.

A good chunk of defensive ability relies on personnel and will be pursued in the offseason to help address this hole in the program. Finding longer defenders who can create turnovers through deflections and assist in reducing 6’s and 7’s through their vertical ability and size is desired. While these players will be sought out, the dialogue surrounding the significance of giving up certain system points can also assist in growth defensively.

Another version of improvement involves the integration of the system into workflow through the creation of a web app. In the current set up, all of the data is localized in a Google Sheet which has been appropriate for harnessing a single year's worth of data and creating simple outputs. While the Google Sheet is shared with all coaches, the interactability is less than ideal since each coach can only view the sheet rather than play with the data. Not only that, what they see is not the most appealing to the eye and even if the spreadsheet was improved aesthetically, it would not match that of what a web app could accomplish. Finally, the Google Sheet is beginning to reach its limitations of one year's worth of data, so adding an additional year's worth may prove ineffective. All of these reasons are motivations to introduce an exclusive web app that can help solve these issues and assist in overall workflow as a result.

In the first iteration, the data collection, management and output would remain mostly the same as in the Google Sheet. Data would be collected on a game-by-game basis for all teams along with player data for the University of Charleston. This data allows for single game and season long insights into the teams shot quality, stint quality, result quality, each shot's percentage and execution, shot and possession margin information along with their associated actual outputs for each with the overall evaluation of the system included as well. While all of these features would mostly be retained with few being added, in an ideal version of the web app, the coaches can toggle through various formats when looking at not only Charleston, but other teams as well. These formats can include single game breakdowns, multi-game summaries to the coaches choosing (say, the last 5 games), season aggregations, etc. This would improve workflow as it would allow coaches to see everything involving the system score in their own time frame as they prepare for opponents, self-scout the team, etc.

The study currently is under the restriction of data collected from Mountain East Conference games (including those with Salem). While this could be considered as a threat or opportunity depending on the perspective, it more likely falls under the opportunity umbrella. Since the scope of the study is contained within the MEC, it could be argued that it cannot be safely applied to outside of this league in any capacity - other Division II games, any level of Division I, or even the NBA. In the three scrimmages against non-league opponents, five non-league regular season games, and the one national tournament game, the system score predicted the winner correctly in every one of those games. This is not significant evidence that it can be applied to other games outside of the MEC in Division II, but it certainly shifts the perspective that there is hope that the scoring system is translatable.

This leads to the idea that additional research and tracking of the system score across varying levels would be an appropriate method to see if the scope can be safely expanded.

Simply tracking games via a representative sample throughout Division II would be the best place to start and could be done within National Tournament games. It could be argued that there may be some bias in choosing these games given the inherit environment being different than another regular season game, however these are the teams that can encapsulate maybe even bigger importances that do not show up in the current data in determining a championship-level team. Beyond the Division II level, looking at random games at varying levels of Division I (Low Major, Mid Major, and High Major), and how it stacks up in this level's National Tournament, can give even further indication of how it translates. Finally, looking at how the system score stacks up in the NBA environment also could be completed.

It should be noted that it is clear that the further and further up the level of competition, the players presumably get better and better. When comparing the NBA player to the same pool of data used for the MEC, it might lead to lower accuracy levels and varying expected outcomes for each shot type. This is not a concern, as if the scoring system does hold in any particular level, then there is confidence to keep it rolling. On the other hand, if it does not hold, we can look at the certain cases where it does not and learn from where the system fails at that level. By not assessing these games, then nothing can be learned, so it is best to start from here and take the lessons as they come.

Conclusion

With the new wave of sports analytics infiltrating basketball, but not yet reaching the ranks of Division II, there is opportunity to gain an edge, and the shot quality scoring system creates it. By bucketing expected values of shots throughout the entire MEC season in 2024-25, an aggregation of these values was able to predict the expected outcome of games and player performances. It also demonstrated that it can be an effective tool in decision-making and assisting in buy-in to creating habits that lead to winning basketball. Roster, skill development, drill usage, and schema changes came from lessons learned via the feedback given by the scoring system. To start the year, the team had the highest expected shot quality and was trending well in shooting categories but remained with a 4-6 record where new lessons came about in the mid-season report. This constant give and take, learning and re-learning led to turning around a once-hopeful ruined season into ultimately the team qualifying for the National Tournament with an outright birth. Success from following the insights given by the scoring system was not just limited to the team as a large majority of players achieved career highs in shooting percentages. The system itself held up for the part as well, predicting a high accuracy of games and the individual scoring system shots giving an indication of a strong basis to be used in the future. Before doing so, addressing shortcomings like handling the shot type of 4's and bridging the gap of points per possession through shot margin research is more than necessary. But if these drawbacks are researched thoroughly, perhaps the scoring system could be improved to be an even better one. In addition to this, improving the interface that the scoring system is presented as in the workflow throughout the season could take this to a new level.

There is so much promise to being successful at the Division II level (and perhaps at even higher levels of basketball) that was all found through the conduction of this study. It takes the core concept of understanding basic averages and leveraging them to impact decision-making which in aggregation can take teams to new heights. Whether a team already has a strong foundation, or is on an unbelievable losing streak, or somewhere in between, the flexibility that the system has can lead you to adjustments that you otherwise might have only guessed at. All you have to do is ask: "What would you expect?"