THE EFFECTS AND PREDICTOR VALUE OF IN-CLASS TEXTING BEHAVIOR ON FINAL COURSE GRADES

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Cell phones have become a norm within the collegiate environment but little research has examined their impact on academic attainment. The purpose of this study was to examine the effects that in-class texting behavior had on the final grade score in a freshmen level introductory social science course. Students in three different sections were given three different texting policies to elicit a variety of in-class texting behaviors. Students were given after-course-surveys examining in-class texting behaviors. Final exam scores and texting behaviors were subjected to a Pearson’s correlation as well as a regression analysis. Students GPA as well as ACT scores were also examined in the regression analysis. The study showed there was a negative correlation in the relationship between in-class texting and final grade score. In-class texting was significant in negatively impacting grades after GPA, ACT, and attendance were controlled. While GPA and ACT were still the strongest predictor values, in-class texting behavior still contributed to 22% of the predictor value in final grade.

As technology and information expands, so does their use. Cell phones are quickly becoming one of the most used communications technologies in our culture with over 94% of college students using cell phones (Burns & Lohenry, 2010). Cell phones have begun to permeate every facet of the personal, professional, and academic world. Understanding that cell phones have become a norm within the collegiate environment, it is important to examine the academic implications of cell phone usage within the college classroom and their impact on academic attainment. Educational attainment is an important understudy due not only to the many stakeholders (families, individuals, institutions) but to society as a whole (lenders, economy, service). This study examined the effects of in-class cell phone texting on final grades in a freshmen level introductory social science course.

College Academic Attainment

A significant amount of literature exists that uses standardized tests such as the SAT and ACT as predictors of successful academic attainment as measured by college grades (Munday, 1970; Betts & Morell, 1999; Stumph & Stanley, 2002; Cohn, et al., 2003; Cornel, et al., 2005; Grove, et al., 2006). Munday (1970) explained that correlation of the ACT plus high school GPA showed to be strong predictors of the GPA of college freshmen. Berry and Sackett (2009) argued that if college GPA is the criteria used for academic performance, standardized entrance exam (SAT and ACT) scores as well as high school GPAs are the best predictors. By using SAT scores as well as entering course GPAs, researchers have presented impressive criterion related validity to account for more than half of the variance in college grades in freshmen.
level courses. Berry and Sackett’s (2009) use of both SAT or ACT scores and high school GPA are strong predictors for freshmen level courses.

A strong third predictive factor shown throughout the literature is class attendance (Jenne, 1973; Launius, 1997; Moore, 2003; Moore, et al, 2003; Newman-Ford, Fitzgibbon, Lloyd, & Thomas, 1999). Crede, Roch and Kiesczynka (2010) conducted a meta-analysis examining the relationship between college class attendance and grades. The research showed that class attendance was positively correlated to grades of individual classes as well as overall GPA in college. Moreover, Crede, Roch and Kiesczynka (2010) argued that class attendance was the strongest predictive factor of academic performance including both cognitive (ACT scores, high school GPA) and non-cognitive measures (self-efficacy, study habits, etc.). Crede and Kuncel (2008) presented a meta-analytic review which highlighted that non-cognitive measures, such as study skills and study habits, were almost as predictable as those within the cognitive realm. However, Crede, Roch and Kiesczynka (2010) maintained that classroom attendance should be mandatory as it reflects the strongest predictor for final individual course grades as well as overall college GPA.

In this current study, the college where the data was collected has implemented an institution wide attendance policy. Stephenson (1994) presented that required attendance is not practical within larger institutions where large class size makes taking attendance almost impossible. Hoekstra (2008) argued that new technology, such as classroom clickers or electronic attendance systems (Newman-Ford, Fitzgibbon, Lloyd, & Thomas, 1999) could alleviate this burden. At the college where this data was collected, professors use clickers as well as electronic monitoring systems for class attendance.

