

# **Do you have to Attend to Succeed: Is there a Relationship between Class Attendance and Final Grades?**

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*Abstract:* University classes have a variety of assessments to determine if the students have learned the material. However, the researchers contend attendance is a strong predictor of class success. By comparing the number of absences and the final grade, statistically significant relationships were found. The variables of gender and academic major were also examined to ascertain if they are factors. Interesting conclusions were made as well as implications for practice.

**Key Words:** Class Attendance, Academic Success, Mandatory Attendance Policies

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## **Introduction**

Most people making a purchase want to get their money's worth. They look for sales, special purchases or buy in bulk to stretch their hard-earned dollars. In fact, many overindulge when they can get more than what they paid for, regardless of whether they need it or not. These actions can be seen at “All You Can Eat” buffets, open bars at weddings and intending to buy one suit but ending up getting three since as there was a there was a buy two get one free promotion. However, some students enrolled in higher education classes often seek every opportunity to not attend class. Further, if the faculty cancels class, students nearly universally respond with glee at not having to attend, instead of realizing they have paid for something which they are not getting.

Class attendance is important for many reasons which help the instructor and student. For the faculty, having students attend and be engaged stimulates the learning environment by transforming the class from a lecture into a community of learners with mutual reciprocal learning. Having students consider the material and relate it to their lives provides deeper understanding of the subject. Students who hear the material directly can take notes, ask and answer questions, and they gain more than students just reading the text or looking over the notes of another student. In addition, the rapport and relationship with their classmates and instructor develops both their intellectual and social skills. Conversely, when students are not attending class and relying on notes or the readings from the textbook, there appears to be a shallower understanding of the concepts. Likewise, not being present hinders students from building bonds with their classmates. Finally, students who choose not to attend are not learning the material and consequently are at a disadvantage when taking exams, engaging in discussions, and participating in the required projects which connect theory and practice.

Classroom assessment can take many forms and faculty often use a variety of measures such as exams, oral and written presentations, projects, participation, demonstrations, discussion boards and quizzes to name a few. However, some students have test anxiety, others may be very shy and cannot clearly articulate their thoughts, and others have limitations in their writing ability. Assessments are a gauge of what the student has learned in that class. However, attendance, at its most basic level, is just being there. Attendance does not require prior learning or having mastered a required skill. In fact, film maker, actor and comedian Woody Allen in 1997 is credited with saying “Eighty percent of success is just showing up.” Because of this low bar, which is equal for every student, the authors assert class attendance may be the greatest predictor of class grades. Exams, papers, quizzes, and projects have been intentionally excluded to focus solely on attendance. Due to Covid-19 and market demand, attendance is no longer as cut and dried as it used to be. Institutions now offer online classes with a plethora of courses delivering content from Art Appreciation to Zoology. However, there still are and will continue to be many traditional face to face classes which is the focus of this study.

The purpose of this paper is to determine if attendance has a relationship to the final class grade and to ascertain if there is a “magic number” of absences that lead to failure. Further, the variables of gender or academic major are analyzed to see if they are related to absences and class success. The following research questions will guide this study.

1. Is there a relationship between attendance and final grade?
2. Does gender affect the relationship between attendance and final grade?
3. Does academic major affect the relationship between attendance and final grade?
4. Is there a point where lack of attendance can predict failure?

## **Literature Review**

### *The relationship of class attendance to final grades*

Students entering college have spent their entire academic life from kindergarten to twelfth grade under mandatory attendance policies. A note from the parent or guardian was needed for each absence. Failure to supply such a note led to truancy. However, at institutions of higher education, no formal policy or enforcement mechanism exists. Many new students are unprepared for the increased demands and rigor of college classes as opposed to what they experienced in high school (Cavanagh, 2003; Hebel, 2003). Attendance is the purview of each faculty member. Some faculty value attendance more than others, while some focus their assessment on the attainment of skills and the application of knowledge.

Surveying over sixteen hundred respondents, Friedman, Rodriguez & McComb (2001) found twenty-three reasons for attending class and thirty-three reasons for not attending class. Some reasons for absences included illness, being tired due to other schoolwork, being tired due to fun activities, the students' desire for a break and the belief the teacher doesn't notice or care if they are absent. Conversely, students attended class due to their interest in the content, their desire to take their own notes, to gain understanding of topics they needed to learn, believing attendance is the "right thing" to do, to keep from having guilt for non-attendance and the trepidation of knowing absences would affect their grade. But even with all these reasons, Friedman exasperatedly stated "class attendance is a puzzle." Interestingly, they found higher attendance rates in elective courses versus required courses.

