

The Impact of Cell Phone Use on Academic Achievement in College Students

By Michaela Duranti

Submitted in Partial Fulfillment of the Requirements for the  
Degree of Master of Education

May 2020

Graduate Programs in Education  
Goucher College

## Table of Contents

|   |    |
|---|----|
| List of Tables  | i  |
| Abstract  | ii |
| I. Introduction   | 1  |
| Overview  | 1  |
| Statement of Problem  | 2  |
| Hypothesis  | 2  |
| Operational Definition  | 2  |
| II. Review of the Literature                                    | 4  |
| Primary Use of Cell Phones for College Students                 | 4  |
| Short and Long Term Effects of Cell Phone Use on the Human Body | 5  |
| Impact of Cell Phone Usage on Academic Achievement              | 6  |
| Summary   | 7  |
| III. Methods  | 8  |
| Design  | 8  |
| Participants  | 8  |
| Instrument  | 9  |
| Procedure   | 9  |
| Analysis Plan   | 10 |
| IV. Results   | 11 |
| V. Discussion   | 15 |
| Implication of Results  | 15 |
| Theoretical Consequences  | 16 |

|  |    |
|--|----|
| Threats to the Validity                              | 16 |
| Connections to Previous Studies/ Existing Literature | 17 |
| Implications for Further Research                    | 17 |
| Conclusion   | 18 |
| References   | 19 |

## List of Tables

|  |    |
|--|----|
| 1. Trend of Cell Phone Use (Minutes) for Four Weeks  | 11 |
| 2. Trend of GPA (0-4 scale) for Four Weeks           | 12 |
| 3. GPA vs. Cell Phone Use with Linear Regression Fit | 13 |
| 4. Mean Cell Phone Use in Minutes per Week           | 13 |
| 5. Mean GPA (0-4 Scale) per Week                     | 14 |

## Abstract

The purpose of this action research was to determine if the academic achievement of college students was affected by the amount of time spent on their cell phones. The measurement tool was the online application Canvas and Screen Time, two applications that collect data. The study involved the use of weekly data tracking through multiple forms of online applications that measured times in minutes, and GPA (grade point average). Academic achievement was found to be negatively impacted the more time a student spent on their cell phone. Research in this area should continue given the heightened state of technology in our current times, and in an effort to put preventative measures in place.

# **CHAPTER I**

## **INTRODUCTION**

The purpose of this study was to determine the impact of cell phone use on the academic achievement of college students.

### **Overview**

The study was conducted to show the relationship between cell phone use and academic achievement for college age students. The background of this problem is that even though cell phones are recent technology, in their short existence they have already had detrimental effects on many persons. It is important to recognize that cell phones not only impact academic achievement directly but also the human body. The effect of cell phones on the human body then begins to affect academic achievement. This occurs by impacting areas such as sleep patterns, psychological addiction, and overall fitness. These and others affect the capability of a college student to achieve the academic success he/she desires. Studies conducted have determined that something as simple as sending a text has a negative correlation with final grade scores (McDonald, 2013). While correlation does not prove causation, statistical relationships are the first step in establishing that one variable causes another.

The problem of cell phone use in college students is pervasive in today's society, and it shows no signs of stopping. Students are receiving cell phones at younger ages which only jumpstarts the deterioration of academic achievement. Not only do professors need to be more aware of these situations and implement strict cell phone policies, but the students themselves need to become more educated and self-regulated. They can-not rely on the guidance from their parents at this point in their lives since they are adults, which means that they need to take control of their cell phone usage as well as their academics and take them more seriously.

Those who teach at the college level and students who take their education very seriously observe these effects on a first-hand basis. Students who do not let their cell phones distract them still pay a price because other students take attention away from professors due to constant reprimanding. Also, students not using a cell phones in class may be seated next to students who constantly use their cell phones in class. Colleges and universities need to take a stand before this becomes a more persistent issue leading to irreversible consequences.