**Cell Phones in the Classroom**

Although cell phones are an excellent communication tool, they can also be a nuisance. While appropriate in various settings, Campbell (2006) found that cell phone usage in the classroom was seen as unacceptable by students. Gilroy (2004) highlighted that professors see cell phones as an annoyance and intrusive inside the classroom. Further research from Campbell (2006) highlighted that both professors and students saw texting behavior inside the classroom as being rude and cell phone usage in general, specifically the ringing, as distracting.

Such ringing of cell phones was studied by End, Worthman, Mathews, and Wetterau (2010) to examine if cell phone usage was related to academic impairment. In the study, students were instructed to take notes during a video on which they were to later be tested. Compared to the control group, who did not have cell phones ring during the video, the experimental group, whose phones did ring during the video, performed significantly worse on the disrupted test items. They were also less likely to include those items in their notes.

Burns and Lohenry (2010) highlighted that inappropriate use of cell phones in the classroom is of significance because of its potential to impact learning and instruction. Furthermore, they go on to correlate the distraction of cell phones (texting, checking phone, messages, etc.) to the possible distractions in the students future workplace which could lead to significant issues with workplace performance for themselves and possibly others. They advocate for a program development and student orientation of cell phone policies as well as appropriate modeling and highlighting cell phone etiquette in the classroom.

As research continues to grow in the area of cell phone perception within the classroom, very little research has been conducted examining cell phone texting and final grades.
Ellis, Daniels and Jauregui (2010) performed an experiment where half of a class of 62 students was allowed to text during a class lecture, while the other half was not. Students were tested at the end of class over that day’s lecture material. Even with the students’ understanding that quiz scores would be lower due to none of the students’ foreknowledge of having to take a quiz at lecture’s end, those who were allowed to text in class scored significantly lower on the quiz than those who were not allowed to text. This however was on one quiz at the end of the same class period and not cumulative knowledge throughout an entire course. Furthermore, students did not have a chance to study the material. It is the purpose of this study to examine final grades in an introductory social science course when students were placed into three conditions with varying classroom texting policies.

Based on the above research the following research questions were asked with the accompanying hypotheses:

1. Is there a correlation between in class texting activity and final grade?
2. If a correlation exists, can it be used to help predict final grades when attendance, ACT scores and entering GPA are controlled? And, if so, what is the unique contribution of each independent variable?

Method

This quantitative study examined final grade scores and in-class texting behavior. The convenience sample consisted of 119 students enrolled in three separate sections (n1=56, n2=34, n3=29) of a 3 credit hour, 15 week, introductory social science course at a small college in the Midwest. The college has a standardized attendance policy for all classes in which students are required to miss no more than 20% of the class to pass. Any student exceeding 20% of absences automatically fails the course. No participant in the sample exceeded the maximum absences allowance.

Following IRB approval, each section of the course was randomly selected for each treatment condition. Course Section 1 had a mild texting policy. Previous research was explained to Course Section 1, highlighting that other students and professors found cell phone usage in class to be rude and distracting (Campbell, 2006). The policy was placed in the syllabus stating that “Cell phones were to be turned off and not used during class. This is an issue of respect for others and your professor”. Course Section 2 had a strict cell phone policy. Per their syllabus and professor explanation, students would lose 3% of their final grade each time they were caught texting. This policy was reiterated in class throughout the semester to warn students to turn off their phones before class start. However, due to the need for true final grade analysis, no points were actually taken off of the student’s final grade. Course Section 3 had no presented texting policy and served as a control group. Students were free to have cell phones on and to text as desired.

