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Competition: Motivating or Declination of Academic Success

Nicholas Mazza
nmazza@bgsu.edu

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Competition: Motivation or Declination of Academic Success?

Nick Mazza

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Abstract

This study examines if competition in the classroom is more of a motivating or declining factor. I am examining the positive and negative effects of competitions on students. Games and individual worksheets will be employed to explore influence on academic achievement. Through my research, I did not find competition to be motivating for students. However, I did find the competition intervention to provide higher average quiz scores.

Introduction

Competition is "'A contest in which two or more people are engaged where typically only one or a few participants will win and others will not – Webster'" (Shindler, 2009, np). Having participated and loving sports throughout life has nurtured a competitive spirit. In sports, many coaches may say statements as, "You have to fight for your spot and playing time, beat the guy across from you, have the will to win, put it all out on the line and give it your all" to their players. Within the realm of sports, there is team to team competition to see who will win a game, player to player competition for position status on the team, and personal competition to better one's ability. Adding to competing against teammates, coaches talk about making teammates better. For example, there is a quarterback who is second-string, if they come to practice every day and give 100% effort, then the first-string quarterback has to work as hard, if not harder than the second string, or backup, to ensure they continue to be the first string or starter. With the backup giving 100% effort while working hard, now pushes the starters to better themselves. In this scenario, the starter and backup are competing against each other for the first playing position on the team.

Some people do not like competition because it brings along unneeded and unwanted pressure in their lives. They already push themselves to their limit, so why have someone else push them even more? Why bring in this other stress because it may lessen their standing position? In the world, competition is viewed negatively due to high stakes rewards and recognition where everyone wants to be a winner. It obstructs the concept of personal advancement, improving individual skills.

In this research, the goal is to examine if competition promotes motivation or despair concerning academic standing. Granted, not everyone is competitive or is motivated by competition, however, the goal is to see if competition is a factor when it comes to success in the classroom. I would like to see if pupils embrace competition, or if it deters them from giving their best effort.

Literature Review

Pupils can experience competition at a very young age, which can play a part in how they develop. A psychologist who looked at the identity development of children is Erik Erikson. The fourth stage of his development theory is Industry (competence) vs. Inferiority. In this stage, the industry aspect is, "Children now feel the need to win approval by demonstrating specific competencies that are valued by society and begin to develop a sense of pride in their accomplishments" (McLeod, 2008). For the inferiority aspect, "If the child cannot develop the specific skill they feel society is demanding (e.g. being athletic) then they may develop a sense of inferiority" (McLeod, 2008). Overall, if pupils do not live up to the societal norms of competition, they see themselves as inferior, "Doubting his or her own abilities and therefore may not reach his or her potential", which shows competition may have a negative side-effect of development (McLeod, 2008).

In 1997, the government of Ontario, Canada established an educational reform. As a result of this reform, a study was performed to seek out competitive motivation, and variances between genders. Thus, students were forced to finish secondary school in 4 years rather than 5. The first cohort of the 4-year plan started secondary school in 1999 and would finish in 2003, which would be the same year of completion as the class who started secondary school in 1998.

They called this the Ontario 'double cohort'. Since these two classes graduated at the same time, they applied for college at the same time. Thus, there was a significant increase in college application from 2001 to 2003. The number of applicants went from about 60,000 to over 100,000, respectively. Since there was a larger number of college admissions, it affected the quality of student being admitted to college. With all this said, Louis-Phillipe Morin analyzed the pre-reform and post-reform data of both genders. She found, "The male average grades and the proportion of male students graduating "on time" increased relative to females" (Morin, 2015, p. 443). With further analyzation, she also found these changes were due to increased relative effort rather than self-selection. Self-selection is a common hurdle for researchers when trying to seek unbiased data of a population. In this situation, not all students participated in the research, therefore, not receiving the full representation of the target population. Morin does point out, self-selection is a moot point because, "The results are due to differential changes in effort by gender, rather than self-selection" (Morin, 2015, p. 480).

There are winners, losers, and in-betweens. A downside to competition is the hierarchy which comes with it. Comparisons arise when the loser internalizes a belief their performances makes them less valuable as a person. This mindset can lead to a damaged self-esteem among adolescents. A study was conducted in which Di Stasio, Savage, and Burgos looked at social comparisons, competition and teacher-student relationships in a junior high school and how these comparisons may cause bullying and victimization in some situations. This study was done with 7th and 8th graders at a junior high in Quebec, Canada. Data were collected during two academic years. Students were asked to fill out a survey about bullying and assessed how many times, in the past 30 days, they had experienced bullying, victimization, or fighting. Each student was given a score based on their responses. The researchers also surveyed the students' perception of

the social dynamics of the classroom. This survey consisted of, cooperation/interaction, competition, social comparison and teacher/student relations. Researchers then built a composite score based on both of the surveys. They found social comparison supported Festinger's classical social comparison theory, "This theory maintains that students evaluate their abilities and seek accurate appraisals among their peers, which can lead to increased performance but can also bring out negative affect in students" (Di Stasio et al., 2016, p.213). The research also revealed, "Classroom environments rated high on competition were associated with increased victimization" (Di Stasio et al., 2016, p.214). Victimization is someone who is subjected to bullying. The researchers defined bullying as, "Intentional negative actions (e.g. physical contact, verbal abuse, spreading rumors, and exclusion) repeated over time by one or more person(s)" (Di Stasio et al., 2016, p. 207). "Finally, researchers discovered, "Students' perception of better teacher-student relationships was associated with reduced victimization. Teacher-student relations reflected the amount of care, fairness, respect and attention the teacher displayed toward student" (Di Stasio et al., 2016, p. 214).

Another aspect of competition is the winning or the sense of achieving a goal. In a Chinese study, competition was viewed in relation to its effects on achievement motivation in the classroom. Lam, Yim, Law, and Cheun wanted to know what some of the effects of competition were in an 'authentic classroom setting' (Lam et al., 2004, p.281). They took 52 students from the 7th grade in two different schools in Hong Kong. These 52 students were randomly assigned to experience a competitive or non-competitive 2-hour Chinese typewriting course. Students had to fill out a questionnaire indicating they were interested in the course and were in-between a 50 and 89 on their last Chinese language exam. Students in the competitive course were told they would receive a certificate of attendance which contained relative ranking of performance to the

other students in their group. The non-competitive group was told they would receive a certificate for taking the exam. In the exams, they were given a learning time and then an exam over the section they initially learned. They had a final exam in which they could choose the difficulty level. The researchers gave a much harder mock test before the final test to see how students would respond to failure. In the end, however, there was no final exam, it was merely a ploy for the students to ensure the best results. It was found the competitive students performed better than their counterparts when it came to the easier tasks. The researchers also concluded, "[The competitive group] were more performance-oriented and more likely to sacrifice learning opportunities for better performance" (Lam et al., 2004, p. 281). The competitive students were also susceptible to have worse self-evaluation after failure.

Another study, Tjosvold, Johnson, and Johnson focused on how to have a constructive competition to yield more positive effect on students learning. The researchers examined, "The impact of motives and strategies on the constructiveness of competition" (Tjosvold et al., 2006, p. 87). The researchers asked 68 Chinese managers, and 28 subordinates to those managers to participate. Part of the method was to hold a 3-day management workshop on leadership. This workshop occurred once a week for three weeks. The participants were asked to describe a time where they and another employee competed against each other and how the competition was generally useful. The researchers described competing as, "Trying to win and outdo each other [another employee]" (Tjosvold et al., 2006, p. 90). From this, the employees then rated motives and strategies which affected the competition and its outcomes. From this methodology, researchers found a few outcomes. One was the most powerful influences of competition was internal motivation and the strategy to compete fairly. They also found the motive to hinder another employee, an extrinsic motivation, was a very low influence on competition.

This next study was based on cooperative learning rather than individual competition like the previous research mentioned. Attle and Baker first looked at the combination of cooperation and competition to see how they would work together. They defined cooperation-competition as, "An instructional strategy combining components of cooperative learning with the positive aspects of motivational competition through inter-group competition between collaborative teams of students" (Attle et al., 2007, p. 78). The researchers found students may not want to participate in cooperative-competitive exercises because they are not a fan of group work or they would like to have control over who was in their group. Students may also not like competition because of the impact on their grades. To combat this, the researchers told the students how they would be graded and this allowed them to be focused on the task, rather than the grade. Grading was done by, "The [groups] compete in pursuit of positive individual and team outcomes in the problem-solving process, which can be structured in such a way as to allow for both team and individual grades" (Attle et al., 2007, p. 79). Finally, most of the students came to appreciate the cooperative-competitive exercise and saw this learning experience as valuable as seen through a post-exercise survey.

What happens if an activity engages students so much, students do not know they are learning? Gamification can bring this engagement and is a teaching practice rising. Gamification is defined as, "The incorporation of game elements into non-game settings" (Lee et al., 2011 p. 1). In a study done by Lee and Hammer, they sought to examine if gamification would provide an opportunity to help students with motivation and engagement. They found games connect to the cognitive, emotional and social aspect of players' lives. Cognitively, "Games provide complex systems of rules for players to explore through active experimentation and discovery" (Lee et al., 2011, p. 3). Emotionally, "Games invoke a range of powerful emotions, from

curiosity to frustration to joy… [And] optimism and pride" (Lee et al., 2011, p. 3). Socially, "Games allow players to try on new identities and roles, asking them to make in-game decisions from their new vantage points… For example, a shy teenager might become a guild leader, commanding dozens of other players in epic battles against legions of enemies" (Lee et al., 2011, p. 4).

A study done by Dominguez, Saenz-de-Navarrete, de-Marcos, Fednandez-Sanz, Pages and Martinez-Herraiz examined gamification with its implications and outcomes. They wanted to see how gamification would affect students as an e-learning platform. They had seen gamification be successful in web-based businesses and how it improved user engagement. They wanted to see if they could translate this improvement in business to the education world for students. The researchers designed a game within a university online course. Essentially, the course shell provided students with PDF exercises in which they could download to improve skills. With this game plug-in, it gave the students the same exercises but in a gamified way. The researchers wanted to see if student motivation increased through rewards and competition mechanisms. They discovered students who experienced the gamification achieved higher on practical assignments and an overall score of the whole unit compared to their student counterparts. In this research, the students experienced cognitive, emotional, and social units. Cognitively, "The system of rules in which students must obtain skills, and the tasks that guide the player in the tool mastery process are the optional exercises" (Dominguez et al., 2013, p. 382). For example, there was a list of topics from a subject, exercises from each topic, and challenge activities. Emotionally, "A virtual reward system [was used so] that could create positive emotions on task completion, thus motivating students to complete more tasks" (Dominguez et al., 2013, p. 383). This was shown as students could have received 'trophies' for

completing optional challenge activities. Socially, researchers introduced a leaderboard or ranking system between students. In the end, however, gamified students did worse on written assignments and participated less in-class activities even though their initial motivation was higher.

