

Title IX

Closing the Expenditure Gap Between Men's and Women's Collegiate Athletic Programs

This Capstone Project is submitted in partial fulfillment of the requirements for the course
Data-Driven Decision-Making (MDA 620) during the Fall Semester of 2022.

While writing this Capstone Project, we have not witnessed any wrongdoing, nor have we
personally violated any conditions of the LIU Honor Code.

Marisa Piscitelli
Adam Goodsir
Austin Rook
Anthony Vincent

November 11, 2022

Table of Contents

- Background (page 2)
- Problem Scenario/Business Issue (page 3)
- Objective/Goals for this Report (page 4)
- Data Exploration (page 4)
- Data Visualization (page 5)
- Data Manipulation (page 7)
- Methodology/Model Building/Analysis (page 8)
- Conclusions/Recommendations (page 10)
- Limitations (page 11)
- Works Cited (page 12)

Figures

1. Men's Workout Facilities, 2021 NCAA March Madness (page 4)
2. Women's Workout Facility, 2021 March Madness (page 5)
3. Average Team Expenses by Gender (page 6)
4. Average Total Expense per Athlete by Gender (page 7)
5. Linear Projection of Average Team Expenses by Gender (page 8)
6. Linear Projection of Average Total Expense per Athlete by Gender (page 10)

Tables

1. Summary Statistics (page 6)
2. Created Variables with Formulas (page 8)
3. 2022 Difference between Men's and Women's Average Team Expense (page 9)
4. Intersection between Men's and Women's Expense per Athlete (page 10)

Appendix

- A. List of FBS Schools and Universities (page 13)

Background

Title IX is legislation passed by Congress in 1972 to help eliminate sex-based discrimination and to ensure male and female students have equal access to educational opportunities. These educational opportunities can include athletics, admissions, and housing. “Title IX has improved access to educational opportunities for millions of students, helping to ensure that no educational opportunity is denied to women on the basis of sex and that women are granted ‘equal opportunity to aspire, achieve, participate in and contribute to society based on their individual talents and capacities’” (U.S. Department of Justice, 2013).

Within the scope of the National Collegiate Athletic Association (NCAA), colleges and universities are required to meet one of the following three standards to be Title IX compliant with regard to collegiate athletics (U.S. Department of Education, n.d.).

- The numbers of men and women participating in intercollegiate athletics are substantially proportionate to their overall enrollment
- The institution can show a continuing practice of program expansion responsive to the developing interests and abilities of that sex
- The present program accommodates the interests and abilities of the underrepresented sex

Due to these standards, the number of female athletes has increased since the 1970s. Nowadays, women are entitled to be awarded the same athletic scholarships as male athletes. Although Title IX has provided a multitude of opportunities for women, inequalities in athletics still exist.

