

Smartphone and App Usage Among College Students: Using Smartphones Effectively for Social and Educational Needs.

Dr. Gayle R. Jesse
gjesse@liberty.edu
Liberty University
Lynchburg, VA, 24515

Abstract

Smartphones and the applications (Apps) that can be downloaded to smartphones are inventions that keep individuals connected to society, especially college students. This paper discusses the relationships between smartphone usage and the effects smartphones have on student's social lives, education lives, and physical activity. Furthermore, it explores student preferences on their most and the least useful smartphone apps. There are four main purposes of this study: determine the preferred smartphone operating system among college students, Apps college students use most and least, primary app used, and social media app usage. This study involved comparing data collected via survey from 395 students at two academic institutions during the Spring 2013 semester. This explanatory study yielded four significant findings; prefer Android preferred Operating System, approximately 25 apps installed, most useful apps are Utility Apps; least useful are Travel Apps, most used are Social Media, open Primary app 6 times a day, and Facebook is the primary social media app. Overall, this research study informs the IS community and educators because knowing how to connect to students helps IS educators engage students in the classroom. Smartphones and their apps are two technologies that impact a student's education and psychological well-being.

Keywords: Cellphones, Smartphones, App Usage, Mobile Technology, Social Needs, College Students

1. INTRODUCTION

It is no surprise that Post (2011) found that 99.8% of college students have cellphones. College students feel either cellphones or smartphones are an essential to survive. Today, many students primarily use smartphone for texting and running apps, phones are rarely used to make phone calls. The number of college students using their cellphones during class has increased over the last few years. 80% of students admit to texting at least once in class (Jesse, 2013). Furthermore, smartphone social media apps give the user the ability to check their social media sites anywhere, anytime instead of having to sit in front of their computer screen. Peterson (2011) stated apps are a portable way to stay connected to social media and 97% of smartphone users use apps for social networking

purposes. Cellphone apps have added new features to entice the mobile users as well, like location tagging and status updates. Many students will put exactly where they have been or where they're going on social media and then tag their friends. Although this is scary and not practicing safety, features like these on apps are being used continually by many college students to show their social media friends exactly where they're going. Additionally, app usage of games is also widely accessed among the smartphone community. Laird (2012) conducted a study and reported that 55% of students use gaming apps either regularly or as a leisure activity on their smartphones. Cellphones are used while waiting in line at the coffee shop, searching various topics on Google, keeping track of homework assignments and staying connected to friends from school and friends at home. The increasing use of smartphones and apps affects students.

This research paper will further explore the trends of cellphone and application usage among college students of today. Specifically, this study explored four objectives: preferred operating system, primary app used, most and least useful apps, and social media app usage.

2. LITERATURE REVIEW

Student Learning (Advantages and Disadvantages)

Epstein (2013) researched a clinical practice and how they used cellphones during a therapeutic process by making it more of an individual experience. They incorporate cellphones by recording the patients with their cellphones and then helping individuals with their behavior. According to Epstein (2013), mobile technology is the single most rapidly embraced technology in world history. Additionally, "cellphones are very convenient, easy to carry, and readily integrated into a user's routine and many people have their phone with them during all waking hours" Epstein (2013). Furthermore, a student with social anxiety could use a cellphone to practice a speech to their class by talking on their phone. Epstein (2013) also in this clinical study found that app usage could possibly help improve completion of homework. Further findings were related to text messages, Epstein (2013) found that texting helped the participants to complete homework, enhance therapeutic alliance, improve self-efficacy, and increase their overall positive feelings about themselves. Additionally, Elder's (2013) study explored college students self-reported cellphone usage and beliefs and investigated the effect on student learning. Elder (2013) reported that 85% of university faculty and students both said cellphones were distracting and 45% noticed that vibrating phones in the classroom were problematic. The study described how cellphones have become capable of many more components than just phone calls and college students are now multitasking in classes by texting and listening to the professor's lecture. Chen (2013) researched the educational versus non-educational app usage among college students. Findings include: 58% of the college students used their mobile devices for academic purposes and freshman and sophomores tended to use their mobile devices for educational use. Baker's (2012) study was based on the cellphone use and other electronic devices in the classroom. Baker (2012) found that 45% of students reported spending more than 4 hours a

day on their cellphone. Tulane's (2010) study asked students questions related to cellphones and their usage. The study found that the amount of text messages college students send and receive range from 2 to 25,543 a month with an average of 1,960 texts. Furthermore, cellphone usage is changing how people act in public; texting is used to fill time and the individuals partaking in this do not think their actions are unacceptable.