### **Statement of the Problem**

This study was conducted to determine whether there is an impact on college students who are spending too much time on their cell phones, and not enough time on their academics.

### **Hypothesis**

A student's academic achievement will not be related to the amount of time that is spent using their cell phone.

### **Operational Definitions**

The independent variable is the amounts of time students use their cell phones. This will be measured through tracking the number of minutes per day and will be collected over a one-month period. There are new apps on phone that calculate the amount of screen time used per day; the researcher will use this data to calculate how long students are spending time on their phones. For this study, data will be collected from eight students, constituting a convenience sample. A Microsoft Xcel sheet will be used to keep track of all data by asking the students on a weekly basis to check the data collected on their phone apps. For the purpose of this study, the focus will be on the amount of time each student spends on his or her cell phone, rather than time and type of use.

The dependent variable is student academic achievement. Achievement will be measured by evaluating students' grades after a one-month period has passed, specifically looking into their current GPAs. The individual GPA will be collected prior to the beginning of the study; this way there is baseline data. The achievement statistic will be obtained through personal conversations with each student participating in the study. The students will be from one college, and the specific cohort will be seniors. Access to students will be obtained through the help of a family member who attends the college.



## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

This literature review will consist of several articles that specifically focus their attention on the impact of cell phone usage. Section one focuses on what cell phones are being used for in everyday life for the college student. Section two discusses the long- and short-term effects that cell phone use has on the human body. Section three discusses the affect that cell phone use has on overall academic achievement.

#### **Primary Use of Cell Phones for College Students**

In today's society it is considered "abnormal" not to own a cell phone, and not just any cell phone, but specifically cell phones that have access to certain amenities. These amenities exist in the forms of applications or "apps" that connect us to friends and family through social media, text messaging, Facetiming, etc. According to Hanson, Drumheller, Mallard, McKee, and Schlegel (2010) "The student time diaries illustrated that students are spending a significant amount of time with personal communication and technologies associated with personal communication and less time with academic-related work" (p. 26). This study was a great indication of the fact that students are not always using their time wisely in an academic setting. More often than not on a college campus, students have their phones in their hands and simply disregard the outside world. Students may miss out on opportunities to learn from experienced professors who have an immense amount of knowledge to share because they are too busy seeing what a friend posted online.

The way people communicate with one another has nevertheless changed due to frequent cell phone use and has now filtered over into the world of academics. Gradinaru (2018) states the

following “Social media shaped the way in which people think, read, write, and search information” (p.35). This statement holds true in so many ways, and although not all cell phone connections are shed in a negative light, they continue to affect how one performs academically. That being said, even if people are attempting to stay connected with family or friends who are not at their immediate disposal, they may be missing out on the opportunity to form new relationships.

### **Short- and Long-Term Effects of Cell Phone Use on the Human Body**

Not only do cell phone affect the way relationships are formed between two people, they can be detrimental to our short- and long-term health. There are several negative factors that can be attributed to cell phone use. According to Ingle, Kohli, Meena, and Verma (2016) “Headache, dizziness, numbness in the thigh, and heaviness in the chest were reported among frequent mobile phone users. The study reported an increase in heart rate variability when the mobile phone is kept close to the chest and a decrease when kept close to the head.” (p.6). There are also effects that pregnant women fail to acknowledge, according to Abbassy, Azmy, Bibars, Farid and Taha (2009) who state that “fetal heart rate (FHR) showed higher amplitude of rise while the electromagnetic field was generated than when the phone was switched off” (p.280). Being physically fit is one key factor for a person who intends to live a long, healthy lifestyle. According to Barkley, Karpinski, and Lepp (2014) “High cell phone users were less physically fit than low cell phone users.” (p. 343). Over usage of cell phones can limit one’s life expectancy and cause a person bodily harm.