At a research university in Florida, Stripling, Roberts, and Israel (2013) surveyed over 3,700 students to ascertain reasons why students did not attend classes. The primary reason, cited by 93.5% of the respondents, was attendance was not taken. Following at 90% each were personal emergencies or illness, followed by having the course content available on the web or from other students. Not surprisingly, students in classes with at least forty-five others were more apt to skip class.

In a study of first year medical students Cheema et al., (2022) found a strong positive correlation between overall attendance and the average scores of written examinations. Similarly Khan et al., (2019) asserts class absenteeism is a developing pattern which has a substantial relationship to academic performance.

Moore, (2006) studied the perception and reality of grades and attendance and found class attendance was critical to the academic success of students in introductory science courses. Students who attended at least 80% of classes had a 94%-96% chance of making at least a C in the course. Those who attended less than 80% of classes had no chance of making an A. Students who

attended less than 20% of classes had an 82%-98% chance of making an F, and no chance of making above a D.

In a macroeconomics class in Portugal Teixeira, (2016) found students who did not attend class performed worse academically, and were clustered with other students who displayed similar patterns of attendance. Interestingly, Kassarnig et al., (2017) found high attendance was not necessarily related to higher scores, but low attendance was related to lower performance.

Chen and Lin (2008) found students exam performance increased between 9.4-18% for students who consistently attended class. Similarly, Westerman et al (2011) found robust performance on exams was positively related to attendance. However, these differences were compounded with students with less academic ability who missed class which translates into lower grade point averages.

When viewing students in science classes, Moore (2003) found a strong positive correlation between high class attendance with high grades and poor attendance with low grades. Likewise, Gulekar and Keci (2014) examined three years of data from undergraduate Civil Engineering classes and found a positive correlation between attendance rates and the student's grades. Further, Motsima (2020) examined Engineering students enrolled in a Statistics course and found students with higher grade point averages were more likely to attend class. Lower GPA students attended less than 80% of the classes. Fadelelmoula (2018) examined students in four respiratory curriculum classes and found a positive correlation between attendance rate and final exam scores. Interestingly, Doggrell, (2019) found that in a Pharmacology class, lecture recordings were not equivalent to students who witnessed the lecture live. Latif & Miles (2013), in an introductory Statistics class found a strong correlation between class attendance and exam results. Further, in a study of first year Chemistry students, Comeford (2022) found attendance positively impacted students' grades. Conversely, Berenson, Carter, and Norwood (1992) and St. Clair (1999), found high attendance was not linked to high grades.

Moore (2005) asserts attendance alone does not guarantee learning since someone being present in class may be there in body but not in mind. They could be doodling, daydreaming, or sleeping but also had strong class attendance. However, attendance is not as important as time on task. Motivated students will spend more time on tasks than students less motivated or those that skip and will consequently do better on exams. Interestingly, Moore (2006) hypothesized more absences would occur in classes held before ten in the morning or after three in the afternoon. However, absences at those times were not statistically different than classes in the heart of the day.

A plethora of studies, both national and international, have found class attendance is a significant and positive predictor of course grades (Alexander & Hicks, 2016; Broucek and Bass, 2008 Clump, Bauer and Whiteleather, 2003; Credé & Kieszczynka, 2010; Jover et al., 2018; Fidanza, 2006; Grump, 2005; Karnik et al., 2020; Kezim & Pariseau, 2010; Launius, 1997; Li, et al., 2021; Lin, 2014; Neri & Meloche, 2007; Nordmann et al., 2019; Rendleman, 2017 Ruenitz, 2000; Schmulian & Coetzee, 2011; Senior, 2008; Thomas and Higbee, 2000; Wasan et al., 2021; Yakovlev and Kinney, 2008).

Latta and Lowenstein (2017) found as more classes were missed, the student's class grades declined. Interestingly, they took a monetary perspective and calculated students lost an average of \$2,824 for skipping classes which had paid to take. In addition, the scheduling of classes is a factor as a time gap between classes was greater than two hours more students were apt to leave campus and skip the later class (Fjortoft, 2005).