Even though college student app usage is high, it is not necessarily a bad thing. Nahorniak (2012) explained how professors and students created an app for their finance class to allow them to experience what it is like trading on the floor. Nahorniak (2012) concluded that the app was beneficial to the students, an advantage. The app connected the theories and economic laws being taught in classes by putting students in a simulated situation, which allowed students to develop a better understanding of the workings of markets and the foundations of economic theory. eCycle (2012) also discussed the advantages and disadvantages as learning and teaching tools. Smartphone apps allow college students to access information quickly, thus increasing their college performance. eCycle (2012) states that smartphones can help students create flash cards, make presentations, instantly get answers to questions, record films, record voice, and then send them to their computer. Disadvantages discussed by eCycle (2012) are cost, size of device, battery life, and usability (small keypad making it hard to type). eCycle (2012) explains how administrators should reconsider allowing students to use their phones in class because they can be quite usable in an educational setting, especially since laptops are bigger and less portable than cellphones. Additionally, cellphones could be a good teaching tool to use in the classroom. The first example is the Dropbox app, students use the Dropbox App for file sharing within the classroom. Teachers can use Dropbox to distribute handouts quicker and use less paper helping teachers with another aspect of teaching. It should also be mentioned that Dropbox works on PC's. Therefore, when logged into your PC Dropbox account, the files on your phone Dropbox account can also be seen on your PC Dropbox account. A second example is Evernote, students can use this App to review their lecture notes after class is over. Finally, eCycle (2012) stated that students can also use their cellphone camera to take pictures of the

black/white board or to record their professors' lecture during class to review later.

App Usage versus Smartphone Web Browser

Tally (2012) conducted a study comparing the student preference of apps compared to smartphone web browsers and found that when students want to check the weather they go to the weather app instead of a web browser. These results suggest that the students want to use apps over a regular web browser; furthermore, in Tally's (2012) study 85% of students answered that they preferred the app over the web. Bowen (2012) also determined that students spend more time on mobile apps than smartphone browsers and stated the following: "overall, students reported spending more time using mobile apps, and as students become more advanced in their use of smartphones, the gap widens- the amount of time spent using mobile apps increases, while the amount of time spent using a smartphone browser remains relatively consistent". Due to the increase in App usage, EMarketer's (2012) conducted a study that researched which apps college students used the most. EMarketer (2012) found that most smartphone owners use their apps for communication and social media. More specifically, 21% of college students use their smartphone for communication and 19% use their social networking apps with Facebook being the most commonly used.

Nomophobia – Psychological Effects of Cellphones

Hingorani's (n.d) study was to find out how smartphones support students' lives and the issue of "nomophobia" (short for no-mobile-phone phobia) which is the fear of being without a mobile phone. Results showed that students do not view their phones for just texting and calling; smartphones are used for social media, music, recording, gaming, etc. Hingorani (n.d) stated that students feel like they can multitask when using smartphones in the classroom and professors should not get upset. Additionally, Hingorani (n.d) stated that students use their cellphones to feel connected with each other and without that connection their lives would be impacted negatively. Hingorani's (n.d) study found that many students' answers to the survey showed they could have "nomophobia" and it impacts their lives. Beaver (2010) did a study on cellphone use asking a sample of

college students to go without their cellphones for two days and the results showed that students experienced great distress.

Berger's (2013) study showed that students who use cellphones both more in class and out of class get lower grades than their peers who use their phones less. The study survey consisted of 500 undergrad students with a range of majors. Berger's (2013) findings were as follows: students who used cellphones more had lower grades and higher anxiety and were less happy than students who don't use their cellphone as often. Smith (2013) also determined that students who use their phone more had a lower GPA and higher anxiety. One student in Smith's (2013) survey stated: "The social network sometimes just makes me feel a little bit tied to my phone. It makes me feel like I have another obligation in my life that I have to stick with. Sometimes the cellphone just makes me feel like it is a whole new world of obligation that I have because anybody can get a hold of me anytime by just thinking about me. If my mom wanted to give me a call right now and just talk for a second, she could. And if I did not call her back by the end of the day, she would get worried. It creates a bit of anxiety and it is kind of annoying sometimes". The majority of Smith's (2013) respondents said they depended on their phone, it gave them anxiety when they had to go without it for a certain period of time, and they felt obligated to have to carry their cellphone around at all times.