Methodology

To begin the process of data collection, I wanted to give a survey to provide some qualitative data. In this, I issued to all of the students a pre-survey before the intervention began. For the intervention, it happened in two different stages. The first stage happened when the classes came to a point of an upcoming quiz. The intervention played out as one class did a competition review, and the other class did a review sheet of the same questions. The day before the review day, I told the class who was going to receive the competition to come prepared the next day. On the day of review, I told the competition group they are competing with one another as to who receive the most points (I talk about the specifics of the competition later). After the competition was given, quizzes were taken the next school day. Since the first group did the first quiz of a unit, I thought it would be fitting to have the second group do the first quiz of the second unit. So about a month later, the second group had the competition and I did the same process of telling the students and issuing the competition as the first group. After the intervention was over I gave the post-survey about a week later.

The competition for the students was an individual styled game where they were under the pressure of a clock and achieving a higher score than their peers. To make the competition, I either took questions from the textbook we used, or I made up similar questions from the textbook based on the context of the unit. Once again, both classes used the same questions, but

the questions were given either as a review sheet or in a competition. To score the competition, I had the students score their own answers. They would receive 10 points for having the full and correct answer. 5 points were given if they had a right answer and were missing parts like labels, for example. Finally, 0 points were given if an answer was fully incorrect.

For the quantitative data, after both quizzes given and graded, I took the scores of the students to compare and analyze the data.

With the two classes, there were a different amount of students between them. To offset this, I randomly drew students from the larger class to not be used, to ensure both classes would have an equal number. Also with the number of students in the classes, some of the students did not complete both of the surveys, so I am only choosing students who completed both surveys.

To help organize the data, I took only the responses from the students who were chosen, either randomly or because of class size, and then put everything into an excel sheet. I then synthesized the data by putting their answers into a category. If they said they liked the competition or review more, they fell into those categories. However, some said both or even neither helped, so they fell into those categories.

Data Analysis

As I said in the methodology, I had to adjust how I was going to organize and analyze the data to ensure I had full participation from the students, and the classes were evenly represented. So the data below are students who completed both surveys, completed both quizzes, and the same number of students represented from each class.

Quantitative- Quiz Results

Quiz 1

5th- Competition	Score- x/16	Mean		7th- Review Sheet	Score- x/16	Mean
Amelie	16	15.20833		Meg	14	15.16667
Matthew	16			Annie	16	
Jack E	16			Josh B	15	
Cece	16			Taylor	13	
Drew	15			Mary	16	
Theo	11			Audrey	15	
Gabriella	16			Evan	16	
Erin	15			Sam	16	
Maggie	15			Talitha	15	
Sophie	15.5			Maya	14	
Jack S	16			John	16	
Trey	15			Carter	16	

Quiz 2

5th- Review Sheet	Score- x/25	Mean		7th- Competition	Score- x/25	Mean
Amelie	24.5	23.04167		Meg	25	24.29167
Matthew	24			Annie	23	
Jack E	23			Josh B	24	
Cece	23.5			Taylor	23.5	
Drew	23			Mary	25	
Theo	20.5			Audrey	24.5	
Gabriella	23			Evan	24.5	
Erin	24			Sam	24	
Maggie	24			Talitha	25	
Sophie	20			Maya	24	
Jack S	23.5			John	25	
Trey	23.5			Carter	24	

When looking at the quantitative data of both quizzes, the class who had the intervention of competition had a higher average score than the review sheet class.

Qualitative- Survey Results:

For each of the graphs below, they are organized by a question, and the 5th-period class is always the first graph of a question, and the 7th-period graph follows after. After each graph is a quick summation of the two graphs and possible suggestions based on the data.

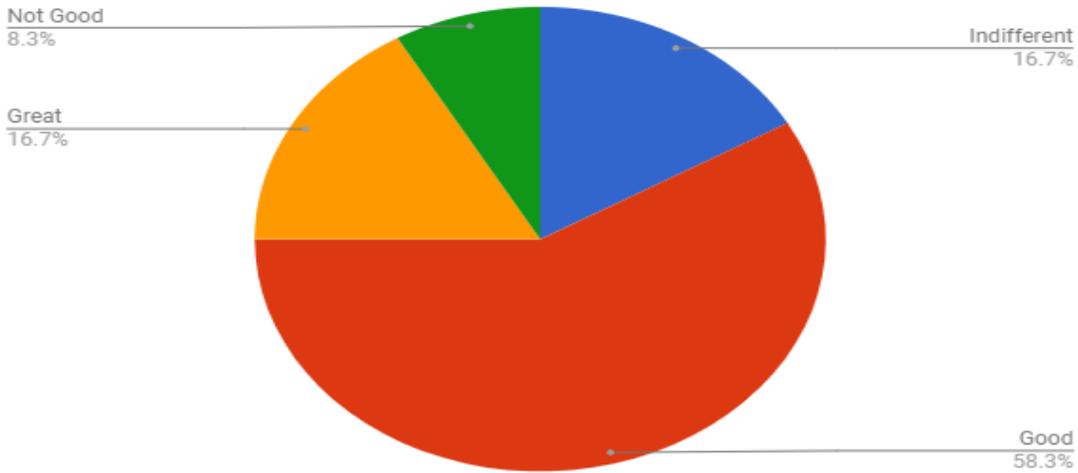**How do you feel when you win?**

How do you feel when you win?

Indifferent
8.3%

Good
25.0%

Great
66.7%

How do you feel when you win?

Indifferent
8.3%
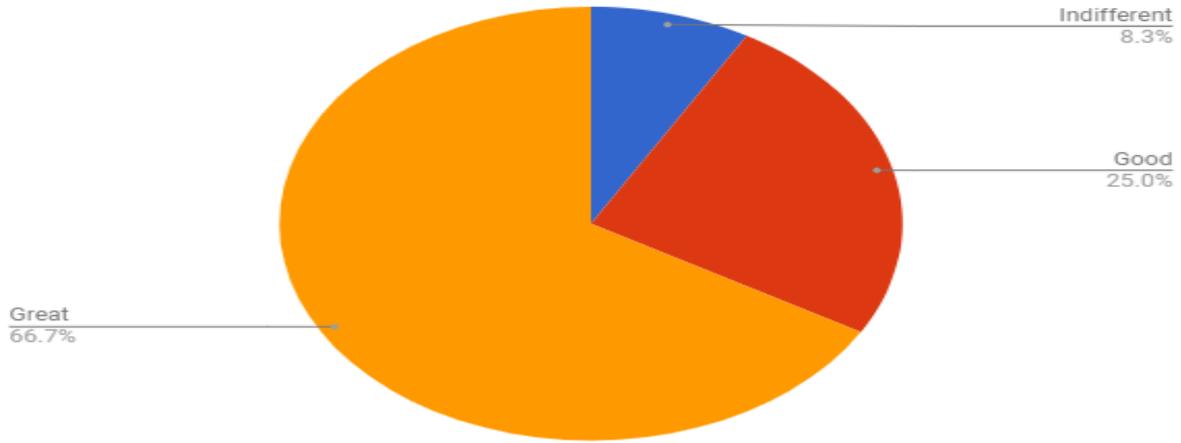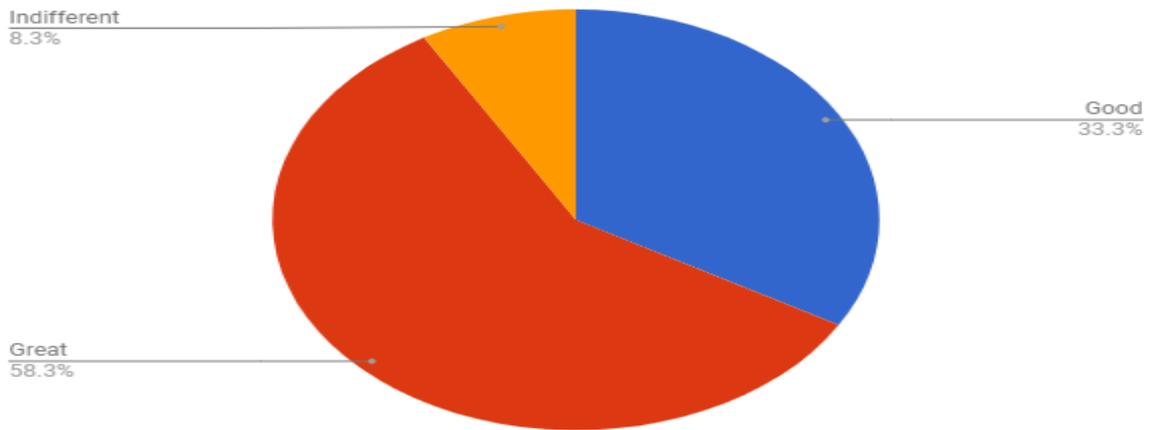
Good
33.3%

Great
58.3%

From both classes, a large majority of students felt great or good about winning. Very few did not have a change in feelings about winning. This could suggest many students strive to win to earn the feeling of winning.

How do you feel when you come in 2nd?

How do you feel when you come in 2nd?

Not Good
8.3%

Indifferent
16.7%

Great
16.7%

Good
58.3%

How do you feel when you come in 2nd?