Finally, in a study encompassing over 21,000 students Credé, Roch, & Kieszczyńska (2010) found attendance has a strong relationship with class grades and assert these relationships are the best predictor of college success. In fact, they contend it is a better predictor than the SAT test, high school GPA, or study habits.

However, there are other studies which do not support the premise that higher attendance is necessary for higher grades. At the honors level, Nordmann et al., (2019) did not find any correlations between performance in exam and attendance. Nor did Hollett et al., (2020) who did not find a relationship between attendance and grades. Even in classes which literally can mean life or death, a study of second year medical students did not show an increase in performance for attending lectures. In fact, when attendance was voluntary less than 25% of the students attended lectures (Kauffman et al., 2018).

Perhaps it is not just attendance, but motivation as several studies have found the students motivation to be engaged in the class was a greater factor than attendance (Hollett et al.2020; Kim, et al. 2020; Rendleman, 2017.)

### *The effect of mandatory attendance policies*

Several studies examined the impact of mandatory attendance policies to significantly reduce absenteeism: Chenneville and Jordan, 2008; Hancock, 1994; Hansen, 1990; Marburger, 2006. Further, several researchers found mandatory attendance policies had a positive relationship to greater academic achievement (Chen & Okediji, 2014; Comeford, 2023; Karnik et al., 2020; Rendleman, 2017). In particular, Higbee & Fayon (2006) contend the learning done in the classroom cannot be made up somewhere else students physically together learn from each other, and gain an understanding of different cultural and communication styles. But, Higbee & Fayon, (2006) caution, if assessment was only individually focused, being together does not matter as attendance is immaterial to teamwork.

However, other studies did not find mandatory attendance policies beneficial. Marburger (2006) found they did not affect academic performance as did Comeford (2023) who found attendance was not a factor for third and fourth year students. But he remarked that without an attendance policy, more students did not attend class. Therefore, this increase in attendance, while forced, increased learning, yet the impact did not appear to be substantial.

Caviglia-Harris, (2004) found having an attendance policy reduced absences but the concomitant disturbances in large classes did not positively impact grades. They noted students in larger classes were more likely to skip class than students in smaller classes. Similarly, Lin &

Chen, (2015) did not find attendance improved learning in a microeconomics class, but they contend the larger class size had more of an impact than attendance.

Higbee & Fayon (2006) and Macfarlane (2013) were critics of attendance policies as they assert such policies keep the student from maturing and accepting the consequences of their decisions to attend or not attend class. Further, these policies coerce less motivated students to attend lectures, and their lack of discipline may have an adverse effect on students with stronger learning motivation. In addition, Credé, Roch, Kieszczyńska, (2010) found mandatory attendance policies only had a slight positive impact on the students with average grades.

#### *International Studies on Attendance and Grades*

Van Schalkwyk, Menkveld, & Ruiters (2010) studied over 2,500 first year students in a South African University and found a strong relationship between class attendance and academic performance. In addition, they inquired about motivation to attend class. The top three responses were, “The lectures helped me to better understand the work” (92.4%), “Useful tips about the exam were given in class”, and “I learn a lot by listening in class” (86.7%). Interestingly, only 62% attended due to mandatory attendance policies. The major reasons for not attending were: “The class was boring” (68.8%), and “The classes were just before an exam” (55.6%). In Ireland, (Kirby & McElroy, 2003) found students who attended class did so to improve their grade and not just to pass the class.

In a study of nearly 1,000 undergraduate students at the Technical University of Denmark, Kassarning et al (2017) compared gender, and academic major to absenteeism. They found attendance was a strong factor for predicting success, but the effect was less when comparing high attendance levels and high performance.

Studying college students in India, Kumar (2018) found a statistically strong correlation between academic performance and class attendance which can predict the student's performance. Similarly, in a study of university students in Bangladesh, Shahjahan, et al (2021) found a positive relationship between class attendance and lower grades. At a university in Finland Lukkarinen, Koivukangas, & Seppälä (2016) found attendance was positively and significantly related to performance as did Ajiboye & Tella (2006) in Botswana. Alanzi (2015) studied Accounting students in Kuwait and found a strong correlation between the students' GPA and lecture attendance. In studying Nigerian students, Cecilia et al (2019) found class attendance was statistically significant in explaining class grades and the overall performance of students.