When the topic of addiction is considered, cell phones don’t spring immediately to mind. That type of addiction does exist these days. According to Chiu, Hong and Huang (2012) “Internet addiction research suggests that young people may not be addicted to the internet itself

but are rather addicted to internet activity” (p. 2153). For many, a cell phone becomes such an addiction that it not only affects daily actions, but also how the body recovers. Sleep is an imperative function for the body’s restorative practices, and lack thereof does not allow humans to function as they should. A study conducted by Carter, Chopak-Foss, and Punungwe (2016) determined that “Cell Phone usage before bed was associated with increased sleep latency, awakenings throughout the night, and waking up too early. The cumulative effects of sleep deprivation and poor-quality sleep show an unrecognized public health problem in the college student population” (p. 316).

Not only are there many physical effects that cell phone use has, but there is a lot of research into the psychological effects that come with cell phone usage. Chiu et al. (2012) determined that there is a stronger relation between female students’ psychological characteristics (including social extroversion, anxiety, and self-esteem) and their mobile phone addiction than their mobile phone behavior” (p. 2157). When a person is not feeling his/her best both physically, and psychologically it may reflect poorly on his/her academic achievement.

### **Impact of Cell Phone Usage on Academic Achievement**

Academic achievement can be measured in many ways, and when it comes to academics on a collegiate level, numbers matter. The difference between passing or failing a test in college can possibly contribute to determining the course of an individual’s life. In a study conducted in Australia amongst primary, secondary, and university students Kemp, Waldron, and Wood (2017) determined that “For university students, however, those who were stable users of predictive messaging performed significantly less well over time on the pseudoword orthographic task than stable nonusers” (p. 399). Studies that are similar in nature at times conclude that text messaging does still have a negative effect on even college level individuals.

Achieving academic competence is one indicator for the overall well-being of an individual. Cell phones may be unfortunately prohibiting many individuals from reaching their full potential as a scholar. McDonald (2013) discovered that “While attendance can be strongly linked to academic performance, a more accurate reflection would be in-class behavior. While a professor certainly cannot control for individual behavior such as daydreaming or doodling, this study presents the necessity of some type of effective texting policy” (p. 39). McDonald concluded the study by determining that “The study showed there was a negative correlation in the relationship between in-class texting and final grade score” (p. 34). This study shows just how significant an impact a cell phone can have on the academic achievement of a college student.

### **Summary**

The review of the literature suggests that cell phone use has a negative impact on the overall well-being of both males and females across many demographics. The literature first determines the main reason why the majority of individuals are using a cell phone, and to what benefit cell phone use has. The literature then discussed the impact on the individual by looking at both short and long terms effects on the body. This then correlates with the third section that the literature discussed which was the impact of cell phone usage on academic achievement. Research regarding to cell phone usage has been conducted across many levels and can thus guide research specifically at the collegiate level.

## **CHAPTER III**

### **METHODS**

This study investigated the impact on cell phone use and the overall academic achievement of college aged students. The goal of this study is to determine if time spent using cell phones is related to overall grade point average (GPA). Such data would be the first step to establish if usage has an impact on impact on academic achievement.

#### **Design**

This study is based on the quasi-experimental design. Students were assessed by collecting data based on their GPA at the beginning of the study, and then again at the end of the study. The data collection period began February 1, 2020, and was completed four weeks later on March 1, 2020. Data were collected on a weekly basis in the same way from each student. Cell phone usage is collected and recorded based on the minutes used.

#### **Participants**

In this study, the participants were eight college students entering the last semester of their senior year. The school used in this research is located in the Washington D.C area. There is a total of around 25,613 students enrolled at the University. The population is very diverse, and students come from families of all different socio-economic status.

The eight students that were selected to participate in this study were based on accessibility and willingness to participate. These students were interviewed and determined that cell phone use could possibly be contributing to their academic achievement. Out of the eight students, four students were female while the remaining three were male. The age range between the students was 21-23. Each student happened to have a major. The eight students were not receiving additional services in the classroom, nor required them.