Indifferent
41.7%
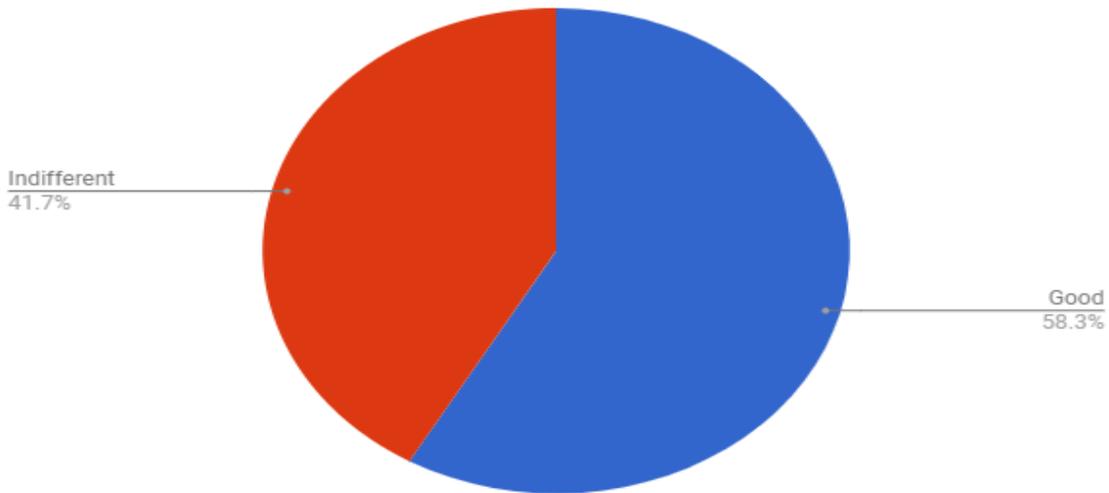
Good
58.3%

 With this question, a majority of students held a positive feeling about coming in second. However, a student did not feel good about coming in second and this could suggest he/she is very competitive to come in first, and not coming in first does not meet their expectations. Also, there is much less percentage of the response "Great" in this question which could suggest the

students felt coming in second as not a great of thrill or feeling as coming in first, which could

motivate them to come in first.

How do you feel when you come in last?

How do you feel when you come in last?

Not Great
25.0%

Indifferent
25.0%

Good
25.0%

Not Good
25.0%

How do you feel when you come in last?

Not Good
16.7%

Indifferent
33.3%

Good
8.3%

Not Great
41.7%
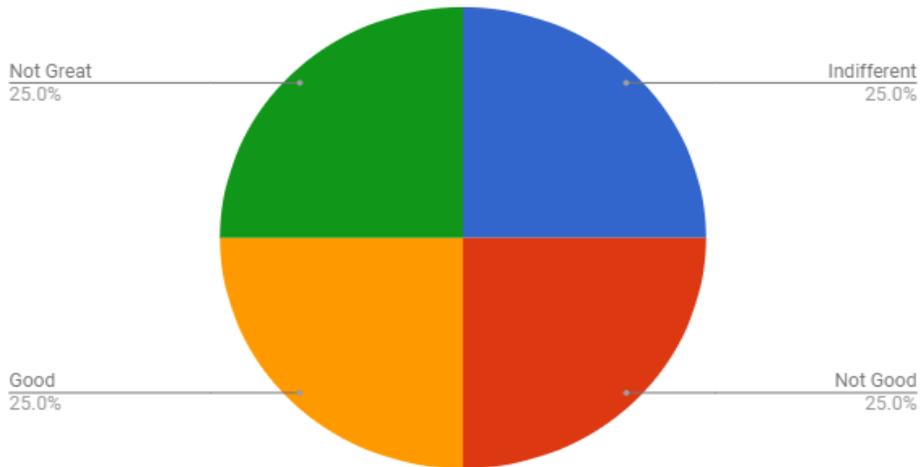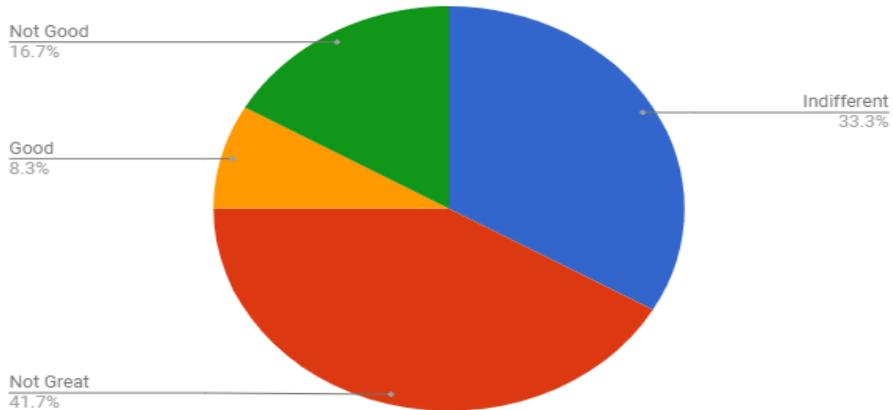
      With this question, these results surprised me. One result I was surprised about was how

in the 5th-period class there were four responses and they all equaled each other. Another

surprising item was the amount of the response "good". I found it to be quite interesting the

students felt good about coming in last. Overall though, the majority of the students felt not good

or not great about coming in last which would suggest they have a negative feeling about coming

in last. Another observation I made from the results was some of the students felt good, or a

positive feeling, about coming in last. This could mean the students do not have a care for

coming in first or last in a competition. The implication for this would be during the intervention

period the students who felt good about coming in last does not care where they end up in the

final standings. If they have this feeling it could lead them to not put forth effort into winning,

thus nullifying the means of competition. However, this could also mean the students who feel

good about coming in last have a positive outlook and use losing as a means to motivate

themselves to do better next time.

Do you participate in sports?

Do you participate in sports?

No
25.0%

Yes
75.0%

## Do you participate in sports?

No
16.7%

Yes
83.3%
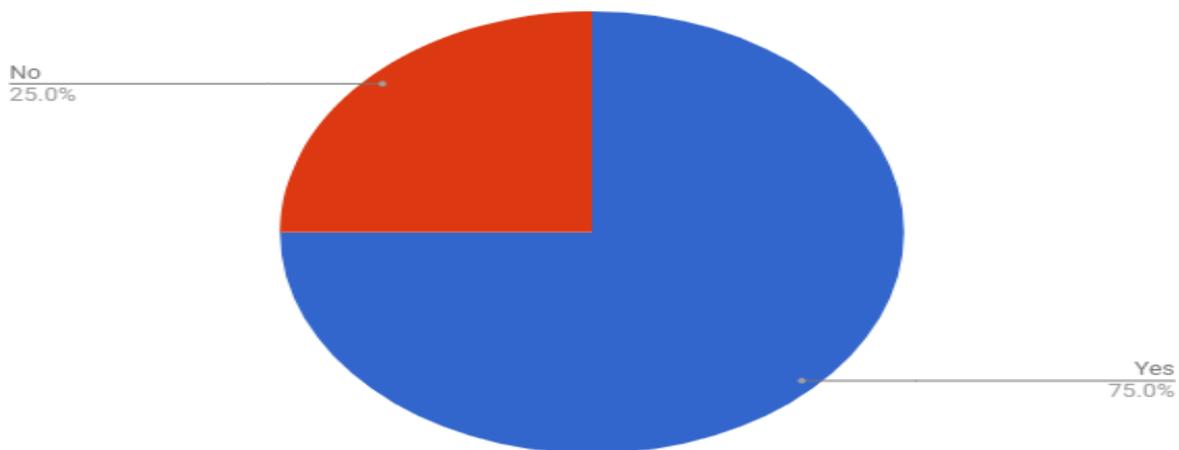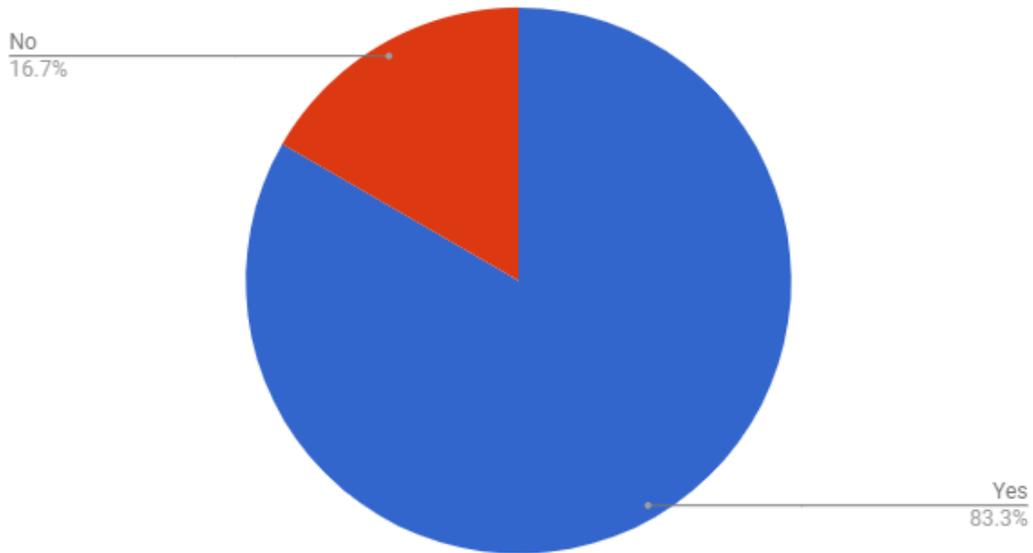
Out of the 24 students who were analyzed in the graphs above, only three did not participate in sports. This could suggest a very large majority of students are in an environment where they face competition in some capacity.
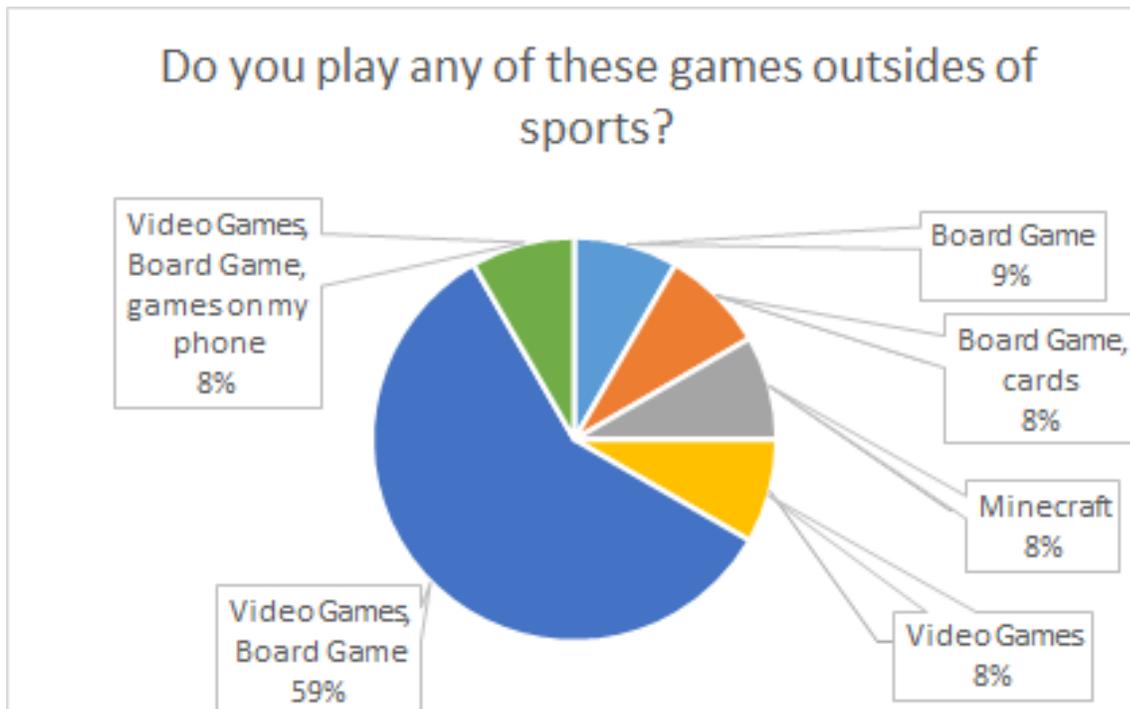
Is your sport competitive or recreational?