Chou & Kuo (2012) at a higher education institution in Taiwan found the strongest predictor of success of a course was based on the student's level of attendance. But in Taiwan, most institutions have attendance policies. However, in this study, class attendance was not considered in the final grades and students were not penalized for absences. Based on the prevalence of required attendance policies many students may not have realized they had the liberty to miss class if they so desired.

Vincenzo and Velasco (2015) studied Economics students in Spain and found better students attend lectures more frequently on average and receive higher grades because of their

inherent high motivation, not necessarily due to their attendance. Likewise, Vincenzo and Velasco (2015) cite the importance of study time with grade performance.

### *Gender and Absences and Grades*

Females performed better than males in several studies due to having better class attendance. For example, in a study of Medical Science students, Hakami (2021) found the exam scores of females were significantly higher than males due to attendance. Further, International Studies had comparable results as Chung, et al (2018) found Korean females performed better due to class attendance, Kumar (2018) surveyed Indian students, and Cecilia, et al, (2019) studied Nigerian students and found females attended class more often and consequently performed better.

Conversely, Ajiboye & Tella (2006) found in Botswana that male students performed better than females. However, Moore (2005) Chenneville and Jordan (2008), and Durfee et al (2014) found no differences in attendance by gender and passing grades.

### *Modes of Delivery*

Even though Higuera-Zimbrón & Rivera-Gutiérrez, (2022) contend academic performance did not suffer in a virtual environment, nearly 25% of the students disagreed and commented that their learning was reduced. Further, the researchers found 40% of students favored in person learning, 40% favored virtual learning, and 20% said they would drop out if they had to continue enrolling in virtual learning courses.

Kortemeyer et al., (2023) examined student performance in face to face, hybrid and online classes and found minimal differences in performance. However, students who attended live lectures performed better than those attending online. Similarly, Nieuwoudt (2020) did not find any differences in grades between in person and virtual classes as recorded lessons were available for the online classes. Similarly, Nyamapfene (2010) found attendance was important for learning, even when abundant videos and notes were made available to the students. Further, students who interacted with the faculty performed better than those who did not. Nordmann et al., (2019) contends making lecture recordings available may cause less in person attendance as did Fidanza, (2006) asserts the availability of class materials online impairs attendance.

## **Methods**

The final grade rosters over the last twelve years were entered into SPSS for analysis. The students' name, gender, major, number of absences, and the final alphabetical grade were recorded. Since passing the class requires a grade of "C" or better, grades of "D" or "F" are listed separately, however, since they both count as failures, students not earning a grade of "C" or better, must retake the class. Students who withdrew were not included in the data.

The instructor had a mandatory attendance policy, but there are absences for items such as illness, funerals, interviews, and university-sanctioned events including athletic competitions, field trips and performances. The instructor provides every student with two unexcused absences which

can be used for anything without penalty. Unexcused absences are when the student did not attend class and did not have a permissible excuse. After two unexcused absences, each additional unexcused absence carries a penalty of two percent. There is no penalty for excused absences, even more than two.

All the data points are from one face to face class by the same professor over the last twelve years. The class, Leadership and Human Behavior, is a required course for all Business majors and serves as a requirement or an elective for a variety of minors. The assessments for the class are tests (40%), team projects (40%), and class participation (20%). Students must be in class to receive points for class participation. The researchers examined two data points: the number of absences and the final grade received. The maximum enrollment per section was 30 students, with most classes consisting of 25-30 students. Due to the relatively small number of students, the instructor was able to easily determine who was present and who was not and not waste valuable class time. However, taking attendance in a larger class would be time consuming and may not be practical.

## Results

There was a total of 540 students who earned grades in the class. Nearly two thirds of the students were male and Business majors accounted for three fourths of the subjects (*see Table 1*).

**Table 1: Demographics**

<b>Gender</b>	<b>N</b>	<b>%</b>		<b>Major</b>	<b>N</b>	<b>%</b>
Female	197	36%		Business	395	73.1%
Male	343	64%		Liberal Arts and SS	70	13.0%
Total	540	100%		Natural Sciences	61	11.3%
				Education	7	1.3%
				Undecided	7	1.3%
				Total	540	100%

Students must earn a grade of “C” or better to pass this class. Consequently, the scores of “D” and “F” are combined to determine the rate of failure. Overall, the failure rate is low at 12.6% (*see Table 2*).