## **Instrument**

For this study, cell phone use was determined through the app “screen time.” The researcher used this data at both the beginning of the one-month period, and at the end. Periodically on a weekly basis as well. GPA was determined through “Canvas,” a course management system that the University uses.

## **Procedure**

Based on accessibility, eight students from a University located in the D.C area participated in this study. Each student shared the classes they would be taking this semester, in terms of how many. Students also shared their grades in each class on a weekly basis. Each week the students would discuss the data collected from the “Screen Time” app on their phones with the researcher.

The duration of this action research project lasted approximately four weeks. The students had phone conversations with the researcher that lasted anywhere between ten to fifteen minutes on a weekly basis. Data was collected in an efficient manner through an XCEL document, and was not shared with the other participants in the study. Information was kept private and confidential to protect the identities of each student. Permission was collected from each student and they understood the fact that their personal names and information would not become available to the public.

## **Analysis Plan**

The following calculations will be made for the eight students in the study:

- Weekly GPA
- Overall weekly cell-phone use in minutes

The following statistical analyses were computed:

- Fit time series curves using regression (linear or nonlinear) to the weekly cell phone use and the weekly GPA
- Correlate the weekly phone use with the weekly GPA
- Test the null hypotheses of no population relationships between the weekly cell phone use and the weekly GPA

## CHAPTER IV

### RESULTS

The main finding of this study is that cell phone use is related to overall academic achievement in college students. Cell phone use in minutes was collected weekly from eight college students. GPA was collected weekly from the same students. A linear trend line was fitted to the mean weekly cell phone use as well as to the mean weekly GPA. The eight students attended the same University in the Washington D.C area, allowing for both access and willingness to participate in the study. Cell phone use in minutes was determined through the app “Screen Time,” and GPA was determined through usage of “Canvas.” “Canvas” is a web-based learning management system.

Table 1

*Trend of Cell Phone Use (Minutes) for Four Weeks*

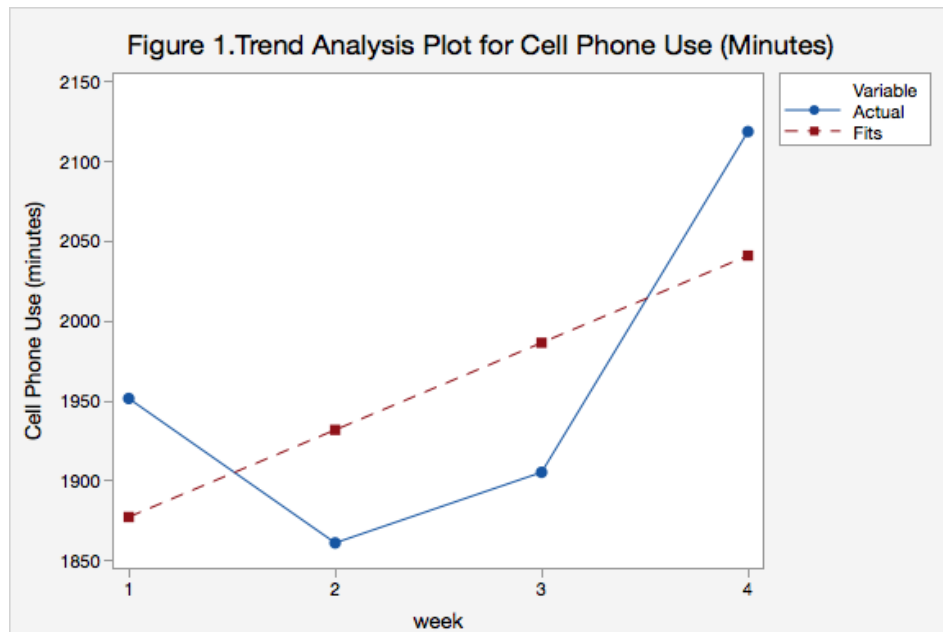




Table 1 illustrates linear regression trend explained 39% of the weekly variation in cell phone use. The linear regression line has a constant slope of +54.6 minutes per week.