If you answered yes to the previous question, is the sport you participate in competitive or recreational? If you answered no to the previous question, just answer n/a

Recreational (Having fu...
25.0%

Competitive (Winning is...
50.0%

n/a
25.0%

If you answered yes to the previous question, is the sport you participate in competitive or recreational? If you answered no to the previous question, just answer n/a

Recreational (Having fu...
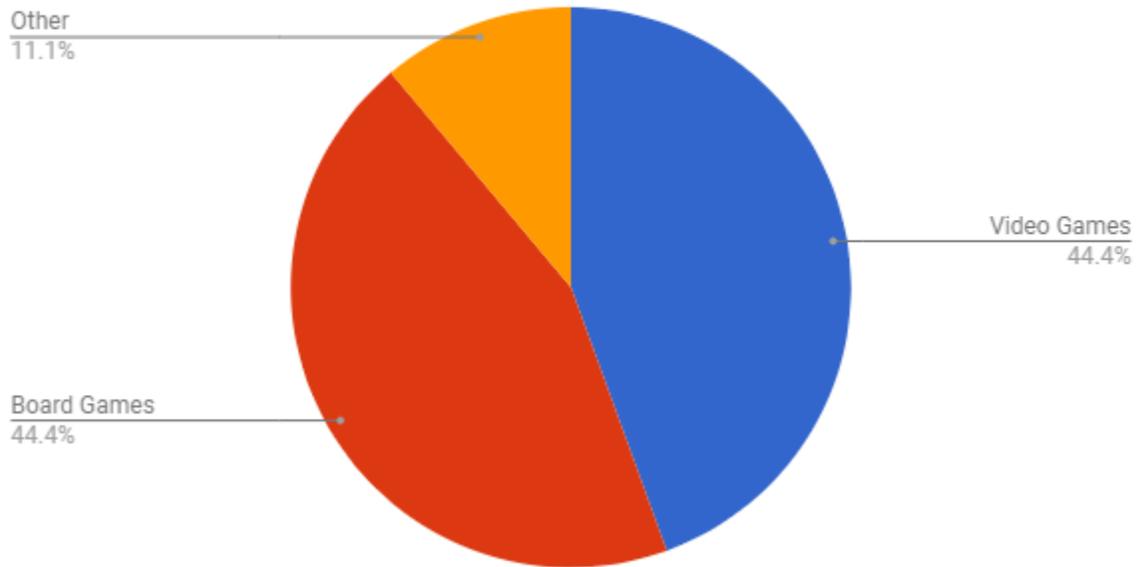25.0%

Competitive (Winning is...
58.3%

n/a
16.7%
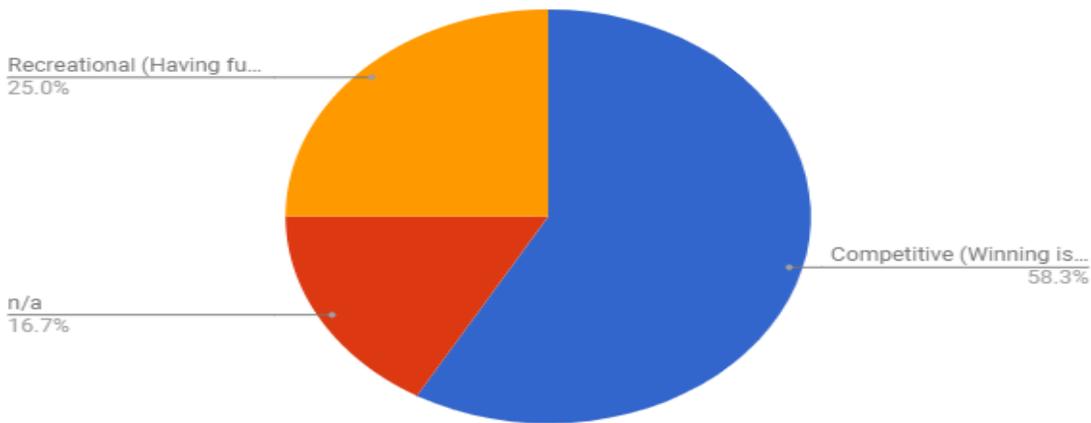
Based on this data, the large majority of the students participate in a competitive sport, which means the students play to win and be first in what they do. This could suggest winning is very important to the majority of the students and is the main reason for them to play sport

Do you play any of these games outside of sports?

Do you play any of these games outsides of sports?

Video Games, Board Game, games on my phone
8%

Board Game
9%

Board Game, cards
8%

Minecraft
8%

Video Games
8%

Video Games, Board Game
59%

Do you play any of these games outside of sports? Check all that apply.

Other 11.1%

Video Games 44.4%

Board Games 44.4%

This data shows even though some of the students may not participate in sports, they may still face competition outside of sports. This could also suggest some of the students may be competitive outside of sports when it comes to video or board games. It also may lead to them being competitive in every aspect of life, including performance in school.

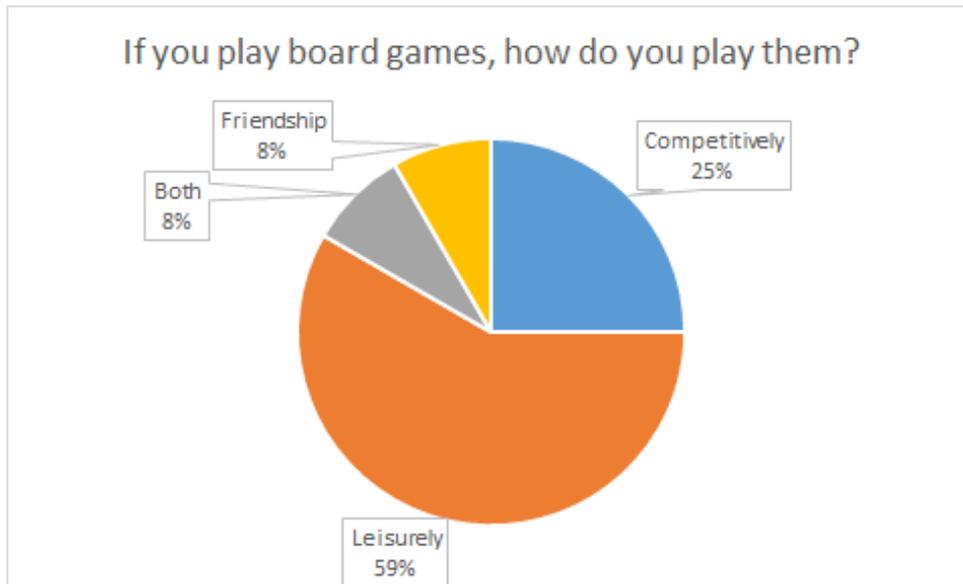**If you do play video games, why do you play? Check all that apply.**

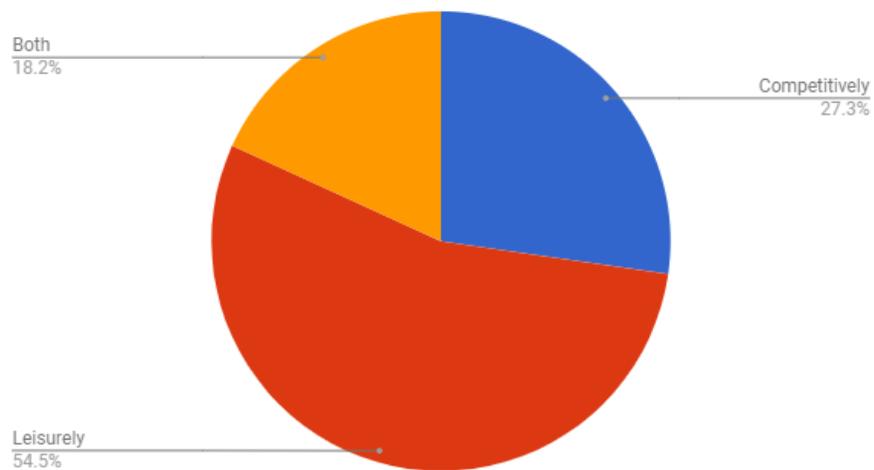If you play video games, why do you play? Check all that apply.
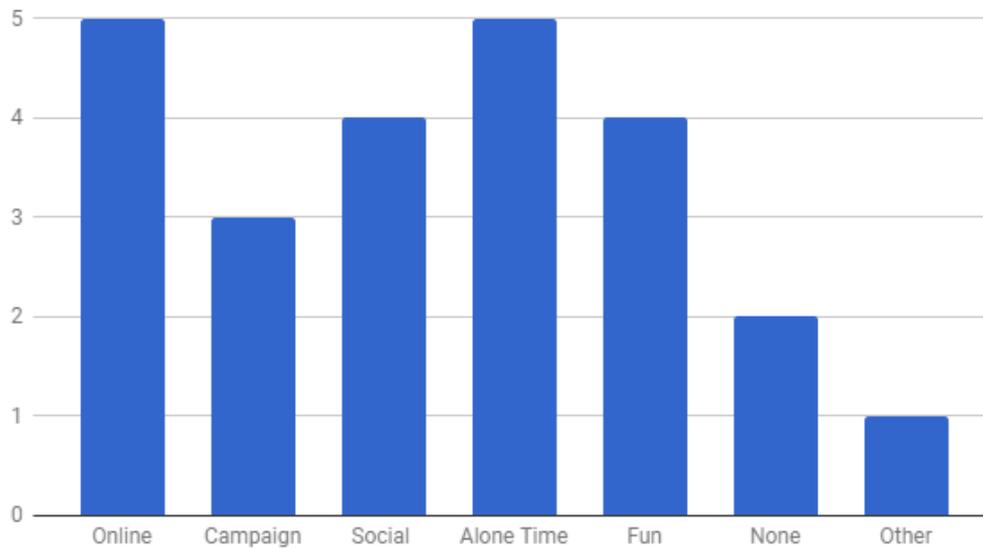
Since this question was a "Check all that apply", if students marked multiple then those marks counted as one response to each option.