**Table 2: Grade Distribution**

	<b>F</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>Total</b>
Total	30	38	152	209	111	540
% Grades	<b>5.6%</b>	<b>7.0%</b>	<b>28.1%</b>	<b>38.7%</b>	<b>20.6%</b>	100.0%



The overwhelming percentage of students, 73%, were Business majors. This was expected as this class is required for all Business majors. Business includes Accounting, Economics, Finance, Marketing, Global Business, Management, Human Resources, and Small Business/Entrepreneurship. Many other programs may require or use this class as an elective. Liberal Arts and Social Sciences, and Natural Sciences account for 13% and 11% of the students, respectively. However, students in Education or Undecided represented 1% each (*see Table 3*).

The failure rate for Business students was 10.7%, Liberal Arts and Social Sciences was 21.4%, Natural Sciences was 14.8%, and Undecided was the highest at 28.6%, however this number is not representative since the number of Undecided students was seven. However, a Chi-Square test revealed no significance based on major.  $\chi^2$  (df 4, N = 540 = 8.989, p = .0613

**Table 3: Grade Breakdown by Academic Major**

		<b>F</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>Total</b>
<b>Business</b>	<b>Count</b>	<b>20</b>	<b>22</b>	<b>120</b>	<b>148</b>	<b>85</b>	<b>395</b>
	% within major	5.1%	5.6%	30.4%	37.5%	21.5%	100.0%
	% within grade	66.7%	57.9%	78.9%	70.8%	76.6%	73.1%
<b>Liberal Arts and Social Sciences</b>	<b>Count</b>	<b>8</b>	<b>7</b>	<b>19</b>	<b>27</b>	<b>9</b>	<b>70</b>
	% within major	11.4%	10.0%	27.1%	38.6%	12.9%	100.0%
	% within grade	26.7%	18.4%	12.5%	12.9%	8.1%	13.0%
<b>Natural Sciences</b>	<b>Count</b>	<b>2</b>	<b>7</b>	<b>12</b>	<b>24</b>	<b>16</b>	<b>61</b>
	% within major	3.3%	11.5%	19.7%	39.3%	26.2%	100.0%
	% within grade	6.7%	18.4%	7.9%	11.5%	14.4%	11.3%
<b>Education</b>	<b>Count</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>7</b>
	% within major	0.0%	0.0%	0.0%	85.7%	14.3%	100.0%
	% within grade	0.0%	0.0%	0.0%	2.9%	0.9%	1.3%
<b>Undecided</b>	<b>Count</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>7</b>
	% within major	0.0%	28.6%	14.3%	57.1%	0.0%	100.0%
	% within grade	0.0%	5.3%	0.7%	1.9%	0.0%	1.3%
<b>TOTAL</b>	<b>Count</b>	<b>30</b>	<b>38</b>	<b>152</b>	<b>209</b>	<b>111</b>	<b>540</b>
	% within major	5.6%	7.0%	28.1%	38.7%	20.6%	100.0%
	% within grade	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The standard Spring and Fall schedules are fifteen weeks in length. This class was always held on a Monday, - Wednesday, - Friday schedule which would equal 45 class days. Natural school closings such as Spring Break, Labor Day and Thanksgiving break reduce that number to forty-two class period. Finally, there are three test days which are not included since the tests are required. Therefore, for calculation 39 class days are assumed to be standard. This number is

important as the number of absences is then divided by 39 to determine the percentage of classes missed. Table 4 depicts the number of absences, the percentage of classes missed, the grade earned, the total number of students for each absence amount and the failure percentage. Table 5 presents the same information except it lists the percentage of each grade instead of the raw number for each grade. The absences ranged from zero to 23.

Not surprisingly, the highest percentage of “A” grades were with students who did not have any absences. Further, not missing a class resulted in a 99.4% passing rate. One absence yielded less “A” grades but had the highest percentage of “B” grades. Students with three absences or less had a 96% chance of passing. Interestingly, after four absences, which represent 10% of the total classes, the failure rate doubles to nearly 10%. One more absence again doubles the failure rate, which only slightly increases at six missed classes. However, seven missed classes (18%) are a tipping point as the failure rate jumps to 58%. When a student misses eight classes (21%) the failure rate goes to 75%. Finally, after nine absences (23%) failure in the class becomes a 100% certainty (*see Tables 4 and 5*).