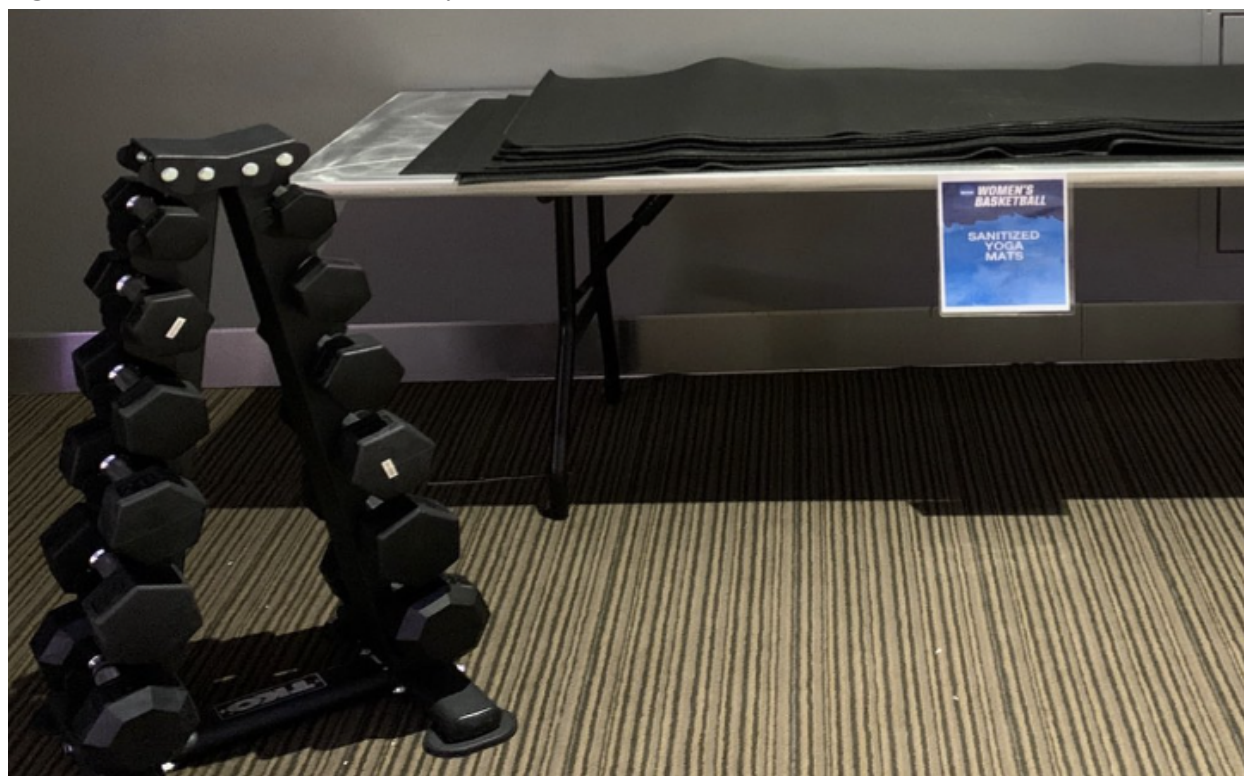
Problem Scenario/Business Issue

During the 2021 NCAA March Madness (Basketball), there was a significant difference between the men's and women's workout facilities (Yucel, 2021). Figure 1 shows the men's workout facility which is full of weights, racks, and dumbbells. Figure 2 shows the women's setup which is only one set of weights. From these two images, one could get a sense of the difference in money spent on the men's facility compared to the women's. This is just one example of the inequalities women face within collegiate athletics. But it raises the question, do colleges and universities spend more money on their men's teams compared to their women's teams? If this is the case, should Title IX create new criteria to equalize expenditure between men's and women's teams?

Figure 1. Men's Workout Facilities, 2021 NCAA March Madness



Figure 2. Women's Workout Facility, 2021 March Madness



Objective/Goals of the Project

The purpose of this project is to investigate the expenditure levels between female and male college sports teams. We believe that higher levels of expenditure result in a higher quality experience for athletes. For example, teams with higher expenditures might spend more money on travel, equipment, and facilities. Through our analysis, we want to discuss whether Title IX should be revisited to create an equal athletic experience for males and females. For this project, we will look at a specific segment of NCAA schools known as the FBS.

Data Exploration

Under the NCAA Conference umbrella sits the Football Bowl Subdivision (FBS) which is comprised of 126 teams divided into 11 different conferences. Of those 11 conferences, six of them stand out among the rest, the Southeastern Conference, the Big XII, the Big 10, the Pac-12, the Big East, and the Atlantic Coast Conference (Lilly, 2012). These schools associated with the

FBS are at the top of college athletics. Not many schools are able to turn a profit from their athletics program but schools within the FBS division are from men's football and basketball and women's basketball. "In all, there are now 24 schools that make at least \$100 million annually from their athletic department, according to data collected from the U.S. Department of Education" (Gaines, 2016). All 24 of these schools fall under the FBS. For a comprehensive list of FBS schools, please reference Exhibit 1 in the Appendix.

Under "The Equity in Athletics Disclosure Act", co-educational institutions of postsecondary education that participate in a Title IV, federal student financial assistance program, and have an intercollegiate athletic program must prepare an annual report to the Department of Education on athletic participation, staffing, and revenues and expenses, by men's and women's teams (U.S. Department of Education, 2008). Due to this act, we were able to collect yearly data from the 126 colleges that are categorized as "NCAA Division 1 - FBS" from 2010 to 2018 from the Equity in Athletics Data Analysis (EADA) dashboard. While data exists for 2019-2021, we thought that COVID-19 wasn't a true representation of a normal collegiate experience. During these two years, some colleges didn't participate in athletics, and expenditure levels were severely reduced.