Fitted Trend Equation:  $Y = 1822.75 + 54.6 \times t$

Table 2

*Trend of GPA (0-4 scale) for Four Weeks*

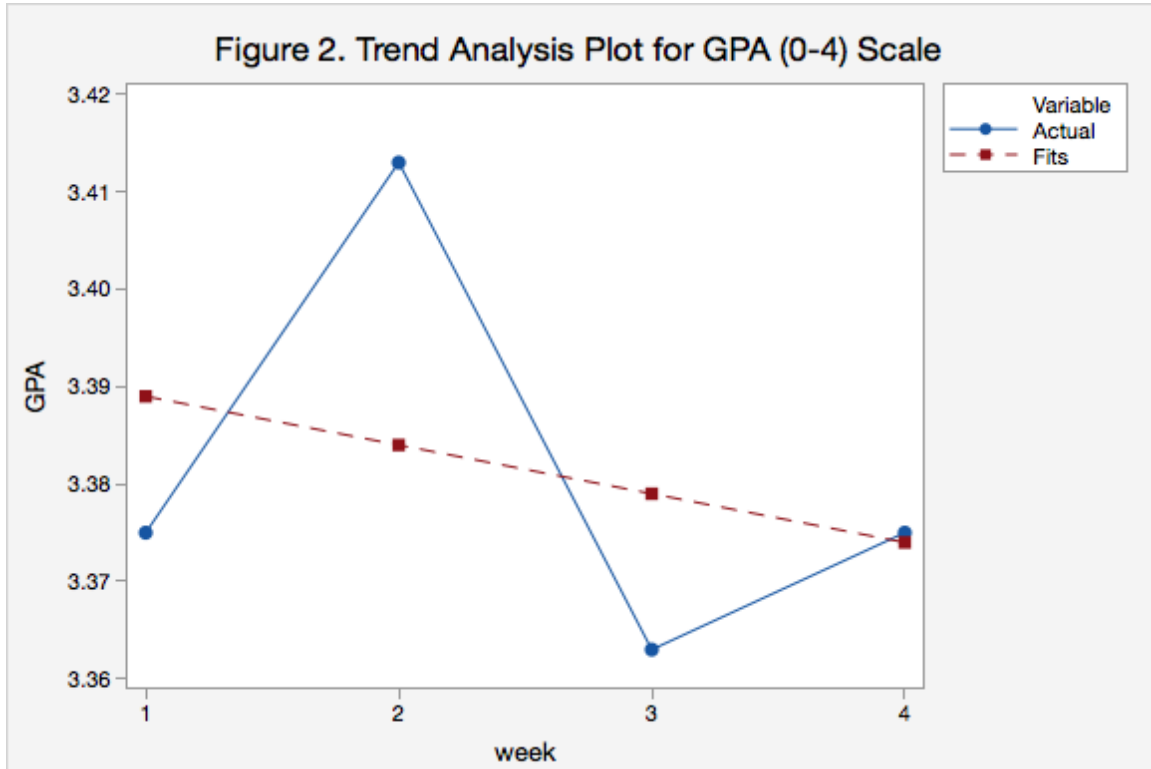


Table 2 shows linear regression trend explained 9% of the weekly variation in GPA. The linear regression line has a constant slope of -0.005 GPA points per week.

Fitted Trend Equation:  $Y = 3.394 - 0.005 \times t$

The GPA in Week 2 was outside of the general trend and likely affected the slope of the line.