**Table 4: Absences and Grades in Units**

# Absences	% Missed of 39	F	D	C	B	A	Total	D/F %
0	0%	0	1	20	62	77	160	0.60%
1	3%	0	1	19	46	25	91	1.10%
2	5%	0	3	23	42	6	74	4.10%
3	8%	0	3	24	41	2	70	4.30%
4	10%	1	3	26	12	0	42	9.50%
5	13%	0	6	22	2	1	31	19.40%
6	15%	1	3	12	3	0	19	21.10%
7	18%	0	7	4	1	0	12	58.30%
8	21%	1	5	2	0	0	8	75.00%
9	23%	5	3	0	0	0	8	100.00%
10	26%	3	2	0	0	0	5	100.00%
11	28%	9	0	0	0	0	9	100.00%
12	31%	1	0	0	0	0	1	100.00%
13	33%	1	1	0	0	0	2	100.00%
14	36%	3	0	0	0	0	3	100.00%
16	41%	1	0	0	0	0	1	100.00%
17	44%	1	0	0	0	0	1	100.00%
18	46%	1	0	0	0	0	1	100.00%
21	54%	1	0	0	0	0	1	100.00%
23	59%	1	0	0	0	0	1	100.00%
<b>Total</b>		<b>30</b>	<b>38</b>	<b>152</b>	<b>209</b>	<b>111</b>	<b>540</b>	<b>12.60%</b>

**Table 5: Absences and Grades in Percentages**

# Absences	% Missed of 39	F	D	C	B	A	Total	D/F %
0	0%	0.00%	0.60%	12.50%	38.80%	48.10%	100.00%	0.60%
1	3%	0.00%	1.10%	20.90%	50.50%	27.50%	100.00%	1.10%
2	5%	0.00%	4.10%	31.10%	56.80%	8.10%	100.00%	4.10%
3	8%	0.00%	4.30%	34.30%	58.60%	2.90%	100.00%	4.30%
4	10%	2.40%	7.10%	61.90%	28.60%	0.00%	100.00%	9.50%
5	13%	0.00%	19.40%	71.00%	6.50%	3.20%	100.00%	19.40%
6	15%	5.30%	15.80%	63.20%	15.80%	0.00%	100.00%	21.10%
7	18%	0.00%	58.30%	33.30%	8.30%	0.00%	100.00%	58.30%
8	21%	12.50%	62.50%	25.00%	0.00%	0.00%	100.00%	75.00%
9	23%	62.50%	37.50%	0.00%	0.00%	0.00%	100.00%	100.00%
10	26%	60.00%	40.00%	0.00%	0.00%	0.00%	100.00%	100.00%
11	28%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
12	31%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
13	33%	50.00%	50.00%	0.00%	0.00%	0.00%	100.00%	100.00%
14	36%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
16	41%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
17	44%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
18	46%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
21	54%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
23	59%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
<b>Total</b>		<b>5.60%</b>	<b>7.00%</b>	<b>28.10%</b>	<b>38.70%</b>	<b>20.60%</b>	<b>100.00%</b>	<b>12.60%</b>

A Pearson Correlation revealed an extraordinarily strong correlation  $r = -.750$   $p < .001$  (see Table 7)

When examining the results by gender it reveals females earned a higher percentage of A's. Interestingly, the percentages of Bs were nearly identical. Males had higher percentages of C, D and F grades. Consequently, the male failure rate was 16% while the female failure rate was 6.6% (see Table 6).

It is clear there is a difference in grades by gender. A Chi-Square test revealed the  $X^2$  ( $df = 4, N = 540 = 29.505, p = < .001$ ). In addition, a Pearson Correlation showed a statistically significant, but much smaller correlation  $r = .155$   $p < .001$  (see Table 7).

However, there was no difference between final grade and major.