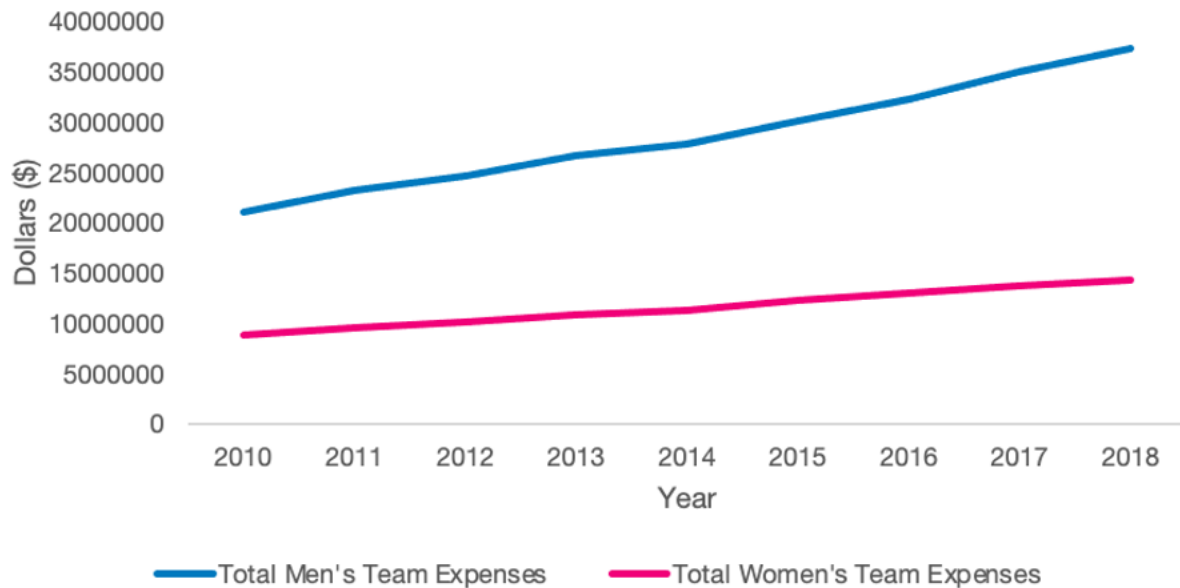
Data Visualization

Table 1 provides the summary statistics (observations, mean, std. dev., min, and max) for each variable used in this project. When looking at each variable, we observe the mean is always higher for men's teams compared to women's teams.

Table 1. Summary Statistics

Variables	N	Mean	Std. Dev.	Min	Max
Total Men's Participation	1134	312.5	84.0	99.0	641.0
Total Women's Participation	1134	284.0	86.6	116.0	589.0
Total Men's Expenses	1134	28675622.7	16831389.8	3498939.0	100569860.0
Total Women's Expenses	1134	11577565.5	5941891.3	2146394.0	34893434.0
Mean Total Expense per Male Athlete	1134	89859.5	45910.4	19803.0	331391.1
Mean Total Expense per Female Athlete	1134	39897.4	15567.2	13303.6	117748.6