Table 3

*GPA vs. Cell Phone Use with Linear Regression Fit*

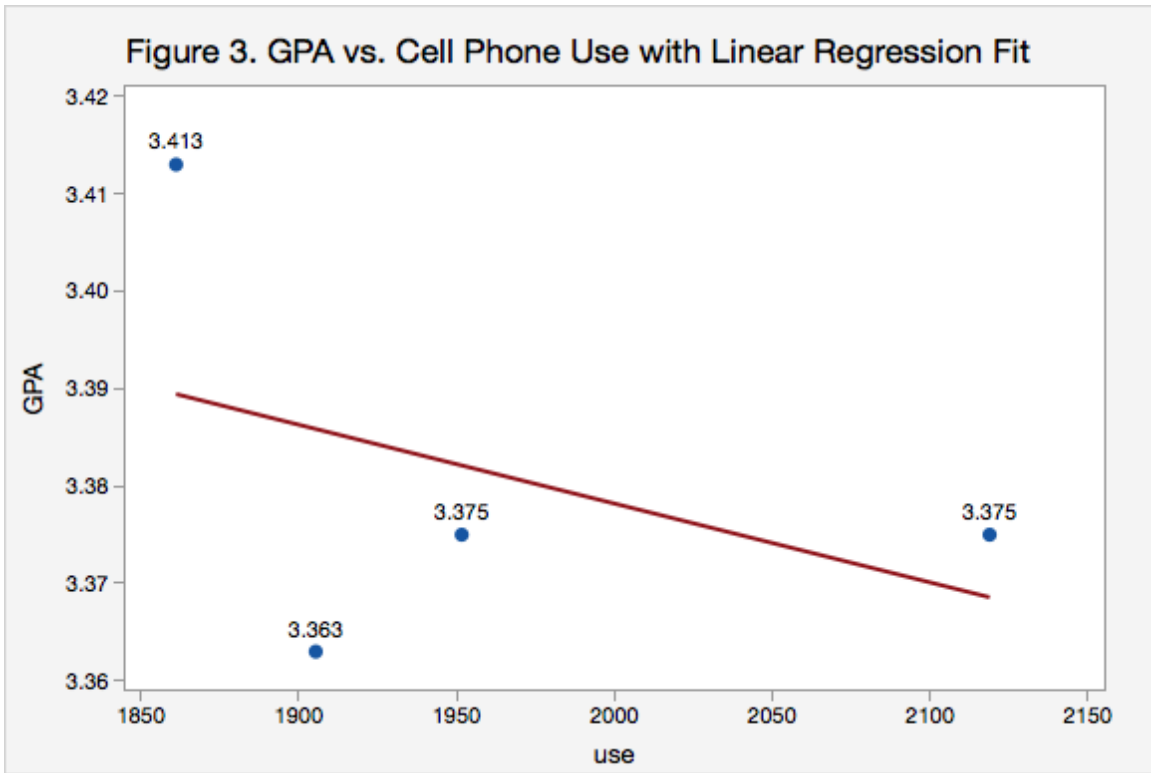


Table 3 illustrates cell phone use explained 18% of the variation in GPA. The linear regression line has a constant slope of  $-0.000081$  GPA points per each extra minute of cell phone use. Recall that GPA is a very short scale of 0-4. That's why the change in GPA per unit change in use (1 minute) is such a small number- ( $-0.000081$ ).

Table 4

*Mean Cell Phone Use in Minutes per Week*

| Variable | Week | N | Mean    |
|----------|------|---|---------|
| use      | 1    | 1 | 1951.63 |
|          | 2    | 1 | 1861.13 |
|          | 3    | 1 | 1905.38 |
|          | 4    | 1 | 2118.88 |

Table 5

*Mean GPA (0-4 Scale) per Week*

| <u>Variable</u> | <u>Week</u> | <u>N</u> | <u>Mean</u> |
|-----------------|-------------|----------|-------------|
| GPA             | 1           | 1        | 3.375       |
|                 | 2           | 1        | 3.413       |
|                 | 3           | 1        | 3.363       |
|                 | 4           | 1        | 3.375       |

## **CHAPTER V**

### **DISCUSSION**

This study was conducted to determine whether the GPA of college students would be associated with their weekly cell phone usage. Through a quasi-experimental design, an assessment of data took place by comparing cell phone usage in minutes to GPAs on a weekly basis. The research took place over a four-week period of time. The null hypothesis that a student's academic achievement is not related to the amount of time that is spent using their cell phone was rejected.