**Table 6: Grades by Gender**

	<b>F</b>	<b>D</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>Total</b>
# Female	5	8	46	76	62	197
# Male	25	30	106	133	49	343
<b>Total</b>	<b>30</b>	<b>38</b>	<b>152</b>	<b>209</b>	<b>111</b>	<b>540</b>
% Female /grade	2.5%	4.1%	23.4%	38.6%	31.5%	
% Male/grade	7.3%	8.7%	30.9%	38.8%	14.3%	

**Table 7: Statistics**

		absences
absences	Pearson Correlation	1
	Sig. (2-tailed)	
	N	540
grade	Pearson Correlation	-.750**
	Sig. (2-tailed)	<.001
	N	540
gender	Pearson Correlation	.155**
	Sig. (2-tailed)	<.001
	N	540
major	Pearson Correlation	0.001
	Sig. (2-tailed)	0.977
	N	540

Since seven absences appear to be the turning point between passing and not passing, the data was transposed utilizing gender and six absences or less and was compared to seven or more absences. Table 8 vividly illustrates how only 13.2% of students with seven or more absences will pass the class.  $r = -.621$   $p < .001$

**Table 8: Grades by Adjusted Absences**

<b>Grade</b>		<b>Absences &lt;=6</b>	<b>Absences &gt;=7</b>	<b>Total</b>
<b>F</b>	Count	2	28	30
	% within	0.4%	52.8%	5.6%
<b>D</b>	Count	20	18	38
	% within	4.1%	34.0%	7.0%
<b>C</b>	Count	146	6	152
	% within	30.0%	11.3%	28.1%
<b>B</b>	Count	208	1	209
	% within	42.7%	1.9%	38.7%
<b>A</b>	Count	111	0	111
	% within	22.8%	0.0%	20.6%
<b>Total</b>	Count	487	53	540
	% within	100.0%	100.0%	100.0%

Interestingly, when comparing by gender students with seven or more absences, only 4.3% of female students passed as compared to 4.6% of males who passed. However, a weak but statistically significant difference by gender was found. Females were more likely to have higher scores than males (*see Table 9*).  $r = -.220$   $p < .001$  (*see Table 10*).

**Table 9: Grades by Gender and Adjusted Absences**

		<b>Absences &lt;=6</b>	<b>Absences &gt;=7</b>
<b>Female</b>	<b>F</b>		100.00%
	<b>D</b>	37.50%	62.50%
	<b>C</b>	95.70%	4.30%
	<b>B</b>	100.00%	
	<b>A</b>	100.00%	
<b>Male</b>	<b>F</b>	8.00%	92.00%
	<b>D</b>	56.70%	43.30%
	<b>C</b>	96.20%	3.80%
	<b>B</b>	99.20%	0.80%
	<b>A</b>	100.00%	

**Table 10: Correlation of Adjusted Absences**

		grade	newabsences7	gender
Grade	Pearson Correlation	1	-.621**	-.220**
	Sig. (2-tailed)		<.001	<.001
	N	540	540	540
New Absence	Pearson Correlation	-.621**	1	.095*
	Sig. (2-tailed)	<.001		0.028
	N	540	540	540
Gender	Pearson Correlation	-.220**	.095*	1
	Sig. (2-tailed)	<.001	0.028	
	N	540	540	540

## Conclusion and Discussion

The four research questions can be answered from the results.

### 1. Is there a relationship between attendance and final grade?

Yes, there is a very strong statistically significant relationship between attendance and the final grade earned by students.  $r = -.750$   $p < .001$

This finding is supported by Alexander & Hicks, 2016; Broucek and Bass, 2008 Clump, Bauer and Whiteleather, 2003; Credé & Kieszczynka, 2010; Jover et al., 2018; Fidanza, 2006; Grump, 2005; Karnik et al., 2020; Kezim & Pariseau, 2010; Launius, 1997; Li, et al., 2021; Lin, 2014; Neri & Meloche, 2007; Nordmann et al., 2019; Rendleman, 2017 Ruenitz, 2000; Schmulian & Coetzee, 2011; Senior, 2008; Thomas and Higbee, 2000; Wasan et al., 2021; Yakovlev and Kinney, 2008).

Further, like the authors of this study, Credé, Roch, & Kieszczynka (2010) contend class attendance is a better predictor than the SAT test, high school grade point average, or study habits.

This finding is not supported by Berenson, Carter, and Norwood, 1992; Hollett et al., 2020; Kauffman et al., 2018; Moore, 2005; Nordmann et al., 2019; and St. Clair, 1999.

### 2. Does gender affect the relationship between attendance and final grade?

Yes, but at a much more moderate rate. While statistically significant, the results are mathematically significant, meaning the results did not occur by chance, but may not be practically significant.  $r = .155$   $p < .001$

This finding is supported by Chung, et al (2018) Kumar (2018) Cecilia, et al, (2019) Hakami (2021)

This finding is not supported by Moore (2005) Ajiboye & Tella (2006) Chenneville and Jordan (2008), Durfee et al (2014).