Martin (n.d.) conducted a study to determine if cellphone usage affects the student's concentration in class and the amount of information they actually receive with the distraction of cellphones. Students responded that cellphone usage in class affects their concentration and the information they receive, but they feel more comfort when they can check their cellphone in class. Martin (n.d) also found that the two most commonly used cellphone features were to text and the clock to check the time. Martin (n.d.) concluded that 45% of students frequently hide their cellphone usage in class and 41% of students are ready to concentrate after they check their phone during class. Weimer (2014) also discussed how distracted students are by their cellphones. Weimer (2014) stated that students really cannot multitask and cellphones are a distraction in the classroom; "students who use their mobile phones during class lectures tend to write down less information, recall less information, and

perform worse on a multiple-choice test than those students who abstain from using their mobile phones during class". Weimer (2014) also discussed how students think they can use their phone and do everyday tasks like eating, driving, etc., and it won't affect their performance of the second activity at all. Weimer (2014) provided suggestions on how to get students to put away their phones and pay attention in class, but ultimately felt that there really is not a good way to get someone to stop using their phone in class.

Relationships

Tulane (2010) publication states that texting can be used for many purposes of communicating and that many text messages sent are to maintain interpersonal relationships. Beaver (2010) also found that cellphones impact relationships. More specifically, African Americans were more bothered by their partner using their cellphone more than Caucasians. Beaver (2010) also noted that many individuals view cellphones as a safety device for parent and child because parents typically fear for the physical safety of their child.

Fitness

Fitness app usage has grown by 87% compared to other apps; however, the predominate users are women ages 25-54, which are not typical college students (Russell, 2014). Thomas (2013) discussed the relationship between cellphone usage and fitness in college students. Thomas hypothesized that students would use their cellphones during physical activity because they are more portable than a television, but his findings were the opposite. Thomas stated "despite the phone's mobility, high use contributed to a sedentary lifestyle for some subjects". Thomas also found that students who had very high cellphone usage also had low cardiorespiratory fitness and the students who were the least fit would spend most of their time on their cellphone. Thomas concluded that "their findings suggest that cellphone use may be able to gauge a person's risk for a multitude of health issues related to an inactive lifestyle". Hamilton (2013) also discussed how cellphone use among college students leads to poor fitness by explaining how high cellphone use contributed to a sedentary lifestyle. Students who spent up to 14 hours on their cellphones were less fit than those who averaged 90 minutes of cellphone use daily. Furthermore,

students who spent a lot of time on phones, often spent their leisure time playing video games and watching movies, which also is not very active. Hamilton (2013) also determined that students were more inclined to pass up going outside or doing any type of physical activity to get on a social networking site instead. Finally, students who used their phones less agreed that they were more motivated to do physical activity and contacted physically active friends to do things together.

Race and Gender Usage Differences

Beaver's (2010) Asians tend to use their devices to complete assignments more than other groups, males use apps for academic purposes more than females, and age has a small but significant impact on the use. This study also found that Caucasians were more likely to regularly use their cellphones than African Americans. Additionally, Beaver's (2010) study reported that African Americans were twice as likely as Caucasians to be annoyed by their partner using a cellphone when the two were together.

Tulane (2010) explored the difference in cellphone usage between males and females. The publication reported that females average more texts a day than males, females use texting as a form of relaxation and escape more than males, and females are more likely to use texting to connect with other individuals than males. Beaver's (2010) study found that females had higher cellphone use than males.

3. METHODOLOGY

Research Design

"This explanatory study was designed utilizing quantitative methods. Conducting this quantitative study involved administering a survey in three phases. The first phase consisted of developing a survey instrument. The second phase included testing the survey with one Thiel College student, which determined the time needed to complete the survey. Finally, the third phase entailed distribution to traditional college-aged Thiel College and Robert Morris University students. The survey research maintained an objective approach. Four software products were used: Moodle Learning Management System, e-mail, SurveyMonkey, and Microsoft Excel" (Jesse, 2013).