At the end of the semester on the last day of class, students were given a pencil and paper survey asking about their frequency of texting behavior. Students were asked to put their names on the survey for coding purposes so that their GPAs and ACT scores could be matched. Students were given the option to not participate but were given an extra credit point toward their 100 point final for participation. All students willingly agreed and participated in the study. When finished, students placed their responses in an envelope. The pre-addressed envelope was then sealed and mailed to a third party for SPSS coding to assure confidentiality of the students. The third party coder also received the students ACT scores and entering GPA to match the information in SPSS. The ACT and GPA records were then destroyed while the surveys and a hard copy of the final grades were maintained.
In the survey, students were presented with a Likert Scale asking of texting frequency which included: Never (0 times this semester), Rarely (>3 Times this semester), Sometimes (1-3 times a week), and Frequently (More than 3 times a week). Each Course Section was misled to believe that there was a confederate to the experiment in their class posing as a fellow student to record their texting behavior. Each Course Section was then told that if they correctly answered their texting behavior on the survey as recorded by the confederate, they would receive an additional point toward their 100 point final. This misinformation was presented to each Course Section to help to control for social desirability and to promote honesty in response. Students in Course Section 2 (strict texting policy) were also assured that their professor would not see the raw data so no additional points would be taken off based on their survey reports. All students participating received 2 points toward their final, one for participation and one for correctness of response. Students were then debriefed via email and presented with experiment results.

Data was entered into SPSS by a third party who had no knowledge or affiliation to the participants or the college where the experiment was conducted. This was done to encourage anonymity of the participants through disassociation of the third party coder to their connection to the college or the experimenter.

Results

Participants

Participants in the study (N=119) were a convenience sample taken from a small college and consisted of 97 Freshmen, 17 Sophomores, 5 Juniors, and 0 Seniors. Females comprised 53% (n=63) of the sample with males comprising 47% (n=56) of the sample. The majority of the sample was Caucasian (81%), with 17% African American, and 3% Hispanic. The majority of students were enrolled on a full-time basis (91%).

Analysis

After all participants data were coded into SPSS, descriptive statistics for each of the Course Sections were tabulated. Table 1 represents descriptive statistics for in-class texting behavior per section based on the Likert Scale of in-class texting behavior. When coded into SPSS, the Likert Scale was weighted as: Never (0 times this semester) = 0, Rarely (>3 Times this semester) = 1, Sometimes (1-3 times a week) = 2, and Frequently (More than 3 times a week) = 3. The scores indicated for each group are the means and the standard deviation for each group on in-class texting behavior.

Table 1. Descriptive Statistics for Course Sections on In-Class Texting Behavior

<table>
<thead>
<tr>
<th>Course Section</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56</td>
<td>2.1</td>
<td>.99</td>
</tr>
<tr>
<td>2</td>
<td>34</td>
<td>2.0</td>
<td>.98</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>3.1</td>
<td>1.06</td>
</tr>
</tbody>
</table>

To explore the research question, a Pearson’s correlation in SPSS was performed to examine if a correlation existed between an individual’s texting behavior and final grade. The relationship between in class texting behavior and final grade was investigated using Pearson product–movement correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a strong medium-sized correlation between the two variables, $r = -.41, n= 119, p > .0001$, with greater in-class texting behavior being associated with lower final grade scores.

Since a correlation was present, hierarchical multiple regression was used to assess the ability of in-class texting behavior to predict final grade scores after controlling for the influence of attendance, GPA, and ACT scores. Preliminary analyses in SPSS were conducted to ensure no violation of the assumptions.
of normality, linearity, multicollinearity and homoscedasticity. GPA, ACT, and attendance were entered as Step 1, explaining 65% of final course grade. After entering in-class texting behavior at Step 2, the total variance explained by the model as a whole was 70%, $F (4, 95) = 21.97, p<.001$. The additional control measure of in-class texting behavior explained 5% of the variance in final course grade, $R^2$ change $= .05, F$ change $(1, 95) = 8.01, p<.001$. In the final model, only three of the control measures were statistically significant with GPA and ACT recording a higher beta value ($B = .35, p<.001$) and in-class texting behavior recording a beta value of $B = -.22, p<.001$. Attendance was not statistically significant as a contributor of final grade score with a beta value of $B = -.06, p<.001$.

Consequently, texting behavior was also negatively correlated to ACT scores and GPA. There was a small sized correlation between the in class texting behavior and ACT scores, $r = -.23, n= 119, p = .01$, with greater in-class texting behavior being associated with lower ACT scores. There was a stronger correlation shown between in class texting behavior and entering GPA, showing medium sized correlation between the two variables, $r = -.31, n= 119, p > .001$, with greater in-class texting behavior being associated with lower entering GPAs.