**3. Does academic major affect the relationship between attendance and final grade?**

No, the student's academic major did not impact attendance and final grade.

$$r = .001, p < .977$$

**4. Is there a point where lack of attendance can predict failure?**

Yes, missing nine classes the student would have missed 23% of the scheduled class sessions. When students reached this number of absences, 100% of the students did not pass.

This finding is supported by Chen and Lin, 2008; Kassarnig et al., 2017; Khan et al., 2019; and Moore, 2006.

*Recommendations*

Educators want students to succeed. Faculty should consider discussing the impact of class attendance and how it could impact their final course grade in the first-class meeting. It would let students know the expectations and the implications of missing future classes.

Faculty who do not have a mandatory attendance policy should consider adding one. This is an interesting conundrum since students in most states have reached the age of majority, they are deemed adults and thus capable of making their own decisions. Students wish to exercise their newfound freedoms while faculty want to treat them like adults. However, many students lack the maturity to realize class attendance is in their best interest. Because of the lack of maturity, Hersey and Blanchard (1982) recommend a telling style for followers who are unable or unwilling, resulting in mandating attendance. As an example, after a four-year study of Macroeconomic students, Brocato (1989) found attendance is more important for younger college students.

Taking attendance can be an arduous and time-consuming task. Passing around an attendance sheet doesn't prevent a student from signing in their classmates. Some faculty perform a knowledge check in the last five minutes of class where the faculty present a question for students to answer and turn in as they leave. Examples along the line of "What was one thing that surprised you about the material today" or "What is one way our topic be applied in a real-world setting? The advantages are that faculty can use this as an attendance tool, but more importantly, allow them to identify which topics students are having difficulty grasping, but this process would be more work for the professor.

There are technological solutions which can help ease this burden. For example, CourseKey's Sound Attendance allows the teacher's device sends out an inaudible signal to the students' phones where they can check in and affirm that they are in class (support.coursekeyeducation.com). QR codes are another effective tool as instructors create an online survey and display a QR code students must scan with their phones to register attendance (jotform.com).

Make classes exciting by incorporating engagement or use the benefits of the flipped classroom. The Derek Bok Center for Teaching and Learning at Harvard University defines a flipped classroom as one that is “*structured around the idea that lecture or direct instruction is not the best use of class time. Instead, students encounter information before class, freeing class time for activities that involve higher order thinking.*”

Sadly, attending class doesn't guarantee a better grade as there are some students who are present in body and not in mind or grapple with tests and projects which leads to failure. Conversely, missing eight or more (21-23%) of the class meetings nearly guarantees failure will be the result. This finding was supported by Moore, (2006) who found students who attended less than 20% of classes had an 82%-98% chance of making an F, and no chance of making above a D.

Finally, many teachers give students a fixed number of absences they can use for any reason. The results suggest students should not seek the short-term gratification of not having to go to class as opposed to the draconian effects of having to take the class over. This is reminiscent of the old axiom from Kafka, “Better to have, and not need, than to need, and not have.” It would be wise to adhere to this wisdom!

## **Future Research**

Future research could examine differences in other Business classes and with data from other faculty. Further, non-Business classes where Education, Natural Sciences, and Liberal Arts have the majority of students enrolled to see how their behavior compares. Compare required classes to voluntary electives to see if Friedman, Rodriguez & McComb's (2001) finding of higher attendance rates in elective courses versus required courses is applicable.

Since several studies found the students motivation to be engaged in the class was a greater factor than attendance ( Hollett et al., 2020; Kim, et al., 2020; Rendleman, 2017), perhaps study on the factors which motivate students rather than just class attendance could be studied.

An examination of the effects of the pandemic on university attendance policies. In addition, with the implementation of blended, synchronized online, and full online instruction, an investigation into attendance and engagement metric could be studied. Does watching a live video or a recorded video impact learning? Also, the efficacy of discussion boards could be studied to determine student engagement.

An exploration of other factors in the classroom which could impact learning such as size of the class, the ability of the faculty, the length of class and delivery (50 minutes three times a week, 75 minutes two time a week or 150 minutes once a week) and compare the time of day-early morning 8 am, midmorning, early afternoon, late afternoon and early evening are some of the items to be studied.



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