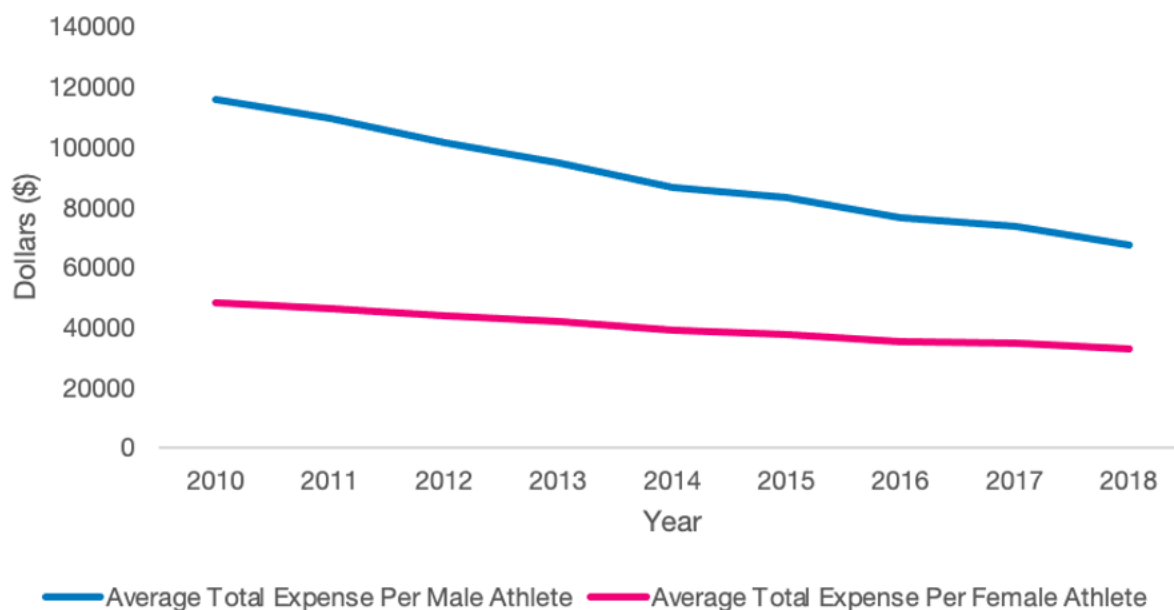
Figure 3 depicts the relationship between “Total Men’s Team Expenses” and “Total Women’s Team Expenses”. From this graph, we notice a large gap between Men’s Team expenditure and Women’s Team expenditure. In 2018, there was a \$22,915,405 difference between men’s and women’s team expenditures. We can also observe from Figure 3 that the gap between men’s team expenses and women’s team expenses is increasing.

Figure 3. Average Team Expenses by Gender

When we account for the number of athletes at the school, we see expense per athlete depicts a different story than Figure 3. Figure 4 shows the relationship between average total expense per athlete by gender. In Figure 4, we can see a decreasing trend from 2010 to 2018 for

both genders. We also notice that the difference between expenses per male and female athletes is getting closer. It is interesting to contrast and compare Figure 3 and Figure 4 which tell two very different stories

Figure 4. Average Total Expense per Athlete by Gender



Data Manipulation

Our first objective in handling our data was to sort through the copious amount of data that we had collected online from the EADA dashboard. We deleted many variables that were missing values or not relevant to this study. Once we had obtained the relevant data, we then calculated the averages of each expense variable to analyze trends from 2010 to 2018. Reference Table 2 for the variables we created with our formulas during this process. After completing this step, we were able to calculate the mean, standard deviation, minimum, maximum, and number of observations for each variable to present Table 1. Then, through the linear projection function in excel, we forecasted future averages from 2019-2022. We thought it valid to forecast these specific years and remove any discrepancies that COVID would show in our data.

Table 2. Created Variables with Formulas

Created Variables	Formula
Average Team Expense per Year	Mean of “Team Expense”
Average Expense per Athlete per Year	Team Expense / Number of Athletes
Average Operating Expense per Athlete per Year	Team Operating Expense / Number of Athletes
Average Recruiting Expense per Athlete per Year	Team Recruiting Expense / Number of Athletes

Methodology/Model Building/Analysis

After analyzing our initial data, it was evident the data was exhibiting clear trends. By using the “Linear Trend” command in excel, we were able to linearly forecast 4 years past our original data. With linear forecasting in Figure 5, we notice the gap between “Average Team Expenses” continues to increase as time goes on. As stated before, in 2018, there was a \$22,915,405 difference between men’s and women’s team expenditures. By using the linear forecasting formulas for men’s and women’s teams we conclude that in 2022 the difference in expenditure between men’s and women’s teams is \$27,738,744 (reference Table 3 for our calculations). This is an increase of over ~\$5,000,000 over the course of 4 years.