Participants

This study involved two target populations: Thiel College (TC) and Robert Morris University (RMU). Both institutions were used as a convenience sample. The survey was distributed to the entire Thiel College population, while only students in the School of Communications and Information Systems at Robert Morris University were asked to complete the survey. At RMU, the School of Communications and Information Systems consists of the following five departments: Communications, Computer and Information Systems, English Studies and Communications Skills, Organizational Leadership, and Media Arts. Thiel College (Greenville, PA) and Robert Morris University (Moon Township, PA) are both located in western Pennsylvania about 70 miles apart. The participation statistics are listed in the Appendices, which provides the Spring 2013 enrollment statistics for both schools. The response rate was approximately 30% at TC and 11% at RMU, averaging a 21% response rate.

Survey participants volunteered to respond by clicking on a SurveyMonkey link distributed via three e-mails sent by the researcher (professor recruitment). Eligible participants were at least 18 years old and enrolled at Thiel College or Robert Morris University. Engaging participants from the entire Thiel College population reflected a true representation of the college's student body across multiple majors and their views on smartphones and apps. However, due to time constraints, only students in the School of Communications and Information Systems at Robert Morris University were invited to complete the survey.

Survey Instrument

"The survey was conducted via surveymonkey.com link. The survey instrument developed for this study was derived from multiple sources and included both validated (surveymonkey.com) and non-validated questions (author created). The initial survey was divided into the following six sections: Consent Form; Demographic Information; Social Media; Smartphones; E-Readers & E-Textbooks; Thank you" (Jesse, 2013). While the survey instrument covered three main sections, Social Media, Smartphones, and E-Readers & E-Textbooks, only the Smartphones results are considered in this paper.

4. RESEARCH QUESTIONS

A significant amount of research has been conducted on the effects of cellphone use among college students. The use of cellphone has caused a dramatic shift in how society uses cellphones. As a society, this shift has gone from occasional cellphone use to constant cellphone use. This shift can be contributed to the fact that individuals have transitioned from using a cellphone without Internet to smartphone with an Internet connection. Due to the many smartphone capabilities, the increased usage of smartphone grew the fastest exponentially when compared to other technologies. Therefore, this study had four objectives: preferred operating system, primary app used, most and least useful apps, and social media app usage. The information and research presented in the Literature Review section, in conjunction with the administration of a survey described in the Methodology section, provided insights to answer seven Research Questions (RQ).

Research Questions

The purpose of this study was to explore app usage among college students. The seven research questions to be answered are as follows:

RQ1: Do college students prefer the Android or Apple operating system for their smartphone?

RQ2: How many apps are typically installed on college students' cellphone?

RQ3: What apps are most useful to college students?

RQ4: What apps are least useful to college students?

RQ5: What apps do college students use the most?

RQ6: How often do college students enter into/use their primary app in a day?

RQ7: What Social Media app is primarily used among college students?

5. DATA ANALYSIS AND DISCUSSION

Microsoft Excel software was utilized to calculate the percentage-based statistics reported in this

study; all results exclude the system missing responses and (N=XXX) represents the number of responses. Appendix A contains the demographic statistics of age, gender, race, grade point average (GPA) on a 4.0 scale, and college majors reported in 2013 from both Thiel College (TC) and Robert Morris University (RMU). The survey results are displayed in two ways: percentage for each school and average percentage between the two institutions. The average percentage between the two institutions was calculated by adding the TC and RMU percent together and then dividing the answer by two. The researcher determined that calculating the average percentage between the two institutions reflected the best overall statistical survey findings for the information systems community. Therefore, Tables 1-7 in the appendix display the response percentages and average percent between the two learning institutions.

RQ1: *Do college students prefer the Android or Apple operating system for their smartphone?* As a whole, the research indicated that 52% of college students own a smartphone with an android operating system and 48% iOS. When looking at data separately per institution, the results were reversed by approximately 10% with Thiel College preferring Apple over Android and Robert Morris preferring Android over Apple. However, this is a limitation to this study because of the different samples size from each institution. See Appendix, Table 1.

RQ2: *How many apps are typically installed on college students' cellphone?* RQ2 found the average college student has 30 apps installed with a median number of apps being 25. See Appendix, Table 2.

RQ3: *What apps are most useful to college students?* The surveys found that Utility apps are the most useful to college students. The second and third most useful apps are Social Networking and Weather apps respectively. See Appendix, Table 3.

RQ4: *What apps are least useful to college students?* The data gathered from the surveys determined Travel apps to be the least useful apps to college students followed by Sports and Entertainment. See Appendix, Table 4.