#### **Implications of Results**

The results of this action research show that the more time a college student spent on their phone, the lower their GPA was. Cell phone use trended upward across the four weeks of the study, while GPA trended downward during the same four weeks. Taken together, cell phone use and GPA were inversely and moderately related statistically significance. Weeks (1-4) and cell phone use were correlated .63, weeks (1-4) and GPA were correlated -.30, and cell phone use and GPA were correlated -.42. None of the correlations were statistically (mathematically) significant at the customary  $\alpha=.05$ , most likely due to very small samples. The treatment effect of cell phone use on GPA, using the correlation coefficient as the effect size, was medium (Cohen, 1992). Therefore despite the small sample size that prevents the statistical test of the null hypothesis from detecting a population correlation, the relationship between cell phone use and GPA has practical significance. The results of this action research study would likely occur in other similar college classrooms. The practical effect of increasing cell phone use would be detrimental to overall achievement as measured by weekly GPA. Of course, the current study did not differentiate different types of cell phone use, collected only the total number of minutes per

week, and was limited to four weeks duration. Nevertheless, the observed inverse relation between cell phone use and GPA, even though the data are limited, registered practical if not mathematical significance.

### **Theoretical Consequences**

Cell phones have been known to cause a number of consequences when used for extended periods of time. This study showed that during a four-week period, students were already experiencing a decrease in GPA while their cell phone use increased. While the results of this study cannot prove that cell phone use caused GPA to decline, it can be inferred that this trend would continue throughout the remainder of the semester causing continuous academic distress. This could then lead to more serious complications such as, failure to produce high quality work and achieve a strong GPA resulting in disadvantages when entering the work force.

### **Threats to the Validity**

There are factors that impacted the validity of the study, especially in how data was collected from each student. Although communication took place on a consistent basis, students were given the charge of providing truthful results. There is always a chance that the participants in the study provided false information. If this happened, the findings of this study would have skewed data. In addition, as students began to understand their data, they may have adjusted the amount of time they were spending on their cell phone. This newfound awareness may have limited the time they spent on their phones.

Threats to validity also exist when attempting to determine what students are using their cell phones for. Collecting data using eight students over a four-week period provided a great deal of information, but also comes with limitations. For example, only the total minutes of use were collected. The minutes were not broken down by specific type of use. It is possible that

subdividing the minutes by type could provide more useful and precise estimates of the effect of cell phone use on GPA. Also, GPA could be too general and insensitive to subtle changes in achievement that are related to specific types of cell phone use. A range of subject specific achievements could provide a stronger link to certain types of cell phone use. Much of the technology that exists today is designed to be beneficial to students, and not always a means for distraction. If a student is using his or her cell phone to further understanding, then this could result as an increase in GPA. Students may also have a job that requires them to use their cell phone.

### **Connections to Previous Studies/ Existing Literature**

Studies that have been conducted on this topic have shown similar results. Coryn, Kates, and Wu (2018) found that “There appears to be a consistent negative, albeit small, effect on educational achievement” (p.112). Coryn, et al.’s study provides an example of research conducted on a larger scale that, has produced similar results. Similar studies have been conducted that produce results using an array of individuals in their study to gain a better understand of lasting effects. Barkley, et al. (2014) found that “The student who uses the cell phone more on a daily basis is likely to have a lower GPA than the student who uses the cell phone less” (p. 6). Literature suggests that cell phone use continues to negatively impact academic achievement in students of various ages.