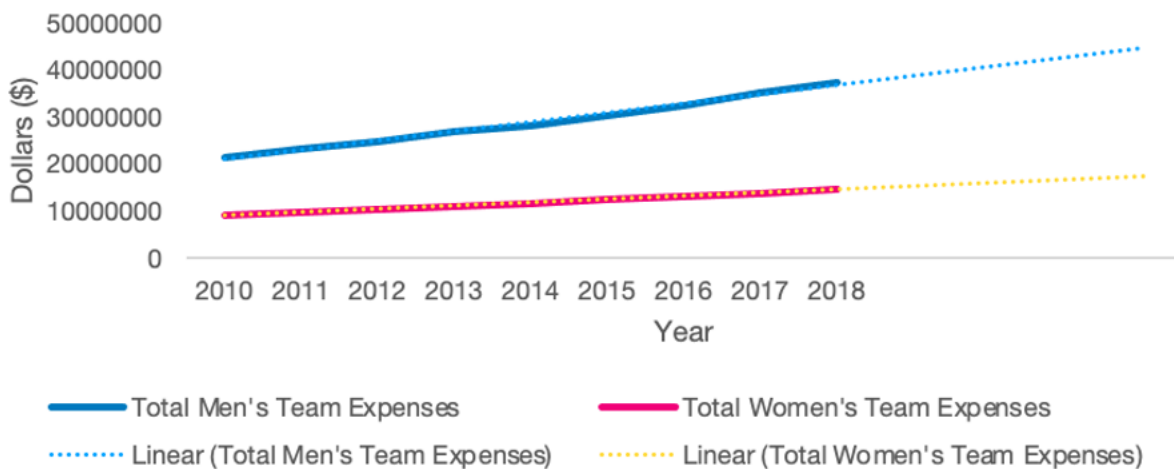
Figure 5. Linear Projection of Average Team Expenses by Gender

Table 3. 2022 Difference between Men's and Women's Average Team Expense

Gender	Formula	2022 Estimated Expenditure
Male	$Y = 2000000x + 20000000$	44000000
Female	$Y = 688438x + 8000000$	16261256
Difference		27738744

By using the same linear forecasting function in excel, we are also able to project the average total expense per athlete until 2022. Figure 4 shows these projections and from this graph, it is evident that these projection lines would intersect at a point in the future. To find this point, we set the two lines equal and solve for x (also our year variable). We find the average total expense per male and female athlete will be equal in 2027 (reference Table 4 for calculations).

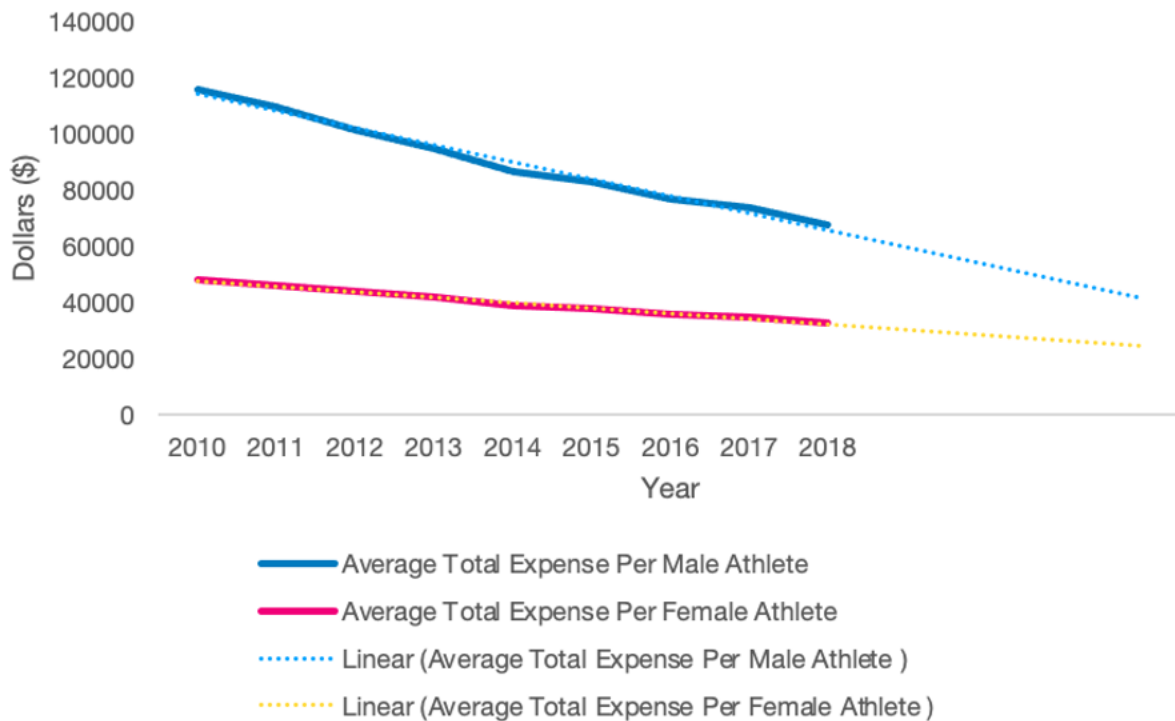
Figure 6. Linear Projection of Average Total Expense per Athlete by Gender