RQ5: *What app do college students use the most?* The researcher discovered that the average college student uses Social Media and Mail & Messaging the most. The third most useful app was where the data indicated a change; Thiel College student preferred Game apps and Robert Morris students used their Web Browsers. See Appendix, Table 5.

RQ6: *How often do college students enter into/use their primary app in a day?* RQ6 found that on average college students enter into their primary app 11 times a day and the

median was 6. See Appendix, Table 6. A primary app is an app that is used the most.

RQ7: *What Social Media app is primarily used among college students?* The data indicated Facebook was the primary social media app amongst college student followed by Twitter and Pinterest. See Appendix, Table 7.

6. LIMITATIONS

This study had two limitations. The first limitation was that both schools were located in western Pennsylvania and only about 70 miles apart. The second limitation involved the distribution of the survey. The entire population at Thiel College was given the opportunity to take the survey, while only students in the School of Communications and Information Systems at Robert Morris University were asked to complete the survey. Due to the sample sizes at the schools involved being very different, 83 at one school and 302 at the other, this could impact some of the general conclusions made in this paper as noted in RQ1.

7. CONCLUSIONS / FINDINGS

This study provides practical insights for the field of computer information systems by exploring college student smartphone usage and the effects smartphones have on college students. The seven research questions in this exploratory study found the following statistics and some were considered to be significant.

Objective 1: Preferred Operating System

RQ1	
52%	Own a smartphone with an android operating system
48%	Own a smartphone with an iOS operating system

Finding:
 Students prefer the Android Operating System.

Objective 2: Primary App Used

RQ2	
30	Apps installed on average
25	Apps installed is the median

Finding:
 Students have around 25 apps installed on their smartphones.

Objective 3: Most and Least Useful Apps

RQ3: Most Useful

74.20%	Utility apps (calculate, convert, translate, etc.)
73.65%	Social networking apps (location check-ins, friend status updates, etc.)
69.75%	Weather apps (local forecasts, natural disaster updates, etc.)

RQ4: Least Useful	
57.35%	Travel apps (airplane tickets, tourist guides, public transportation info, etc.)
40.90%	Sports apps (sports schedules, scores, headlines, etc.)
36.50%	Entertainment apps (movie trailers, celebrity gossip, radio station guides, etc.)

RQ5: Use the Most	
47.25%	Social Media (Twitter, Facebook, Instagram, Pinterest)
14.57%	Mail & Messaging
4.35%	Actual - RMU - Web Browser
7.25%	Actual - Theil - Games
RQ6: Use Primary app every day	
11	Times per day on Average
6	Times per day Median

Finding:

Students most useful apps are Utility Apps, least useful are Travel Apps, used the most are Social Media, and they use their Primary app about 6 times a day.

Objective 4: Determine Social Media App Usage

RQ7: Primary Social Media App	
82.95%	Facebook
62.25%	Twitter
29.15%	Pinterest
9.90%	None

Significant Finding:

Students choose Facebook as their primary social media app.

Additional Findings:

The following three additional findings are based upon other Survey Questions (SQ) that the researcher asked, but were not an objective of this study.

SQ18: Do you personally own/have a Smartphone? [A Smartphone is defined as a cellular telephone with built-in applications and Internet access. In addition to digital voice service, smartphones provide text messaging, e-mail, Web browsing, still and video cameras, MP3 player and video playback and calling. (PC MAG.com)]		
RMU	88% own a smartphone	100 responses
Theil	81% own a smartphone	281 responses

SQ25: Have you used a social media site on your Smartphone while the teacher was teaching in class? (Social Media use was not a required part of the class at that time.)		
RMU	60% use social media on Smartphone during class	83 responses
Theil	67% use social media on Smartphone during class	219 responses

SQ26: Have you sent a text message from your phone (any type of phone) while the teacher was teaching in class?		
RMU	77% sent a text message during class	95 responses
Theil	83% sent a text message during class	274 responses

Overall, the results of this study should be used to inform the information systems community and individuals working in education because students study habits are constantly changing due to the majority owning a smartphone and knowing that this technology can positively impact a college student's education. The current generation of users is considered iGeners, which means the children in classrooms today are tomorrow's work force and they are always "plugged-in" (Ferriter and Garry, 2010). This exploratory research study found that over 80% of the population has purchased a smartphone and how students use their phone differs from the traditional way phones were designed to be used.