**Discussion**

The variables of in-class texting behavior and final grade score in a freshmen level, introductory social science class were the focus of this study. The purpose of this study was to examine any effects that in-class texting behavior had on the final grade score for the course. Factors contributing to academic achievement in college have been the focus of many research studies and meta-analyses (Munday, 1970; Betts & Morell 1999; Newman-Ford, Fitzgibbon, Lloyd, & Thomas, 1999; Cohn et al. 2003; Cornwell et al. 2005; Grove et al. 2006; Crede, Roch, & Kiesczynka, 2010). Academic attainment has been linked to various cognitive measures such as standardized tests, entering GPA and class attendance (Berry & Sackett 2009; Crede, Roch, & Kiesczynka, 2010). These cognitive factors represent a historical, empirically supported model of prediction. However, with the rapid expansion of the use of cell phones for communication, specifically texting, a study was needed to determine the effects of in-class texting behavior on academic success. Understanding how in-class texting behavior affects a student’s final grade in a course is essential. This study filled such a void.

Understanding Berry and Sackett’s (2009) research which argued that academic performance predictor models be used for individual classes rather than overall college GPA, a single freshmen level social science course, taught by the same professor, was selected for the study. Three Course Sections of this same course were given three different texting policies to elicit a variety of in-class texting behaviors. Course Section 1 had the texting policy where the students were educated about texting etiquette and reminded of the need to respect others in regard to cell phone usage. This Course Section had the highest mean final grade score of 81%. Course Section 2 ($M=77\%$) which had the most strict texting policy with punitive consequences for texting had the second highest final grade score. This offered justification to Burns and Lohenry (2010) pilot study where the researchers argued for the need for department/professor/student commutation that encourages courtesy and professionalism to optimal teaching and learning in the college classroom. Course Section 3, which had no texting policy for control, had the highest in class texting behavior; their mean final grade was 73%. Moreover, the mean differences in each Course Section were significant.

The differences in the mean texting behavior are of particular relevance since the study showed there was a negative correlation in
the relationship between in-class texting and final grade score. The more a student participated in in-class texting behavior, the lower their final grade. Consequently, since there was a negative correlation present, it was of importance to see how this fit into a model of predictability. It was important to see if in-class texting behavior still affected final grades negatively if other factors which were historically and empirically linked to academic performance were controlled.

In-class texting was significant in impacting grades after GPA, ACT, and attendance were controlled. While GPA and ACT were still the strongest predictor values, in-class texting behavior still contributed to 22% of the predictive value. Attendance had no significance in final grade. It must be reiterated that at this small college, attendance is still mandatory. However, this leads to a more important discussion on attendance and in-class texting.

While a student may be required to attend a college course, attendance is more than merely sitting in a classroom. Attendance should equate to actually interacting with the material and a deliberate awareness of the presented material. 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.

In this study, the most effective texting policy was Course Section 1, 81%. Course Section 1 had a texting policy which used education and respect as primary factors in texting during class. Course Section 2 relied on punitive measures, taking points away from students for texting. While the latter may seem to be more effective by producing fear in students for texting, it does require an excessive amount of recorded keeping and policing the classroom on the part of the professor. Burns and Lohenry (2010) maintain that educating students on the effect of texting in the classroom should be a cornerstone in institutional policies.

**Conclusion**

As technology advances, so will its benefits and troubles. It is up to colleges and universities to provide environments that are conducive to not only learning, but also to anticipatory professional socialization in the workplace. Requiring attendance is one way to do both. However, allowing students the freedom to monitor and use texting within the classroom does neither.

Future research should focus on the other effects of texting in the classroom as well as different classes that are geared toward those in a higher class ranking. Research investigating different in-class texting policies should be explored as well as replication studies that continue to explore the relationship between in-class texting and final grades. What is for certain is that technology will continue to grow and education must continue to grow with it.

**References**