For both periods, online was a top option. With online, alone time and social were a high option. This could suggest students like playing online because it gives them both experiences. They either can play by themselves in an online environment, which could also play into why the alone time option was high, or they could play online with a team of their friends. When it comes to video games, there are many different options of how you can play them. It seems from the results, it is difficult to make any real suggestions about the data. I think further, and more focused research could be done about why students play video games.

If you play board games, how do you play them?

If you play board games, how do you play them?

Friendship 8%
Both 8%
Competitively 25%
Leisurely 59%

If you play board games, how do you play them?
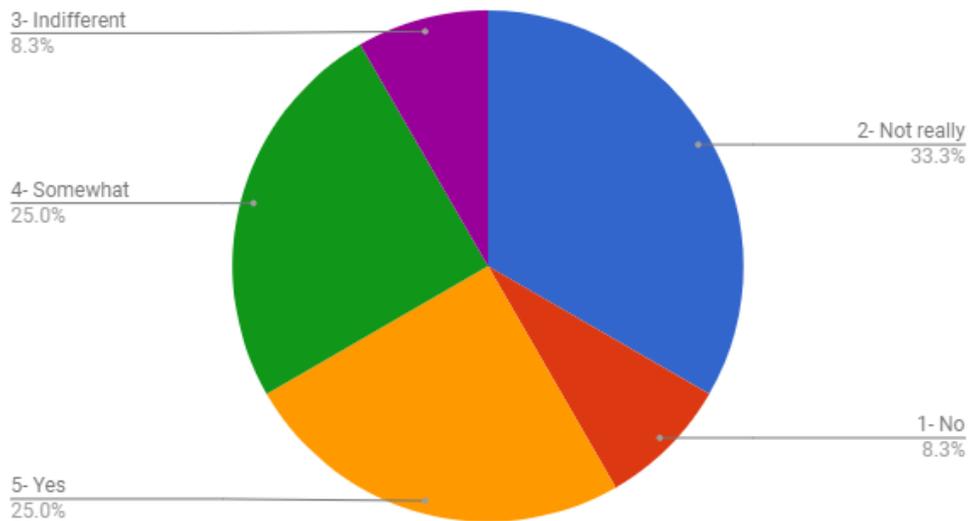
Both 18.2%
Competitively 27.3%
Leisurely 54.5%

For this set of data, I found it very interesting. A majority of students see board games more as a leisure activity than a competition. Now, this would suggest the students do not
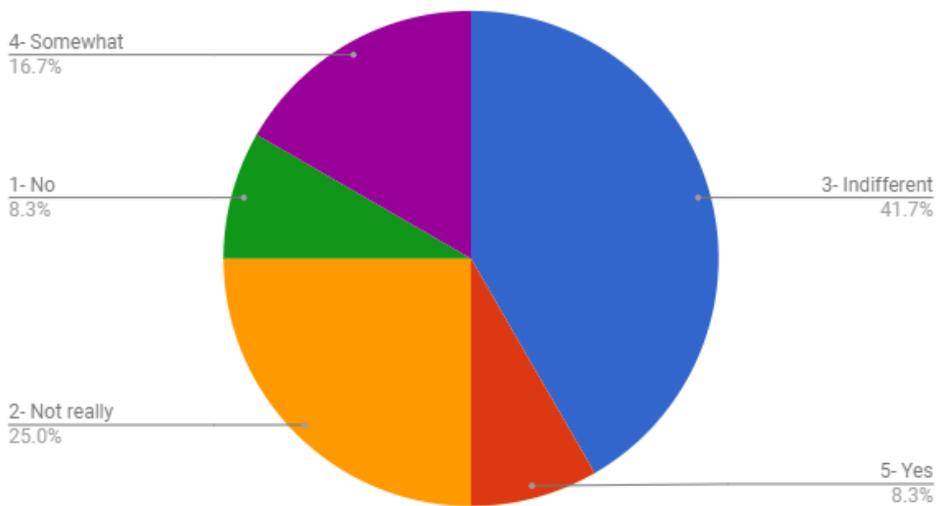
translate their competitiveness into other facets of life, which I find interesting based on the other

graphs of the data.

Did you like the competition review more than the review sheet?

Did you like the competition review more than the review sheet?

3- Indifferent
8.3%

2- Not really
33.3%

4- Somewhat
25.0%

1- No
8.3%

5- Yes
25.0%

Did you like the competition review more than the review sheet?

4- Somewhat
16.7%

1- No
8.3%

3- Indifferent
41.7%

2- Not really
25.0%

5- Yes
8.3%

Based on this data, out of the 24 students being analyzed, only nine of them had a

positive feeling toward the competition review rather than the review sheet. This could suggest

they are used to and prefer review sheets. One of the students wrote this about preferring review

sheets, "I think they both made me look over notes more but I prefer assigned review problems

that we go over in class, or am at least told what to review". This also could suggest they just

did not really like the competition review. I had many interesting responses to the competition

review in the post-survey. One student said, "No. It didn't feel like a competition. It just felt like I

was doing a test under a small time constraint".

Were you more motivated to know the content because your knowledge there was going to

be a competition the next day? Why or why not?

Were you more motivated to know the content because your knowledge there was going to be a competition the next day? Why or why not?

Both 8.3%

No 41.7%

Yes 50.0%

Were you more motivated to know the content because your knowledge there was going to be a competition the next day? Why or why not?

Both
8.3%

Unsure
8.3%

Yes
16.7%

No
66.7%
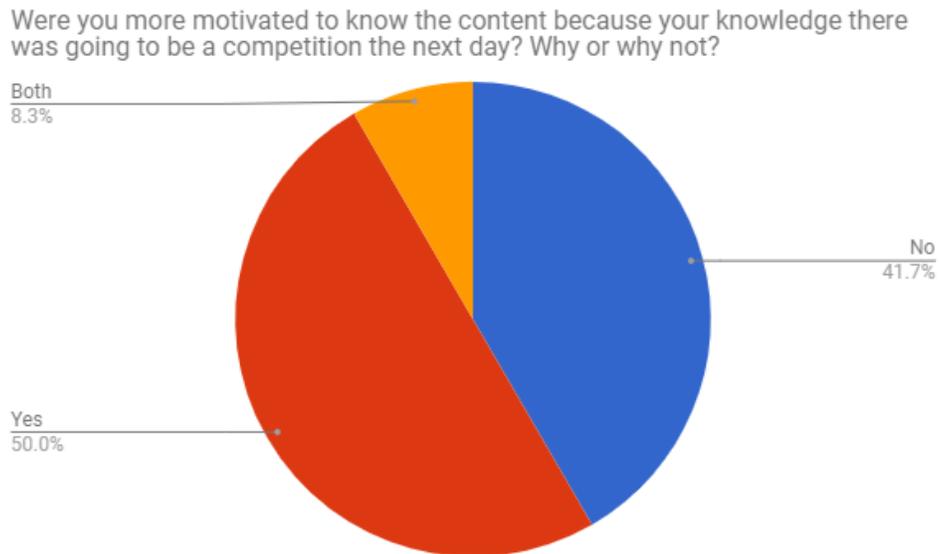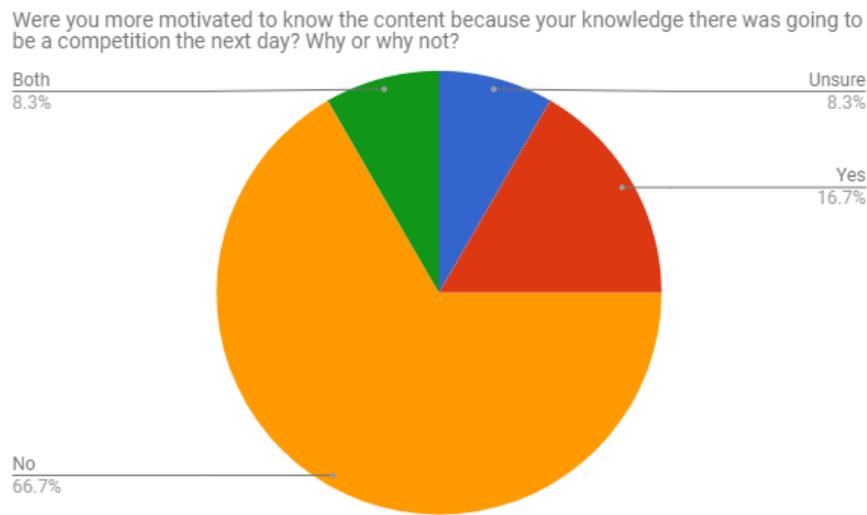
From this data, it can be seen a very large majority of the students were not motivated knowing there was a competition the next day. This could suggest they did not feel the need to prepare themselves because they were confident about their knowledge of the content. It also could suggest they were not motivated to do well in the competition because they did not see the significance in the competition. However, in the 5th-period class, 50% of the students were motivated because of the competition. My thoughts on this are the 5th-period class were the first to experience this competition and the unknown factor may have played into them being motivated. Whereas the 7th-period class may have found out from the 5th-period class and they knew what to expect and 7th period may not have had the same unknown factor as 5th period.