### **Implications for Future Research**

The study revealed that during a four-week period the minutes spent on a cell phone per student were inversely related to GPA. The timeline of the research could have possibly impacted the results, due to the fact that it was not conducted over an extended period of time. Future research should follow students throughout an entire semester, or an entire academic

school year. It would be beneficial, therefore, to conduct additional research on a larger scale over a longer time and with a larger sample of participants. Research could be conducted in a more controlled environment where the researcher has better access to what exactly the cell phone is being used for. Cell phone use could be tracked on a larger scale and throughout an even longer period of time if research were to begin when a student first received a cell phone. Tracking usage throughout high school, and then onto college could help to demonstrate when the excessive usage takes place. Could this be a trend across different age groups, or once stricter rules/regulations of cell phone usage no longer exist when a person becomes more independent as age increases does cell phone use increase?

### **Conclusions**

This action research study is a health-related reminder of the impact that cell phones have on peoples' everyday lives. The use of cell phones in day to day life continues to increase. Cell phones can be a means of connecting to others, but at the same time they have negative effects, as well. Human interaction is imperative to our individual growth. This interaction does not take place when people are constantly on cell phones. Students, in particular, may become more distracted by cell phones during class instruction on multiple academic levels. It is becoming increasingly more common for young children to have cell phones, which means this cycle only starts earlier.

This goal of the current study was to provide perspective on the prolonged impact that cell phone use can have on college students. It may be important to remind college students that they should aim to focus their attention on the plethora of information that college can provide to them so that they may become productive members of society after graduation.

## References

- Abbassy, A., Azmy, O., Bibars, M., Farid, A., & Taha, T. (2009). Consequences of exposure to electromagnetic waves of mobile phones on fetal blood flow and heart rate. *Archives: The International Journal of Medicine*, 2(3), 279–281. Retrieved from <https://goucher.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=44451983&site=ehost-live&scope=site>
- Barkley, J. E., & Karpinski, A. C. & Lepp, A., (2014). The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students. *Computers in Human Behavior*, 31, 343-350. doi:10.1016/j.chb.2013.10.049
- Carter, B., Chopak-Foss, J., & Punungww, F. B. (2016). An analysis of the sleep quality of undergraduate students. *College Student Journal*, 50(3), 315–322. Retrieved from <https://goucher.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=118727236&site=ehost-live&scope=site>
- Chiu, S.-I., Hong, F.-Y., & Huang, D.-H. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese university female students. *Computers in Human Behavior*, 28(6), 2152–2159. <https://doi.org/10.1016/j.chb.2012.06.020>
- Cohen, J. (1992) A power primer. *Psychological Bulletin*, 112(1), 156-159.
- Coryn, C., Kates, A., & Wu, H. (2018). The effects of mobile phone use on academic performance: A meta-analysis. *Computers and Education*, 127, 107-112. <https://doi.org/10.1016/j.compedu.2018.08.012>



- Gradinaru C. (2018). Social media and literature: A troublesome relationship. *Argumentum: Journal the Seminar of Discursive Logic, Argumentation Theory & Rhetoric*, 16(1), 35–50. Retrieved from <https://goucher.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ufh&AN=128556229&site=ehost-live&scope=site>
- Hanson, T. L., Drumheller, K., Mallard, J., McKee, C., & Schlegel, P. (2010). Cell phones, text messaging, and Facebook: Competing time demands of today's college students. *College Teaching*, 59(1), 23–30. <https://doi.org/10.1080/87567555.2010.489078>
- Ingle, G. K., Kohli, C., Meena, A, Verma, J. (2016). Mobile phone use and possible cancer risk: Current perspectives in India. *Indian Journal of Occupational & Environmental Medicine*, 20(1), 5–9. <https://doi.org/10.4103/0019-5278.183827>
- Kemp, N., Waldron, S. & Wood, C. (2017). Use of predictive text in text messaging over the course of a year and its relationship with spelling, orthographic processing and grammar. *Journal of Research in Reading*, 40(4), 384–402. <https://doi.org/10.1111/1467-9817.12073>
- McDonald, S. E. (2013). The effects and predictor value of in-class texting behavior on final course grades. *College Student Journal*, 47(1), 34–40. Retrieved from <https://goucher.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=92757381&site=ehost-live&scope=site>