Furthermore, research indicated that the most popular apps are social networking and games, which could have been probably guessed. Additionally, students tend to only use their cellphones for apps and texting and not everything else the phone is capable of doing including actually making phone calls to others.

However, students are still using their cellphones for communication and to stay in touch with each other; students have discovered a new way of staying connected with their friends. The times of walking down the street to meet someone have gone away because now students simply text their friends to communicate and, when friends are simply a click away, feel secure and safe, which is a basic need of humans.

In summary, with the research gathered, disadvantages to increased cellphone usage include hindering classroom performance because college students are consistently on their smartphone and the usage keeps increasing. The increased usage could possibly cause students to develop more problems on their education journey thus resulting in dropping out of college and reducing the number of college graduates. Another disadvantage to increased smartphone use is that it is causing students to experience anxiety because they have the constant need to have their phone on them at all times. Finally, further disadvantages to a student using their phone in class include that it is both a distraction and annoyance to the other students and teacher because it shows lack of paying attention.

This study found several advantages to increased cellphone usage which includes phones being used as teaching and learning tools to benefit the students by being able to teaching to the different learning styles. Students are able to simply pull out their smartphone and open an app to study their notes for classes. Further added benefits to increased smartphone use for educational purposes are not wasting paper and the ability to keep information for a longer period of time and access it at anytime and anywhere. The researcher's personal observation of students has determined that the majority of college students use their apps for academic purposes. The researcher suggests that college students should continue using their smartphone to study if it helps them to get better grades because getting better grades would cause students to have a more positive outlook on life and ultimately continue to achieve their academic goals.

It is very apparent that iGeners are very technologically savvy; however, the overall state of literature provides evidence that students use their cellphones with high frequency and this

could cause problems in education. Further research needs to be conducted to determine if problems in education could arise due to increased smartphone use. However, in my observation and small discussion with iGeners, I have concluded that iGeners are so busy that they do not have time to participate in surveys to gather the actual research that needs to be conducted on this topic to eliminate the gaps in the research. Finally, in light of the research conducted, the researcher has a very important warning to express that people should be aware when using technology such as e-mail/texting/messaging and social media. When sending e-mails, message, or posting to social media, watch your typed words or remember to use netiquette when using digital technology. The researcher has sent several e-mails/messages and regretted the instant the send button was clicked. Therefore, a suggestion is to write the e-mail, save it as a draft, and then re-read the e-mail sometime later to ensure the typed words bring clarity and not damage to the recipient. In regards to social media posts, the researcher suggests the following: think before you post, imagine the recipient is sitting next to you, remember when you are online you are in a spotlight of visibility and everyone can read what you post, ask yourself if you really have the right to address to subject being discussed, ask yourself if you have a close enough relationship with the person that they will understand your opinion, and when you do you post/write let your "written words" be filled with grace or positive thoughts, so that you make the most out of every opportunity of interaction with others.

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Appendices

Table 1. RQ1: Preferred Operating System

Q18: What operating system (O.S.) is on your Smartphone?	TC (N=219)	RMU (N=83)	Average (N=302)
Android	47.10%	57.80%	52.45%
Apple	52.90	42.20%	47.55%

Table 2. RQ2: Number of apps installed on cellphone

Q19: About how many apps do you currently have on your smartphone?	TC (N=214)	RMU (N=81)	Average (N=295)
Average	27	33	30
Median	20	30	25

Table 3. RQ3: Most useful app

Q20: Which types of apps are most useful to you?	TC (N=218)	RMU (N=84)	Average (N=302)
Utility apps (calculate, convert, translate, etc.)	73%	75.00%	74.20%
Social networking apps (location check-ins, friend status updates, etc.)	79%	67.90%	73.65%
Weather apps (local forecasts, natural disaster updates, etc.)	69%	70.20%	69.75%
Game apps (puzzles, charades, etc.)	67%	52.40%	59.70%
Productivity apps (calendar, to do list, price checker, etc.)	51%	61.90%	56.20%
Search tool apps (directions, phone numbers, recipes, etc.)	45%	46.40%	45.90%
Sports apps (sports schedules, scores, headlines, etc.)	40%	39.30%	39.60%
Entertainment apps (movie trailers, celebrity gossip, radio station guides, etc.)	36%	41.70%	38.75%
News apps (local news, national headlines, technology announcements, etc.)	30%	40.50%	35.15%
Travel apps (airplane tickets, tourist guides, public transportation info, etc.)	12%	11.90%	11.90%