In terms of motivation, which one caused you to study/look over notes more? The competition of review sheet? Why or why not?

In terms of motivation, which one caused you to study/look over notes more?
The competition or reivew sheet? Why or why not?

Neither
16.7%

Review
50.0%

Competition
33.3%

In terms of motivation, which one caused you to study/look over notes more? The competition or reivew sheet? Why or why not?

Other
8.3%

Unsure
8.3%

No
8.3%

Neither
8.3%
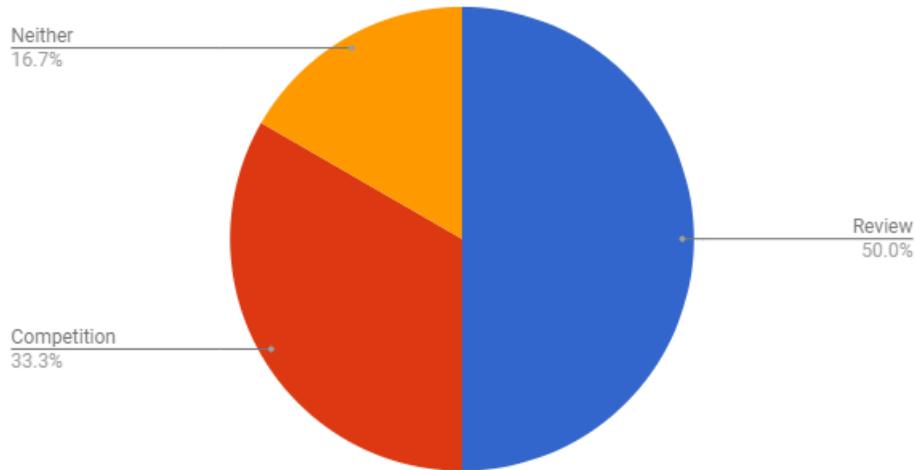
Competition
25.0%
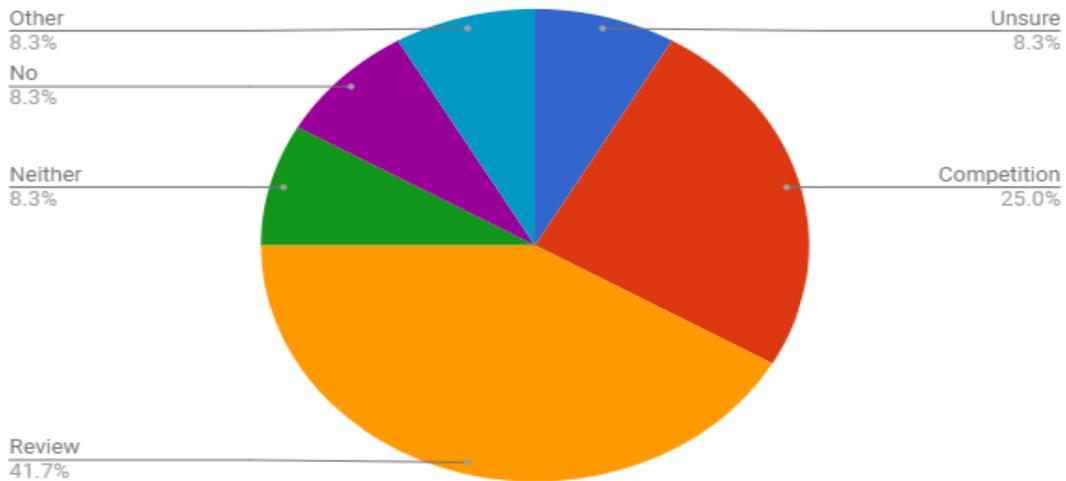
Review
41.7%

From this data, this clearly shows the review was a leading option to motivate students to study/look over their notes. Once again, this could suggest the students' preference for the familiarity of a review sheet. One of the students said, "I think they both made me look over notes more but I prefer assigned review problems that we go over in class, or am at least told

what to review". However, a couple of the students said they preferred the competition because

they knew what the answers to the questions were, and they could check if they found the right

or wrong answers. This could suggest they were concerned about doing the math right and

finding the answer rather than being right and winning a competition. Once again, seeing the

competition as not a big deal in the long run of their grades.

Based on your personal outcome from the competition, did that outcome encourage you to

study further?

Based on your personal outcome from the competition, did that
outcome encourage you to study further?

2- Not really
16.7%

3- Indifferent
25.0%

4- Somewhat
25.0%

1- No
16.7%

5- Yes
16.7%

Based on your personal outcome from the competition, did that
outcome encourage you to study further?

2- Not really
16.7%

4- Somewhat
25.0%

3- Indifferent
58.3%
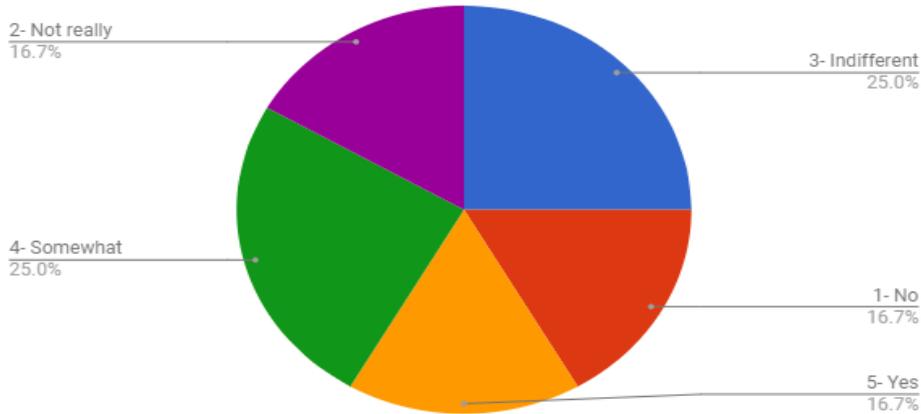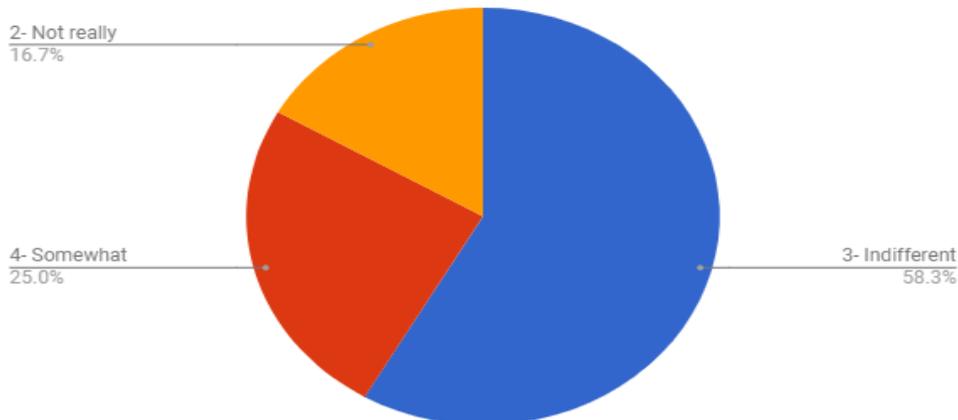
When it comes to this question, it seems the students do not have strong feelings based on their outcome in the competition to continue to study further. This could suggest, once again, they feel confident about their knowledge of the content and does not need to study further. It also could suggest their performance in the competition gave them the confidence to know they needed to study further.

Overall, do you believe the competition made you interested in spending more time to study for the quiz?

Overall, do you believe the competition made you interested in spending more time to study for the quiz?

1- No
8.3%
2- Not really
8.3%
3- Indifferent
41.7%
4- Somewhat
41.7%

Overall, do you believe the competition made you interested in spending more time to study for the quiz?

5- Yes
25.0%
2- Not really
16.7%
1- No
25.0%
4- Somewhat
25.0%
3- Indifferent
8.3%
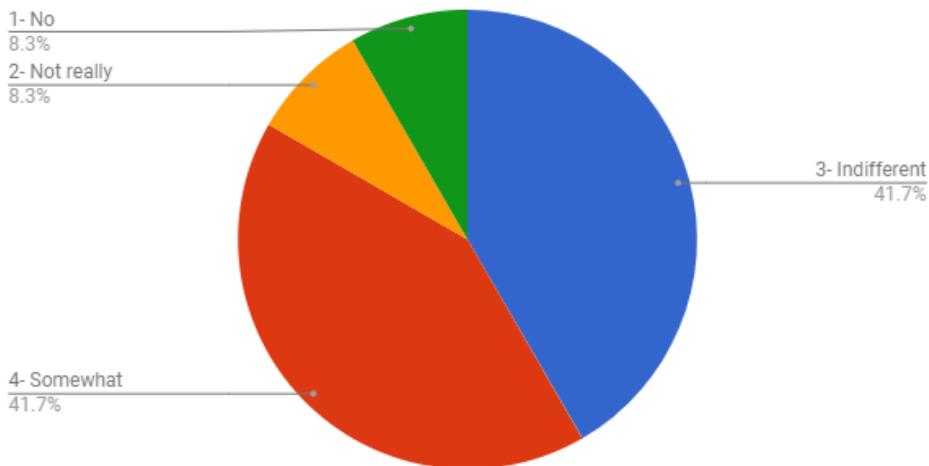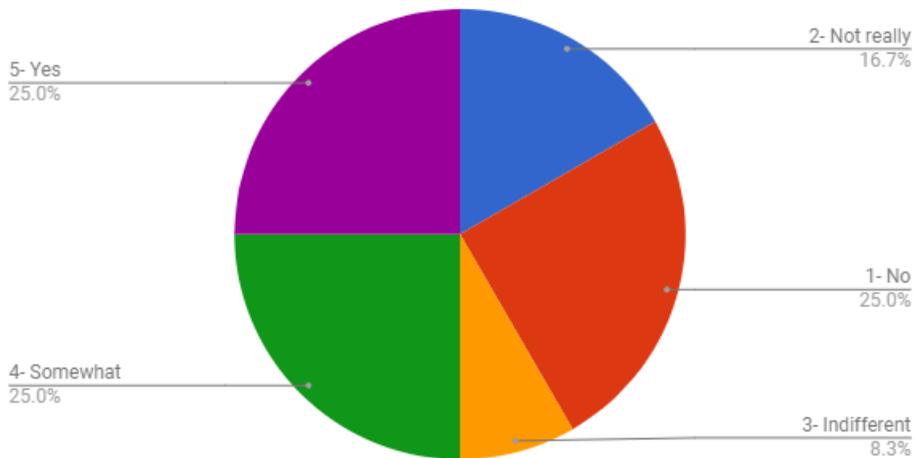
As can be seen from this data, it seems as if the competition has made somewhat of a significant impact on the students to spend more time studying for the quiz. Now it is not the majority, but half the students from 5th period and almost half from 7th period positively believed the competition made them more interested in studying for the quiz. The majority of the students either did not have a feeling or had a negative feeling towards the quiz. However, the positive feelings were more than the negative feelings. This could suggest the students did not feel the competition made a huge difference, but maybe it helped to open their eyes to become more interested in the material and to understand the content.