Table 4. Intersection between Men's and Women's Expense per Athlete

Gender	Formula
Male	$Y = -6064.1x + 120180$
Female	$Y = -1935.3x + 49574$
Intersection	x= 17 or 2027

Conclusions/Recommendations

From our data, we conclude that men's teams have higher levels of expenditure compared to women's teams. The schools we examined are partially defined by the success of their football program. Thus, these colleges and universities are incentivized to spend more money on this men's sport which might be a reason behind this gap in expenditure. As noted by our projections, this gap will continue to grow. When analyzing expense per athlete, we can conclude that male athletes have a higher average expense than female athletes. However, this gap is not increasing. By our projections, male and female athletes will have the same per athlete expense in 2027. In Table 1, we note that the average number of male athletes is higher than the average number of female athletes which may be the reason for this trend. From a holistic point of view, FBS colleges and universities tend to spend a massive amount more on their men's teams compared to their women's teams. The 2021 March Madness example is just one incident that gives us perspective on the inequality of athletic experience between males and females.

From our analysis, we recommend that Title IX be revisited to include the quality of athletic experience to be equal between men's and women's sports teams. With the current system and list of standards, schools only have to provide equal opportunities for male and female students. These standards don't account for equal experiences or quality of experience.

For example, men's and women's teams should have the same quality of travel, locker rooms, weight room facilities, etc. We are confident with this standard that colleges and universities will be forced to spend more money on women's teams and close the gap to men's teams.

Limitations

There are many limitations that exist within this study that we want to note. First off, we analyzed only 126 colleges and universities which only represent a small fraction of the whole collegiate landscape. Thus, our results can only be generalized to those specific schools and not other conferences and leagues. In addition, one large assumption we make is that a team's expenditure has a positive relationship with athletic collegiate experience. One could argue that higher levels of expenditure are due to inefficiencies in an athletic program that don't result in higher levels of accommodation for the athletes. Finally, we decided not to include COVID-19 data in our analysis. While we believe these years weren't a true representation of a normal collegiate year, including this data may have affected our results and analysis.