Table 4. RQ4: Least useful app

Q21: Which types of apps are least useful to you?	TC (N=209)	RMU (N=75)	Average (N=284)
Travel apps (airplane tickets, tourist guides, public transportation info, etc.)	58.70%	56.00%	57.35%
Sports apps (sports schedules, scores, headlines, etc.)	49.30%	32.50%	40.90%
Entertainment apps (movie trailers, celebrity gossip, radio station guides, etc.)	33.30%	39.70%	36.50%
News apps (local news, national headlines, technology announcements, etc.)	24.00%	34.00%	29.00%
Game apps (puzzles, charades, etc.)	26.70%	23.90%	25.30%
Search tool apps (directions, phone numbers, recipes, etc.)	16.00%	12.40%	14.20%
Social networking apps (location check-ins, friend status updates, etc.)	17.30%	11.00%	14.15%
Productivity apps (calendar, to do list, price checker, etc.)	9.30%	15.80%	12.55%
Weather apps (local forecasts, natural disaster updates, etc.)	9.30%	6.70%	8.00%
Utility apps (calculate, convert, translate, etc.)	5.30%	9.10%	7.20%

Table 5. RQ5: App most frequently used

Q22: What is the name of the app you use the most on your smartphone?	TC (N=207)	RMU (N=80)	Average (N=287)
Social Media (Twitter, Facebook, Instagram, Pinterest)	57.00%	37.50%	47.25%
Mail & Messaging	2.90%	26.25%	14.57%
Web Browser	4.35%	7.50%	5.92%
Games	7.25%	3.75%	5.50%
Music Apps	4.83%	6.25%	5.54%
System (Calendar, Alarm, Notes, E-mail, Camera, maps, flashlight)	5.80%	3.75%	4.77%
Sports	2.90%	5.00%	3.95%
Weather	5.31%	1.25%	3.28%
Miscellaneous Apps (App mentioned only one time)	5.31%	1.25%	3.28%
Nutrition/Health	1.93%	2.50%	2.22%
Reading apps	1.45%	2.50%	1.97%
News	0.97%	2.50%	1.73%

Table 6. RQ6: App most frequently used

Q23: How often do you enter into/use your primary app in a day on your smartphone?	TC (N=200)	RMU (N=80)	Average (N=280)
Average	11.50	9.99	10.74
Median	6.00	6.00	6.00

Table 7. RQ7: Primary Social Media App

Q24: Select ALL that apply. Which of the following Social Media Apps do you use on your smartphone?	TC (N=218)	RMU (N=84)	Average (N=302)
Facebook	81.00%	84.90%	82.95%
Twitter	54.80%	69.70%	62.25%
Pinterest	26.20%	32.10%	29.15%
None	14.30%	5.50%	9.90%
Other	81.00%	84.90%	82.95%

Participation Statistics for Thiel College (TC) and Robert Morris University (RMU)

	TC (Entire Population)	RMU (School of C & LS.)	Average Participation
Total Enrollment	981	931	1912
Consent Agreement & >18 years old	291	104	395
Percent of population surveyed	30%	11%	21%

Demographic Statistics for Thiel College (TC) and Robert Morris University (RMU)

Age	TC	RMU	Gender	TC	RMU	GPA	TC	RMU
18	17.2%	6.8%	Male	40.1%	64.7%	A (4.0 & >)	17.1%	28.2%
19	27.0%	15.5%	Female	59.2%	35.3%	A/B (3.5)	27.2%	40.8%
20	26.0%	17.5%				B (3.0)	28.9%	22.3%
21	16.6%	18.4%	Race	TC	RMU	B/C (2.5)	21.3%	8.7%
22	8.8%	6.8%	White, Caucasian	85.9%	91.2%	C (2.0)	2.4%	0.0%
23	0.3%	3.9%	White, non-Hispanic	2.8%	1.0%	C/D (1.5)	1.4%	0.0%
24	0.3%	1.0%	African-American	6.0%	5.9%	D (1.0)	0.3%	0.0%
25-30	0.3%	15.5%	Hispanic	2.5%	0.0%	Don't know	0.7%	0.0%
30	2.4%	14.6%	Asian-Pacific Islander	0.4%	1.0%			

