What I learned throughout this course is how to conduct research from a series of questions to the participants answers to how to use those answers as a recoded variable to conduct statistical studies with it. When the course first started, we had to form a series of questions for survey participants to answer based on activities that guardians and their children in the HEAD Start program were sent home with. We had to form these questions so that they were concise and easy to understand without any extra interpretations. The surveys were sent out to the participants, and we received their results back. We had to then recode the variable in RStudio and SPSS in order to use the data.

We then went through a series of tests in order to figure out what the interpretations of the data meant and what we could in turn use that data to figure out the analysis and what it means in statistical terms. The first thing that was learned was how to calculate the measures of central tendency. We had to find the mean, median and mode by hand and then how to use this in RStudio and SPSS. This was used to find the central values in the distribution of the variables that were calculated. The next step was to find the measures of variability, such as the range, variance, and standard deviation of a continuous variable. This was also calculated by hand as well in RStudio and SPSS. This is used to find how far data points lie from one another and how far they are away from the center of the distribution in the model.

Z-scores and probability was learned and calculated by hand as well as in RStudio and SPSS. This is used to find the probability of a z-score in a normal distribution model. A z-score is used to find out how far away from the mean a set point is. Once we found the z-score, we used probability to determine what the likelihood of that z-score will happen and the relationship between it. We then calculated the confidence intervals and had to find the standard errors on a 68%, 95% and 99% confidence interval level. We used this to understand the degree of certainty in a sample. This will tell us the probability limits in what we are measuring. This was done in calculations by hand as well as in RStudio and SPSS.

Next, we used the analysis of variance (ANOVA) to determine whether there are any significant differences between the means of multiple groups. These would consist of multiple independent variables and how it can cause change in the singular dependent variable. We had to calculate this by hand, and then we calculated it in RStudio and in SPSS. The next test was chi-squared. We had to measure the difference between frequencies of the outcomes of the measured variables. This test was used to check the relationship between the variables, by hand as well as RStudio and SPSS.

Pearson’s correlation coefficient was used and measured by hand an in RStudio and SPSS. The purpose of this is to find the relationship between two continuous variables. This is done on a linear scale with a scatter plot. This will tell us how closely related variables are from the data that was used. We then ended the statistical section on regression. Regression is used to find the relationship between one dependent variable and multiple independent variables. We had to use OLS binary regression model as well as how to plot a regression line. We then had to find the p value in the set. We learned to calculate this by hand and by using RStudio.

The importance of the statistical calculations that we learned to use was how to understand and how to interpret the data that we collected. When we started this class, I had no idea the amount of work and effort it took to determine what the statistical value of conducting research was and the time it took to do it. Ever step that we conducted was used in correlation with one another and we needed those to help us look at the bigger picture of it all. We needed the data from the step before to use it in order to continue on to the next process of the data interpretation.

This matters because we were trying to determine whether our data has a significant meaning or if it was just a random correlation. From the variables that I looked at, most of the tests that were conducted had a correlation in a way. I looked at how parental involvement can help a child grow academically. I took variables that involved how guardians helped their children and how it affected the activities that they did. This showed the relationships between these two variables from the statistical applications that were used.

When doing research, it is important to get the bigger picture. You have to make sure that we do everything that you can to conclude that your research is done correctly and that what you are trying to compare lines up and has a strong correlation between one another. Throughout this, there were several roadblocks that had to be dealt with. I had a hard time recoding the variables into the categories that were required for each test, but with some practice and help, it became easier. I also had a hard time taking my time in doing the calculations by hand and making sure that I took the time to do each step and make sure that my math added up to what it was supposed to do be. I had to take a step back and take my time to ensure that I was getting the correct answers and doing the problems step by step to ensure that they were right.

These skills can transfer into my working career by the ability to already know how to conduct research from the initial survey, to taking those results and calculating the different correlations that are within those questions. This can be very useful as not many people know how to conduct this and how to do it by hand as well as on different software types including RStudio and SPSS. I plan on using these skills in the workplace if I ever need to conduct research in the field that I choose to work in. I think that knowing these skills can really help me in the future and what I learned in this class can be carried with me throughout my professional career.