Works Cited

- Diaz, J. (2021, October 27). *The NCAA's focus on profits means far more gets spent on men's Championships*. NPR. Retrieved November 10, 2022, from <https://www.npr.org/2021/10/27/1049530975/ncaa-spends-more-on-mens-sports-report-revals>
- Gaines, C. (2016, October 13). *The 25 schools that make the most money in college sports*. Business Insider. Retrieved November 10, 2022, from <https://www.businessinsider.com/schools-most-revenue-college-sports-2016-10>
- Lilly, B. (2012, October 10). *College Football explained*. The Guardian. Retrieved November 10, 2022, from <https://www.theguardian.com/sport/blog/2012/oct/10/college-football-explained-ncaa>
- U.S. Department of Education. (2020, June 11). *Equity in athletics disclosure act*. U.S. Department of Education. Retrieved November 10, 2022, from <https://www2.ed.gov/finaid/prof/resources/athletics/eada.html>
- U.S. Department of Education. (n.d.). Equity in Athletics. Retrieved November 10, 2022, from <https://ope.ed.gov/athletics/#/>
- United States Department of Justice. (2013, June 23). *Equal Access to education: Forty Years of Title IX*. Title IX Report. Retrieved November 10, 2022, from <https://www.justice.gov/sites/default/files/crt/legacy/2012/06/20/titleixreport.pdf>
- Yücel, E. (2021, March 20). *Men's and women's NCAA March Madness facilities, separate and unequal, Spark Uproar*. NPR. Retrieved November 10, 2022, from <https://www.npr.org/2021/03/19/979395795/mens-and-womens-ncaa-march-madness-facilities-separate-and-unequal-spark-uproar>

Appendix

Appendix A. List of FBS Colleges and Universities

Institution Name	State CD	Classification Name
Appalachian State University	NC	NCAA Division I-AA
Arizona State University	AZ	NCAA Division I-A
Arkansas State University-Main Campus	AR	NCAA Division I-A
Auburn University	AL	NCAA Division I-A
Ball State University	IN	NCAA Division I-A
Baylor University	TX	NCAA Division I-A
Boise State University	ID	NCAA Division I-A
Boston College	MA	NCAA Division I-A
Bowling Green State University-Main Campus	OH	NCAA Division I-A
Brigham Young University-Provo	UT	NCAA Division I-A
California State University-Fresno	CA	NCAA Division I-A
Central Michigan University	MI	NCAA Division I-A
Clemson University	SC	NCAA Division I-A
Coastal Carolina University	SC	NCAA Division I-AA
Colorado State University-Fort Collins	CO	NCAA Division I-A
Duke University	NC	NCAA Division I-A
East Carolina University	NC	NCAA Division I-A
Eastern Michigan University	MI	NCAA Division I-A
Florida Atlantic University	FL	NCAA Division I-A
Florida International University	FL	NCAA Division I-A
Florida State University	FL	NCAA Division I-A
Georgia Institute of Technology-Main Campus	GA	NCAA Division I-A
Georgia Southern University	GA	NCAA Division I-AA
Georgia State University	GA	NCAA Division I-AA
Indiana University-Bloomington	IN	NCAA Division I-A
Iowa State University	IA	NCAA Division I-A
Kansas State University	KS	NCAA Division I-A
Kent State University at Kent	OH	NCAA Division I-A
Liberty University	VA	NCAA Division I-AA
Louisiana State University and Agricultural & Mechanical College	LA	NCAA Division I-A
Louisiana Tech University	LA	NCAA Division I-A
Marshall University	WV	NCAA Division I-A
Miami University-Oxford	OH	NCAA Division I-A

Michigan State University	MI	NCAA Division I-A
Middle Tennessee State University	TN	NCAA Division I-A
Mississippi State University	MS	NCAA Division I-A
New Mexico State University-Main Campus	NM	NCAA Division I-A
North Carolina State University at Raleigh	NC	NCAA Division I-A
Northern Illinois University	IL	NCAA Division I-A
Northwestern University	IL	NCAA Division I-A
Ohio State University-Main Campus	OH	NCAA Division I-A
Ohio University-Main Campus	OH	NCAA Division I-A
Oklahoma State University-Main Campus	OK	NCAA Division I-A
Old Dominion University	VA	NCAA Division I-AA
Oregon State University	OR	NCAA Division I-A
Purdue University-Main Campus	IN	NCAA Division I-A
Rice University	TX	NCAA Division I-A
Rutgers University-New Brunswick	NJ	NCAA Division I-A
San Diego State University	CA	NCAA Division I-A
San Jose State University	CA	NCAA Division I-A
Southern Methodist University	TX	NCAA Division I-A
Stanford University	CA	NCAA Division I-A
Syracuse University	NY	NCAA Division I-A
Temple University	PA	NCAA Division I-A
Texas A & M University-College Station	TX	NCAA Division I-A
Texas Christian University	TX	NCAA Division I-A
Texas State University-San Marcos	TX	NCAA Division I-AA
Texas Tech University	TX	NCAA Division I-A
The University of Alabama	AL	NCAA Division I-A
The University of Tennessee	TN	NCAA Division I-A
The University of Texas at Austin	TX	NCAA Division I-A
The University of Texas at El Paso	TX	NCAA Division I-A
The University of Texas at San Antonio	TX	NCAA Division I-AAA
Troy University	AL	NCAA Division I-A
Tulane University of Louisiana	LA	NCAA Division I-A
University at Buffalo	NY	NCAA Division I-A
University of Akron Main Campus	OH	NCAA Division I-A
University of Alabama at Birmingham	AL	NCAA Division I-A
University of Arizona	AZ	NCAA Division I-A
University of Arkansas	AR	NCAA Division I-A
University of California-Berkeley	CA	NCAA Division I-A
University of California-Los Angeles	CA	NCAA Division I-A