Which was your preferred way to prepare for the quiz?

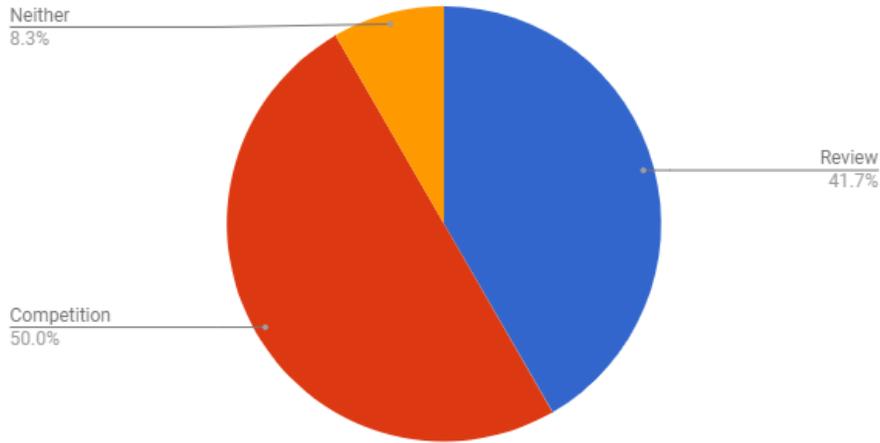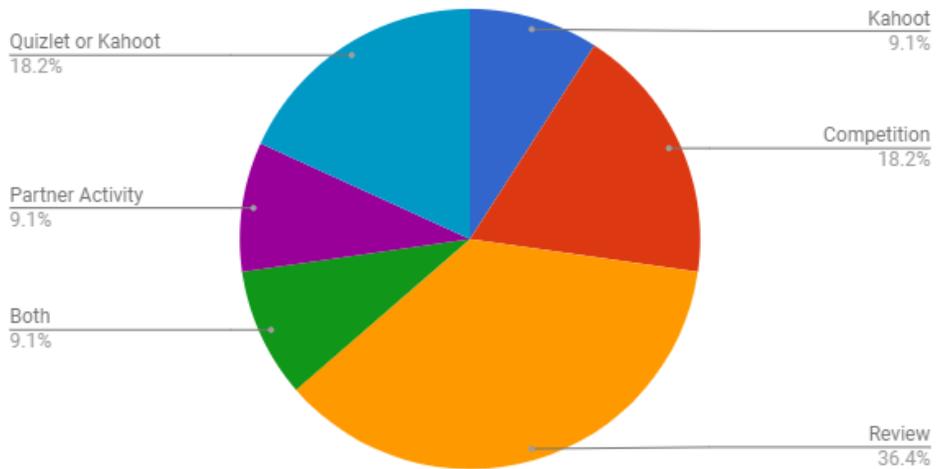## Which way was your preferred way to prepare for the quiz?
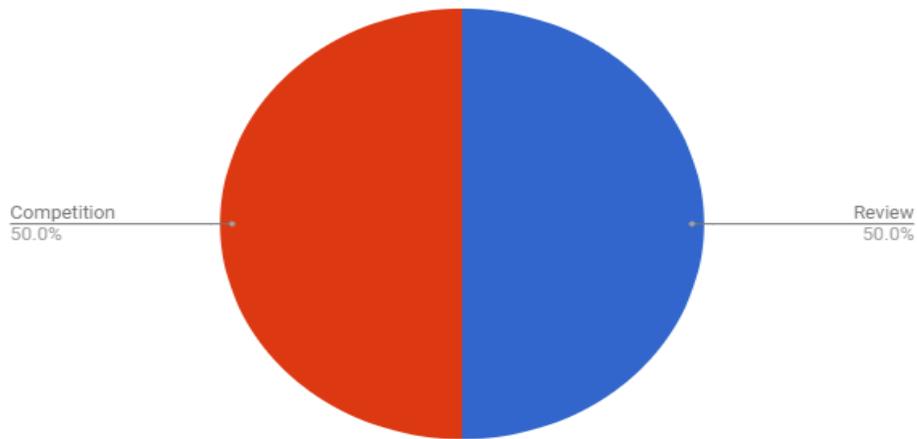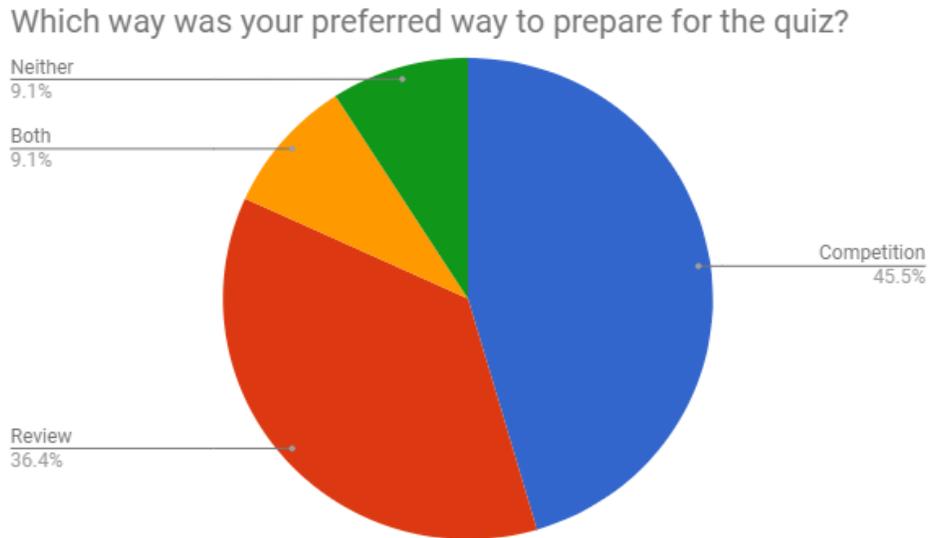
For 5th period, it was a 50/50 split of what the students preferred. However, when it came to 7th period, it wasn't the majority, but the largest portion of students chose the competition as their preference. This could suggest the students felt indifferent about the competition which is a common theme among the last few questions of the students not have strong feelings about the competition or the review sheet.

In the future, what would you prefer to use in preparing for an assessment?

In the future, what would you prefer to use in preparing for an assessment?

Neither
8.3%

Review
41.7%

Competition
50.0%

In the future, what would you prefer to use in preparing for an assessment?

Quizlet or Kahoot
18.2%

Kahoot
9.1%

Competition
18.2%

Partner Activity
9.1%

Both
9.1%

Review
36.4%

From this data, even though for 7th period, the competition choice tied for second. However, when omit or reword this as I am not combining anything we look at the quizlet or kahoot percentage and the kahoot with the competition because quizlet and kahoot can be used in a competitive way, then those choices, with the competition percentage, all add up to a larger portion than the review. This suggests the students preferred some sort of competition as a

leading source to study for an assessment. However, the data also shows another large portion of the students preferred a review sheet. This could suggest they did not like the competition. It also could suggest the students have experience with review sheets, quizlet, and kahoot and prefer all of those more than the competition because it brings a sense of familiarity of how to prepare for an assessment rather than a competition like I conducted in class.

Conclusion

Implications:

There are many interesting observations I made throughout the analyzing of the data. One observation I made was how the quantitative data showed a direct relation to the competition review and a higher average of test scores. An implication of this observation is the competition review did improve test scores. The difference of class averages from quiz 2 is a score of 1.25. Where this difference is not large, for a class to be more than one point below their class counterpart I think is important. However, the difference in averages for the first quiz was a score of .04, which shows the performance on this quiz was about even. Overall, when the intervention of competition was used, the average quiz score of the class who experienced the intervention was higher than the class who experienced the review sheet.

Another observation I found was this sense of familiarity of review sheets and different competitive games with the students. When it came to the survey questions of if the students liked the competition review more than a review sheet, and the question of which one caused you to study/look over notes more, there were many preferences to a review sheet or games like kahoot or quizlet. All three of these items are things the students are familiar with because they have talked about them in class before. With all of this in mind, the implication for this

observation would be to give the students a competition they are familiar with, or a different way to have them compete which then becomes familiar

The final observation I had was it seemed the competition did not really make a difference in the feelings of the students as I thought it would. I thought if something was exciting and fun to do, while we were also studying, there would have been a larger majority prefer the competition than the review sheet. However, this was not the case. In the final few questions of the post-survey, we can see only about half of the students preferred the competition to the review sheet. Another reason why I believe the competition was not preferred was because some of the students even told me it was not very fun. More so, in the final survey one of the students wrote how the competition was unmemorable, "I barely remember either one…" So the implication for this is the competition would need to change to be more exciting and fun for the students to experience. It also would need to satisfy some of the needs by which some of the "pros" of the review sheet provide so the students would view the competition as a useful and capable of preparing them for an assessment.