University of Central Florida	FL	NCAA Division I-A
University of Cincinnati-Main Campus	OH	NCAA Division I-A
University of Colorado Boulder	CO	NCAA Division I-A
University of Connecticut	CT	NCAA Division I-A
University of Florida	FL	NCAA Division I-A
University of Georgia	GA	NCAA Division I-A
University of Hawaii at Manoa	HI	NCAA Division I-A
University of Houston	TX	NCAA Division I-A
University of Illinois at Urbana-Champaign	IL	NCAA Division I-A
University of Iowa	IA	NCAA Division I-A
University of Kansas	KS	NCAA Division I-A
University of Kentucky	KY	NCAA Division I-A
University of Louisiana-Lafayette	LA	NCAA Division I-A
University of Louisiana-Monroe	LA	NCAA Division I-A
University of Louisville	KY	NCAA Division I-A
University of Maryland-College Park	MD	NCAA Division I-A
University of Massachusetts Amherst	MA	NCAA Division I-AA
University of Memphis	TN	NCAA Division I-A
University of Miami	FL	NCAA Division I-A
University of Michigan-Ann Arbor	MI	NCAA Division I-A
University of Minnesota-Twin Cities	MN	NCAA Division I-A
University of Mississippi Main Campus	MS	NCAA Division I-A
University of Missouri-Columbia	MO	NCAA Division I-A
University of Nebraska-Lincoln	NE	NCAA Division I-A
University of Nevada-Las Vegas	NV	NCAA Division I-A
University of Nevada-Reno	NV	NCAA Division I-A
University of New Mexico-Main Campus	NM	NCAA Division I-A
University of North Carolina at Chapel Hill	NC	NCAA Division I-A
University of North Carolina at Charlotte	NC	NCAA Division I-AAA
University of North Texas	TX	NCAA Division I-A
University of Notre Dame	IN	NCAA Division I-A
University of Oklahoma Norman Campus	OK	NCAA Division I-A
University of Oregon	OR	NCAA Division I-A
University of Pittsburgh-Pittsburgh Campus	PA	NCAA Division I-A
University of South Alabama	AL	NCAA Division I-A
University of South Carolina-Columbia	SC	NCAA Division I-A
University of South Florida-Main Campus	FL	NCAA Division I-A
University of Southern California	CA	NCAA Division I-A
University of Southern Mississippi	MS	NCAA Division I-A

University of Toledo	OH	NCAA Division I-A
University of Tulsa	OK	NCAA Division I-A
University of Utah	UT	NCAA Division I-A
University of Virginia-Main Campus	VA	NCAA Division I-A
University of Washington-Seattle Campus	WA	NCAA Division I-A
University of Wisconsin-Madison	WI	NCAA Division I-A
University of Wyoming	WY	NCAA Division I-A
Utah State University	UT	NCAA Division I-A
Vanderbilt University	TN	NCAA Division I-A
Virginia Polytechnic Institute and State University	VA	NCAA Division I-A
Wake Forest University	NC	NCAA Division I-A
Washington State University	WA	NCAA Division I-A
West Virginia University	WV	NCAA Division I-A
Western Kentucky University	KY	NCAA Division I-A
Western Michigan University	MI	NCAA Division I-A