External Factors:

As in any educational study, there are many external factors which may arise as the study rolls along. With this study, there is no exception to many external factors. One factor was the time period of the study. The reason this was a factor because the study took place over a month's time, yet the intervention was done at the beginning and the end of the particular time. The pre-survey was done at the beginning of the second semester, and the first intervention happened about a week after that. The next intervention did not happen until about a month later. The reason for this was because since the first intervention was done for the first quiz of a unit,

and to not bring in other external factors I had to wait until we came to the first quiz of another unit. This led to many of the students who experienced the intervention first to forget their feelings about the intervention when it came time to fill out the post-surveys. Which led me to have to remind them what the intervention even was. Another time factor was when I assigned the students to do the post-survey, which was the Friday right before spring break. This could have led to inaccurate answers to questions because the students were excited about the break and the thoughts and feelings about the intervention may not have been there for them to write about.

Another external factor was trying to figure out an individualized math game which could be fun and engaging. I have seen many games which include teams and working together, but for the study, I wanted to focus on the motivation of the individual, thus making an individual game. Another aspect of math is it is all about the showing of knowledge, and not so much remembering facts. If I would have done a game like jeopardy or kahoot, it is a quick remembering of facts and not so much showing understanding of the work, and this was not what I wanted. With this game, trying to make it fun was difficult. I had many of the students tell me the competition was not a "game" or how it was not fun. In an educational research article, author Judy Willis said this, "Many education theorists (Dulay & Burt, 1977; Krashen, 1982) have proposed that students retain what they learn when the learning is associated with strong positive emotion" (Willis, 2007).

A challenge I had to work with was not all the students participated in both studies. This was a factor because I was not able to capture a holistic representation of the classes. This led to me only being able to represent a little around 60% of both the classes. Another factor from not finishing the surveys was some students finished them at different times. Some people finished

the Friday before spring break, whereas others finished during or even after spring break. This could have led to some differences in the study because the students may have lost those initial feelings about the intervention because they were wrapped up with spring break and other factors of life.

Changes to the Study:

Overall, I feel good about the project and how it went, but there are a few ideas I have to change. One thing would be to make the game more fun and enjoyable for the students. Also, to have a review game which is consistent in the class where they feel confident the game prepares them could have built a sense of familiarity with the competition. All of this may have changed how they felt about the competition in a positive light.

Another idea would be to ensure to have all the students complete both the surveys in a timely manner. I could have had the first group do the intervention, and the same day or day after, have the first group also complete the post-survey to ensure they did not lose or forget the feeling they had about the intervention. If all of the students had done both surveys, I could have used more data to find a better representation of the students rather than about 60% percent in both classes.

A common factor in all educational research is the environment of the classroom. First off, there were a different number of students in each class, and the culture in each class might be totally different because of the number of students. Also with the environment of the classroom, 5th period happens right before lunch. The students in 5th period might have a feeling of wanting to not be in math because they are hungry. However, in 7th period it is near the end of the day and 7th-period students might have a wanting to go home.

How to take my project further:

If I were to take my project further, I would do a couple things. First off, I need to figure out a better game which is fun and engaging. I need have something to help motivate the kids to want to do well. Another idea would be to have an external motivation like a pizza party or candy for the better average quiz scores between classes and the individual with the highest score for the review game, respectively. I was focusing on internal motivation in this study by seeing if competition motivated students with their grades.

At this age, I think it is hard for students to have intrinsic motivation to do well. It seems at the high school or college level, more people are intrinsically motivated because of the sudden future of being an adult. It would be interesting to see how the results would change depending on the population.

The final way I could further this study would be to look at teams, and how teams could motivate students. How being on a team builds accountability and responsibility for a position and how being in competition with the team leads to the motivation of contributing to the team.

Final result:

My project was looking at if competition could motivate students to perform well. In some scenarios and students, I believe competition helps to motivate. If we just were to look only at the quantitative results, it would seem the competition intervention played a factor in the quiz scores. However, students have so many other factors in their life to motivate them: parents, future, being eligible for a sports team, etc. Any number of these factors can play into how a student studies and pushes themselves to learn and perform on assessments. From what I gather,

and we were to look at the study holistically, competition does not play a significant factor in

motivating students grades.

References

Attle, S., & Baker, B. (2007). Cooperative learning in a competitive environment: Classroom

applications. *International Journal of Teaching and Learning in Higher Education*,

19(1). Retrieved from

https://pdfs.semanticscholar.org/71b6/3a437e7450089092dea7201c0b4109bd248c.pdf

With this source, I wanted to see the effectiveness of cooperative learning. I wanted to use the

results to counter to my other sources which mainly focused on individuals entities.

Di Stasio, M. R., Savage, R., & Burgos, G. (2016). Social comparison, competition and teacher

student relationships in junior high school classrooms predicts bullying and victimization.

Journal of Adolescence. Retrieved from http://ac.els-

cdn.com.ezproxy.bgsu.edu:8080/S014019711630135X/1-s2.0-S014019711630135X-

main.pdf?_tid=0e9e4eec-0ffc-11e7-8172-

00000aacb35e&acdnat=1490296271_475b9269597c20dddb83e4773d8b7ac4

In competition, some negative side effects of social comparison are prevalent. With this journal,

I wanted to see how teachers can impact those negative side effects.

Domínguez, A., Sáenz-de-Navarrete, J., De-Marcos, L., Fernandez-Sanze, L., Pagés, C., &

Martinez-Herraiz, J.-J. (2013). Gamifying learning experiences: Practical implications

and outcomes. *Computers & Education*. Retrieved from Elsevier database.

Businesses have used gamifying experiences and have seen positive results. I used this article to

see the effects of gamification and the impact on classroom use.

Lam, S.-F., Yim, P.-S., Law, J. S.F., & Cheung, R. W.Y. (2004). The effects of competition on

achievement motivation in Chinese classrooms. *British Journal of Educational

Psychology*. Retrieved from

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n+on+achievement+motivation+in+Chinese+classrooms&rft.jtitle=The+British+journal+

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8279&rft.volume=74&rft.issue=Pt+2&rft.spage=281&rft_id=info%3Apmid%2F1513019

2&rft.externalDocID=15130192&paramdict=en-US

I used this article to see other studies done to see the effect of competition. In this case, it was a

Chinese classroom, but this was to see how competition affects achievement motivation.

Lee, J., & Hammer, J. (2011). Gamification in education: What, how, why bother? *Exchange

Organizational Behavior Teaching Journal*. Retrieved from

http://www.gameprof.com/wp-content/uploads/2013/03/AEQ-Lee-Hammer-2011.pdf

This journal was mentioned in the business gamification article above. This study looked at

gamification in education, which will give me great insight into the education realm.

McLeod, S. (2008). Erik Erikson. Retrieved from SimplePsychology database.

I wanted to use some psychological basis to understand how students might react to competition.

In this case, I used some developmental stages of Erikson to get some insight.

Morin, L.-P. (2015). Do men and women respond differently to competition? *Journal of Labor

Economics*, *33*(2). Abstract retrieved from University of Chicago Press Journals database.

I wanted to see how men and women react to competition. I wanted to see if they were similar or

different, and in which ways they were similar or different.

Shindler, J. (2009). Examining the use of competition in the classroom. In J. Shindler (Author),

Transformative classroom management. Retrieved from

http://web.calstatela.edu/faculty/jshindl/cm/Chapter18competition-final.htm

This is a published book and it gave me a definition of competition.

Tjosvold, D., Johnson, D. W., Johnson, R. T., & Sun, H. (2006). Competitive motives and

strategies: Understanding constructive competition. *The American Psychological

Association*. Retrieved from

http://psycnet.apa.org.ezproxy.bgsu.edu:8080/journals/gdn/10/2/87.pdf

This is a published study that looked at the effects of competition in the workplace. I wanted to

see what they found and what effects competition has between people.

Willis, J. (2007). The Neuroscience of Joyful Learning. *Educational Leadership,64*.

doi:10.1007/springerreference_302575

This is a published article that gave many different examples of research where positive

experiences and learning go hand in hand. I used this to further my point about making

my competition fun for my students to learn.

Appendix A- Survey Questions

For each of the questions, I provided a number system of 1-5 with 1 being the lowest

score, and 5 being the highest. Some of the questions have certain answers, or are open-ended

questions have the students answer freely.

My pre-intervention survey questions are:

1. How do you feel when you win?

    a. 1- Not great

    b. 2- Not good

    c. 3- Indifferent

    d. 4- Good

    e. 5- Great

2. How do you feel when you come in 2nd?

    a. 1- Not great

    b. 2- Not good

    c. 3- Indifferent

    d. 4- Good

    e. 5- Great

3. How do you feel when you come in last?

    a. 1- Not great

    b. 2- Not good

    c. 3- Indifferent

    d. 4- Good

  e. 5- Great

4. Do you participate in sports?

  a. If so, would you say it is competitive or recreation

    i. Competitive- Winning is key, best players receive most playing time

    ii. Recreation- Having fun is key, all players receive similar playing time

5. Do you like playing games outside of sports? Check all that apply.

  a. Video games

  b. Board games

  c. Fill in blank

6. If you play video games, why do you play? Check all that apply

  a. Self-competition(campaign)

  b. Other-competition(online)

  c. More social connection

  d. Alone time

7. If you play board games, how do you play them?

  a. Leisurely (For fun and enjoyment of the game)

  b. Competitively (To win the game)

  c. Fill in the blank

For my post-intervention survey, my questions are:

1. Did you like the review competition more than the review sheet?

  d. 1- no

  e. 2- not really

  f. 3- indifferent

      g. 4- somewhat

      h. 5- yes

2. Were you more motivated to know the content because your knowledge there was going to be a competition the next day? Why or why not?

      a. Yes

      b. No

      c. Why or why not?

3. In terms of motivation, which one caused you to study/look over notes more? The competition or review sheet? Why or why not?

      a. Game

      b. Sheet

      c. Why or why not?

4. Based on your personal outcome from the game, did that outcome encourage you to study further?

      a. 1- no

      b. 2- not really

      c. 3- indifferent

      d. 4- kind of

      e. 5- yes

5. Overall, do you believe the competition made you interested in spending more time to study for the quiz?

      a. 1- no

      b. 2- not really

    c. 3- indifferent

    d. 4- kind of

    e. 5- yes

6. What was your favorite way to prepare for the quiz

    a. Game

    b. Review sheet

    c. Other

7. In the future, what would you prefer to use to prepare for an assessment

    a. Game

    b. Review sheet

    c. Other